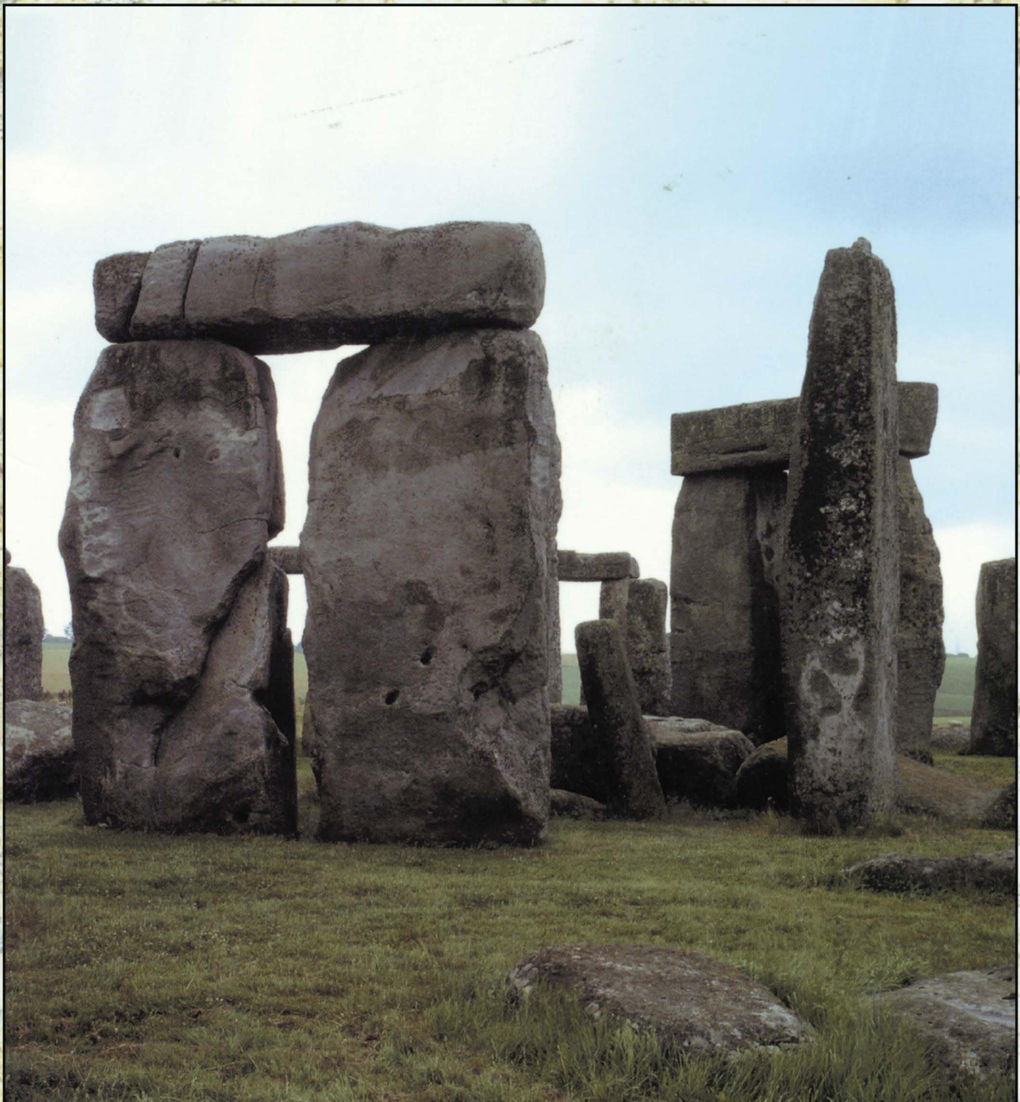
# STONEHENGE

## in its landscape

*Twentieth-century excavations*

R M J Cleal, K E Walker, and R Montague



ENGLISH HERITAGE

# STONEHENGE

## in its landscape

*Twentieth-century excavations*

Rosamund M J Cleal, K E Walker, and R Montague

with major contributions by
Michael J Allen, Alex Bayliss, C Bronk Ramsey, Linda Coleman,
Julie Gardiner, P A Harding, Rupert Housley, Andrew J Lawson,
Gerry McCormac, Jacqueline I McKinley, Andrew Payne,
Robert G Scaife, Dale Serjeantson, and Geoff Wainwright

ENGLISH HERITAGE
1995
ARCHAEOLOGICAL REPORT 10

# Preface

Stonehenge and the cultural landscape within which it stands is unique; there is no other monument or landscape like it anywhere else in the world. Within an area of less than two square kilometres are hundreds of prehistoric monuments built between 5000 and 3000 years ago. At the centre of this landscape stand the remains of the stone circle itself, with its huge uprights and lintels of local sandstone and the smaller Bluestones – transported from the Preseli Hills in Pembrokeshire, some 385km distant. On account of its particular international importance, Stonehenge and its landscape are part of a UNESCO approved World Heritage Site within which over 450 archaeological monuments of national importance can be identified.

In hindsight, for such an important monument, Stonehenge has not received the sympathetic management is so richly deserves. Concepts of management have changed and what was previously considered to be appropriate is now demonstrably inadequate to meet modern needs. Whilst it is the most visited prehistoric monument in Britain, the Public Accounts Committee of the House of Commons has rightly condemned its inadequate and inappropriate visitor facilities as a national disgrace. English Heritage and the National Trust agree wholeheartedly that something must be done to improve the conservation and the visitor facilities of Stonehenge and its landscape. Central to the implementation of this programme is the relocation of the existing visitor facilities to a site further away from the stones and the reunification of Stonehenge and its landscape by the removal of the roads which run close to the monument and bisect the landscape. It is also remarkable that despite years of excavation this century – in which almost half the area of the monument has been investigated – there has never been published a definitive account of Stonehenge based on the primary archaeological records. For a monument of such importance the lack of a full report on the investigations carried out this century is totally unacceptable. It was clear to us at an early stage in the development of a new management strategy for the monument and its landscape that the ordering of the archive of the investigations which had been undertaken and the preparation of a report on the results were essential elements in the overall plan. In 1993 English Heritage therefore commissioned such a study from Wessex Archaeology with a clear brief to organise the site archive and produce such a report.

This volume is the first comprehensive account of Stonehenge and presents in detail the evidence for its structural history. The presentation of the evidence is of fundamental importance to anyone who wishes to understand the monument or wishes to advance a new theory. New questions about the site have been raised as a result of this work and will be addressed in a carefully designed research project that will approach the issues with the battery of scientific techniques which are now available. That research programme will proceed alongside the implementation of our management initiatives and will enhance our understanding and appreciation of what is truly our greatest prehistoric monument.

***Jocelyn Stevens***
Chairman, English Heritage
March 1995

# Contents

# Illustrations

**Plans in wallet**

# List of Tables

## Colour Plates

# Acknowledgements

This volume is the outcome of a series of projects aimed both at defining and organising the various disparate archives resulting from the twentieth-century excavations at Stonehenge and at producing a definitive report on those excavations. These projects were initiated by Andrew Lawson, in collaboration with English Heritage, who has remained a driving force throughout the course of the work. Various stages of the overall programme have been managed for Wessex Archaeology by Andrew Lawson, Susan Davies, and Julie Gardiner.

The work has involved many individuals and organisations and has enlisted help from many quarters. First, the authors are grateful to Peter Berridge and Margaret Ehrenberg, former research assistants of Professor Atkinson's, who undertook much of the initial sorting and indexing of information in the late 1970s and whose painstaking work provided the framework for much of our analysis.

Assessment of the archives was undertaken by Frances Healy and two of the principal authors, Rosamund Cleal and Karen Walker, and the major tasks of structuring and coordinating the archives, assigning context numbers and descriptions, and compiling basic site databases and matrices by Karen Walker and Rebecca Montague. The analysis of finds and other archive material was carried out at Salisbury and South Wiltshire Museum, Salisbury, with the help and cooperation of the Curator, Peter Saunders and Keeper of Archaeology, Janet Bell. Margaret Brooks, English Heritage Conservator, conserved the bone skewer pins.

We would like to thank Bob Bewley, RCHM(E) for commenting on and supplying aerial photographs, providing a copy of the RCHM(E) survey of Stonehenge area, and arranging for a flight over Stonehenge during August 1994; Roy Canham, Wiltshire County Archaeologist, for providing unpublished Historic Landscape information and other data; Mark Corney, RCHM(E) for information on the West Amesbury end of the Avenue prior to publication and other advice; Roy Entwistle for providing unpublished information on various environmental sequences; Stephen Briggs for providing prints of some of Hawley's original photographs; Annie Mildred for cataloguing the Atkinson photographic archive; Ian Barnes for his assessment of the aerial photographic cover; and Anna Stanford for analysis of English Heritage's graphics archive.

The staff of all the museums and other institutions visited or contacted during the project are warmly thanked for their assistance and for granting permission to use copyrighted material where appropriate. Much practical help was provided during the project by the following Wessex Archaeology staff: Christine Butterworth, Andrew Crockett, Rachel Griffin, Caron Newman, and Sarah Wyles, and in the final stages of preparation of the report by Christine Butterworth, Melanie Gauden, Erica Hemming and Moira Laidlaw. Help and advice in a number of areas was provided by English Heritage staff, namely David Batchelor, Brian Attewell, Mike Corfield, Brian Davison, Clewes Everard, and Sharan White.

Specific assistance and advice were obtained from R Bevins and D G Jenkins, National Museum of Wales (bluestone sources), Andrew Coombes, Salisbury College (CAD), John Davies and Sue Margeson, Norwich Castle Museum (bone objects), Clive Gamble and Lars Larssen (Mesolithic pits), Richard Macphail and Mark Robinson (environmental data), Stuart Needham (sandstone object), Stuart Piggott (archival details), Andrew Sherratt, Ashmolean Museum (chalk objects), Andrew Tucker, Devizes Museum (identification of bluestone), Roger Mercer, University of Edinburgh (finds archive), and the Library of the Society of Antiquaries of London (Gowland and Hawley archival information).

Dale Serjeantson is grateful to Mary Iles for her assistance with recording the antlers and Kate M Clark and A J Legge for advice. Mike Allen would like to thank John Evans for discussing the molluscan sequences. Rosamund Cleal would like to thank Isobel Smith and Peter Woodward for information on earlier prehistoric pottery. Comments were kindly provided on drafts of the various specialists reports by S Davis and A J Legge (antler), G W Dimbleby (pollen), A David (geophysical), J G Evans (environmental), J Hather (plant remains), S Payne (animal bone), and A Stirland (human bone).

We are particularly grateful to the academic referees who read and commented so thoroughly on the final draft and who have provided much actual and moral support: Richard Bradley, John Evans, and Geoffrey Wainwright. Additional comments were provided by Andrew Powell, and final editorial comments by Ellen McAdam, to both of whom many thanks.

It goes without saying that all the contributors to this report are heartily thanked for their work and especially for striving so hard to meet tight deadlines while dealing with such difficult archive material. The illustrations in this report were mostly produced by Linda Coleman using CAD. Such were the difficulties encountered in using the archive (as discussed in the text) that much of the written report could not have been produced without her very detailed analysis and digitising of a vast amount of the original drawn archive. She is thus duly acknowledged as a major contributor to the volume.

Other illustrations are by S E James and Julian Cross with assistance from Karen Holt. Elaine Wakefield took

hundreds of photographs for the project, a large number of which are reproduced here, and provided most other publication prints from the photographic archives.

Professor Atkinson kindly met two of the project team (RMJC and AJL) shortly before his death in October 1994 and was able to provide some additional information to that available in the archive. Although he offered to read and comment on the text, the draft was not completed by the time of his death. Much enthusiastic support and every assistance was given by Mrs Faith Hawley, Rev Anthony Hawley, and Mr Francis Hawley: Lt-Col Hawley's daughter-in-law and grandsons respectively.

# Summary


This volume presents a detailed discussion of the structural history of Stonehenge derived from the primary records of the excavations carried out between 1901 and 1964. These major campaigns of excavation and recording include those of Prof William Gowland (1901); Lt-Col William Hawley (1919–26); Profs Stuart Piggott and Richard Atkinson with Dr J F Stone (1950, 1953–5, 1956, 1958, and 1964), and some smaller, previously unpublished campaigns as well as more recent, small-scale excavations which are already published.

The evidence for the uses of the monument from the Middle Neolithic to the present day are discussed in their contemporaneous landscape and social settings. The evidence for the rephasing of the monument, including surviving artefactual and ecofactual assemblages, details of the radiocarbon dating programme, geophysical surveys, transcriptions of available field excavation trench plans, sections, and stone elevations is presented together with a variety of summary lists, concordances, and a guide to the site archive.

Detailed examination of the varied and disparate excavation archives has made it possible to revise the phasing of the monument; to produce a detailed and fully illustrated description of the sequence; to discussion of the surviving artefactual and environmental assemblages; and to place the development of this most important of prehistoric monuments in its wider landscape and social settings. A new suite of radiocarbon determinations has been obtained which redefines our understanding of the sequence of construction and use of the monument, and augments the surviving archaeological data.

In the Mesolithic period (ninth–eighth millennia BC, several thousand years before the structure known today as Stonehenge), a series of deep pits was dug a few hundred metres to the north of the monument site. These pits almost certainly held large upright pine posts of unclear purpose. Pollen and Molluscan evidence, combined with radiocardon dates, provide a detailed picture of the environment in the area at that time.

In the Middle Neolithic period (*c* 2950–2900 cal BC) environmental evidence suggests an essentially open landscape, with short, grazed turf interspersed with tracts of wildwood. Within this landscape numerous monuments, including the great Stonehenge Cursus, the causewayed enclosure at Robin Hood's Ball, and at least 10 long barrows, as well as sites of a domestic nature are known to have existed. Phase 1 of Stonehenge itself, belongs to this period and consisted of a circular ditch with an internal bank and slight external or 'counterscarp' bank, followed by the construction of a circle of pits, the Aubrey Holes, which ran around the inside of the bank.

These features are reminiscent of both causewayed enclosures and henge monuments but do not fit easily into either class. The circular ditch was dug as a number of connected segments, perhaps 60 in all, whic seem to have been been dug as a single operation although the work too place over a long period of time. Two certain entrances are known, the major entrance in the north-east and a smaller one in the south of the circuit, with a possible third entrance in the south-west. Artefacts from the ditch indicate the presence of placed deposits near the ditch terminals at the entrances. These include cattle skull and jaw bones, and possibly also antler, stone, bone, and chalk objects.

The Aubrey Holes were later placed at regular intervals inside the circle described by the bank but did not respect the entrances. They seem to have originally held a ring of upright posts which were subsequently removed. The end of phase 1 is marked by the development of a layer of dark organic material, probably of anthropogenic origin, above the primary silts in the ditch.

Major changes occurred in the Late Neolithic period (*c* 2900-2400 cal BC). In southern England generally, this period saw the development of new styles of artefacts in pottery, stone, and other materials as well as marking the appearance of major henge monuments such as those at Durrington Walles and Woodhenge. In the area of Stonehenge there is evidence for extensive domestic occupation within a varied but generally open, grazed landscape in which increasing importance seems to have been placed on the keeping of livestock.

In phase 2 at Stonehenge itself, the upper ditch filling is a mixture of deliberate backfill and natural silting into which small recuts were made, which sometimes contained deposits of pottery and animal bones. In some instances human remains, mostly cremated, were inserted into the ditch and bank and also probably inot other areas inside the monument. Many of the Aubrey Holes, now devoid of posts but only partially filled, contained secondary insertions of cremation burials, some accompanied by bone skewer pins. A complicated structure of timber posts was erected in the interior, though insufficient evidence has so far been recovered to elucidate its nature. Other complex post structures existed, placed across the causeway of the north-east entrance and running towards the southern entrance.

A large palisade ditch, running south-west to north-east and passing close to the monument on its northern side, probably also belonged to this phase. There is no direct stratigraphic link but there is an entrance at its closest point to Stonehenge and the ditch may have been intended to divide the landscape around the monument into eastern and western parts.

In the Late Neolithic-Early Bronze Age (*c* 2550–*c* 1600 cal BC) the landscape around Stonehenge consisted largely of open grassland with dispersed settlements and areas set aside for burial and barrow cemeteries. It was at this time that the various elements comprising the stone settings were erected. Phase 3 is a complicated sequence of erection and removal of individual and paired stones at the circumference, particularly around the main entranceway where the Heelstone and its ditch, the Slaughter Stone, and a number of other stoneholes have been examined and recorded. The Station Stones and the North and South Barrow probably also belong to this phase but the lack of stratigraphic relationships hampered full resolution of the sequence.

The major components of the stone settings in the interior also presented few direct stratigraphic relationships and few well stratified artefacts suitable for radiocarbon dating were available. However, the main sequence is clear:

Bluestones erected in the Q and R Holes and then dismantled,

The Sarsen Circle and Trilithons were erected, possibly accompanied by a Bluestone setting which may have also included trilithons but which was then dismantled,

The Bluestone Circle and an Oval setting were erected within the Sarsen Circle and Trilithons,

An arc of Bluestones was removal from the Oval to leave the Bluestone Horsehoe and Circle,

The Y and Z Holes were dug, probably to hold stones which were never erected.

Also in Phase 3, the Avenue was constructed, running through a series of straight and curved sections from the main entranceway to the river Avon *c* 2.8km away. It consisted of two roughly parallel banks with outer ditches which varied in depth along its length, partly as a result of differences in the bedrock through which it was cut. Numerous, generally small-scale excavations along its length produced relatively few artefacts and little indication of any activities taking place within it or associated with its ditches. New radiocarbon dates indicate clearly that it was built during phase 3 and not as suggested by Professor Atkinson in his last (1979) edition of *Stonehenge* with a much later extension.

## Résumé

Cet ouvrage propose une analyse détaillée de l'histoire de la construction de Stonehenge à laquelle on est parvenu en intégrant les témoignages des comptes-rendus originaux des fouilles effectuées entre 1901 et 1964. Parmi les campagnes de fouilles majeures, et les rapports correspondants, on compte celles du Professeur William Gowland (1901), du Lieutenant-Colonel William Harvey (1919–26); des Professeurs Stuart Piggott et Richard Atkinson en collaboration avec Docteur J F Stone (1950, 53–55, 56, 58 et 64), auxquelles on doit ajouter des campagnes de moindre importance dont les résultats n'ont jusqu'à ce jour pas été publiés ainsi que d'autres fouilles, plus récentes, mais sur une plus petite échelle et qui ont déjà fait l'objet d'une publication.

Les indices qui attestent de l'usage qui a été fait du monument de la fin de l'Age du Bronze à la période actuelle sont examinés dans le contexte du paysage contemporain et des structures sociales, les témoignages qui nous ont incités à apporter des modifications aux phases du monument et qui comprennent des collections d'objets, façonnés et naturels, des études géographiques, des copies de tous les relevés de terrain

disponibles, avec coupes et élévations de pierres, sont présentés accompagnés de diverses listes de résumés, de concordances et d'un guide des archives du site.

Une étude détaillée de ces archives de fouilles, variées et disparates, a permis de réviser les différentes phases de la construction du monument, de produire une description détaillée et entièrement illustrée de son déroulement; d'analyser des collections d'objets manufacturés et de trouvailles relatives à l'environnement et de replacer ce monument préhistorique majeur dans le contexte plus étendu du paysage et de la structure sociale. On a obtenu une nouvelle série de déterminations au radio-carbone qui modifie notre conception du déroulement de la construction et de l'utilisation du monument, et qui enrichit les données archéologiques qui ont survécu jusqu'à maintenant.

Au mésolithique (9ème–8ème millénaire av J-C, plusieurs milliers d'années avant le début de la construction du monument que nous connaissons aujourd'hui sous le nom de Stonehenge), un certain nombre de fosses profondes avaient été creusées à quelques centaines de mètres au nord du site du futur monument. Il semble que dans ces fosses se dressaient de gros poteaux de pin dont la vocation reste à définir. Des traces de pollen et de mollusques, associées à des dates au radio-carbone, nous fournissent un tableau détaillé de l'environnement dans la région à cette époque.

Dans la période qui couvre le milieu du néolitique, vers. 2950–2900 av J-C, en années calibrées, des vestiges relatifs à l'environnement donnent à penser que la région était essentiellement découverte avec des espaces de pâture entre des étendues de forêt laissées à l'état sauvage. Dans les limites de cette région, on sait qu'il existait de nombreux monuments dont le grand Cursus de Stonehenge, l'enclos avec chaussée empierrée de Robin Hood's Ball et au moins dix tumulus en longueur ainsi que des sites d'origine domestique. C'est à ce moment que fut construite la première phase de Stonehenge, elle consistait en un fossé circulaire doublé d'un talus interne et d'un petit talus ou 'contrescarpe' à l'extérieur; puis apparurent les trous Aubrey qui se situaient à l'intérieur du talus.

Ces particularités rappellent à la fois les enclos à chaussée empierrée et les monuments à enceinte, mais sans se rattacher clairement ni à l'un, ni à l'autre. Le fossé circulaire a été creusé par segments, joints les uns aux autres, peut-être 60 en tout; l'ouvrage semble avoir été le résultat d'une seule opération bien que les travaux se soient étalés sur une longue période. On connait avec certitude l'existence de deux entrées, l'entrée principale au nord-est et une plus petite au sud du circuit, avec peut-être une troisième entrée au sud-ouest. Des objets façonnés provenant du fossé indiquent la présence de dépotoirs délibérément placés près des extrémités des fossés, aux entrées. On a mis à jour, entre autres, des crânes et des os de mâchoires de bétail ainsi que peut-être des objets en bois de cerf, pierre, os, et craie.

Plus tard les trous Aubrey furent placés à intervalles réguliers à l'intérieur du cercle délimité par le talus, mais sans en respecter les entrées. Ils semblent avoir à l'origine contenu un anneau de poteaux verticaux qui furent enlevés plus tard. La fin de la phase 1 est marquée par le développement d'une couche de matières organiques foncées, probablement d'origine anthropogénique, audessus des dépôts de limon primaires du fossé.

D'importants changements se sont produits au cours de la période du néolithique tardif vers. 2900–2400 av J-C en années calibrées. Dans le sud de l'Angleterre en général, cette époque a vu l'introduction de nouveaux styles d'objets artisanaux en poterie, pierre et autres matériaux, en même temps qu'elle marquait l'apparition des importants monuments à enceinte à Durrington Walls et Woodhenge. Dans la région de Stonehenge on a trouvé des témoignages d'occupation domestique extensive dans le cadre d'un paysage varié mais généralement découvert et mis en pâture; l'élevage de bétail semble y avoir occupé une place de plus en plus importante.

Au cours de la phase 2 une structure compliquée de poteaux en bois fut érigée à l'intérieur du monument; jusqu'à présent on a mis à jour un nombre insuffisant de témoignages pour en éclairer la nature. Il existait d'autres structures de poteaux complexes placées en travers de la chaussée empierrée à l'entrée nord-est et orientées en direction de l'entrée sud. A ce stade, la couche supérieure du fossé consistait en un mélange de matériaux déposés délibérément et de limon naturel dans lequel on avait pratiqué de petites coupures qui contenaient parfois des dépôts de poteries et d'os d'animaux. Dans certains cas des restes humains, provenant en particulier d'incinérations, avaient été introduits dans le fossé et le talus, et aussi probablement en d'autres lieux à l'intérieur du monument.

Un grand nombre des trous Aubrey, maintenant privés de leurs poteaux mais seulement partiellement remblayés, contenaient des insertions secondaires d'incinérations, certaines accompagnées de broches en os. Il se peut aussi qu'un fossé avec palissade, orienté du sud-ouest au nord-est et passant à proximité du côté nord du monument, fasse également partie de cette phase. On n'a pas découvert de lien stratigraphique direct mais il comprend une entrée près de l'endroit où il s'approche le plus du monument et il est possible qu'on ait eu l'intention d'utiliser ce fossé pour diviser la région autour du monument en parties orientale et occidentale.

Au cours de la période néolithique ou au début de l'Age du Bronze, entre environ 2500 et 1600 av J-C en années calibrées, le paysage aux alentours du monument consistait en grande partie en pâturages découverts avec des occupations dispersées et des emplacements discrets réservés aux inhumations et aux cimetières à tumulus. Ce fut à cette époque que les divers éléments, y compris les alignements de pierres, furent construits. La phase 3 consiste en une suite compliquée d'érections et d'enlèvements de pierres individuelles et jumelées, ceci est évident sur la circonférence, particulièrement autour de l'entrée principale où on a examiné et identifié la pierre

Talon ('Heelstone') et son fossé, la pierre du Sacrifice ('Slaughter Stone') et un certain nombre d'autres trous de pierres. Les pierres de Poste ('Station Stones') et les tumulus nord et sud appartiennent probablement aussi à cette phase, mais l'absence de relation stratigraphique directe a mis un frein à la possibilité de résoudre complètement le problème de la séquence de construction.

De même, les principaux composants des agencements de pierres à l'intérieur ne présentaient que peu de liens stratigraphiques directs, et on ne disposait que d'un petit nombre d'objets façonnés bien placés susceptibles d'être soumis à une datation au radio-carbone. Toutefois la séquence suivante est évidente:

Les Pierres Bleues ('Bluestones') furent érigées dans les trous Q et R, puis démantelées.

Le cercle de Monolithes de grès ('Sarsen Circle') fut érigé, peut-être avec un agencement de Pierres Bleues (qui comprenait peut-être aussi des trilithes) puis il fut démonté.

Le cercle de Pierres Bleues et un agencement ovale furent érigés à l'intérieur du cercle de monolithes et de trilithes.

Un arc de Pierres Bleues fut enlevé du cercle de Pierres Bleues faisant place au fer à cheval de Pierres Bleues et aux cercles de monolithes et Pierres Bleues.

Les trous Y et Z furent creusés, peut-être pour recevoir des pierres qui ne furent jamais dressées.

C'est aussi au cours de la phase 3 que l'avenue fut construite, en une série de sections droites et courbes allant de l'entrée principale à la rivière Avon, à 2,8 km de là. Elle consistait en deux talus plus ou moins parallèles bordés par des fossés du côté extérieur dont la profondeur variait sur la longueur, en partie à cause des différences dans la couche de roche dans laquelle ils étaient creusés. De nombreuses fouilles effectuées sur toute la longueur, mais généralement sur une petite échelle, ont produit relativement peu d'objets façonnés et peu d'indications sur les activités prenant place ou associées à ces fossés. De nouvelles dates au radio-carbone indiquent clairement qu'il fut construit au cours de la phase 3, et non, comme l'a suggéré Professeur Atkinson dans sa dernière édition de Stonehenge (1979), avec un prolongement plus tardif.

**Traduction:** *Annie Pritchard*

# Zusammenfassung

Dieser Band ist die Wiedergabe ausführlicher Debatten über die strukturelle Entstehungsgeschichte von Stonehenge. Die anhand der Zusammenführung von Beweisen direkter Berichte über die von 1901 bis 1964 durchgeführten Ausgrabungen entstanden ist. Unter diesen bedeutenden Ausgrabungsaktionen und Berichten befinden sich auch die der Profeßor William Gowland (1901), Lt Col William Hawley (1919–1926), Profeßoren Stuart Piggott und die Richard Atkinsons mit denen J F Stones' (1950, 1953–6, 1958, und 1964) und einige weniger bedeutende, bis jetzt noch unveröffentlichte Aktionen und eine Anzahl von erst vor kurzem, schon veröffentlichten, Ausgrabungsberichten.

Festellunger über die Benutzung des Monuments von der Spät-Bronzezeit bis zum heutigen Tag werden inmitten der sich in derselben Epoche befindenden Landschaft und im sozialen Rahmen diskutiert. Das Beweismaterial für eine Neubearbeitung der Phasen des Monuments, inklusive überkommene, künstliche und ökologische Aßemblagen, Details über Radiokarbondatiermethoden, geophysische Vermeßungen, Transkripte aller vorhandenen Fachpläne, die Abschnitts – und Steinaufriße mit einer Auswahl an Übereinstimmungen und Anhaltspunkten zu Geländearchiven werden hier behandelt.

Ausführliche Überprüfungen dieser verschiedenen und ungleichen Ausgrabungsarchive haben es ermöglicht, die Phasen des Monuments zu revidieren, eine ausführliche und voll illustrierte Beschreibung der Reihenfolge zu reproduzieren, die überkommenen, künstlichen und natürlichen Aßemblagen und dieses bedeutende vorgeschichtliche Monument in eine umfaßenderere Landschaft und einen sozialen Rahmen zu stellen. Eine neue Serie, durch Radiokarbondatierung festgestellter Ermittlungen verändern unser bisheriges Verständnis der Reihenfolge der Erbauung und Verwendung des Monuments und erweitern unsere gegenwärtigen archäologischen Angaben.

Im Mesolithikum (9–8 Millenium v. Chr.), also mehrere tausend Jahre bevor das Gebilde gebaut wurde, welches wir heute als Stonehenge kennen, wurde eine Anzahl tiefer Gräben einige hundert Meter nördlich des zukünftigen Monumentgeländes gegraben. Diese Gräben hielten wahrscheinlich senkrechte Kieferpfeiler, deren Zweck unklar ist. Beweismaterial, bestehend aus Blütenstaub und Weichtieren, zusammen mit Radiokarbondatierung schildern ein ausführliches Bild über die Umgebung in diesem Gebiet um diese Zeit.

Umweltsmaterialien aus dem Mittel-Neolithikum k. 2950–2900 ber. v. Chr. regen zur Annahme an, daß die Landschaft im wesentlichen offenes und kurz abgegrastes Weidegebiet mit einzelnen verteilten Streifen von wilden Wäldern war. In dieser Landschaft existierten zahlreiche Monumente, inbegriffen der Stonehenge Cursus, eine mit Damm versehene Umfriedung bei Robin Hood Ball und mindestens zehn lange Hügelgräber, sowie auch Gelände häuslicher Art. In dieser Zeit wurde Stonehenges erste Phase konstruiert; dieser Teil hatte einen runden Graben mit einem inneren Wall und einer kleineren äußeren Gegenböschung und einen Kreis von Pfeilergruben, die Aubrey Löcher, die im inneren Wall entlang liefen.

Diese Merkmale erinnern an die mit Dämmen versehenen Umfriedungen und die rundförmigen Monumente, die sich aber nicht leicht, weder in die eine noch in die andere Kategorie, einordnen laßen. Der kreisförmige Graben war aus einer Anzahl zusammenhängender Segmente gebaut, vielleicht 60 im ganzen, und wurde in einem einzigen Arbeitsgang, der sich jedoch über eine lange Zeit hinstreckte, gegraben. Gewiß ist, daß es zwei Eingänge gab: einen größeren nordöstlich und einen kleineren südlich des Kreises, vielleicht auch noch einen dritten, südwestlich gelegenen Eingang. Artefakten aus diesem Graben zeigen, daß Ablagerungen absichtlich in der Nähe der Grabenende bei den Eingängen abgesetzt wurden. Unter diesen fand man Rinderschädel, Kieferknochen und möglicherweise auch Geweihe, Steine, Knochen und Kreideobjekte.

Die Aubrey Löcher wurden später in regelmäßigen Abständen an der Innenseite des mit dem Damm umschriebenen Kreises erbaut. Die Eingänge wurden dabei nicht berücksichtigt. Es scheint, daß diese Löcher einen Ring aus aufrechten Pfeilern enthielten, die aber später entfernt wurden. Das Ende der ersten Phase wird durch die Entwicklung einer Schicht aus dunklen und organischen Materialien, wahrscheinlich anthropogenischen Ursprungs, über dem primären Schwemmsand im Graben, markiert.

Bedeutende Veränderungen entstanden im Spät-Neolithikum k. 2900–2400 ber. v. Chr. Im allgemeinen zeichnet sich dieser Zeitabschnitt in Südengland durch die Einführung neuer Stile in Artefakten aus Tonwaren, Gestein und aus anderen Materialien, sowie die Entdeckung bedeutender, rundförmiger Monumente bei Durrington Wall und Woodhenge, ab. In dieser Gegend von Stonehenge gibt es Beweismaterial, das die ausgedehnten häuslichen Siedlungen innerhalb eines unterschiedlichen und, im allgemeinen, abgegrastern Weidelandschaft bestätigt und das dem Halten der Tiere immer mehr Bedeutung zuspricht.

Die zweite Phase bestand aus einem komplexen Gebilde von Holzpfeilern, die, obwohl im Inneren des Monuments errichtet, bis heute noch kein ausreichendes Beweismaterial erbrachten, um die Beschaffenheit dieser Pfeiler zu erklären. Andere komplexe Pfeilergebilde existierten, die quer über dem nordöstlichen Eingang standen und die gegen den südlichen Eingang liefen. Zu diesem Zeitpunkt war der Inhalt dieses Grabens eine Mischung aus absichtlich zugeschüttertem und natürlichem Schwemmsand, in den man Einschneidungen machte und wo man manchmal Ablagerungen von Tonscheiben und Tierknochen fand. In manchen Fällen wurden sogar menschliche Überreste, meistens eingeäscherte, im Graben und im Wall und wahrscheinlich auch in anderen Stellen, innerhalb des Monuments eingefügt.

Viele der Aubrey Löcher, die jetzt keine Pfeiler behausten, aber nur teilweise gefüllt waren, enthielten sekundäre eingeäscherte Grabastätten, in denen man bei einigen Knochenspießnadeln gefunden hatte. Ein weiter, von Südosten bis zum Nordosten reichender Palisadengraben, der nahe der nördlichen Seite vorbeiführt, könnte auch zu dieser Phase gehören.

Vom Spät-Neolithikum bis zum Früh-Bronzenzeitalter, k. 2500-1600 ber. v. Chr. bestand die Landschaft um dem Monument zum größten Teil aus offener Weidelandschaft mit vereinzelten Siedlungen und Flächen, die eigens für Grabstätten und Hügelgrab-Friedhöfe gedacht waren. In diesem Zeitalter wurden die verschiedenen Bestandteile, aus denen das Steingefüge besteht, konstruiert. Die letzte Phase besteht aus einer komplexen Sequenz von Erbauungs- und Abrißarbeiten einzelner und paarweise angeordnete Steine, wahrscheinlich an der Kreislinie, im besonderen um den Haupteingang herum. Wo der Fersenstein (Heel Stone) und deßen Graben, der Opferstein und eine Anzahl von anderen Steingraben überprüft und verzeichnet wurden.

Die Stationßteine und die Nord- und Südhügelgräber gehören wahrscheinlich auch zu dieser Phase, aber der Mangel an statigraphischen Beziehungen bereiteten Schwierigkeiten hinsichtlich einer Lösung der Folgereihe. Die bedeutenden Teile der Steingebilde im Inneren stellten auch einige direkte stratigraphische Beziehungsprobleme, und nur wenige gute stratifizierte Artefakten waren zur Radiokarbondatierung geeignet. Man ist sich aber der folgenden Reihenfolge sicher:

Blausteine wurder in den Q under R Löchern errichtet und dann wieder abgerißen.

Die Sandsteinfindlinge, die 'Sarsens' und die Trilithen wurden wahrscheinlich mit einem Blausteingebilde (die vielleicht auch Trilithen enthielten) gebaut und dann wieder abgerißen.

Der Blausteinkreis und ein ovales Gebilde wurden im Inneren des Findlingskreises und Trilithonen errichtet.

Ein Bogen aus Blausteinen wurde vom Blaustenkreis entfernt und hinterleiß den Blaustein Hufeisenstein (Heelstone) und Sandsteinfindlinge, die 'Sarsens' - und Blausteinkreise.

Y und Z Löcher wurden gegraben, wahrscheinlich für Steine, die noch nicht errichtet waren.

In der letzten Phase wurde auch die 'Avenue' (der Prozeßionsweg), die in Serien von geraden und gebogenen Abschnitten, die vom Haupteingang bis zum 2,8km weit entfernten Fluß Avon führten, gebaut. Sie bestand aus ungefähr gleichlaufenden Wällen mit äußeren Gräben, die der Länge nach unterschiedliche Tiefe aufzeigten, teilweise wegen der Unterschiede im Grundgestein, durch das sie lief. Eine große Anzahl im Durchschnit kleinerer Ausgrabungen entlang dieser 'Avenue' (Prozeßionsweg) erbrachten relativ wenige Artefakten und wenige Hinweise auf Aktivatäten,die hier oder in ihren Gräben stattgefunden hatten. Neue Radiokarbonatdatierungen haben deutlich gezeigt, daß sie während der letzten Phase gebaut wurde und nicht, wie Profeßor Atkinson in seiner letzten Ausgabe über Stonehenge (1979) andeutete, mit einer viel späteren Vergrößerung.

**Übersetzung:** *Monika Schmid-Jenkinson*

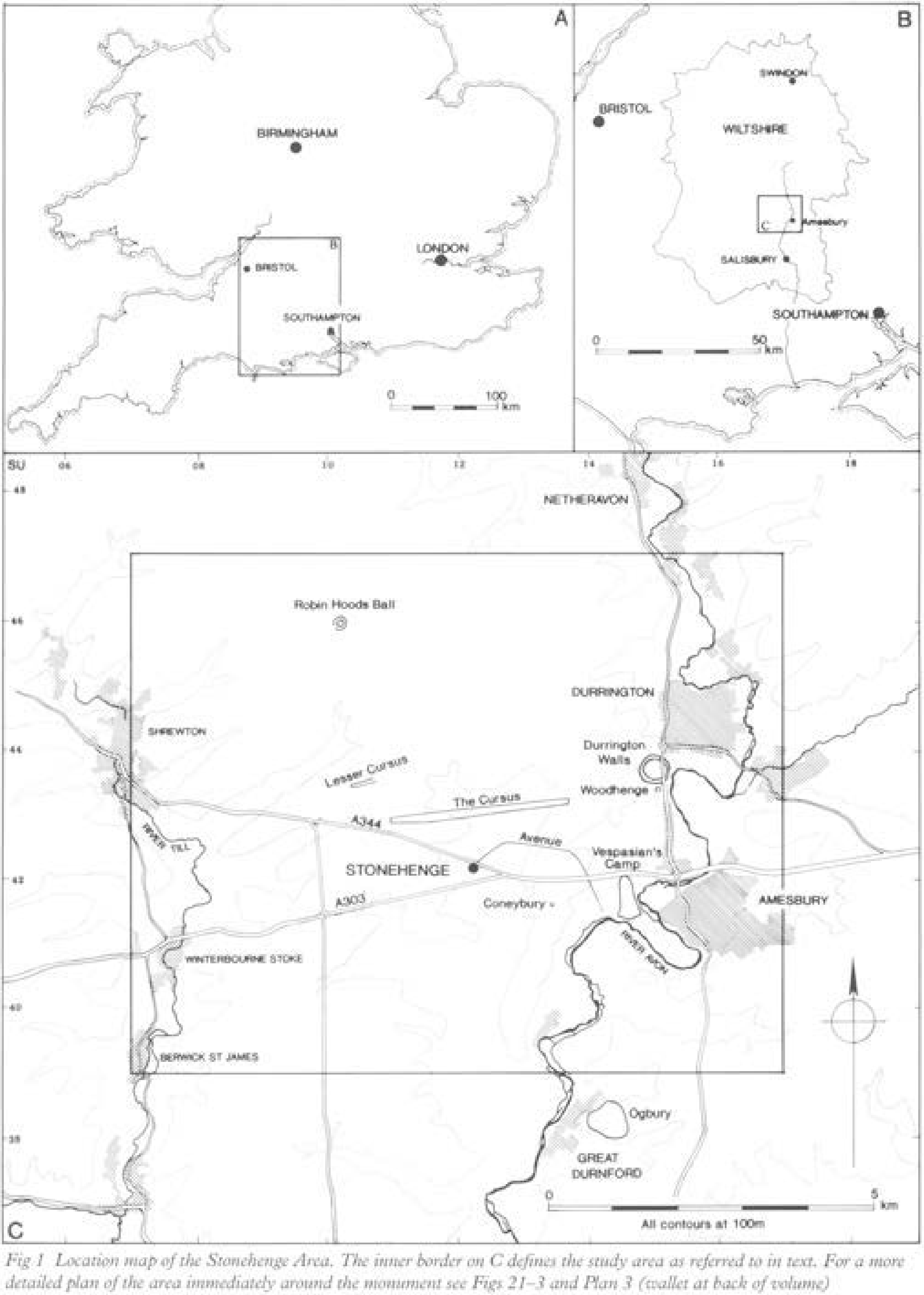



*Fig 1 Location map of the Stonehenge Area. The inner border on C defines the study area as referred to in text. For a more detailed plan of the area immediately around the monument see Figs 21–3 and Plan 3 (wallet at back of volume)*

# Part 1: Geography and history of Stonehenge

## 1 Introduction

*by Julie Gardiner*

Stonehenge is undoubtedly one of the most important prehistoric monuments in Europe. It is certainly the best known. With its unique and complex stone settings, its extraordinary stone lintels, its symmetry and planning, it stands at the centre of a World Heritage Site as a remarkable testimony to the capabilities, ideology, and ingenuity of the prehistoric communities that built and used it.

It has stood, evocative and enigmatic, in the midst of the vastness of Salisbury Plain for some four and a half millennia (Fig 1; Plan 3). This position, apparently in the middle of nowhere, adds to the mystique and even the hardened prehistorian, for whom no accomplishment of our Neolithic or Bronze Age forebears is surprising, has to marvel at the astonishing feats of 'primitive' engineering and labour management involved in the transportation, dressing, and erection of the stones. Even now, or perhaps especially now that we are able fully to appreciate the technical achievement of its physical construction, it is difficult to imagine just how those great blocks of sarsen were erected with such precision and the lintels hoisted into place, by communities for whom we have precious little evidence of how (or where) they built their own homes, let alone a monument as complex as Stonehenge. It is small wonder that Stonehenge has excited so much interest, speculation, reverence, and simple awe down the generations. From Merlin to the Martians, theories of how, when, and in what order it was built have exercised the minds of many – presumably since even before the Ancient Celtic Druids of Stukeley's (1740) imagination claimed it as their own.

The twentieth century has seen a number of major, and many minor, campaigns of excavation and research at the monument. The stimulus for the first of these (*Chapter 2*) was the need to stabilise dangerously leaning stones and much of the subsequent work is inextricably linked with episodes of refurbishment of the settings. All major excavation at the monument ceased in 1964 with the completion of a campaign of research and 'rescue' work by Richard Atkinson, Stuart Piggott, and John F S Stone.

Since then, the majority of 'interventions' have been relatively small-scale and associated with infrastructure requirements. The exception to this was the more extensive work undertaken in the 1960s when the new car park, buildings, and pedestrian underpass were constructed.

Yet despite years of excavation – during which, in total, almost half the area of the monument has been investigated – there has never been published a definitive account of Stonehenge based on the primary archaeological records. Short reports by the early excavators (*see Chapter 2 for details*) were published and Lt-Col Hawley presented the results of his work to the Society of Antiquaries of London who were financing it. Recent small-scale work, by, for instance, the then Central Archaeological Unit of English Heritage (CEU) and Wessex Archaeology, has been reported in print, as a matter of course, but the only report on the major campaign of Atkinson, Piggott, and Stone remains the Penguin book *Stonehenge*, first published in 1956 after only two seasons of work and largely unaltered even in its last edition of 1979. As a popular account of the monument it is undoubtedly a good read, but it is not a substitute for a full report on the excavations.

To the modern archaeologist the lack of a full report on any site excavated to this extent is deplorable – but for a monument of such importance, both archaeologically and in the collective consciousness of hordes of people throughout the world, it is, as Atkinson himself once wrote of the failure of archaeologists to publish their results, 'a crime against science' (Atkinson 1946, 178). This was recognised by English Heritage as part of their current management strategy for Stonehenge and a project was commissioned from Wessex Archaeology to rectify the position.

This volume is, therefore, the first attempt at presenting a comprehensive account of Stonehenge as an archaeological site. The text which follows is based on the primary archaeological records, such as they are, not only of the excavations by Atkinson *et al* but of all the previously unpublished, or inadequately published, excavations of the twentieth century. Archaeological methodology, excavation techniques, and practical aspects such as the availability and quality of labour have all changed radically since Gowland first put pick to earth within the monument in 1901 and it is therefore especially significant that this volume presents the results of all these campaigns in a uniform, integrated, and rationalised format so that, as far as possible, the story told is a chronological account of the development and use of Stonehenge based on all the available results.

### Background to the project: aims and objectives

This volume is the outcome of a major research project commissioned by English Heritage from Wessex Archaeology between April 1993 and December 1994. Its principal stated aim was to present an account of the structural history of Stonehenge derived from the primary records of all the excavations this century in order that the development of this internationally important monument and its contemporaneous setting might be better understood – not solely for academic reasons but also to facilitate its future management.

As the 1980s progressed it became increasingly clear that failing health prevented the retired Professor Atkinson from completing the production of a full report on the excavations at Stonehenge (the main paper archives were in Cardiff, where Professor Atkinson was based, whereas the majority of the finds were in Salisbury Museum). By this time Dr Stone had been dead for many years and Professor Piggott was also retired and no longer in possession of any of the archives.

English Heritage was concerned that these excavations remained unpublished, as indeed did much of the earlier work, at a time when the monument's history and meaning were enjoying a new surge of interest amongst the general public. At the same time it was recognised that the various archives relating to the many excavations had become widely dispersed and were of very variable quality and that it would make considerable sense for all the archives to be traced, collated, and, as far as possible, curated in one place. It was extremely difficult for a researcher to reassess any aspect of the site or its assemblages of finds.

Given the significance of Stonehenge in the locus of European prehistory, it was considered essential that these two omissions be rectified by the preparation of an ordered, coherent, and accessible archive for future research, and by the preparation and publication of an objective description of the monument's development, which could be related to its contemporary landscape.

In 1993 English Heritage commissioned a project from Wessex Archaeology which had ten objectives:

1 the enhancement of the current disparate archives into a unified, consistent, and usable format which could be interrogated by future researchers without recourse to the primary (and fragile) records,
2 the provision of an index and 'users' guide' to the archives,
3 the analysis of the structural development of the monument in its prehistoric phases, based on those primary records,
4 the recording and analysis of the artefactual and environmental datasets in relation to the structural development of the monument,
5 to assemble a full archaeological account of the structural development of Stonehenge in its prehistoric phases,
6 to investigate and describe the spatial and temporal relationships between Stonehenge and its immediate prehistoric hinterland,
7 to describe and discuss the contributions of the artefactual and environmental datasets to the understanding of the monument within its natural and social landscapes,
8 to reassess the interpretation of Stonehenge in its national and international setting,
9 to describe and discuss the post-Bronze Age history of the monument, including twentieth-century episodes of demolition and reconstruction resulting in its current appearance and setting, and
10 to disseminate the results of these analyses and descriptions as a published synthesis.

English Heritage viewed the publication of this monograph as an essential part of its campaign, in conjunction with the National Trust, for the improvement and management of Stonehenge and its landscape. Stonehenge is our best known monument and it was regarded as insupportable that considerable resources should be expended on such management plans whilst the monument itself – the focus for those plans – did not possess a definitive publication. The appearance of this volume should therefore be seen as an indispensable part of those plans.

## Parameters

This report has inevitably involved the reassessment and interpretation of archaeological features, relationships, and artefact assemblages but the aim throughout has been to present the information in as objective a manner as possible. As will become clear, there are major difficulties in understanding much of the site archive and it has to be accepted from the outset that some areas of uncertainty remain. It has been necessary to make many decisions on how best to interpret and present the available information. In order that it should be clear on what basis this has been done there is an emphasis within these pages on illustration and, in particular, on the presentation of original field drawings (copied exactly but employing common scales and conventions as described below) so that the reader may draw independent conclusions from the same evidence without recourse to the original drawings.

Some of these illustrations are provided with extended captions which describe and discuss their contents in detail, thus reserving the main text of the report for more narrative interpretation and discussion. Likewise, the appendices at the back of this volume include a considerable amount of basic data which deserved to be made easily available. For those who require to go back to the original records an index to the archive has been provided, including a list of the various computer databases which provide the basis for the report which follows.

Stonehenge means many things to many people as part of our common heritage. This report is the closest that it is possible to get to a definitive account of the monument and is based on the *primary archaeological* *records*. In some cases this has led to conclusions radically different from those of earlier excavators. The report is concerned with understanding the physical development of the monument and its associated assemblages in relation to its contemporary physical and social landscape. It is not concerned with the wealth of associations that the monument has for all who are privileged to walk among the stones. It is the purpose of this volume to set out the facts for those who wish to create their own associations from them.

## Layout and conventions

Part 1 of this volume is a general introduction to the monument as it is today in its modern setting, with a review of its recent history, a summary of the archaeological work that has been undertaken during the present century. The methods employed in the compilation and manipulation of the archives, details of the various archives, the history and methodologies of the major excavations, details of how and why it has been possible to rephase the monument, and the rationale behind the post-excavation analyses are discussed. A brief physical decription of the monument as it now stands is also presented.

Part 2 tells the story of Stonehenge in terms of both its physical features and our interpretation of them for each major phase in the sequence of construction, use, abandonment, and decay. It begins with a consideration of the landscape and archaeology of the immediate area before construction of the monument and proceeds through each main period of construction. These phases are, for the most part, not the same as those proposed by Atkinson (1956 *et seq*) and enshrined in the literature, and they are backed by a new series of radiocarbon dates. Throughout these chapters the place of Stonehenge within its landscape is stressed and the composition and distribution of the various artefact assemblages in relation to each phase is examined. Chapter 8 deals with the assimilation of the monument, essentially its place in the landscape after its main period of use but while it was still a place of some importance within the folk memory of communities living nearby, and with the later history of the monument from the later Bronze Age to the present day.

Part 3 presents a summary of the finds assemblages, both artefactual and ecofactual, concentrating on those categories which pertain to the main periods of construction and use.

Part 4 presents a full discussion of the sequence of the monument, and its position in local, national, and international terms, concluding with a an outline strategy for future work.

Finally, the appendices provide summary information on various aspects of the archive, including an index, together with details of the geophysical surveys and technical details of the radiocarbon programme. All available original site plans are presented as exact copies at a common scale, together with the Ministry of Works elevation drawings of the stones.

### Conventions

Throughout the report a number of conventions have been followed in the text, mainly in an attempt to make more readable those parts of the report which draw heavily on older reports and notes. It was the intention from the beginning to incorporate as much as possible of Lt-Col Hawley's own descriptions, and this applied also to those of Professor Atkinson's, where they exist.

The many references to Hawley's Diaries are always quoted by date where possible, and given as date, month, year in full, eg 1/12/1921. Occasionally the Diary was not completed on a day-to-day basis, and in these cases the reference given reflects the easiest way to find the passage, generally without using a page number. The avoidance of page numbers is necessary because the copy of the Diary which has been used for the report is a typed transcript held by Salisbury and South Wiltshire Museum and there is some evidence to suggest the existence, or former existence, of another transcript with slightly different page numbering.

As no full excavation reports exist, it has been necessary to refer frequently to Atkinson's book *Stonehenge*. Throughout this volume reference is made to the most recent edition, that of 1979, unless it is necessary to make comparisons between the first (1956) and 1979 editions, in which case both are cited.

All archaeological interventions have been allocated a cutting number (*see Plan 1 and Chapter 2*) which is abbreviated throughout to C, for instance C45, C56. References to Aubrey Holes and Y and Z Holes are generally abbreviated to, for instance, AH24, YH9, ZH12. Major components of the monument and individually numbered stones are capitalised. The numbering used for the stones is that devised initially by Flinders Petrie (1880), used and extended by Atkinson to include other features such as the Aubrey, Y, and Z Holes, and now in familiar use in the literature (*see Fig 13, below*).

Following the principle of using the excavator's own words wherever possible has also led to the inclusion of some terms which are idiosyncratic or no longer current. These consist of the following:

**Bluestone:** the famous Bluestones of Stonehenge are in fact composed of a number of rock types, notably dolerite, rhyolites, volcanic ash, and sandstones. Throughout this report, as indeed in the archives, the term bluestone is used to describe the pieces and fragments of all these rocks encountered during the excavations, whereas the stones of the Bluestone settings are referred to using the capital letter.

**Compo:** used by Hawley, but followed by Atkinson. The term seems to be derived from 'compo mortar' and almost always refers to chalk which has been either puddled with water – usually accidentally – or redeposited with water. Occasionally it is used to mean chalk mixed with clay, but the essential definition is that it is chalk which is no longer in its natural state, the structure having been broken down and some mixing with water having taken place.

**Morganite:** used by Atkinson. It is recorded in notes from Atkinson (*in archive, C45*) as puddled chalk.

**Concrete:** used by Atkinson. It is recorded in notes from Atkinson (*in archive, C45*) as also meaning puddled chalk; the term 'morganite' was later used for the same material.

**Cardboard:** used by Professor Atkinson to refer to ancient decayed wood (*notes in archive, C45*).

**The Stonehenge Layer:** This composite layer, so christened by Hawley, was apparently encountered in all excavation trenches by both Hawley and Atkinson *et al* and is frequently referred to in this report. It overlay most cut features and where no features occurred it was found directly over the chalk. It included material of all periods from the later Neolithic to the present day and its importance lies in the fact that very few chips of bluestone or sarsen occur in layers below it, other than in cut features directly related to the erection of the stones (ie stoneholes). Hawley took this to indicate that the base of the layer marked the period at which the first Bluestones were erected; Atkinson, on the other hand, considered it to have originated some time later, at a time when the stones were being dismantled or wrecked. (*For a full discussion see Chapter 8.*)

## Plans and section drawings

For many of the individual excavations discussed in this volume the only detailed recording was by section drawing. Clearly, where a number of excavators and illustrators were involved the drawings themselves and the descriptions of the layers depicted (where such descriptions exist) differ. The scales at which sections were drawn also varied and in a few cases it has not been possible to identify the scale used. Careful re-examination of all the section drawings has enabled us to clarify and rationalise these descriptions and to redraw the sections using the standard set of conventions established for all illustrations in this report (Fig 2).

Throughout this report section drawings are presented at a common scale of either 1:40 or, less often and where important detail would be otherwise difficult to distinguish, 1:20. For the Avenue and the Mesolithic pits all the available section drawings are illustrated in three ways: first as exact copies of the field drawings, with their original annotations; secondly as 'rationalised' sections (ie employing common symbols for fill types, etc; *see Fig 2*); and thirdly as schematic interpretations of the ditch fills divided into primary, secondary, and tertiary as defined below. These schematic sections are at a scale of 1:80. The Aubrey Holes, Y and Z Holes, Palisade Ditch, and certain other features with more complicated sequences of fills are presented as field drawings and rationalised sections only. Most plans and sections relating to features in the interior of the monument are reproduced as exactly as possible from the field drawings, as are those for the Ditch. For these, scales vary depending on the level of information required for particular drawings. The same conventions for the different types of stone (including conventions for standing, fallen, and missing) are used throughout. Various types of tone and colour are used to aid the reader in understanding individual illustrations and small, schematic location plans are used wherever necessary for orientation.

Plans (ie other than original excavation plans) which cover the entire monument, or large parts of the interior, appear at various scales as applicable to the text. To some extent these overall plans are 'best fits' derived from a number of sources (*Chapter 2*). Two 'master plans' are included as a loose sheet in the pocket at the back of the volume. These show the entire monument (Plan 1) with all cuttings numbered and shown by excavator, and with all excavated features shown and coloured by phase (Plan 2). Plans 3 and 4, also loose-leaf, show the area around Stonehenge and the Avenue in detail, and detailed plans of the Avenue 'Zones' (*see Chapter 7*). All plans showing the Bank and Ditch are based on the 1919 survey of the earthworks except where specifically stated otherwise (*see Chapter 2*).

Plans of Stonehenge have often been presented with the main axis orientated vertically on the page (eg Atkinson 1979, fig 1). In this volume all plans are presented in true orientation, with grid north to the top, unless specifically stated otherwise. National grid references are given on the borders of each plan.

## Ditch and feature fills

*by Michael J Allen*

For clarity and interpretative reasons throughout this volume ditch and feature fills (where appropriate) have been classified and are discussed in terms of the tripartite classification of ditch sediments outlined by Evans (1972, 321–8) and Limbrey (1975, 290–300).

The natural infilling of ditches has been divided into the three main categories; primary, secondary, and tertiary. These are based on both the concepts of natural ditch infill and experimental earthworks on chalk (Overton and Butser) and sand (Wareham) geologies (Crabtree 1971; Jewell and Dimbley 1966) and on recent reviews of these and other experiments (Crabtree 1990; Bell 1990; Bell *et al* forthcoming). Although not all ditches contain all three fills, and the ditches are not necessarily uniform in the distribution and nature of such fills along their length, the recognition of primary, secondary, and tertiary fills has significant archaeological and interpretative implications and is a convenient

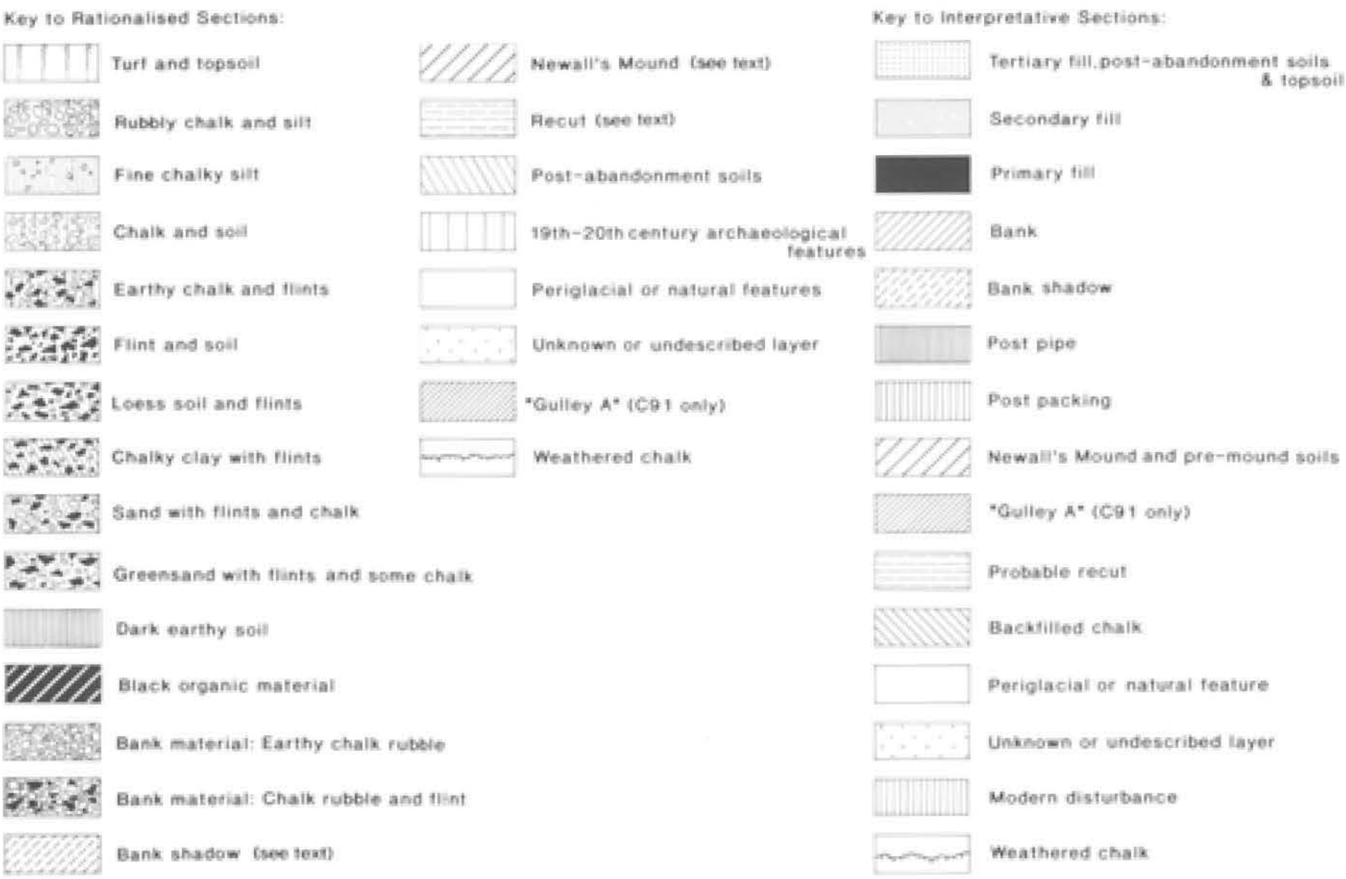



*Fig 2 Conventions used in this volume*

method of grouping together a number of contexts which belong to the same episode or phase of ditch infill (but are not necessarily directly tied to the phases of archaeological activity).

The concept and description of resultant deposits specifically for chalk-cut ditches are largely derived from Evans (1972) and Limbrey (1975) respectively and may be summarised thus:

**Primary fill:** is the initial stabilisation of the 'natural' through which the ditch is cut. The initial, rapid silting is often confined to the first 20 years after construction. The occurrence of primary fills will b e largely dependent on the specific nature of the substrate (ie Lower, Middle, or Upper Chalk) and size and shape of the feature. Primary fills can be thin bands or occupy as much as 60–70% of the ditch. They result from the weathering and frost shattering of the newly cut ditch sides, the soil and turf line, and weathered natural (regolith). They may include the results of immediate settling and erosion of any adjacent bank. Weathering results in the accumulation of 'clean', angular, rock debris largely in the corners (flat-bottomed ditches) or the base (V-shaped ditches). Turves and (top)soil may fall into the ditch and come to rest on its sides or base, appearing as relatively well defined dark humic patches. The primary fill may have a laminated appearance, suggested in the experiments at Overton and Butser (Bell 1990; Bell *et al* forthcoming) to represent annual weathering; however, in archaeological features weathering, frost, and worm action may blur any lamination. Archaeologically, therefore, these fills represent activity immediately following ditch construction but palaeo-environmental data may be derived from the contemporaneous soil through which the ditch was cut and thus reflect the pre-ditch environment.

**Secondary fill:** is the gentle and gradual natural accumulation of ditch silts, often occupying the main body of the feature. Gradual infilling, resulting from continued erosion and weathering of the ditch sides and surrounding soil, slows with time as the angle of slope decreases and the infilling material becomes colonised with patchy vegetation. Finer, more humic sediments which tend to become less stony higher up the ditch profile and may show traces of bedding, characterise the secondary fill. The rate of infill may slow, enabling vegetation colonisation to increase to such an extent that a stable soil horizon may develop which, in turn, may show evidence of worm sorting into stonefree or small stone lenses. Sometimes the secondary fill includes silty (loessic), windblown (aeolian) material derived from exposed ploughed areas (eg at Mount Pleasant, Dorset; Evans and Wainwright 1979). At Stonehenge itself Cornwall (1953) noted such aeolian deposits in the Y and Z Holes and attributed these to a period of warmer climate. This is not a strict correlation, however, and these deposits are more likely to have been derived from nearby ploughed fields exposed to strong winds in dry summers. Archaeologically, the secondary fill represents the period of use of the ditch as a feature of the site of which it is a part. Artefacts and environmental data contained within it are therefore likely to be contemporary with the use of the ditch and, in this case, the monument.

**Tertiary fill:** is the final ditch fill, generally derived from ploughing and plough wash or deliberate backfill. Essentially, where tertiary fills occur at Stonehenge they relate to post-monument activity taking place over the ditch rather than in relation to it. The fill consists of homogeneous colluvial material containing few large stones but common small chalk pieces, resulting from cultivation or deliberate infill of the surviving, shallow, ditch and associated with farming, clearance, or landscaping activities. The tertiary fill is usually, but not always, centuries younger than the construction and use of the ditch itself. Archaeologically, therefore, this deposit represents later activity not directly associated with the use of the monument, but possibly with its destruction and decay and with reuse of the landscape for other activities.

**Topsoil:** above the tertiary fill the modern rendzina soil is likely to be deeper over the ditch than adjacent to it, as a result of the greater moisture and nutrient content and rooting potential of the underlying fills. Here soil and tertiary deposits are not generally distinguished as they are not often clearly differentiated on original section drawings.

## Radiocarbon dates

Relatively few radiocarbon determinations exist from previous excavation programmes at Stonehenge (*Table 62; Appendix 2*). The opportunity was therefore taken to obtain a suite of new dates from the surviving archive in an attempt to define the chronology and duration of each major phase of activity. A rigorous selection programme was adopted and all submitted material carefully examined for context, suitability for dating, and the appropriateness of the impending result for meeting various chronological objectives. These matters are discussed in Appendix 2 where reasons for rejecting several dates are also explained. The results of all the accepted dates for the monument, on which is based the dating of the phases described in subsequent chapters, are presented in full in Table 64, and in summary in Table 1.

Throughout this report the radiocarbon results are conventional radiocarbon ages. They are expressed in radiocarbon years BP (Before Present – AD 1950) using the 5568 half life in accordance with international convention (Stuiver and Polach 1977).

The results are calibrated using the datasets detailed in Appendix 2. All radiocarbon determinations before 6500 BP are calibrated using the datasets provided with CALIB 3.0.3 (Stuiver and Reimer 1993), while those after 6500 BP are calibrated using the datasets provided with CALIB 2.1 (Stuiver and Reimer 1986). Calibration and analysis has been performed using OxCal 2.16 and CALIB 2.1.

The most accurate method of conveying the complex relationship between a radiocarbon result and the calendrical date of the sample is to present a graph showing the probability distribution of the calibrated date. Those interested in the detailed chronology of the site should refer to Table 64 in Appendix 2 for these distributions. It is necessary to cite the radiocarbon dating evidence in the text however, and for this reason calibrated date ranges are also given. All calibrated ranges are quoted at two standard deviations (95% confidence), unless otherwise specified. They are quoted in the form recommended by Mook (1986), with the end points rounded outwards to 10 years when the radiocarbon age has an error term greater than or equal to 25 radiocarbon years, and rounded outwards to 5 years for error terms less than this.

The calibrated date ranges quoted in normal type (eg 3350–2920 cal BC) have been calculated using the maximum intercept method (Stuiver and Reimer 1986; *pace* Bowman 1994). This simple method of calculation has been chosen to improve the readability of the text, since it produces single continuous ranges.

The calibrated date ranges quoted in italics (eg *1640–1520 cal BC*) have been calculated as part of the mathematical analysis of the dating evidence presented in Appendix 2. These ranges derive from the radiocarbon evidence, and so are cited as 'cal BC', however they are not definitive, further constraining evidence can and will change them, and the mathematical model presented here is only one of many which could be advanced for the site. Unlike the maximum intercept method, these calculations may produce several ranges from a single probability distribution. In Appendix 2 these have been given in full, but in the rest of the text the earliest date and latest date from the 95% ranges have been given to improve the readability of the text. Where ranges have been combined in this way the date range is marked with an asterisk (eg *2280–1920* cal BC*). The probability that the calendar date under consideration lies between the two limits will in fact be greater than 95%.

Occasionally it has been necessary to refer to dates assigned to archaeological sites or features either before the availability of radiocarbon dates, without the calibration used having been defined, or on the basis of typology or associations. These dates are expressed as 'calendar years bc'.

**Table 1 Summary of radiocarbon dates from Stonehenge**

| *General location* | *Material* | *Lab ref* | *Result* | *Calibration (cal BC)* |
|---|---|---|---|---|
| ***Mesolithic*** | | | | |
| Postpit WA9580 | *Pinus* charcoal | OxA–4920 | 8400±100 | 7580–7090 |
| Postpit WA9580 | *Pinus* charcoal | OxA–4919 | 8520±80 | 7700–7420 |
| Postpit WA9580 | *Pinus* charcoal | GU–5109 | 8880±120 | 8090–7580 |
| Postpit A | *Pinus* charcoal | HAR–455 | 9130±180 | 8820–7730 |
| Postpit B | *Pinus* charcoal | HAR–456 | 8090±140 | 7480–6590 |
| Mesolithic activity took place over *300–600 years* from *8500–7650 cal BC* to *7500–6700 cal BC* | | | | |
| ***Pre-phase 1*** Sarsen Circle | Animal bone | OxA–4902 | 5350±80 | 4360–3990 |
| ***Phase 1*** | | | | |
| Ditch, primary, nr S entrance | Ox right jaw | OxA–4834 | 4460±45 | 3350–2920 |
| Ditch, primary nr S entrance | Ox right jaw | OxA–4835 | 4455±40 | 3340–2920 |
| Ditch, primary nr S entrance | Red deer tibia | OxA–4833 | 4550±60 | 3500–3040 |
| Ditch, primary, nr S entrance | Ox skull | OxA–4842 | 4520±100 | 3510–2920 |
| Ditch, primary | Antler | UB–3788 | 4381±18 | 3095–2920 |
| Ditch, primary | Antler | UB–3787 | 4375±19 | 3085–2920 |
| Ditch, primary | Antler | UB–3789 | 4330±18 | 3030–2910 |
| Ditch, primary | Antler | UB–3790 | 4367±18 | 3040–2915 |
| Ditch, primary | Antler | UB–3792 | 4365±18 | 3040–2915 |
| Ditch, primary | Antler | UB–3793 | 4393±18 | 3095–2920 |
| Ditch, primary | Antler | UB–3794 | 4432±22 | 3305–2925 |
| Ditch, nr NE entrance | Antler | BM–1583 | 4410±60 | 3340–2910 |
| Ditch, nr NE entrance | Antler | BM–1617 | 4390±60 | 3330–2910 |
| The structured deposits were collected over a period of *100–900 years* from *3800–3050 cal BC*. The Ditch was dug in *3020–2910 cal BC* | | | | |
| ***Phase 1/2*** | | | | |
| Aubrey Hole 32 | Charcoal | C–602 | 3798±275 | 3020–1520 |
| ***Phase 2*** | | | | |
| Ditch | Antler | UB–3791 | 4397±18 | 3095–2920 |
| Ditch, secondary | Antler | OxA–4904 | 4365±55 | 3300–2900 |
| Ditch, secondary | Animal bone | OxA–4903 | 3980±45 | 2660–2400 |
| Ditch, secondary | Animal bone | OxA–4881 | 4300±60 | 3080–2700 |
| Ditch, secondary | Animal bone | OxA–4841 | 4295±60 | 3040–2700 |
| Ditch, secondary | Animal bone | OxA–4882 | 4270±65 | 3040–2660 |
| Ditch, secondary | Animal bone | OxA–4880 | 3875±55 | 2560–2140 |
| Ditch, secondary | Animal bone | OxA–4879 | 3885±55 | 2570–2150 |
| Ditch disturbance/cut | Animal bone | OxA–4843 | 4315±60 | 3100–2700 |
| Ditch, secondary/disturbed | Animal bone | OxA–4844 | 4220±60 | 2930–2610 |
| Ditch, cut in secondary | Bone chisel | OxA–4883 | 4300±70 | 3100–2700 |
| The Ditch filled up over a period of *400–730 years* and was completely full by *2570–2230* cal BC* | | | | |

**Table 1 (cont)**

| *General location* | *Material* | *Lab ref* | *Result* | *Calibration (cal BC)* |
|---|---|---|---|---|
| ***Phase 3*** | | | | |
| Sarsen Circle | Antler | UB-3821 | 4023±21 | 2655–2485 |
| Sarsen Trilithon 53/54 | Antler | OxA-4840 | 3985±45 | 2470–2200 |
| Sarsen Trilithon 57 | Antler | OxA-4839 | 3860±40 | 2470–2200 |
| Sarsen Trilithon 56 | Antler | BM-46 | 3670±150 | 2480–1680 |
| Bluestone Circle | Antler | OxA-4900 | 3865±50 | 2480–2140 |
| Bluestone Circle | Animal bone | OxA-4878 | 3740±40 | 2290–2030 |
| Bluestone Horseshoe | Antler | OxA-4877 | 3695±55 | 2280–1940 |
| Stonehole E | Antler | OxA-4838 | 3885±40 | 2490–2200 |
| Stonehole E | Antler | OxA-4837 | 3995±60 | 2860–2350 |
| Z Hole 29 | Antler | OxA-4836 | 3540±45 | 2030–1740 |
| Y Hole 30 | Antler | UB-3822 | 3341±22 | 1735–1530 |
| Y Hole 30 | Antler | UB-3823 | 3300±19 | 1675–1520 |
| Y Hole 30 | Antler | UB-3824 | 3449±24 | 1880–1690 |
| 'Beaker' burial | Human femur | OxA-4886 | | |
| 'Beaker' burial | Human femur | BM-1582 | | |
| 'Beaker' burial | Human femur | OxA-5044 | 3817±27 | 2450–2140 |
| 'Beaker' burial | Human femur | OxA-5045 | | |
| 'Beaker' burial | Human femur | OxA-5046 | | |
| Phase 3 occurred over a period of *850–1110 years*. The dated events within the phase are: Sarsen Circle (start of phase 3) *2580–2480* cal BC*; Sarsen Trilithons *2450–2110 cal BC*; Bluestone Circle *2280–2030 cal BC*; Bluestone Horseshoe *2280–1920* cal BC*; Stonehole E *2480–2200* cal BC*; Beaker-age burial *2400–2140* cal BC*; Z Hole *2030–1750 cal BC*; and Y Hole (end of phase 3) *1640–1520 cal BC* | | | | |
| ***Avenue*** | | | | |
| Stonehenge terminal | Antler | OxA-4884 | 3935±50 | 2580–2300 |
| Nr Avon terminal | Animal bone | OxA-4905 | 3865±40 | 2470–2200 |
| N side of A344 | Antler | HAR-2013 | 3720±70 | 2350–1930 |
| Stonehenge terminal | Antler | BM-1164 | 3678±68 | 2290–1890 |
| Material from the Avenue spans a period of *190–640 years* between *2590–2330 cal BC* and *2240–1880 cal BC* | | | | |
| ***Post-monument dates*** | | | | |
| Palisade Ditch | Human femur | UB-3820 | 2468±27 | 775–410 |
| Sarsen Circle | Bone point | OxA-4885 | 2840±60 | 1260–840 |

# 2 Previous work and methods

*by K E Walker*

## History and methods of the principal excavations

Stonehenge has long been an object of public and antiquarian interest and speculation. Some of the earlier observations have proved invaluable. John Aubrey's plan of 1666 identified 'depressions at intervals within the circular earthwork' which later caused Hawley to search for and identify the features which were consequently named the *Aubrey Holes*. Professor Flinders Petrie's plan (published in 1880) still forms the basis of the numbering system used for the stones of the monument (*see Fig 14*). There are also known to have been 'excavations' within the monument prior to the twentieth century. Among those believed to have dug here is the Duke of Buckingham (1620), who 'did cause the middle of Stonehenge to be digged, and under this digging was the cause of the falling down or recumbencey of the great stone there, twenty-one foote long' (Antrobus nd, 29). The exact position of this hole is not recorded, although augering in 1994 through a clear but amorphous parchmark in the centre of the monument in a position not known to have been excavated suggested the presence of backfill (Wessex Archaeology 1994a; see also Fig 290 and Plate 6.3). William Cunnington (1802) dug at several places, particularly in front of the Altar Stone, though he took care not to go too near the stones (Chippindale 1983, 117), and under the Slaughter Stone, where he considerately left a bottle of port (*see Chapter 8*). One Captain Beamish, *c* 1839, was granted permission by the then owner, Sir Edmund Antrobus, to dig 'in order to satisfy a society in Sweden that there was no interment in the centre of Stonehenge' (quoted by Chippindale, 1983, 161). This excavation was apparently 8ft (*c* 2.4m) square in front of the Altar Stone and went down about 2m, but found nothing. There are, however, no usable records of the early excavations, and so it is only with the twentieth-century excavations that this volume has been concerned. A history of events before and after the turn of the century which led to the gift of Stonehenge to the nation in 1918 is provided in Chapter 8 below, and in more detail by Chippindale (1983). A complete list of the 'archaeological interventions' so far identified is in Appendix 3, with a summary in Table 2.

*Fig 3 Professor William Gowland (© Wiltshire Archaeological and Natural History Society)*

### Professor William Gowland (1901)

The fall of Stones 22 and 122 (*see Fig 14 and Plan 2 for numbering and position of the stones*) at the close of the last century drew attention to the poor state of the monument and prompted the inception of an advisory committee comprising representatives of the Society of Antiquaries of London, the Society for the Protection of Ancient Monuments, and the Wiltshire Archaeological Society. The committee's suggestions to the then owner, Sir Edmund Antrobus, were published in the *Times*. One priority was Stone 56, which was leaning dangerously and was therefore to be straightened with Sir Edmund's agreement. In addition to the architect, Mr Detmar Blow, and the engineer, Mr Carruthers, Professor William Gowland, a mining geologist from the University of London and a Fellow of the Society of Antiquaries (Fig 3), was appointed to undertake the archaeological supervision of the work (Antrobus nd, 45). Gowland's excavations were confined to a relatively small area around Stone 56 (C64) and to six small holes where shoring timbers were to be inserted (C70–75).

The excavation (18 August to 25 September 1901) was meticulously undertaken and recorded and was published in detail (Gowland 1902). The methods em-

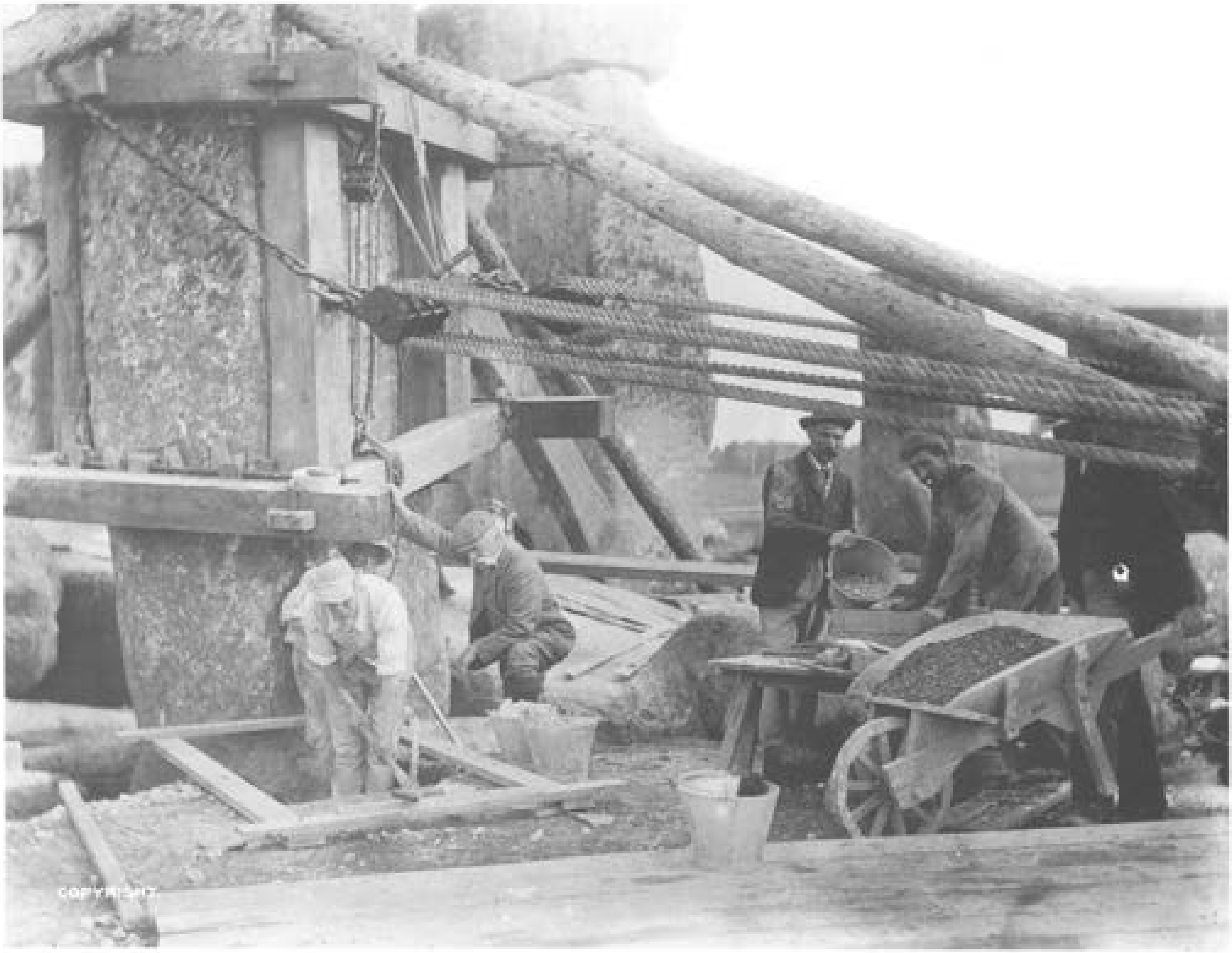



*Fig 4 Excavation around Stone 56 in 1901. Gowland is crouching beside the stone. The workman with the pickaxe is within the frame for trench VII of C64 (© Wiltshire Archaeological and Natural History Society)*

ployed by Gowland are described in his report. By working from an established datum line of 337ft 4in ('1ft 5in below the OS datum 338.9ft Bench Mark Stone 16') or 102.9m above sea level, the positions of objects were three-dimensionally recorded to within a space of 12 x 12 x 6in anywhere within the excavation using a lettered grid and a numbered vertical rod (Gowland 1902, 40). The 'registering frame' (Fig 4) was placed in a horizontal position, at the level of the datum, around the area to be excavated. The soil was then removed, not in stratigraphic units but in 3in or 6in spits ('layers') measured with the vertical rod, 'of approximately one foot square in area, except in one or two places honeycombed with rabbit burrows... ' (*ibid*, 42). Within each excavation the nature of the 6in spits is described. Section drawings were published for five of the excavations (*Chapter 7, Figs 149, 150*) which show that stratigraphy was encountered.

Unfortunately it is difficult to relate stratigraphic units within the separate excavations and to produce a detailed overall plan. The lack of such a plan may have been partly the result of the method enforced by engineering requirements whereby each excavation had on completion to be at least partially filled with concrete before the next could proceed. The soil was sieved through a series of meshes from one inch to one eighth of an inch in order that 'no object, however small, might be lost' (*ibid*, 43).

From his excavation Gowland was able to suggest a stratigraphic relationship between the Bluestone Horseshoe and the Sarsen Trilithons. He also suggested the construction methods used, described the finds in detail, suggested a date for the monument based on the largely Neolithic technology employed, and incorporated the date determined by Sir Norman Lockyer's computation from the astronomical alignment of the principal axis, later published in 1909.

Following the gift of Stonehenge to the nation by Mr (later Sir) Cecil Chubb in 1918, the relevant government body (that is, the Office of Works, the Ministry of Works, the Department of the Environment, and later the Historic Buildings and Monuments Commission/English Heritage) was responsible for commissioning or permitting works at the site, although the Society of Antiquaries of London maintained an interest and provided funds. Much of the work under-

**Table 2 Summary list of twentieth-century excavations within and around Stonehenge**

| *Year/excavator* | *Description* | *Cutting no* |
|---|---|---|
| 1901, Gowland | Stone 56 & area | 64–70 |
| 1919, Newall/ MoW | Section of water pipe along A344 | 103 |
| 1919-20, Hawley | Stones 6 & 7 | 1 |
| 1920, Hawley | Stones 1, 2, 29, 30, 31, 49 | 2.1–2.5 |
| | Ditch & Bank | 18.1–4 |
| | 'South Barrow' | 4.1 |
| | Aubrey Holes 1–26, 56 | 32.1–26, 32.56 |
| | Ditch (SW of C18.3) | 19 |
| | Various unidentified | 31.3, 31.8–10 |
| 1920–21, Hawley | Ditch (SW of C19) | 20 |
| 1921, Hawley | 'South Barrow' | 4.2 |
| | Ditch (SW of C20) | 21 |
| | Aubrey Holes 27–9 | 32.27–9 |
| 1922, Hawley | Ditch (opposite Aubrey Holes 2–4) | 22 |
| | Ditch (NW of C22) | 23 |
| | Ditch and terminal | 24 |
| | NE entrance causeway | 5 |
| | Aubrey Holes 18 & 55 | 32.18, 32.55 |
| | Ditch terminal | 25 |
| | 'Natural' chalk hole | 31.11 |
| 1923, Hawley | Z Holes 1–11, 29, 30 | 33.1–11, 33.29–30 |
| | Y Holes 1–11, 29, 30 | 34.1–11, 34. 29–30 |
| | Strip between Y Holes 9 & 11 | 9 |
| | Station Stone 91 | 30 |
| | Slope of Bank, SE of Slaughter Stone | 31.1 |
| | Area SE of Slaughter stone inc Aubrey Hole 3 | 31.2 |
| | Small features | 31.4–7 |
| | Trial trenches on NE side | 7.1–107 |
| | Area of Stones 8 & 9b | 8 |
| | Avenue terminal & interior, Heelstone ditch | 6 |
| 1923, Crawford & Passmore | Avenue, King Barrow Ridge | 88 |
| | Avenue, nr A303 | 104 |
| | Avenue, nr Stonehenge–Amesbury road | 105 |
| 1924, Hawley | Y Holes 12–15 | 34.12–15 |
| | Z Holes 12–15 | 33.12–15 |
| | Between Stones 150 & 32 | 12 |
| | Inside Stones 8 & 9, Stones 33 & 34 | 13 |
| | Stone 12 | 16.1 |
| | Stone 13 | 16.2 |
| 1924, Hawley | Around Z Hole 13 | 16.3 |
| 1924, Hawley | Stones 15–57 | 17 |
| | Ditch (SW of C21) | 26 |
| | Aubrey Hole 30 | 32.30 |
| | Near Stone 72 | 54 |
| | General trenching | 10.1–109 |
| 1925, Hawley | General trenching | 11.1–15 |
| | Ditch (between C18.3 & C22) | 28.1–20 |
| 1926, Hawley | Ditch (SW of C26) | 29.1–12 |
| | Opposite Stones 31, 49, 48 | 12.1–3 |
| | Lintel fragments 160 A–C | 12.4 |
| | Opposite Stones 46 & 47 | 12.5 |
| | South of WA 5613 | 12.6 |
| | Near Stones 60 & 46–49 | 12.7 |
| | Adjacent to above | 12.8 |
| | Near Stonehole J | 12.9 |
| | Near Stone 150 | 12.10 |
| 1927, Clay | Close to Stonehenge–Amesbury Road | 89 |
| 1929, Newall & Englehart | Stone 36 | 111 |
| 1935, Young | Car park area | 94 |
| 1950, Atkinson *et al* | Aubrey Holes 31 & 32 | 34.1–32 |
| 1950, Newall | Stone 66 | 112 |
| 1952, Newall | Stones 71 & 72 | 113 |
| 1953, Atkinson *et al* | Z Hole 16 | 33.16 |
| | Y hole 16 | 34.16 |
| | Heelstone–Avenue ditch | 36 |
| | 'Oblique' Ditch | 38 |
| | N ditch of Avenue at elbow | 95 |
| | As above | 39 |
| | S ditch of Avenue at elbow | 40 |
| | 'Gate Ditch' | 37 |
| 1954, Atkinson *et al* | Ditch W of NE entrance | 41 |
| | Ditch (W of C41) | 42 |
| | Bank & Counterscarp | 43.1–2 |
| | Bank opposite Aubrey Hole 14 | 44 |
| | Stones 32 & 33 | 45 |
| | Stonehole 33a, Q & R Holes 8 | 14/46 |
| | Stone 36 | 47 |
| 1956, Atkinson *et al* | re-excavation of Hawley C12 | 12 |
| | Avenue NE of A344 | 48 |
| | Ditch opposite Aubrey Hole 40 | 49 |
| | Ditch, Station Stone 94 | 50 |
| | Heelstone Ditch | 51 |
| | Stones 59a, 58, 70 | 35 |
| | Ditch at Station Stone 94 | 50 |

**Table 2 (cont)**

| *Year/excavator* | *Description* | *Cutting no* |
|---|---|---|
| 1956, Atkinson *et al* | Heelstone ditch | 51 |
| | Between Stones 59a, 58, 70 | 35 |
| | Trial trench to find Avenue | 90 |
| | As above | 106 |
| | Re-excavation of Hawley C17 | 17 |
| 1958, Atkinson *et al* | Stones 22, 58, 69, 70 | 52 |
| | Stone 55a and Altar Stone | 53 |
| 1959, Atkinson *et al* | Stones 60, 72, 59a (incorporating Hawley C54) | 54 |
| | Stones 4 & 5 | 55 |
| 1964, Atkinson *et al* | Re-excavation of Hawley C13 | 13 |
| | Stones 53 & 54 | 56 |
| | Stone 23 | 57 |
| | Stone 25 | 114 |
| | Stones 27 & 127 | 58 |
| | Small squares around Stones 53 & 54 | 71–80 |
| 1966, Vatchers | Car park | 82 |
| 1967, Vatchers | Pedestrian underpass | 81 |
| | Avenue, A303 | 86 |
| | Unlocated evaluation trenches (probably Vespasian's Ridge) | 108 |
| 1968, Vatchers | SEB cable trench, A344 | 83 |
| | A303 widening | 107 |
| | Floodlight cable trench | 84 |
| ?1968, Vatchers | Geophone cable trench | 85 |
| 1973, CEU | N Avenue ditch, Avon end by Smith | 87 |
| | Avenue, Avon end | 109 |
| 1978, Evans | Re-excavation of C42 | 61 |
| | Re-excavation of C40 | 62 |
| | Avenue N ditch at elbow | 96 |
| | Gate Ditch | 97 |
| 1978, Thom & Atkinson | NE side of Station Stone 94 | 63 |
| 1979, CEU | Car Park | 93 |
| 1979–80, Pitts | Cable trench through Heelstone ditch & Avenue | 91 |
| 1981, CEU | Footpath through monument | 92 |
| 1984, WA | Sewage pipe | 98 |
| 1988–9, WA | Visitor facilities | 99, 100 |
| 1990–1, WA | Grass repair | 110 |
| 1993, WA | Temporary toilets | 101 |
| | Electricity cable | 102 |
| 1994, WA | Limited auger survey | 115 |

*CEU = Central Excavation Unit*
*WA = Wessex Archaeology*

taken was initiated as a result of the periodic need for consolidation.

## Lt-Col William Hawley (1919–26)

Following the end of the First World War, attention was again focused on the monument. The immediate need was still to prevent further damage to those unstable stones which had been identified by the original advisory committee. The outer circle was in a particularly poor state, with several stones supported by wooden props (Fig 5). Lieutenant-Colonel William Hawley (Fig 6), another Fellow of the Society of Antiquaries, who had excavated at Old Sarum, was nominated by the Society of Antiquaries to assist the Ministry of Works, initially to undertake the excavations necessary to allow repairs and stabilising measures. The excavations, which began on 12 September 1919, were to continue each year (usually March to November) until September 1926.

Lt-Col Hawley has been severely criticised as being responsible for

> ...one of the most melancholy chapters in the long history of the monument [with the] ... regrettable inadequacy in his methods of recording his finds and observations and, one suspects, an insufficient appreciation of the destructive charcter of excavation per se, [which] has left for subsequent excavators a most lamentable legacy of doubt and frustration.
> (Atkinson 1979, 196)

It should be pointed out, however, that his work was undertaken on a low budget, often alone, with few facilities, and with the supervision and full knowledge of the Ministry of Works and the Society of Antiquaries. After Lt-Col Hawley's Fourth Report, the president of the Society of Antiquaries said:

> In time, patient excavation and careful record were bound to throw light on the many problems of Stonehenge, and in

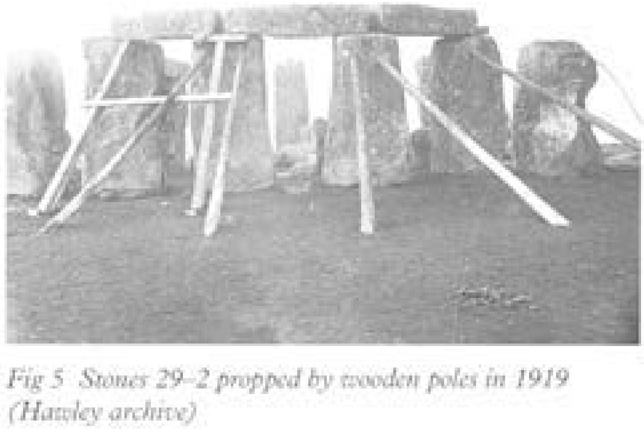


*Fig 5 Stones 29–2 propped by wooden poles in 1919 (Hawley archive)*

*Fig 6 Lt-Col William Hawley (photo courtesy of Faith Hawley)*

> warmly thanking Col. Hawley for his past efforts, the Society hoped that he would be able to continue the work and find his reward in further and greater discoveries.
> (Hawley 1924, 39)

A year later, again thanking the Colonel, the President said 'Such patience and accuracy would serve as a model in all branches of research ...' (Hawley 1925, 36). For the first season at least he was accompanied by Robert Newall, a local archaeologist, who acted as assistant and draughtsperson, but thereafter, when funds seem to have been more restricted, Newall was only occasionally on site.

Accustomed as we are to modern transport and communications, it is easy to underestimate the logistic and engineering problems encountered by Lt-Col Hawley (and possibly by Gowland as well, although his excavation was relatively small and the season short). In 1918 Sir Frank Baines wrote 'For the moment there are military establishments in the immediate vicinity of the monument, but normally it is one of the most solitary spots in the Kingdom' (Baines 1918, unpublished letter PRO WORK 14/2463). Entries in Hawley's Diaries show that practicalities were clearly frustrating: 'All hands are at work dismembering the crane emptying one of the counterpoise boxes and moving the gear...' (4/5/1920).' ... we are hung up on account of non arrival of pulley and pin for jib — may be so for a week more.' (4/6/1920) 'The absence of cement is our trouble now ...' (31/8/1920) 'no news of cement coming ...' (4/9/1920), 'cement arrived at Amesbury station yesterday' (23/9/1920).

Living alone on site in a small hut at the mercy of the weather and with only intermittent help, restricted for company to workmen assisting with the restoration work (Fig 7), Hawley's health must have suffered; 'all I know is that he was completely knocked up two or three times' (Englehart, 25/10/1921, unpublished letter PRO WORK 14/2463). When not in his hut on site the Colonel spent his time living and writing in somewhat primitive conditions in a cramped and tumbledown mill at Figheldean, well remembered by his daughter-in-law, where he was obliged to climb up and down an external vertical ladder to reach his bed (Faith Hawley, pers comm).

This said, the quality of the site records and the methods employed should be reviewed. These varied over the seasons, but were generally of a reasonably high standard for the time. For example, the general method employed by Hawley was not unlike that of Harold St George Gray (a former assistant of Pitt Rivers) at Maumbury Rings, Dorchester, between 1908 and 1913 (Bradley 1976, 5). Turf and topsoil were stripped down to chalk bedrock and intrusive features were recorded. It is possible that features above the chalk were not noted, although there is not generally a great depth of stratigraphy at Stonehenge. Comparison of Hawley plans with those prepared during later re-excavations of certain areas indicates that most negative features were recognised and recorded.

The progress of the excavations and details of features and finds were recorded in daily Diaries. At least one,

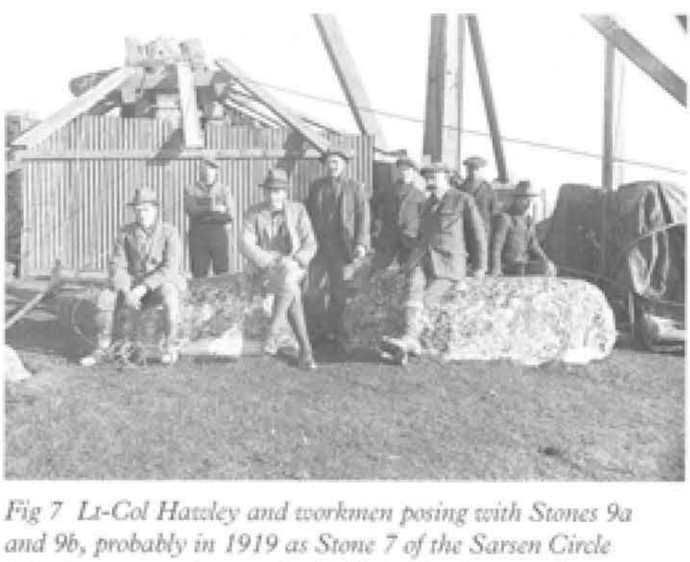


*Fig 7 Lt-Col Hawley and workmen posing with Stones 9a and 9b, probably in 1919 as Stone 7 of the Sarsen Circle is in the process of re-erection behind. Hawley, sporting handlebar moustache and flat cap, is seated on the right-hand stone (Hawley archive)*

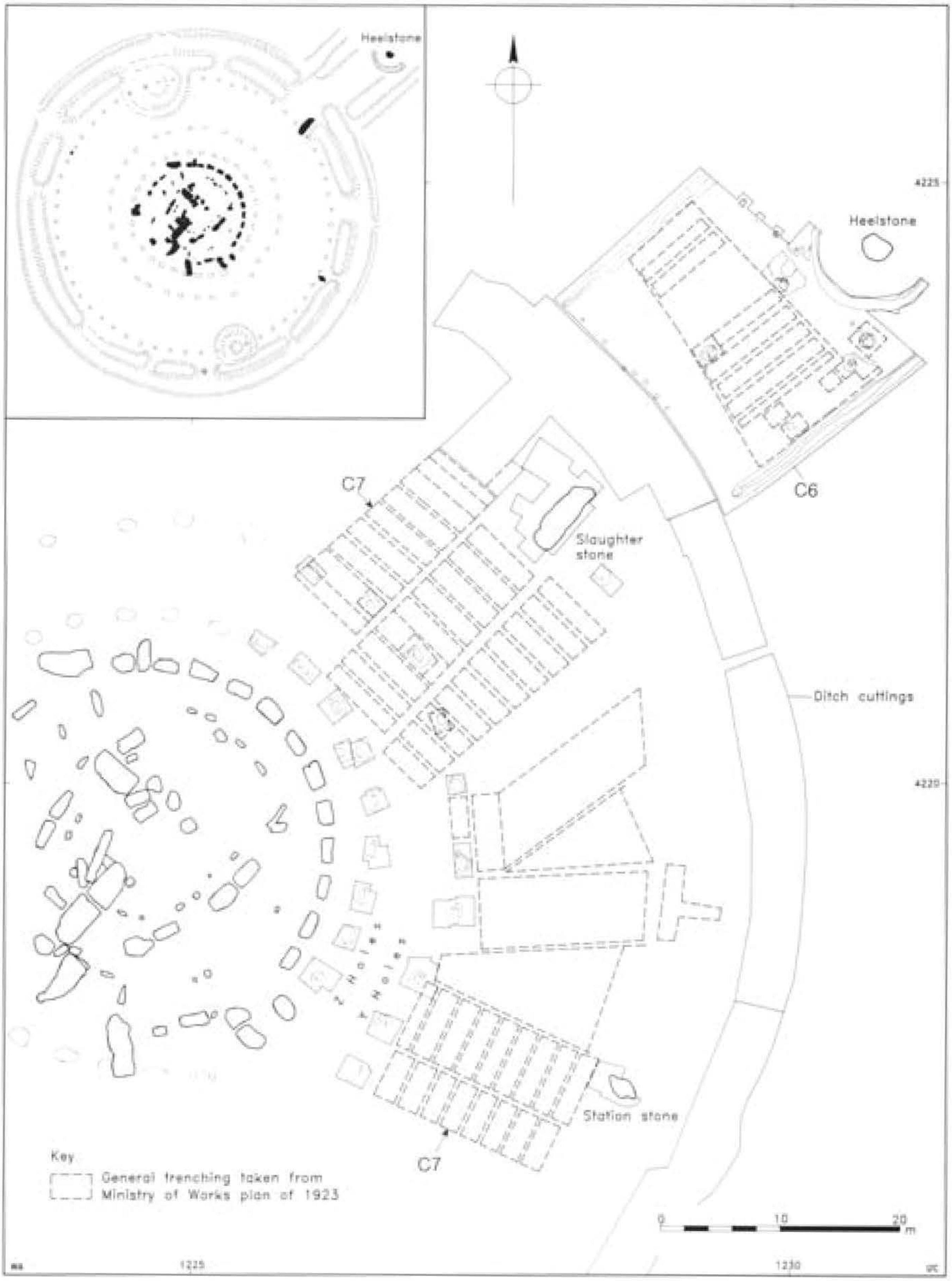



*Fig 8 Hawley's general trenching in the north-eastern part of the monument (C7) from the original MoW plan (see Plan 1)*

and probably two, transcriptions of large parts of the Diaries were prepared (one by the Society of Antiquaries and one by Robert Newall (correspondence 1953)). There are, however, both acknowledged gaps (for example when Hawley was busy working on his annual report) and parts which have apparently not been preserved.

Although some sketch plans and sections were prepared during the excavation, mainly by Newall, official recording was undertaken by an MoW surveyor (Mr Wright) each season. This has implications for what was recorded (profiles predominating over detailed sections), since the surveyor visited only occasionally and, it seems, irregularly. In some cases, both the pencil originals and final inked versions have been preserved. Photography was also used to record some sections, particularly of the Ditch.

Hawley regarded the recovery and recording of finds as important; 'Newall looks after the sieving if my attention has to be wholly occupied with getting out the soil' (Hawley, 1919 unpublished letter PRO WORK 14/2463). Overall numbers of finds were recorded in the Diaries. Comparisons suggest that only selected material was retained (*see also Chapter 9, stone, for an assessment*). Stone chips were washed and counted, samples of different types retained, and then, possibly because finds storage was a problem both on site and later, the rest were buried in a series of pits dug specifically for the purpose some distance to the south of the monument which became known as 'Hawley's Graves'. Most of the cremated human bone was deposited in Aubrey Hole 7 (*see Chapter 9, human bone*). The retained finds were each given a number and letter code, and many can be reasonably securely placed back in context, with the help of a catalogue produced by Newall and the Diary descriptions. Unfortunately, although stratigraphic relationships were apparently recognised by Hawley, the site was excavated in 'spits' rather than stratigraphic units. Some finds therefore have doubtful contextual provenance and must be treated accordingly. As at Maumbury Rings (Bradley 1976, 5), the depth of the finds is generally given as as a depth from the turf, BGL (Below Ground Level) being a common abbreviation throughout the archive.

As his initial task in excavating and securing Stones 6 and 7 (C1) was essentially the same as Gowland had undertaken for Stone 56, Hawley employed the same method and used the same type of 'registering frame'. This process was also applied to Stones 29–1 (C2).

During the 1920–22 seasons, the same method was applied to excavation of the Ditch (C18–25). After this the paucity of finds recovered from the Ditch may have been the reason for his abandoning the technique, although he continued to note the depth BGL of finds 'of importance'. Features cut into the chalk were emptied in 'spits', with fill descriptions and numbers of finds generally noted in the Diary. However, as mentioned above, there are some gaps in the Diary as preserved.

For the interior of the monument, between the Ditch and the stone settings, and in the area between the main entranceway and the adjacent road (A344), Hawley employed a rolling programme of strip trenching (Fig 8). Cuttings 7, 10, 11, and part of 6 were excavated in this manner but although large expanses of the site were thus exposed, the backfilling of completed strips meant that large areas were not generally visible in plan at any one time (Fig 11, *below*).

As a result of his excavations, Hawley was able to agree with Flinders Petrie (1880) that the Bank and Ditch were of an earlier date than the stone monument. He also suggested a period of abandonment between these phases (*see Chapter 6*). In addition, Hawley discovered the Aubrey Holes and the Y and Z Holes, numerous postholes, and recognised the erection ramps for some of the stones.

The excavation results were reported annually to the Society of Antiquaries and the reports were published promptly in the *Antiquaries Journal* (Hawley 1921–26; 1928). Although the reports contain some mistakes (in the numbering of illustrated features, for example) and little analysis, they present a considerable amount of basic information.

## Professors Richard Atkinson, Stuart Piggott, and Dr J F S Stone (1950–64)

In 1950 Professors Richard Atkinson, Stuart Piggott, and Dr J F S Stone (Fig 9), having been given the task by the Society of Antiquaries of reporting fully on the previous excavations, applied for permission to excavate at Stonehenge in order to answer specific questions which were outstanding following Lt-Col Hawley's excavations. The initial investigation, that of Aubrey Holes

*Fig 9 Piggott (far left), Atkinson (left), and Stone (right, with pipe) taking a latex mould of the carvings of Stone 53. This is virtually the only archive photograph showing all three together (Archive no P51058)*

*Fig 10 Straightening of Trilithon 53/54 in 1964 following excavation of C56 (P50934)*

31 and 32, was published in 1952 (Atkinson *et al*). Further excavations were undertaken in 1953, 1954, 1956, 1958, 1959, and 1964, some partially as a response to various works put in hand to secure the safety of the monument (Fig 10) (*see Plan 1 for locations of excavations and cutting numbers*). The principles underlying the excavations were made clear by Professor Piggott, 'At all times during the recent excavations of the site, the paramount necessity of restricting the excavated areas to the minimum has been in our minds, and we have been very conscious of the need to leave for future generations of archaeologists the opportunity of checking our own work ' (Piggott, 3/9/1956 communication to the *Times*). Detailed reports of these excavations have not been published, although the results were used as the basis for Professor Atkinson's popular book on the monument (Atkinson 1956 *et seq*).

The work on site was undertaken by the three principal investigators with various student helpers. Written site contextual records and/or site day books were apparently not maintained. Plans of trenches showing features cut into bedrock hachured (some with depths noted) were prepared but detailed section drawings of individual features (with the exception of Aubrey Holes 30 and 31, Y Hole 16, and Z Hole 16) are largely absent.

Although sections (mainly profiles only) were drawn of the edges of some trenches, the relationships between features cannot always be ascertained from the surviving archive. In November 1994, following the death of Professor Atkinson, further archive material became available which included field notebooks (containing primary field survey data including a contour survey of 1956 and a 1959 Avenue survey), and contemporaneous information regarding a very small proportion of the finds and photographic archive. It has been possible to incorporate relevant information into this volume as appropriate. The archive material itself has been reunited with the main archive.

Information about the archaeological excavation, recording methods, and finds retrieval is varied. The season for which most information is available is 1954. The positions of some finds, at least those from the 1954 Ditch cuttings at least, were three-dimensionally measured and recorded. Instructions were issued by Professor Atkinson to students intending to participate in the 1954 excavations:

> The object of this excavation is to obtain reliable evidence for the detailed stratification of finds, and especially of stone chips, in the silting. All finds even the smallest, must therefore be recorded accurately, and, so far as practicable, individually by measurements in three dimensions. However as the number of finds in the upper levels of the silt will probably be very large, a simplified form of record will be used for them, which will be abandoned as soon as the density of finds falls sufficiently to permit individual recording. The procedures outlined below must be thoroughly understood and followed strictly.
>
> (Atkinson, 1954 archive document)

Although registers for these finds and a plan with some of them plotted have recently been recovered, the plan of datum/grid pegs from which the finds' positions were computed is no longer available. As the finds from each season were individually numbered, it seems likely that a detailed record of their positions was intended, although only the finds from the 1954 are related to the 1ft (0.3m) square grid system which was adopted for the Ditch sections, and details for the other seasons, and indeed of other trenches in 1954, are far scantier.

Comparisons of the Atkinson material with the range of artefacts and other finds in both the Hawley collection and from other sites indicate that finds retrieval was good (ie small-sized and less robust material was recovered as well as the more obvious pieces). Unlike the earlier excavations, there seems to have been no policy of discarding finds after processing, although some were later allocated to teaching collections (University of Edinburgh) and some could not be found in the collection at Salisbury Museum. The animal bone is a particularly good example of this (*see Chapter 9*). Panchromatic negatives have been preserved, although generally unaccompanied by any contemporaneous documentation.

There is a particular problem in comparing the depths of features excavated by Hawley and by Atkinson *et al*. As mentioned above, Hawley usually recorded from ground level (noting depths as BGL). Where his section drawings have been preserved and show the natural chalk surface it is sometimes possible to estimate depths below chalk surface of the features he encountered. Where any depths are noted on Atkinson's plans they appear to be measurements below chalk surface so that it becomes possible to compare the depth of features excavated first by Hawley and later by Atkinson *et al*.

It is also possible in some cases to extrapolate the depths of features recorded on the same plan as those which do have measurements. Unfortunately, in many cases the height of the datum was not recorded (or has not survived in the archive), so that absolute heights OD cannot be obtained except in a few cuttings.

Professor Atkinson continued to take an interest in work at the monument. He and Lance Vatcher are known to have probed both the excavated and unexcavated Aubrey Holes in 1973 (details in archive) and he cooperated with Alexander Thom in a small investigation of a Station Stone hole (Stonehole 94) in 1978 and with John Evans in his 1978 reinvestigation of the Ditch and Avenue cuttings. He was also instrumental in obtaining radiocarbon dates for the Avenue (*see Chapter 7*). A plan of the Thom excavation has been preserved. Work by Evans is discussed below.

### Mrs Faith de M and Major Lance Vatcher (1967–8)

Faith Vatcher was responsible for the archaeological recording of several developments in the immediate vicinity of the monument, often with the assistance of her husband Lance Vatcher. Although she did not undertake any major programme of works within the monument itself, her rescue recording during a series of infrastructure and security projects completed in the late 1960s, had significant results. These included the pedestrian underpass (C81; *see Chapter 6, the Palisade Ditch, and Chapter 8*), the car park (C82; *see Chapters 4 and 8*), geophone and floodlight cable trenches (within the monument; C84 and 85), sections across the Avenue in advance of road building of the Amesbury bypass/A303 (C86 and 107; *see Chapter 7*), and a Southern Electricity Board cable trench just north of the A344 (C83). A full series of plans and sections was produced (though often in sketch form only) with a largely undocumented photographic record. Finds were three-dimensionally recorded.

The results of the excavation in the car park were published (Vatcher and Vatcher 1973, *but see Chapter 4*). Notes on the other excavations were published in the *Wiltshire Archaeological Magazine* with the exception of the geophone/floodlight trenches.

### Other excavations

More recent small-scale work at the monument by John Evans, Michael Pitts, the Central Excavation Unit, and the Trust for Wessex Archaeology has employed standard modern excavation and recording systems, details of which are available in the relevant archives and are summarised in the excavation reports. With the exception of Evans's reinvestigation of the earlier Atkinson trenches, recent work has comprised watching briefs and evaluations. For the other earlier excavations, such as the various interventions along the Avenue, there is very little information on the methods used, and in some cases even the trench location is unclear. Such information as exists is incorporated into the relevant discussions presented below.

## Archives

This section describes very briefly the archives as they existed before commencement of the various episodes of work undertaken by Wessex Archaeology, which have resulted in the publication of this volume. The location of original archive material is given where known. Several people have been involved with the organisation and analysis of the archives over a number of years. Margaret Ehrenberg and Peter Berridge, research assistants of Professor Atkinson in the 1970s, were responsible for bringing together much of the information relating to Hawley's excavations and for basic work on the finds and contextual information. It was Berridge who established the system of Cutting Numbers which has been maintained and extended in this report, and he has recatalogued much of the finds assemblage.

### Professor Gowland

The Gowland excavation archive is divided between the library of the Society of Antiquaries (written and drawn records, photographs, correspondence, publication notes, and drawings) and Salisbury Museum (finds). The finds were originally housed at Devizes Museum.

### Lt-Col Hawley

Lt-Col Hawley's written site archive principally comprises site day books or Diaries. These include details of work undertaken, counts of finds, some stratigraphic details, and general observations (for example regarding weather, site visitors, etc). Although not a full record by any means, and rather inadequate in their description of the relationships between features, the Diaries are written in a fairly objective manner and include many useful, if unquantifiable, references. For example, they record the presence of spreads of flint artefacts or concentrations of animal bone on the Ditch bottom, the presence of land snails, or the distribution of bone within the Aubrey Holes. The original volumes are retained by the Hawley family, who have kindly allowed microfiche security copies to be taken and placed in the National Monuments Record. A typed transcript is held at Salisbury Museum. Concordances of various categories of finds were prepared by Berridge and are housed with the main archive in Salisbury Museum.

The nature of the surviving drawn record was partially dictated by the arrangement with the Ministry of Works, whose surveyor visited only periodically. This

*Fig 11 Aerial view of Stonehenge, taken in 1923, showing Hawley's strip trenching in the NE entrance (C5 and C6), excavation of Station Stone 91 (C30) and of some of the Y and Z Holes. Also visible, where the righthand trackway passes the MoW hut in the right foreground, are 'Hawley's Graves' (see text). The Avenue can just be made out in the field beyond the Heelstone and road (now the A344) (Crawford Collection, RCHM(E), © Crown copyright reserved)*

allowed the production of detailed plans of features (which could be left open until the end of the season) but relatively few section drawings (those that exist were mostly drawn by Newall). MoW plans are housed primarily with English Heritage in London (Historic Maps and Plans Room) and the Public Record Office at Kew. Some MoW duplicates are in Salisbury Museum, with additional original material (mainly sketches and notes, probably by Newall). Some duplicate material (mainly engineering) is held by English Heritage in Bristol and Salisbury.

The importance of a photographic record was recognised by Lt-Col Hawley, who was also interested in obtaining aerial photographs of the site through the local RAF Stations. A number of air photographs survive (National Monuments Records Centre, Swindon). The surviving site photographs include Ditch sections (copies at the Society of Antiquaries and Salisbury Museum) and a series of details of the restoration of the stones, fortunately recovered after being lost for many years and now held by RCHM(W) (Aberystwyth). In addition, the Gaumont Company made a cinematograph film and took photographs in early 1920 recording the replacement of Stones 6 and 7. No copies of this film have been located.

Newall appears to have kept many of the Stonehenge finds at his home for several years 'at present I have the bones in my loft as the museum has no room for them' (Newall 1934, unpublished letter, PRO WORK 14/2463). It was he who catalogued the finds and deposited the information at Salisbury. Many of the finds, though it is not known what proportion, were reburied in 'Hawley's Graves', a series of ten pits dug on the line of a track close to Hawley's hut, to the south of the monument. These show on an aerial photograph taken in 1923 (Fig 11) and are marked on an MoW plan (123/32/A2.1 archive no 77). Presumably this is where they remain.

A selection made by Newall saw the bulk of the retained finds presented to Salisbury Museum, with representative samples to the British Museum, the Ashmolean Museum, Oxford, and Cambridge University amongst others. Further material was deemed unnecessary, 'We have here a very careful selection made by Newall himself, part of which is on exhibition and part preserved for study purposes. We have, I think a full representative series and should not require any more' (Stevens 1934 unpublished letter, PRO WORK 14/2463). Advantage was taken of Young's work at the car park in 1935 to provide labour to rebury the 'excess' bone in Aubrey Hole 7 – actually virtually all of the cremations – where, again, they presumably remain.

## Professors Atkinson, Piggott, and Dr Stone

No written site records have been found from the 1950–64 excavations, and it seems that none were produced. Plans and sections (pencil and inked) of some areas showing excavated negative features were prepared (*Chapter 7 and Appendix 6*). It would appear that some of the original site drawings are no longer available for consultation, including the plan showing datum points and grid pegs mentioned above.

The photographic archive now comprises 2096 black and white negatives. Two sets of prints have been made (one copy will be held with the main archive at Salisbury Museum and one at the National Monuments Record Centre, Swindon). Almost no documentation accompanied the photographs, although it has proved possible to interpret many of them, for example through comparison with site plans or the position of the more easily recognisable stones. The information has been entered onto a database (*see below, Appendix 9*). A notebook of Atkinson's which recently came to light contains a list of photographs, but these seem to be shots that he intended to take rather than records of those actually taken; no concordance with any sequence of shots in the archive has been established.

Copies of secondary sources (correspondence, concordances, 'cuttings records', etc) compiled by research students at Cardiff University (principally Ehrenberg and Berridge) have been obtained and will be deposited with the main archive at Salisbury Museum.

The finds recovered each season were allocated individual numbers starting from 1. For example S.53.91 indicates season of 1953, number 91. A card catalogue of the finds was prepared by Peter Berridge. The finds have largely been deposited at Salisbury Museum but some seem not to be with this material. There are, for example, no finds, and no record of any finds, for the 1959 season of excavations. There is a small number of finds in Salisbury Museum from other seasons with no card index entries, and there are cards for apparently missing finds. A small teaching collection was established at the Department of Archaeology of the University of Edinburgh, but this is no longer in its original boxes and it seems likely that much of it has become detached from its original labelling (A Saville, pers comm).

Two films, made in 1955 and 1958, recorded restoration work at the monument. VHS copies are held by the National Film and Television Archive in London.

## Mrs and Major Vatcher

Finds from the underpass (C81), the Southern Electricity Board cable trench (C83), the floodlight cable trench (C84), the geophone cable trench (C85), and some from the Avenue (C107)/A303–Amesbury bypass (C86) were deposited in Salisbury Museum. Finds from the car park (C82) and some from the Avenue (C107)/A303–Amesbury bypass (C86), together with correspondence and site drawings related to various Vatcher Stonehenge excavations, formerly held by the Alexander Keiller Museum, Avebury, are currently held by Wessex Archaeology but will be deposited with the main archive at Salisbury Museum.

## Others

Records produced by Newall throughout the many years of his association with the monument include sketches of the stones and some excavated features, and rubbings of carvings. Correspondence and a draft copy of an unpublished work *Stonehenge Extracts* are also preserved. These are held at Avebury Museum. Copies of some of this material have been obtained and will, it is hoped, be deposited at Salisbury Museum with the main archive.

The finds from the 1978 research excavations by Evans have been deposited with the full excavation archive at Salisbury Museum. One exception is a small amount of graphics material related to the reopening of the 1954 Atkinson Ditch cutting (C61), which is currently held by Wessex Archaeology but which will be deposited with the main archive.

Finds from Young's 1935 car park excavations (C94) have also come into the care of Wessex Archaeology and will also be deposited with the main archive at Salisbury Museum. Copies of the 1978 Thom survey results and a plan of the investigations round the hole for Station Stone 94 are also held by Wessex Archaeology. The finds and site archives from the Central Excavation Unit excavations of 1979 and 1981 (C92 and 93) are held at Salisbury Museum, as is the complete archive of the Pitts excavations of 1979 and 1980 (C91).

The complete archives for the small previously unpublished Wessex Archaeology watching briefs and evaluations will be deposited at Salisbury Museum. It may be of interest to note that the complete archive produced by the Stonehenge Environs Project (Richards 1990) is also held by Salisbury Museum.

No information has been retrieved to date for the various small investigations of the Avenue by Crawford and Passmore in 1923 (C88, 104, and 105) or Clay in 1927 (C89). The archive and finds from George Smith's Avenue investigations (C87 and 109) have not been located, although the publication states that they were to be deposited at Salisbury Museum.

## Post-excavation rationale

*by K E Walker and Julie Gardiner*

The 'Stonehenge Archive' incorporates primary and secondary material from a number of different excavators and excavations, both within the monument and from the surrounding area. This material is of variable quality and widely dispersed (*see above and Appendix 9*). A primary aim of the present work was to locate the many and various materials resulting from the twentieth-century excavations (and where possible to ensure the existence of security copies of records). As well as contacting the known and 'obvious' institutions directly, an article was published in *Antiquity* to herald the present study and and to elicit information on unknown sources (Lawson 1992). As there are some topics which have had to be excluded from the brief of this volume, and it is anticipated that the issues raised will stimulate further discussion, it was felt to be important to make as much of the material as possible available for further study. To this end, perhaps rather more words than usual have been given over in this volume to discussing the archives.

As has been mentioned, the bulk of the finds and some records, particularly from the Hawley excavations, have already beeen deposited at Salisbury Museum. Graduate student assistants of Professor Atkinson, particularly Margaret Ehrenberg and Peter Berridge, were responsible for producing and preserving much of the secondary Atkinson archive, parts of which are copied at Salisbury. Berridge collated information, compiling detailed finds lists, allocating a series of 'cutting' and feature numbers, and ascertaining the general provenance of many finds within the monument.

Building on the existing base, Wessex Archaeology has gathered a 'core' of original site records (graphic and photographs), duplicate records, and post-excavation materials which is of prime importance, and which has been the focus of this study. It is expected that this will be deposited at Salisbury Museum with a guide, as a coherent and usable archive capable of interrogation by future researchers. In addition, a record has been compiled of known non-archaeological disturbances (interventions) within the Stonehenge Triangle. Copies of some of this material have been already been placed within the public domain (microfiche records and a complete set of the Atkinson photographs may be found at the National Monuments Records Centre, Swindon).

It should be noted that although this report has used the work of Berridge and Ehrenberg as a basis for completion of the ordering of the archive and cross-referencing, none of the draft text prepared by the latter has been incorporated here. It was felt that the present report should be undertaken from first principles, the interpretations presented being based entirely on the observations and deliberations of the current authors.

It was clear from the outset that in view of the variability of the recording attempts would have to be made to compile an integrated basic context record and finds database covering all the excavations under consideration to as high a standard as possible. The preparation of the text of the volume presented here would also be dependent on the achievement of this objective.

To this end, every discrete context that could be identified from the records was allocated a new number in a single numeric sequence. Over 4000 context numbers have been issued. Individual context records sheets have been compiled, though it must be admitted that very little information could be included on many of these. Summary context information has been entered onto a database. All extant finds in Salisbury Museum were reassigned to their original contexts by using a combination of Berridge's finds concordances and card index, Hawley's Diaries, any original markings on boxes and bags, and any available information from the lesser excavations.

Where it was possible only to assign finds to a cut or feature (such as an Aubrey Hole) but not to an individual layer within that feature, a group context number was allocated for all contexts within the feature to which the finds might belong. In certain cases where only a general or group context number could be assigned, individual artefacts (notably several of those selected for radiocarbon dating) were unambiguously from the very base of the relevant features. In these cases context numbers were assigned which relate to the specific artefacts only; for instance, antler picks from the base of Y Hole 30 are assigned context no 3927, whereas the fill of this hole is assigned general context no 1665.

The bulk of the finds are in Salisbury Museum and these have have been studied in detail or scanned using standard Wessex Archaeology procedures for different material types. The depth of analysis of various finds varied according to the security and relative value of contextual information. The assemblage was divided in the first instance into three categories which reflected their potential:

**Priority 1:** consisting of material from pre-'Stonehenge Layer' levels which are major elements of the monument; and from negative features containing artefactual material uncontaminated by later artefacts, and

**Priority 2:** consisting of some finds from the Stonehenge Layer and from the layers above; from negative features recognised as post-prehistoric by the excavators; from negative features which included predominantly post-prehistoric artefacts.

**Priority 3:** all other surviving material.

There was so little material from the Avenue excavations that providing the contextual information was secure, it was treated as Priority 1.

Specialist time was allocated according to the priority of the finds, and Priority 1 material was recorded in greater detail than Priority 2 or 3. Prehistoric pottery was treated slightly differently in that sherds from all negative features which are major elements of the monument were treated as Priority 1, whether containing only prehistoric pottery or not. The sherds were also recorded in more detail. Prehistoric pottery in other repositories was studied, although other find types were not, because other finds are known to have been selected as only a typical and representative sample and could add little extra information (*see Chapter 9*).

All finds examined were entered into one of several compatible/interactive computer databases (*see Appendix 9*). All artefacts have been fully and individually recorded using specially designed forms based on Wessex Archaeology's standard recording system for finds, modified to accommodate the various numbering systems adopted by the different excavators and previous workers. All finds were catalogued according to their original contexts and finds numbers, the former then being converted to the new Wessex Archaeology Context Number. A series of numerical finds codes was assigned to each class of artefact by category of material, together with object numbers for individual artefacts (as opposed to undiagnostic pieces of, for instance, bluestone, sarsen, flint flakes, glass, etc). Full details of the codes used are in archive. Thus, each find's record includes all the various context and finds numbers assigned to the individual pieces since they were excavated. Standard Pottery Scanning and Recording sheets were completed, the individual sherds of earlier prehistoric pottery being allocated an individual Pottery Record Number. The animal bone and antler picks/rakes were recorded by direct data entry by the specialist concerned using the standard recording techniques of the Faunal Remains Unit, Southampton University.

Production of the illustrations used in this report has been extremely difficult. Since the excavations at Stonehenge span many years and were carried out by different people, the drawn archive is extremely variable in quality: that is, in terms of scale of (re)production, size, detail, annotation, orientation, and surviving condition. The best of the graphics are highly accurate MoW plans and sections which relate mostly to Hawley's work but also include a range of survey plans of different dates and contents and many detailed architectural elevation drawings of the stones (*Appendix 7*).

Unfortunately, because the work of recording Hawley's excavations was only sporadic, much detail was inevitably omitted. Section drawings for the Ditch are regrettably absent though profiles were drawn at regular intervals along its length. Many of the accurate plans and section drawings which we would expect from modern excavations are absent and in many cases all that is available is an odd scribble or copy of a copy that has started to fade. Originating from so many different hands, the quality of the drawing is also extremely variable, as are the number and type of conventions used: some drawings are highly stylised but are accompanied by detailed descriptions of layers or features, whilst others are much more realistic in their presentation but unannotated.

All of the relevant originals (or copies) that have been assembled by Wessex Archaeology were scanned and digitised using a computer aided design program (CAD). It must be remembered that many cuttings originally excavated by Hawley were reopened by Atkinson *et al* (and some of Atkinson's reopened by Evans) in some cases to more or less the exact extent, but in other cases on a slightly different alignment, to a slightly different extent overall, or with one or more extensions. Different versions of plans of the same cutting may also indicate it to have been of different size and shape. In some cases, too, it is clear that Hawley did not quite reach the bottom of features which were then further emptied by Atkinson *et al*. This often led to the inclusion of repeated information from different years/excavators, but it was vital to make use of all available information in order to overcome some of the difficulties highlighted above.

The digitised information was then added to a master drawing based on the English Heritage 1990 survey of the stones, in CAD, and was used to build up an overall picture of the excavations and changes that took place. This was necessary for a number of reasons. First, the large size of some of the originals presented potential problems of distortion resulting from xerographic reductions. Secondly, use of varied and mixed scales, some imperial and some metric, meant that hand transcription to a suitable common scale would have been extremely time-consuming and open to considerable error. Thirdly, and most problematic, was the fact that plans of the excavations were not always accurately located. In many cases the only 'fixed point' for reference was the edge of one of the stones and it proved most efficient and accurate to rotate them on the CAD system in order to obtain the best fit with the information that was available. As additional plans of the same areas of the monument were overlaid it was often apparent that there were discrepancies in the recorded location and extent of trenches and stones which again were provided with a 'best fit' using CAD. A related problem arose because many of the stones have been moved and/or re-erected since excavation around them took place. Both 'before' and 'after' information was needed in order accurately to relocate the excavations, depending upon the year in which they occurred.

The largest single problem of all, however, was the lack of an accurate plan of the entire monument. The 1919 MoW plan of the stone settings and the Bank and Ditch, incredibly enough the most recent full plan that could be identified, was used as a base, complemented by a more detailed survey of the stone settings of the same date, a 1980 survey of the stones (which differs considerably by virtue of the movement and re-erection of stones shown as fallen on the 1919 version), a 1991 contour plan of the entire monument undertaken by RCHM(E), and various versions of the stone settings from intervening years and from a variety of sources. Nevertheless, there are a few trenches where one should read 'best guess' rather than 'best fit'.

The result was a multi-layered plan of Stonehenge comprising two earthwork surveys, three or four stone surveys, and numerous versions of excavation plans and their positions. The overall site plans, the cuttings plans, and the phase plans presented in this volume are all generated from this 'best-fit' compromise: they are therefore internally consistent and as accurate as possible, although precisely how accurate could probably be resolved only by stripping the entire monument.

In this report great care has been taken to present the excavations in as objective a manner as possible. In any report of this nature, however, it is impossible to avoid subjective interpretation, particularly where no standard recording system has been used and the authors have been reliant on excavators' notes and diaries and on incomplete finds assemblages. From the outset it was intended to make extensive use of the original drawings and photographs and to use the excavators' own words, and this has been done wherever possible. This not only helps the authors to defend themselves against possible criticisms of interpretative licence but also, much more importantly, enables the reader to see on precisely what evidence the interpretations have been based without having to have recourse to the archives. It is hoped that, within these pages, justice has been done to the various excavators concerned and that the results of their work are presented in a readable and coherent form which would both have satisfied them and will satisfy, and be of lasting use and benefit to, all who are interested in the archaeology of the monument. The consolidation and ordering of the archive has been a task even greater than the production of the text and it is to be hoped that it will prove a much more manageable and usable mine of information for future research than it has in the past.

As the text of this report was nearing completion, news was received of the death of Professor Richard Atkinson on 10 October 1994. Some weeks later, in November 1994, Dr John Evans of Cardiff University informed the authors that a quantity of hitherto unknown archive material had been recovered from the Professor's home. This material was quickly made available and has been assessed and assimilated, and much information from it was used in the final stages of preparing this volume. Among this 'new' archive was a series of notebooks in which Professor Atkinson had noted hundreds of measurements, but as far as could be ascertained there are no details of what they are, or from where or how they had been calculated. This is just one small area of the overall archive which is bound to provide endless hours of research for some future scholar. Now that the archives have been made more accessible it is certain that there are many more aspects of the monument which can, and no doubt will, be further interrogated. This volume presents the story of Stonehenge as told by the archaeological excavations of the twentieth century. It is hoped that it now provides the basis for the continued story of the monument in the twenty-first century and beyond.

# 3 The monument today

*by K E Walker*

## Stonehenge in its modern setting

*by K E Walker and Julie Gardiner*

Approaching Stonehenge from almost any direction (Plan 3), one is struck by the openness of the landscape and the domination of it, not as one might expect by the monument but by the modern intrusion of the two main roads. These divide at Stonehenge Bottom, barely 300m to the east, and bracket the monument with a seemingly unbroken line of cars, caravans, military vehicles, and heavy goods lorries. The position of the monument on a low plateau places it on the skyline from only limited stretches of road, the means by which most modern visitors approach, and depending on the time of day and the lighting conditions, it can sometimes barely be seen (Fig 12; Plate 3.2).

Looking out from Stonehenge the roads again dominate the landscape and certainly in summer when the traffic is heavy even before dawn, a feeling of noisy claustrophobia may be engendered. Apart from the current visitor facilities, numerous fencelines, and plantations, however, there are few obvious modern intrusions. In many respects the present landscape view from the monument seems rather barren but this is in sharp contrast to the view which the prehistoric visitor would have had, as described below.

The Stonehenge 'Triangle' is an area of just over 19ha lying between the A303, the A344, and a byway (the Larkhill Track) which runs from Larkhill, to the north of Stonehenge, to Wilsford Down to the south-west. Within the Triangle lie the monument itself and a group of barrows. A large area of land around the monument is owned by the National Trust. The Triangle and the monument itself are owned by the Secretary of State on behalf of the nation. Stonehenge is a Scheduled Monument in the guardianship of English Heritage and is part of a World Heritage Site.

Formerly, within this century, there were custodians' cottages at the eastern point of the triangle and, across the A344 from them, a café. All were demolished in the 1930s (Chippindale 1983, illus 164). The current visitor facilities, situated on the opposite side of the A344 from the monument, began with a small car park in 1935, followed by various extensions and improvements which culminated in the construction of an underpass in 1967. The triangle itself, fields on the north side of the A344


*Fig 12 Stonehenge in the 1990s looking south-west from the A303 as it climbs King Barrow Ridge (Wessex Archaeology)*

containing part of the Avenue, and much of Countess Down are now farmed as pasture and most of the remaining National Trust land is under arable cultivation by tenant farmers.

Weathering, the long history of its use, and disturbances of many kinds have had a considerable impact on the monument, although some effects are more visible than others. Many of the stones have fallen over the millennia, as documented by the earliest accurate records dating from the seventeenth century AD. Some of the stones have fallen comparatively recently, some have been re-erected, and others have probably been removed. The Stonehenge which stands today is not only considerably altered from any of its presumed prehistoric forms, but through the evidence of paintings, sketches, lithographs, photographs, and other artistic representations, can be seen to have had a complex recent history.

During the present century the popularity of the monument as a tourist attraction (currently more than 700,000 visitors a year) and as a place of pilgrimage, worship, and contemplation has taken its toll. The visitor facilities have been recognised to be inadequate whilst the visual impact, noise, and atmospheric pollution from both the facilities and the roads have become unacceptably intrusive. Until the 1960s it was possible for visitors to stroll among the stones, resulting in considerable erosion and disfiguring graffiti. During the 1960s the previously excavated areas of the centre of the monument were emptied and refilled with power station coke (Chippindale 1983, 255; Atkinson pers comm). The centre was then gravelled over and compacted, although it has since been returned to grass. A path has been constructed, partly between the Ditch and stone circles and partly outside the Ditch, from which the public are now obliged to view the stones.

## Physical description

There are many available descriptions of the monument, including some of considerable antiquity (for example, Atkinson, 1956; 1979; Chippindale 1983 with extensive references). What follows is a summary description both to remind readers of the main elements of the monument with their traditional nomenclature, and of the principal characteristics of those elements. Figure 13 shows the major features of the monument apart from the postholes, which are omitted for clarity.

Stonehenge was illustrated in a posthumously published study by Inigo Jones in 1655, a sketch plan by John Aubrey in 1666, and the 'restoration' of William Stukeley in 1740 (see Chippindale 1983 for a full account of the early descriptions), but the earliest accurate ground plan was published in 1747 by John Wood. In 1877, W M Flinders Petrie undertook a detailed survey of the monument; he considered this to be accurate to within one tenth of an inch (2.5mm) in any direction and the published lithograph (Petrie 1880) to be accurate to within one two-thousandth of an inch.

The system conventionally used at Stonehenge for the numbering of the stones was initiated by Flinders Petrie. Numbers for each of the main elements start at the monument's axis and increase in a clockwise direction (Fig 14). Thus, the circle of outer stones is numbered 1–30, and allowance was made for those presumed to be missing. The surviving stones of the smaller circle within are numbered 31–49, with no allowance for missing stones. The Trilithon uprights are numbered 51–60, and the innermost horseshoe 61–72. The so-called Altar Stone is Stone 80, and stones beyond the main settings are numbered 91–7. Lintel stones were numbered 100 more than their higher numbered support: thus Stone 156 is the lintel of the now collapsed Trilithon whose uprights were Stones 55 and 56. Subsequent excavation has identified the stumps of, or sockets for, additional stones which have been given either letters or suffixed numbers, so that a simple numerical sequence no longer exists (*see below*).

Working from the outside towards the centre are the following elements of the monument.

### The earthworks

The stone settings of Stonehenge are surrounded by an interrupted ditched enclosure, the outermost element of which, the Counterscarp Bank, is a very slight bank around the outer edge of the Ditch, now barely and only intermittently visible. It seems unlikely ever to have been a major feature and is said to have been only 13 inches (0.33m) high when sectioned in 1954 (Evans 1984; Atkinson pers comm). Its existence as an integral and continuous feature of the monument has been open to question and there seems to have been no attempt to measure its extent accurately. However, recent resistivity survey has revealed it, clearly defined, encircling the entire Ditch (*Payne, this volume, Appendix 1, Fig 260*). It was encountered during excavations by Evans and Atkinson in reopening C42 close to the main entranceway in 1978 where it was described as 'intermittent patches of chalk lumps, not more than 0.03 to 0.05m thick' (Evans 1984, 7) and an auger hole through it in the western area of the monument (*see Plan 1*) showed it to be composed of compacted chalk fragments 0.05m thick (Wessex Archaeology 1994a). It was presumably composed of upcast from the Ditch.

The main Ditch defines a fairly accurate circle of (computer-generated; *see caption to Fig 79*) radius 53.5m = 107m diameter to its approximate centre line, *c* 110m (331ft) being the diameter usually cited. The Ditch is interrupted by at least two entrances, a main entrance on the north-east side of the monument and a smaller, less well defined one on the south. A third possible entrance occurs in the south-west (*see Chapter 5*) but is not now visible on the surface. There are a number of further gaps which are the result of post-medieval or modern trackways crossing the site, but whether they correspond with additional genuine entrances is unknown. The eastern half of the Ditch, where former

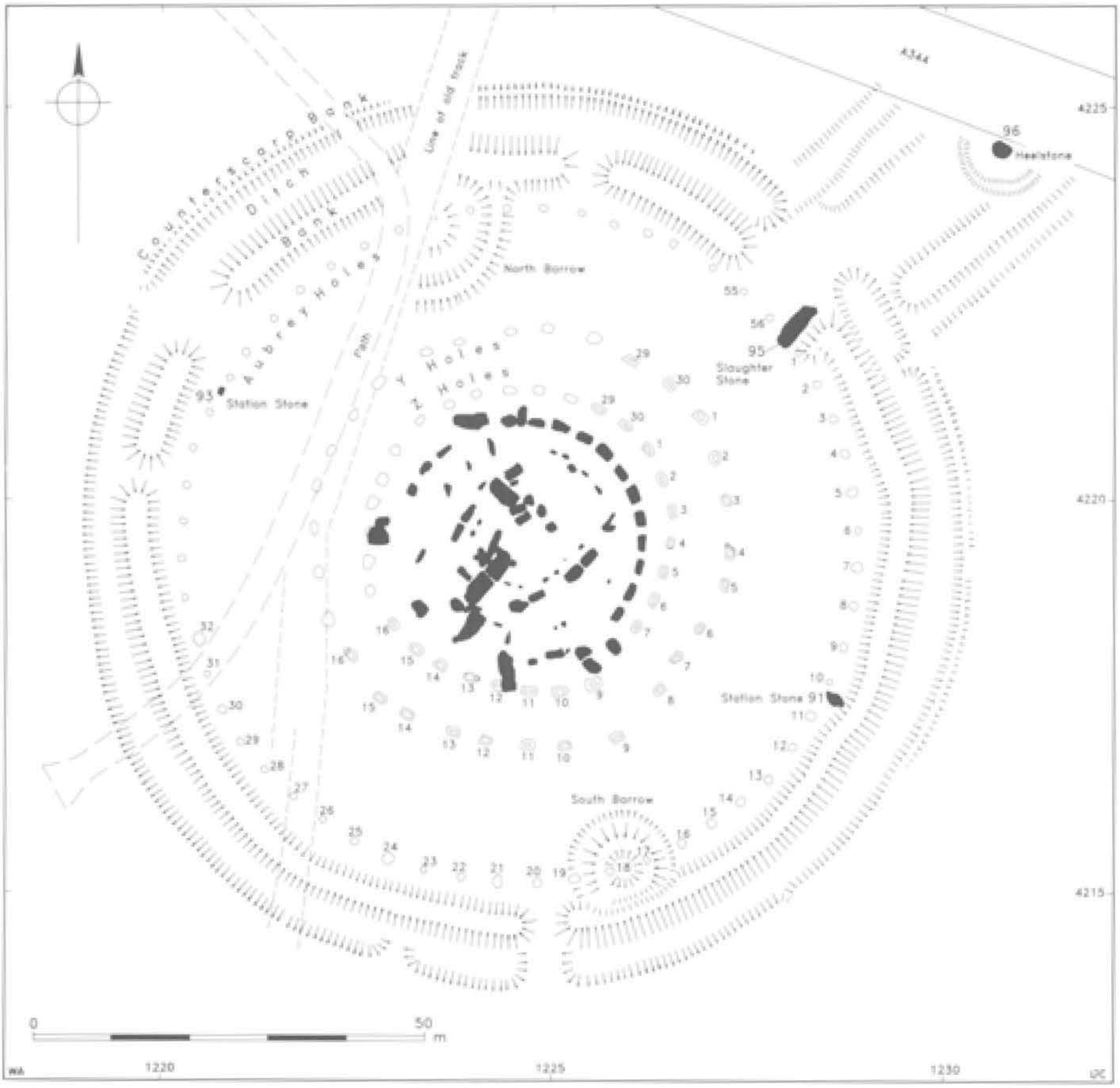


*Fig 13 The major components of the monument (excluding postholes)*

excavation trenches were only partially backfilled, is more noticeable to the visitor. Its surviving depth here is variable, though it is nowhere more than about 0.90m below the top of the Bank. The unexcavated half is slighter still, with a maximum surviving depth of no more than *c* 0.50m. The Ditch merges into the Bank with no discernible berm between them.

Inside the Ditch is the *Bank*. The medial line of the Bank forms the circumference of a circle of (computer-generated) radius 48.3m = 96.6m diameter. This is slightly less than the usually cited 320ft (97.5m) estimated by Atkinson (1979, 9). It survives as a low mound interrupted by a number of breaks, not all of which correspond with breaks in the Ditch and most of which are likely to be post-medieval in origin. Atkinson (*ibid*, 15) estimated its original height at 1.8m. Evans (1984) described it as being composed of 'chalk lumps loosely dispersed in a humic matrix' where it was encountered in his 1978 excavation. Here, the surviving remnant was 0.15m thick with possible traces of a buried soil beneath. Following augering in 1994, Allen described the 0.12m depth of bank material recovered in the auger core as 'chalky rubble comprised of medium (and larger) chalk pieces within a calcareous silty loam matrix' (Wessex Archaeology 1994a), below which was a clearly defined relict old ground surface (*see Chapter 4*).

From the main north-eastern entrance the Avenue runs north-east and is cut by the A344. The low twin parallel banks with ditches on the outside are visible at the monument and can be seen in the grass of the field across the road. The earthwork runs straight for *c* 530m towards the north-east before turning east-south-east to cross Stonehenge Bottom, from where it climbs the hill towards King Barrow Ridge and disappears from view beneath arable fields. It continues through various straight and curved sections until it meets the river Avon at West Amesbury (*see Plan 3 and Chapter 7*). The Avenue was interpreted by Atkinson as a processional approach to Stonehenge along which were transported the Bluestones. A number of small-scale excavations across various sections of one or both ditches produced ambiguous results which are presented together for the first time and reinterpreted in Chapter 7, below.

## Pit circles

A circle of 56 pits, the Aubrey Holes, with approximately the same centre point as the earthwork, lies 4.8–4.9m (*c* 16ft) in from the median line of the Bank, the centres being on average 4.57m (15ft) apart. There have been various estimates in the past of the circumference of this circle. Newall's estimate (commonly accepted in the literature) is 87.8m (288ft). The computer-generated diameter is 87.05m (287ft). Thirty-four of the Aubrey Holes have been excavated, 32 by Hawley and a further two by Atkinson *et al* in 1950. The positions of the excavated holes are now marked with white concrete circles. The remainder of the circle was determined by probing; the pits are not visible on the ground but they can be clearly seen in the geophysical survey plots (*see Payne, Appendix 1*).

Two concentric but irregular circles of pits lie outside the Sarsen Circle at a distance of 11m and 3.7m respectively. These pit circles, which are no longer visible on the ground, were found after the Aubrey Holes, which had initially been named 'X' Holes by Hawley. The two new circles were called Y Holes (outer circle) and Z Holes (inner circle). This temporary method of distinguishing the various circles (Hawley 1925, 28) has become the accepted nomenclature. On average the Y Holes lie 5.64m (18ft 6in) and the Z Holes 2.25m (*c* 7ft) apart. Each circle was possibly intended to number 30 pits, although only 29 Z Holes have been identified (*Chapter 7*). Although they are not physically associated, the two circles of holes have been assumed to belong to the same phase of activity at the monument, as they share characteristic distributions and shape. The presence of late pottery in the fills led Hawley to the conclusion that the Y and Z Holes were of pre-Roman Iron Age date at the earliest (Atkinson 1979, 21). Atkinson, who considered them to have been dug as stoneholes but never used, associated them with a hypothetical double circle of dressed Bluestones (*Chapter 7*).

## Stone settings

In the description which follows (Fig 14, *see also Plan 1*), measurements of the stones are taken from Atkinson (1979), since it was not possible to undertake a full measured survey of the stones within the remit of this project. A photogrammetric survey has recently been undertaken by English Heritage but the results are not available at the time of writing. The heights of all the stones above ground level as recorded by Atkinson (or, in some cases, in the Chief Architect's Report of 1919) are provided in Appendix 5.

The sarsen stones make an immediate visual impact on the visitor. These natural blocks of hard-grained sandstone with a silaceous cement were probably imported from the Marlborough Downs some 30km to the north (see Howard 1982 for a recent discussion).

The Heelstone (96) is a standing sarsen, not deliberately shaped (dressed), with traces of a circular ditch of internal diameter *c* 9m still visible around it, just inside the eastern bank of the Avenue, *c* 25m outside the entrance causeway and immediately inside the fence running along the verge of the A344. It is the position of the Heelstone in relation to the centre of the monument and the midsummer sunrise that has attracted so much attention over the generations. This stone leans in towards the monument, although it was presumably originally upright. It is sub-rectangular in shape, *c* 2.4m thick. Its top is nearly 5m above present ground level.

At the entrance to the earthwork lies a recumbent sarsen, known as the Slaughter Stone (95), with evidence for some dressing. This is one of the largest stones at the site and it was assumed by Atkinson (1979, 31) that it once stood as one of a 'pair of upright pillars which formed a gateway to the monument'.

Four more sarsen stones known as the Station Stones (91–4) formerly stood just inside the Bank on about the same line as the Aubrey Holes. Only two, both with slight evidence of dressing, are now visible, one upright and one fallen. Around each of the two missing stones was a circular ditch. That around Stone 92 created the appearance of a central mound although the height of the ground surface within is hardly different from that surrounding each ditch. That around Stone 94 has been partly cut away by recent tracks (Fig 13) and seems to have enclosed a circular bank rather than a mound. These are known as the South and North Barrows, although they are not burial mounds.

A circle of dressed sarsen stones about 30m in diameter, the Sarsen Circle, forms the outermost of the stone circles (Fig 14 and Chapter 7). The Circle (Stones 1–30) seems originally to have consisted of 30 uprights, although only 17 now stand, the north-eastern side of the monument being the most complete. They are evenly spaced 1.0–1.4m apart. Most of the stones are sub-rectangular in outline, *c* 0.9–1.25m thick at ground level, and *c* 2m wide. Although they appear straight this is an illusion created by the slightly convex tapering of the stones which conteracts the foreshortening effect of their height when viewed from below (average *c* 4m). Depth below ground varies between *c* 0.9m (3ft) and *c* 1.5m (5ft).

The sarsens were capped by horizontal stones ('lintels') which formed a continuous circle around the top,


*Fig 14 Plan of the stone settings showing material used and numbering of the stones*

although few remain *in situ*. The upper surfaces of the upright stones are slightly dished to receive the lintels. The lintels were secured to the uprights by mortice and tenon joints – a construction technique traditionally associated with wood rather than stoneworking – and were further secured by tongue and groove on each end (Plate 5.2). Five lintels remain in place, or have been replaced. These are rectangular blocks of sarsen, shaped to the curve of the circle, bearing sub-circular mortices in their lower surfaces. They average 3.2m (10ft 6in) in length, 1.06m (3ft 6in) in width and 0.7m (2ft 6in) in thickness.

The Bluestone Circle, within the Sarsen Circle, is a smaller circle of upright 'Bluestones' (31–49, 150), most of which show little evidence of having been dressed. The term 'bluestone' covers a variety of geologically similar igneous rocks which, after much research and debate, have been shown to have sources in the Preseli

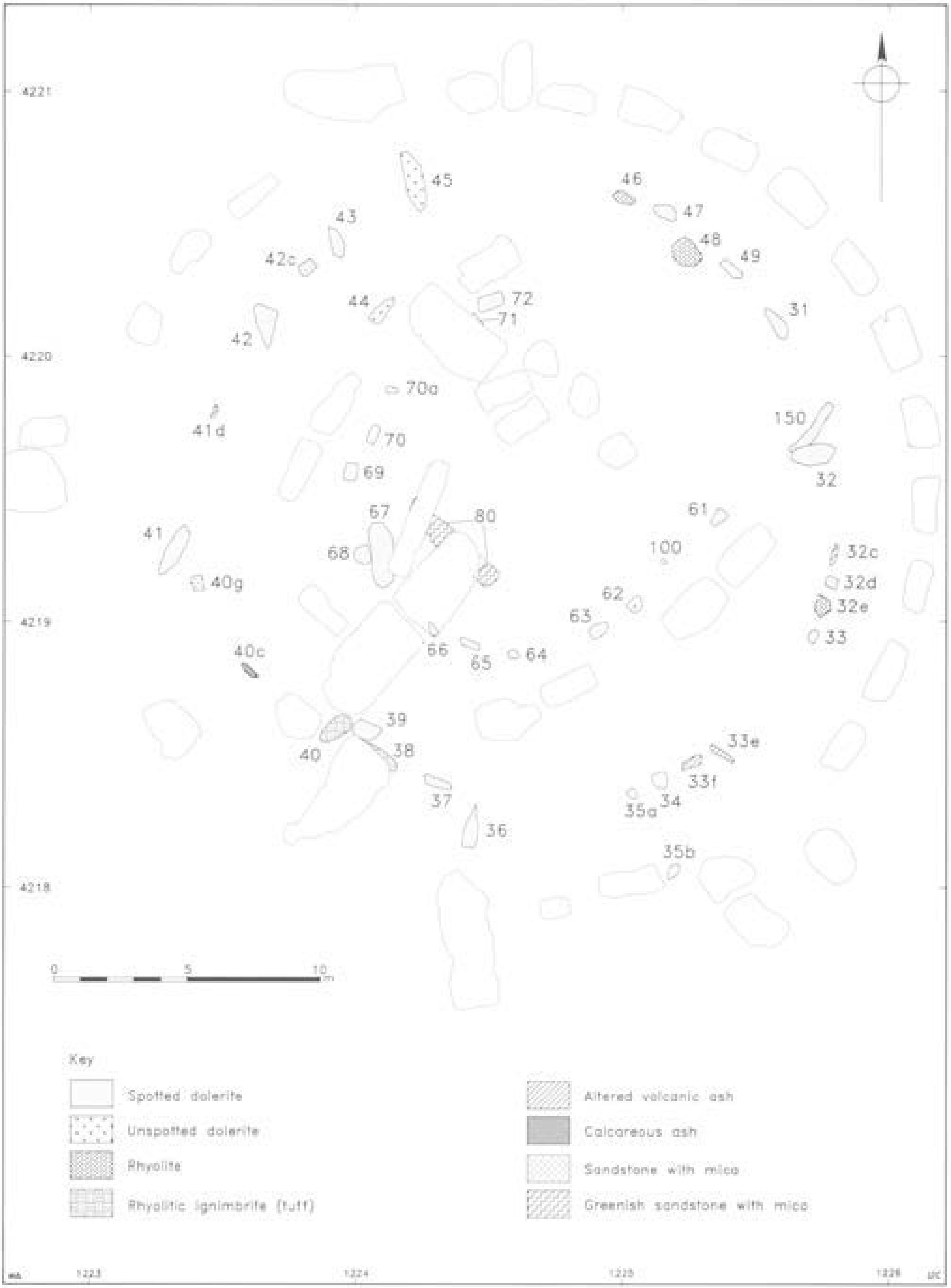



*Fig 15 Composition of the Bluestones (after Thorpe et al 1991, fig 1)*

*Fig 16 View of the stone monument from the Avenue terminal, looking through the main north-eastern entrance (Wessex Archaeology)*

Hills of Wales. The Bluestones in the Circle (Figs 14 and 15; *Chapter 7, phases 3iii, 3iv*) consist of spotted dolerite, altered volcanic ash, rhyolites, and unspotted dolerite, as well as calcareous ash and sandstone (Thorpe *et al* 1991, 106; *see Chapter 9, stone, for further discussion*). There are now only 6 completely upright stones in this circle, though 12 others survive, either leaning or fallen (including the fallen Stone 44 included in the circle by Atkinson (1979, 37; Fig 15)), and stumps of at least 9 more lie buried. They may originally have numbered 60. It appears that at least two of these stones (150 and 36) had been used previously in another setting, either at the monument or elsewhere, as they have mortice holes which are not necessary in their current setting. The Bluestones in the Circle are variable in size and shape (average *c* 1.22m (4ft) wide and 0.75m (2ft 6in) thick) and also in their heights above (*c* 2m (6ft 6in)) and below ground level. Atkinson (1979, 38–9) argued that all the Bluestones in the setting, with the exception of the two possible lintels, were essentially 'in their natural state ... and none shows any sign of deliberate tooling or dressing'.

Five structures of dressed sarsen, the Sarsen Trilithons (each consisting of a pair of upright stones and a horizontal lintel), form a horseshoe. They were arranged symmetrically around the north-east to south-west axis inside the Bluestone Circle and open to the north-east (ie towards the main entrance). Three are now complete and the other two have one standing stone, with the second stones and lintels lying on the ground. The Trilithons are graded in height; the tallest is in the central position opposite the main entranceway. The two outermost Trilithons (represented by the upright Stone 60 and Stones 51 and 52) have an overall height above ground level, including the lintel, of just over 6m (20ft), the next two (Stones 57 and 58, 53 and 54) of *c* 6.6m (21ft 6in), and the largest (Stone 56) of *c* 7.3m (24ft). Atkinson notes (1979, 28) that the depth below ground of the stones varied from *c* 1.2m (4ft) for Stones 57 and 58 to *c* 2.4m (nearly 8ft) for Stone 56.

A further setting of dressed, pillar-shaped Bluestones, the Bluestone Horseshoe, lies just inside the Trilithon setting (61–72, 100). Atkinson (1979, 42) suggests that there were originally 19 stones set at intervals of *c* 1.7m (5ft 6in) centre to centre. Only six remain in place, though stumps of six others survive above ground or are buried (100, 64–6, 70a, 70b). These Bluestones also consist of unspotted and spotted dolerite (Thorpe *et al* 1991, 106; Fig 15) but, unlike the Bluestone Circle stones, these are clearly carefully dressed. They are on average 0.6m (2ft) square and over 1.8m (6ft) tall, generally tapering towards the top, and the top surfaces are dressed flat and level. Two of the stones appear to have had tenons (67 and 70), now much worn, one (69) a dished top, and one (68), a groove worked down the side (Atkinson 1979, 17; Plate 5.1) into which the tongued side of (buried) Stone 66 may have fitted.

A large broken dressed block of fine-grained rock known as the Altar Stone (80) lies embedded in the ground 'in front' of the largest of the Trilithons, oriented approximately north-west to south-east but neither aligned with nor at right-angles to the main axis through the north-eastern entrance. This is the largest of the non-sarsen stones, *c* 4.9m (16ft) long, 1m (3ft 6in) wide and 0.5m (1ft 9in) thick. The fallen Stones 55 and 156 lie across it. The rock has been identified as greenish Cosheston Beds Sandstone from south Wales (Atkinson 1979, 46). It is the only one of the stones identified as

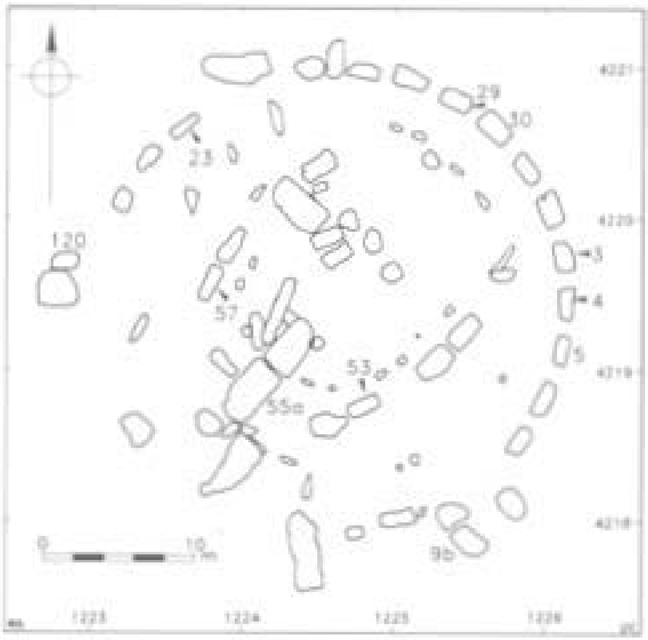


*Fig 17 Position of the supposed prehistoric carvings*

being of this material, though only a small number of stone samples has been analysed in recent years and some 9% of the pieces and fragments of bluestone surviving in museum collections have been so identified. The relevance of this is discussed in Chapter 9. (It should be noted that Thorpe *et al* (1991, 141, table 12) comment that a flake from Hawley's excavations petrologically identified as Cosheston Beds Sandstone and re-examined by them is 'probably lower Palaeozoic Sandstone units of SW Wales not Cosheston Beds'.)

## Other sub-surface features

Other excavated elements of the monument are not visible on the ground although some of them can be distinguished on air photographs and from geophysical survey (Plan 1 and Fig 259). These include numerous postholes, many of which appear to be early in the sequence of the monument (*see Chapter 6*), complex but incomplete settings such as the Q and R Holes in the centre of the monument, at least two possible graves, and other stoneholes including significant features on the periphery of the monument. These are discussed in Chapter 7, below.

## Prehistoric carvings

*by Andrew J Lawson and K E Walker*

Many of the sarsen stones of the monument have been inscribed with graffiti. Although the majority are almost certainly post-medieval in origin, a number are apparently prehistoric. The presence of carvings which could reveal the stones' 'true history' had been proposed as early as 1893 but this was dismissed as an unbalanced idea (Rogers 1991). A memo in the Public Record Office mentions a search for 'cup or analogous markings surviving on any of the stones. (I) succeeded in determining markings on I think eight stones' (Mann, 16/4/1924 PRO Work 14/2463). It was not until 1953, however, that the existence of carvings was accepted as fact. The first was discovered on Stone 53 by Professor Atkinson at about 5 pm on 10 July 1953. Subsequently, others were found by D Booth, Mr Barnett (a site custodian), R S Newall, B Hope-Taylor, and O G S Crawford (Atkinson 1952; Crawford 1954). The majority of the carvings have been found fortuitously when the observer, aware of the possibility of the existence of prehistoric carvings, was able to view the stones under favourable lighting conditions (Plate 7.2).

Although casts have been made of restricted areas of the stones where carvings have been recognised, no systematic recording of the stone surfaces and their carvings (including modern inscriptions) has apparently been conducted. The best records comprise photographs, both archival and published, and the surviving archive of a survey undertaken by Newall in 1953-4 (Figs 18–20). Newall died on 17 January 1978 at the age of 93 and his papers were subsequently acquired by Avebury Museum.

Newall did not describe his methods but deductions about these can be made from the archival records (78510367/4D; 95000205-6). During his survey he made rubbings on thin tissue paper of small areas of the surfaces of the Sarsen Stones. It is not clear what he used as a blackening agent. The position of each of the recorded carvings was triangulated and a scale drawing constructed (Figs 18–20). It is possible that he created a full-size illustration of one stone (4) because a surviving smaller document is described as a photograph of the 'natural size' illustration.

At about the same time plaster casts were made of the identified carvings. Some of the casts were silvered by the application of thin foil (two different brands appear to have been used). Both direct observation and further rubbings of the 'silver' were then used to clarify the details of individual carvings. In 1956 and on subsequent occasions latex moulds were made, and from them plaster casts, both by Atkinson *et al* (Atkinson 1979, 208; Fig 9, *above*) and others (Mario Varela Gomes pers comm). Forty-three casts of parts of Stones 3, 4, and 53, mostly made by Newall, are stored in Salisbury Museum.

A different technique for objective recording was pioneered in September 1967 when staff from University College, London, used a stereometric camera for recording a 0.49 x 0.73m area of the carvings on Stone 53. The negatives obtained were used to plot graphic images with micro-contours at intervals of 5mm. This method is described in print elsewhere (Atkinson 1968).

As a result of these studies carvings are said to exist on the following stones:

Stone 3: three axeheads on the outer face. The largest is 0.21m long and 1.20m wide, the smallest 0.13 x 0.09m (Fig 18). In addition, Atkinson (1979, 209)

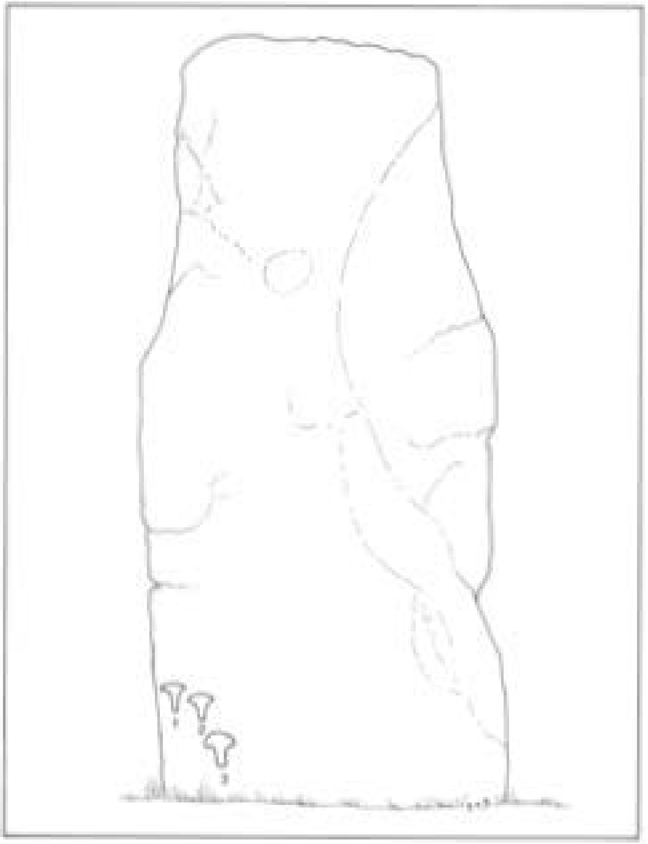


*Fig 18 Newall's measured drawing of the axe carvings on Stone 3. Scale c 1:40*

*Fig 19 Newall's measured drawing of the axe carvings on Stone 4. Scale c 1:40*

reported 'a trellis or lattice pattern ... low down ... of a kind similar to some of the geometric patterns executed on the kerb-stones of ... New Grange in Ireland.' No further information on this is available.

Stone 4: 26 axes on the outer face. The largest is 0.36m long and 0.28m wide, the smallest 0.16 x 0.13m (Fig 19). Newall made comments on several of these, for example: (axe no 14): 'This axe though very clear on the silver cast is almost invisible on the stone.' (18): 'This is one of the more doubtful axes though I have no doubt that one was intended and begun.' (22): '... is one of the more doubtful axes but ... is clear on the silver mould though very faint on the stone.' (24): 'very bad — only the right side recognisable.' (Newall, notes in archive). Atkinson (1979, 208) seems to have accepted only about a dozen of these as genuine carvings.

Stone 5: an axe, the position of which is not known (Atkinson 1979, 209).

Stone 23: 'small knife', squat with an oval pommel and no hilt, on the south side (Crawford 1954, pl viia).

Stone 29: 'torso' 16 inches (0.41m) in height and described by Crawford (1954, pl viib), on the south side, c 1.80m above the ground.

Stone 53: a dagger (the original discovery by Atkinson) and at least 14 axes (Fig 20; Plate 7.2). The dagger is 030m long and 0.14m wide and the smallest axe is 0.12 x 0.08m. One of the 'axes' (Newall's no 12) on the south-west edge of the stone has also been described (by B Hope-Taylor) as a second dagger or possibly a human figure.

Stone 57: an 'irregular quadrilateral 3ft 9ins [0.99m] in height, with a protuberance in ... the middle of the top side'; on the inner face of the stone, said to be a 'highly conventionalised figure of a god or goddess' or 'box-symbol' of Breton type (Crawford 1954 pls v and vi). The 'mother goddess' was described fully by Atkinson in (unpublished) notes compiled for the information of the MoW Press Office during restoration work in 1958:

> the form of the carving is a roughly rectangular outline with a projection in the centre of the top side — not unlike the outline of an old-fashioned tea-cosy. Like all the other prehistoric carvings at Stonehenge, it has been executed not with edge-tools, but by prolonged battering with stone hammers, so as to produce a broad shallow groove on the otherwise smooth surface of the stone.

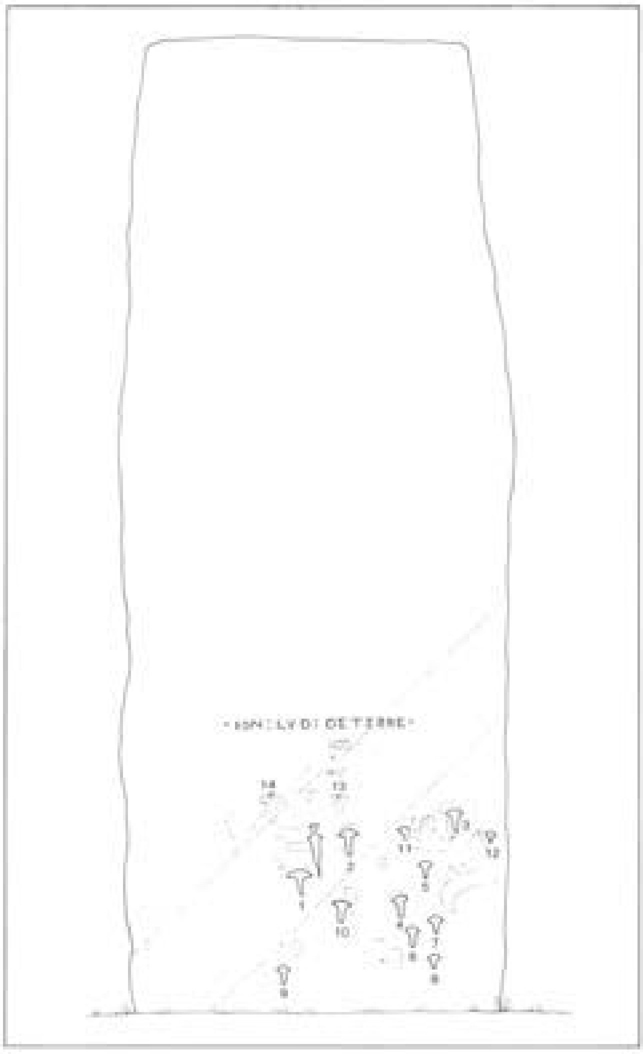


*Fig 20 The prehistoric carvings on Stone 53. Taken from Newall's measured drawing superimposed on an elevation of the complete south face of the stone. Scale c 1:40*

Atkinson (1979, 45) suggests that below the base of this carving are 'traces of another rectilinear design of much smaller proportions' although this was not noted by Newall.

In addition, a number of other, less coherent hollows, lines (Stones 4, 9B, 30, and 55A), and ribs (Stones 53 and 120) have been noticed but thought to be unconvincing as decorative devices (Crawford 1954; Atkinson 1979, 209)

The majority of these carvings have been produced by the lowering of the area within the outline of the symbol to create a shallow negative impression. The 1967 photogrammetric plot shows the greatest depth of the dagger carving to be about 10mm. Newall suggested there might be two 'styles' apparent. 'The larger axes seem to be cut more especially on Stone 4 on the sides or body of the axe, whereas the smallest seems to be hammered or "pebble dressed"'. Such differences in execution were also commented upon by Atkinson (1952, 236). A more pronounced use of a groove to delimit the symbol is seen on the 'small knife' on the side of Stone 23. Similarly, although the central field of the quadrilateral symbol of Stone 57 is slightly lowered, a deeper border is demonstrated by Newall's rubbings. Only in the 'torso' of Stone 29 does there seem to have been an attempt to create a more sculptured *champ-levé* symbol.

**Identity and dating of the carvings**

It has previously been pointed out that the quadrilateral symbol of Stone 57 bears some resemblance to the series of *idoles* of the first passage-graves (*dolmens à couloir*) of the late fifth millennium BC in north-west France. The largest series of these symbols occurs in the dolmen of the Ile Longue at Larmor Baden (Morbihan) (L'Helgouac'h 1979, 179). The later, more elaborate *motifs en écusson* of the fourth millennium are characterised by a depression in the upper line of the design and by vertical median divisions, for example in the *sepultures en équerre* such as Les Piérres Plates at Locmariaquer (*ibid*, 267).

However, these motifs are part of the repertoire of the internal art of megalithic tombs of a different country, built as much as 3000 years before the first stone monument of Stonehenge. They do not occur on the freestanding menhirs of France or the Atlantic border, nor are there parallels in Britain. Such observations cast doubt on the identity of this symbol and it seems possible that a more prosaic explanation should be found. Had this motif been a prehistoric symbol carved on the stone while it was standing it would have been out of reach from the ground. It is possible that it may have been executed by a later visitor, perhaps even after the collapse of the stone in 1797, who wished to leave a commemorative inscription in a prepared panel, although the intention may never have been fulfilled.

The majority of the carvings are of unhafted axe blades with splayed or recurved cutting edges, in a vertical position. Crawford (1954, 28) suggested that two types were represented, those on Stone 3 having a broader butt than others, whereas the bodies of those on Stone 4 converged to a point. As a result of weathering of the stones, it is difficult to be precise about the intended outline, and hence what form they copied. Precise typological comparison may be spurious. However, it can be stated confidently that these are representations of indigenous metal axeheads, most probably bronze flanged axes of the type represented in the Arreton Down hoard and dated around 1500 calendar years bc (Britton 1963, 284–93; Needham *et al* 1985, A6; Needham 1986). The flanged axes in this hoard typically range in length from *c* 0.11m to *c* 0.20m. Hence, although some of the smaller carvings are lifesize copies the largest appear to be exaggerated. Although many of the bronzes of the Early Bronze Age were doubtless for ceremonial use, they were not produced in obviously non-functional and amplified proportions, as were some later bronzes such as certain Middle Bronze Age dirks (for example those discussed in Needham 1990).

The dagger carving on Stone 53 was interpreted by Atkinson as a representation of a Mycenean bronze dagger of the sixteenth century calendar years BC (Atkinson 1952), a deduction hinted at earlier in the discussion of the elaborate Early Bronze Age grave assemblages of Wessex (Piggott 1938, 95–6). This helped to fuel a fertile debate on contacts between Britain and the eastern Mediterranean (Renfrew 1968; McKerrell 1972; Barfield 1991). Since its discovery, visitors have frequently touched this carving, with the result that its true shape may have deteriorated. It is now certainly much more marked than any other carving. It is possible that the symbol was once two separate axe carvings, the butt of the smaller, upper carving having eroded into the cutting edge of the lower. However, it is considered here to be the representation of a dagger.

Indigenous daggers of the Early Bronze Age characteristically comprise an elongated, triangular or ogival bronze blade riveted to a hilt. The blades are typically 0.15–0.35m long (Gerloff 1975), as examples from barrows near Stonehenge itself illustrate (Annable and Simpson 1964, nos 169–70). Unlike some of the Central European daggers on which the Armorico-British series is based, which have metal hilts, the hilts of British daggers were of organic materials and do not normally survive. Hence, the full range of forms in use cannot be demonstrated.

Nevertheless the exceptional preservation of some organic hilts demonstrates that they were of composite construction even in earlier, Beaker, times and that their form may have expanded like the base of an inverted triangle (for example, Methilhill, Fife; Gerloff 1975, no 27; Clarke *et al* 1985, 221, 267, 268). Similarly, organic traces on the surfaces of some excavated blades suggest that the weapons were kept in sheaths which have not survived intact and whose form is not known. The knowledge of the form of the blade, the possible form of the hilt, and likely existence of sheaths make it easier to suggest that the Stonehenge carving is a life-size representation of a local rather than exotic weapon form of similar date to the axes.

The decipherment of the 'small knife' symbol of Stone 23 is more difficult because of its imprecise outline, but it may represent a knife dagger with enlarged pommel. Similarly, the 'torso' of Stone 29 and other suggested markings are difficult to interpret accurately.

All of the known axe and dagger carvings are situated at or below eye level. This may be a function of survival or recognition; others at higher levels may have either eroded away or not been observed. It may also offer some indication of their use at the monument. Their positions suggest that they were executed once the stones had been erected. Although there is a possible overlap between the overall date range for the phase 3 monument (*2550–1600 cal BC*) and the typological dating of the bronzes from which the carvings were copied, they could most easily have been created without the need for scaffolding in the sixteenth century cal BC, after the Sarsen Stones were in place.

It cannot be assumed that the entire distribution of carvings is known, indeed, the reverse is probably the case. However, there appears to be no regularity in their layout. It is possible that they were not all created at the same time. However, although Newall comments (archive notes) that the largest carving (no 17, Stone 4) must have been formed later than one of its neighbours because the 'body of the axe avoids No. 23', no great time separation need be implied.

**Archaeological context**

The dagger and axe carvings are another feature of the unique architecture of Stonehenge. The earliest surviving moulds for casting metal tools in Britain are of stone (Tylecote 1986, 81). The portable stone blocks used as moulds show that the technique of creating an accurately shaped hollow was frequently achieved. However, these moulds were for a functional purpose whereas the carvings at Stonehenge appear to be for display, whatever potency they were thought to have embraced or ceremonial use they performed. Such symbolism is uncommon in British prehistory. Although some Neolithic passage graves may have been elaborately decorated with abstract signs (most notably those similar to the Boyne Valley monuments of Ireland; O'Kelly 1982), naturalistic decoration of monuments in the Bronze Age is less easy to demonstrate.

The burial mounds near Kilmartin, Argyll, in which Early Bronze Age axeheads are carved into cist slabs, are the best known examples (Mapleton 1871; Craw 1930). The sole parallels for the Stonehenge dagger carving are the two examples on a block of sandstone from the Early Bronze Age Badbury Barrow in Dorset (Piggott 1939, Pl59), part of which is now in the Durden Collection of the British Museum. Here, two additional triangular carvings may be schematic axeheads. The presence of five cupmarks on the Badbury stone and the superimposition of axe carvings over cupmarks at Nether Largie North Cairn, Kilmartin (Craw 1931), imply that not all the small circular hollows on the sarsens of Stonehenge are necessarily of natural origin or represent modern damage, and that these cupmarks may be related to the wider series of cupmarks on architectural slabs and utilised natural rock surfaces throughout north and west Europe, although this is a tradition of Neolithic origin (Burgess 1990).

The sepulchral context of the parallels cited above, and the earlier traditions of passage-grave art, appear to set Stonehenge apart unless it is viewed as an integral part of a united landscape. In the Early Bronze Age burial mounds abound in this landscape (*see below*) and their grave-goods include daggers and, unusually, an axe at Bush Barrow. It surely cannot be a coincidence that both axes and a dagger were carved at Stonehenge at about the same time.

## Geographical and topographical setting

*by Michael J Allen*

The monument is sited on Salisbury Plain (Fig 1), which constitutes one of the largest expanses of Cretaceous Chalk downland in southern Britain and lies at the junction of several prominent chalk topographies. These are: the Dorset Downs and Cranborne Chase to the south-west, the Marlborough Downs incorporating Avebury to the north, and the Hampshire Downs to the east. Salisbury Plain has steep escarpments on its north and western edges which overlook the Vale of Pewsey and the country beyond Warminster respectively and most of the lowland chalk landscape lies between 100 and 200m OD. The Plain is considered to end at the Vale of Wardour to the south and to the east at the Avon valley (Barron 1976). The Plain, however, forms a broad plateau characterised by a dendritic pattern of dry valleys whose main systems run broadly north-south down the 'dip slope'.

Topographically Stonehenge is sited between two almost parallel, major east-west syncline axes, one of which runs less than 2km north of the monument from Shrewton and Larkhill to Durrington and upon which lie the causewayed enclosure of Robin Hood's Ball and the long barrow at Larkhill. The other is almost 10km distant and south of the Wylye Valley (cf Barron 1976, fig 6.2). Much of the Plain is open chalk downland or class 3 agricultural land supporting brown rendzinas of the Andover 1 Association and humic rendzinas of the Icknield Association, with grey rendzinas of the Upton Association on the steeper slopes, notably valley sides (Findlay *et al* 1984).

### The Stonehenge landscape: local topography

Since one of the aims of this volume is to place Stonehenge within its landscape rather than isolate it as previous work has tended to do, the local area is important here. The area of landscape study chosen for the purpose of this report is defined to the east and west by the topographical features of the Avon and Till valleys respectively, and to the north and south by the topographically arbitrary but archaeologically pertinent OS grid lines (Fig 1).

The second landscape parameter is that of the visual envelope discussed below. Within this study area the monument can be seen to lie on a low, southward-dipping Upper Chalk plateau. Overall, the land rises in three directions and drops in one, though significantly, the immediate topography presents the opposite aspect (*see below*). The area is bisected by the Stonehenge/Spring Bottom dry valley system described by Richards (1990).

Most of this downland is uncapped by Tertiary deposits, but localised areas of clay-with-flints occur on the higher ridges (eg Normanton Down). The remaining drift geology largely comprises chalky drift in the dry valleys, largely a product of periglacial solifluction, and valley gravels of both colluvial and alluvial origin. The relict distribution of loess deposits is reflected in the ubiquitous silty nature of downland soils (Allen 1988) and was widespread over the chalklands to a depth in excess of 0.4m (Catt 1978; 1979). The ubiquitous occurrence of colluvium in dry valleys elsewhere on the southern chalk observed by Bell (1983) and Allen (1991) is strangely lacking from the Stonehenge landscape, as demonstrated by unsuccessful attempts by Martin Bell and Julian Richards to section colluvial deposits at a number of locations within the Stonehenge Environs (Richards, 1990, 210–11, fig 8). This was confirmed by recent attempts to recover colluvial sequences north of the Stonehenge Cursus (Allen 1994, 268, fig 56). Shallow colluvial deposits of up to 0.75m have been isolated on a tributary valley to the south-west of King Barrow Ridge (Wessex Archaeology 1993b).

The solid and drift geologies influence the main soil types recorded in the area. Where colluvial deposits occur colluvial brown earths and typical brown earths have been recorded. Deeper typical argillic brown earths of the Charity Series are formed only over the clay-with-flints. They are not common but have been observed by the author on Durrington Down and King Barrow Ridge. Where the chalk is devoid of drift deposits the soils are the characteristic shallow rendzinas; brown rendzinas of the Andover Series occur primarily on the low shallow ridges and plateaus, and humic rendzinas (Icknield Series) and typical calcareous brown earths (Coombe Series) are present in Stonehenge Bottom. The Stonehenge Triangle itself comprises primarily humic rendzinas, and grey rendzinas (Upton Series) occur on the steeper valley sides particularly along the Avon valley and areas of prolonged cultivation. This mosaic of soils not only reflects the topography and solid and drift geologies but also, to some extent, both recent and past landuse. Although the majority of the soils are classed as 'thin' rendzinas, the former soils would have been considerably thicker (in part as a result of the late glacial addition of (potentially considerable) amounts of loess and the development of mature brown earths), before significant erosion following deforestation and tillage. Thus it can be postulated that the pre-Bronze Age soils may have been significantly different in character (typical brown earths or even argillic brown earths) and possibly up to 1m in total depth. This point may have some bearing on the visibility studies conducted for this study (*below*).

## The visual envelope

*by Rosamund M J Cleal with Michael J Allen*

The term 'visual envelope' refers to more than just that part of the landscape which is visible from the monument and from which the monument (or its site) can be viewed. Because of the nature of the local topography

Stonehenge is very much a monument enclosed within its landscape, and this term is intended to embrace not only the concept of physically enclosing an area around the monument, but also the complex web of intervisibility which is discernible among the many monuments within that area which were contemporary with Stonehenge in one or more phases.

Throughout this study the landscape is viewed in relation to the monument (and *vice versa*), and in subsequent sections the nature of the landscape and landuse as it changed through time is discussed by monument phase. This is an approach which could not be undertaken in detail in the two major studies of the area carried out in the last two decades, the RCHM(E) (1979) study and the Stonehenge Environs Project (Richards 1990), both of which discuss the geology and topography of the area around Stonehenge. The detailed analysis of the monument which has now been undertaken enables Stonehenge to be integrated into the discussion of how the landscape was used and viewed throughout prehistory.

Understanding the visual envelope is important in interpreting the choice of the setting of the monument and of other monuments within this landscape. Indeed, one of the major questions about the location and siting of the monument is whether it was sited to be seen from the surrounding landscape or as a point from which to view features and sites around it.

There are two aspects to consider in this monument-centred view of the landscape. These can be stated in simple terms as 'the view in' and 'the view out'. For the former it is necessary to consider how the monument appeared to observers in the surrounding countryside and in addition how even the site of the monument appeared in the periods before it was built. In some ways this is one of the most interesting aspects of all, perhaps giving some hint of why this apparently unremarkable site was chosen for this monument. For the latter, the view out, the point of view of an observer within the ditched enclosure, or on the site of the ditched enclosure, must be considered.

In the discussion which follows the emphasis is on the monument with its stone settings in place and it is assumed that the original height of the Bank had been considerably reduced by this time.

## 'The view out': the landscape as seen from the monument site

Observations on the ground suggest that there are at least four elements to the view from the monument: foreground; near horizon; far horizon; distant horizon.

Figure 21 shows the archaeological and topographical features of the visual envelope with the near horizon indicated. The views from the monument are summarised graphically in Figures 22 and 23.

**Foreground**

This is simply the nearest ground to the monument outside the ditched enclosure. Because the site is on a slight spur this area falls away in three directions and rises in one. To the north and north-east (the direction of the Avenue) the ground falls away markedly within only about 350m of the monument. This is also true to the east where it descends into Stonehenge Bottom. To the south there is only a very moderate undulation before the gentle rise to Normanton Down, and to the west the land rises evenly towards a single horizon only *c* 250m from the monument (Figs 21; 23; Plate 2; *see Plan 3*).

**Near horizon**

The near horizon is actually a 'false' horizon created by slight ridges. It is visible around most of the view, and in the Early Bronze Age was the site of several barrow cemeteries. Along some stretches of the view it is combined with the far horizon to form a single 'true' horizon and in other stretches there is more than one false horizon. It is clear that in some phases of the monument some of these landscape features became more important than in others.

To the north this horizon is marked by the slight swell of the ground as it rises to a rounded ridge on which the Cursus barrows lie, the land falling away to the north and rising finally to the far horizon. Whether there would be another false horizon towards Larkhill if there were no trees is not certain, but the contours suggest not. To the south the horizon is also masked by trees, but there is a clear near horizon running along Normanton Down.

To the east the near and far horizons combine along King Barrow Ridge but towards the south-east the situation is confused, both by the presence of the dry valley of Stonehenge Bottom and by three plantations, which obscure the view. The distinctive nature of the western edge of Stonehenge Bottom makes the foreground a strong feature of the eastern view (Fig 22) but there is also a discernible fold of land running down from King Barrow Ridge and disappearing into the round plantation, which is similar to a near horizon. A weak but discernible near horizon can then be traced southwards on the western side of Stonehenge Bottom, finally running up onto Normanton Down, where there is a very clear near horizon, as noted above. Directly to the west the land rises quite smoothly to a single true horizon barely beyond the foreground.

The lack of a well-defined near horizon to the south-east is reflected in the disposition of barrows in that area, as compared with those areas where the near horizon is clearly idntifiable. The Cursus barrows lie along an easily perceived near horizon and Figure 291 (Appendix 6) indicates how well sited is, at least, the barrow known as the Monarch of the Plain, in terms of the ridge which forms the near horizon. Similarly, to the south, the well-defined near horizon carries a large barrow cemetery in which the barrow with probably the richest burial


*Fig 21 The immediate visual envelope of Stonehenge. The area bounded by the near horizon is unshaded*

(Bush Barrow) is ideally situated, being slightly higher on the ridge than the other barrows in the group. To the east the combined horizon of King Barrow Ridge has a long line of large barrows (principally the New King Barrows). The western view, with no near horizon, has only a group of barrows which are mostly now ploughed-out but which are closer to the monument than all the others in the area apart from Amesbury G11, presumably because the combined horizon in this area is so close to the monument. To the south-east, however, with no single well-defined near horizon, the western edge of Stonehenge Bottom carries some barrows (eg G16) and a short linear cemetery runs along below the far horizon on the eastern side of Stonehenge Bottom (G117, G118, G18) in a non-crest position.

**Far horizon**

The far horizon is the most obvious feature of the landscape, constituting, for most of the view, the line marking the division between land and sky. For most of its length it forms a continuous line, distinct from the near horizon and foreground, and only rarely lying in front of an even more distant glimpse of higher ground. To the north the far horizon lies around Larkhill, *c* 2km away, masked by trees. In the east it runs along King Barrow Ridge, the now sparse cover of King Barrow Wood revealing its line intermittently.

King Barrow Ridge runs south into Coneybury Hill, the brow of which forms the far horizon in that direction. Further south the far horizon of Wilsford rises behind the near horizon of Normanton Down and remains in view, though obscured by trees, as far west as Normanton Gorse, where it combines with the near horizon. There is only a single horizon to the west as far north as Fargo Plantation.

**Distant horizon**

The distant horizon is not a continuous or major feature of the landscape and may not have constituted a significant feature of the view. The term is intended to describe those occasional glimpses of the very far distance which appear at rare intervals around the view beyond the more or less continuous and gently undulating line of the far horizon. There are no such glimpses to the west, and barely any to the north, where most of Salisbury Plain is too distant and at a lower or similar altitude; the position of Robin Hood's Ball, although just visible, would not be readily distinguishable from the surrounding land with the naked eye.

To the east the high ground of Beacon Hill is evident in the far distance beyond King Barrow Ridge. The trees mask the view, but it is just visible as far south as the point at which the present road (the A303) crosses the ridge. Further south, although the large hangar at the Ministry of Defence establishment at Boscombe Down can be seen, the natural landscape of Boscombe Down itself does not seem to be visible to the naked eye. The exact configuration of the far horizon in this stretch of the view is obscured by a plantation, but it is unlikely that a distant horizon was visible. A very distant landscape feature can be seen to the south of the far horizon behind Normanton Down. Apart from this nothing can be seen beyond the far horizon. These distant views are possible only in good weather with good visibility and would not have been permanent features of the view from the monument site. The other three landscape zones just described are visible in all weather conditions except fog or heavy mist.

**Visibility shadow**

In addition to the four major elements of the landscape visible from the monument site there are specific areas of ground which cannot be seen from the site, lying in what could be termed 'visibility shadow'. Beyond the near horizon extensive areas are not visible, as the false horizon is created by ridges of ground which stand out from the background and obscure the landscape behind them. In the area between the near horizon and the foreground there are other such areas to the east, principally along Stonehenge Bottom and also towards Fargo Plantation. These areas of 'shadow' are also areas from which the monument, except in some cases its very topmost parts, cannot be seen.

## 'The view in': the monument and its site viewed from the landscape

As with the 'view out', in which some features of the landscape have to be visualised as absent in some periods, the view of the monument and its site has two elements: the view before the monument was built, and its appearance since. The site itself is undistinguished, forming a slight low spur at around 100m OD on the edge of Stonehenge Bottom. It is relatively flat, and is a subtle rather than a prominent feature of the landscape. Without the monument in place it would not be easily distinguished from the gently undulating surrounding countryside, and it cannot be said to form an obviously important landscape feature from any direction. The fork of the two main roads lends it undue prominence in the modern landscape.

The site is most completely visible from the east; the highest point of King Barrow Ridge is approximately 10m higher and Coneybury Hill is at about the same altitude. The monument site is therefore viewed very slightly from above (*see Fig 12 and Plate 3*). Without the monument in place there would be nothing to separate the site visually from the rest of the western edge of Stonehenge Bottom, but the monument itself (except in some lighting and weather conditions) stands out clearly against the background of downland. It does not appear against the skyline from this direction, but it is a prominent feature of the view, and would appear even more anomalous without the present-day roads which run either side of it and break up the downland. From King Barrow Ridge the monument is well placed in the landscape, lying towards the centre of the field of view and surrounded by higher ground (*but see below*).

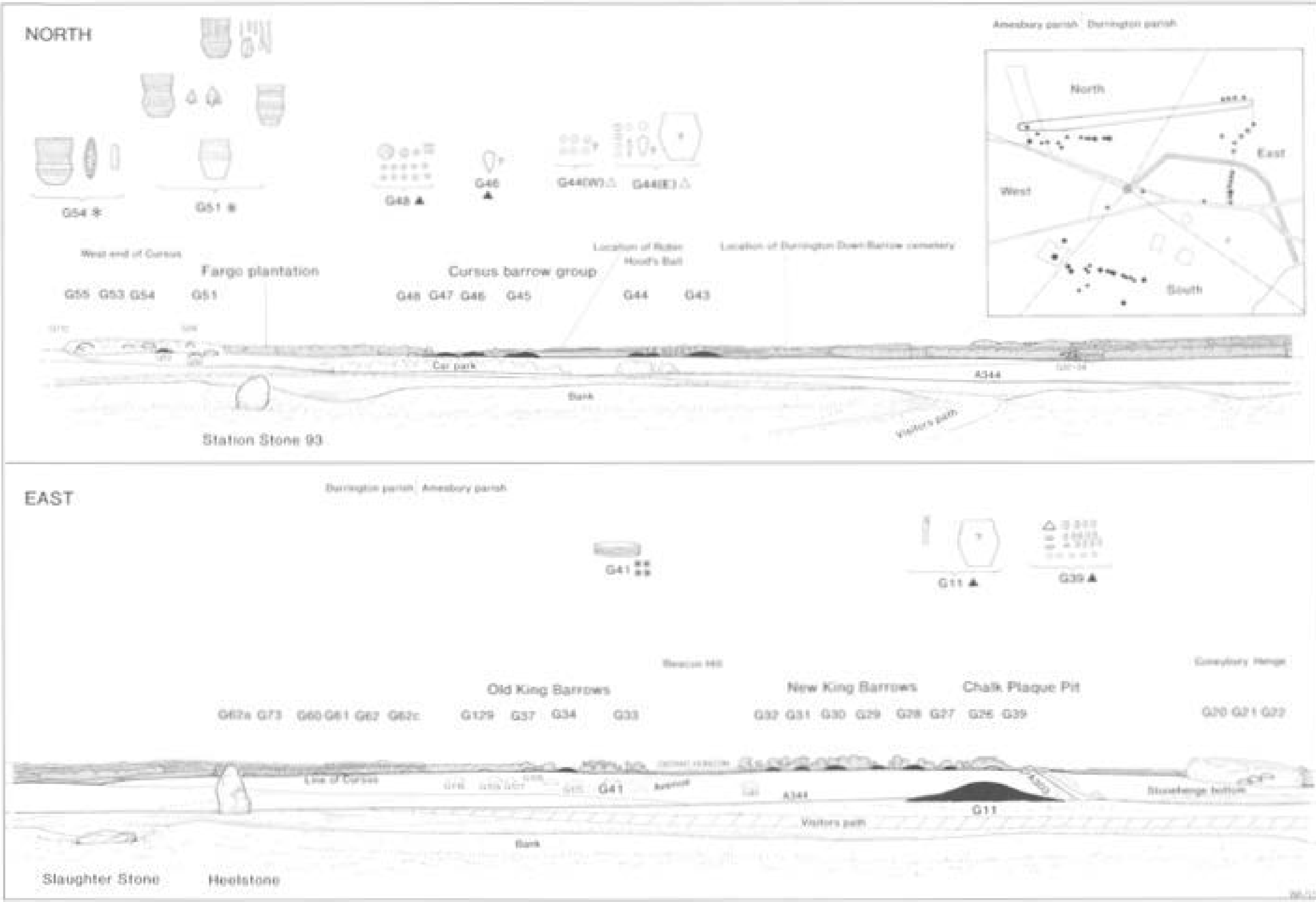



*Fig 22 The view out from Stonehenge looking a) north and b) east showing grave groups from barrows on and within the near horizon*


*Fig 23 The view out from Stonehenge looking c) south and d) west showing grave groups from barrows on and within the near horizon*

From the south the monument is on the skyline from some views along the line of the modern A303 road, but as the viewer moves west it is quickly lost behind the rolling swell of ground which lies immediately to the west of Stonehenge. From further afield to the south the monument is visible but appears small and distant. It is not easily visible further south than Normanton Down, *c* 1km away.

The view from the west is the most striking because it is the closest, the furthest point from which the monument is visible being less than 1km from the site. The whole elevation of the monument is in view, set against the rising ground of King Barrow Ridge in the distance.

To the north, the direction from which the Avenue approaches, much of the ground within the half kilometre nearest to Stonehenge is at a lower altitude than the site. The monument is visible from much of this area, or at least the upper parts of the stone settings are, but there are areas, particularly just to the north of the modern A344, where it cannot be seen at all. Without the monument in place there would again be nothing to distinguish the site from the rest of the high ground around it which forms the southern horizon when viewed from north of the road and south of the ridge on which the Cursus Barrows lie. From this ridge most but not all of the monument's elevation is visible, but it appears small and distant.

From the Cursus itself the lintels are just visible from the top of the southern Cursus bank almost directly to the north of the monument, but they cannot be seen from the interior of the Cursus or its northern bank, which lie at a lower level. More specifically, it seems that the earthworks would not have been visible from any point along the Cursus, even allowing for the millennia of soil erosion. Although both the Cursus and the Stonehenge earthworks would have been more prominent in the later Neolithic it seems unlikely on this evidence that visibility of, or intervisibility between, these two monuments was an important feature of the siting of either.

**View from the Avenue**

*by Julie Gardiner*

If the interpretation of the Avenue as a formal approach or processional way is accepted (*see Chapter 7*) then it may reasonably be assumed that the view of the monument from the Avenue was of some significance. Moving along the Avenue towards Stonehenge, it first becomes visible on King Barrow Ridge, some distance east of the line of barrows (Plan 3). It is difficult to be precise here because the ground level is likely to have changed somewhat over the millennia. What is clear is that the tops of the Trilithons were visible at least 50m and possibly 100m before the crest of the ridge was reached. The monument is fully in view at a point level with the line of barrows.

From the crest of King Barrow Ridge the Avenue runs in a straight line downslope into Stonehenge Bottom. From the ridge itself, as stated above, Stonehenge does not appear on the skyline but is framed by slightly higher ground around it. The entire line of the Avenue up to Stonehenge is visible from the top of the ridge.

The course of the Avenue is interesting; clearly the main entranceway was the target, but the route taken from King Barrow Ridge is certainly not the most direct and its choice only makes sense on the ground. Along the descent into Stonehenge Bottom, Stonehenge itself is off to the left, but it is possible that the Avenue may have been laid out in this stretch with some reference to other monuments in that it heads directly for the very large barrow G55, the 'Monarch of the Plain', which would have been prominent on the skyline (though now hidden by trees). This begs the question, however, of which came first and it is equally possible that G55 was positioned in relation to the line of the Avenue. As the Avenue descends the slope Stonehenge is gradually elevated until, at about 350m from the top of the ridge, it appears on the skyline with the land sloping away in all directions. The line of at least the southern bank of the Avenue remains in view throughout.

The Avenue takes the gentlest available slope down into Stonehenge Bottom from where, though there is short, relatively steep slope to climb, its ascent out of the valley is also the least difficult. If the stones of the monument were really dragged along its length from the River Avon, then this would have been the easiest route from King Barrow Ridge. Stonehenge is maintained on the skyline until *c* 150m east of the elbow, from which point it rapidly disappears behind rising ground on the opposite side of Stonehenge Bottom.

For a distance of 100–150m in its lowest stretch within the dry valley neither Stonehenge (nor G55) are visible. Indeed, as the Avenue turns towards the monument there is no obvious point of visual reference, unless the feature known as 'Newall's Mound' (*see Chapter 7 and Plan 4, Zone E*), now barely distinguishable, is considered. This low mound, only *c* 8m in diameter and, where excavated (*see Chapter 7 and Plan 4*), composed of 'grey soil with flints', does not seem to have been a barrow and may have been a marker, as it appears on the immediate skyline, hard against the southern Avenue ditch, from the 'blind' area at the elbow. The only other monuments in view are the tops of barrows G43 and G44.

The ground rises rapidly from the elbow and Stonehenge appears quite suddenly and very dramatically within 50m. From this point on it dominates the approach, standing in full elevation against the skyline for most of the final 450m with the ground falling away on either side of the Avenue. The approach is made more dramatic, even today, by the slight convergence of the Avenue banks as they approach the entrance to the monument. (*For a detailed description and discussion of the Avenue, see Chapter 7.*)

# Part 2: Stonehenge, the monument and its setting

## 4 Before Stonehenge

*by Michael J Allen*

### Early post-glacial landscape and environment

Our understanding of the early post-glacial environment of the chalklands surrounding Stonehenge is based almost entirely on national preconceptions of a vegetational succession from tundra to a wooded landscape. In the Stonehenge area the landscape was considered by Richards to have been 'thickly wooded; oak, birch, elm and lime forming a dense canopy beneath which Mesolithic communities hunted game and gathered edible plants and berries' (Richards 1990, 2).

Although numerous molluscan sequences have been examined which indicate the presence of woodland on the chalklands of southern England the species composition of this environment has only been inferred from deeply stratified, key pollen sequences obtained from the alluvial corridors and mires on the adjacent Tertiary deposits (cf Evans 1975). There is little direct evidence from the chalk itself.

The only direct evidence is from Dimbleby's pollen analysis (in Evans 1971) of the soil sealed beneath the Late Neolithic bank at Durrington Walls. This analysis indicated a hazel-dominated woodland, and included hazel (*Corylus*), birch (*Betula*), pine (*Pinus*), oak (*Quercus*), lime (*Tilia*), and elm (*Ulmus*). It has been suggested elsewhere that this predominance of hazel, typical of the Boreal *Corylus* maxima, can be attributed to human activity (*cf* Scaife 1982; Allen *et al* 1990). A woodland environment is also confirmed by molluscan evidence beneath the Woodhenge bank (Evans and Jones 1971) which it has been argued is of Mesolithic date (Evans and Wainwright 1979), but we do not know the species composition, characteristics, or absolute date of this woodland.

In short, we are dealing with a period from the early post-glacial to the Late Neolithic covering nearly five millennia for which, realistically, we know little of the environment except by assumption and inference from adjacent areas away from the chalk. No Mesolithic sites which have the potential for providing such evidence have yet been identified on the chalk. For the earlier part of the Neolithic, however, there are monuments in the Stonehenge area, such as the causewayed enclosure of Robin Hood's Ball and long barrows including Amesbury 42 and Netheravon Bake, which have the potential to provide stratified palaeo-environmental information about both landscape and economy.

### Mesolithic landscape and environment

Since our evidence for the character of the chalkland landscape in the Mesolithic is based on assumptions and inference from pollen spectra from mires and alluvium elsewhere in southern England, we have no direct evidence for the nature of the Mesolithic landscape at Stonehenge. Indeed, for southern England generally such evidence is restricted to a handful of pollen sequences from alluvium adjacent to the chalk, such as those at The Brooks, Lewes, in East Sussex (Thorley 1971; 1981), Winnall Moors, Winchester, Hampshire (Waton 1982; 1986), the Isle of Wight (Scaife 1980), and more recently from the Avon floodplain at Durrington only 3–4km from Stonehenge (Scaife forthcoming). The last sequence is more relevant here, and although the basal peats are dated to 7950–7030 cal BC (8460±200 BP; GU-3239), the sequence as a whole suffers from the lack of a series of radiocarbon dates. The pollen evidence indicates a woodland dominated by birch and pine with increasing importance of oak, elm, and hazel. No evidence for anthropogenic intrusion into this natural vegetational sequence could be detected (Scaife forthcoming; Allen forthcoming a).

Evidence for Mesolithic activity on the chalklands in southern England is usually limited to localised, rarely excavated, flint scatters. The evidence of habitation or features of this period is scarce and generally ambiguous. In Wiltshire, a Late Mesolithic flint assemblage (Pitts 1983) was excavated and dated to 6370–5760 cal BC (7230±140 BP; BM-447) at Cherhill (Evans and Smith 1983), and more recently a ditch buried beneath 2.4m of colluvium at Strawberry Hill has been attributed to the Mesolithic on the basis of radiocarbon dates and molluscan data (Allen 1992; 1994).

There are no significant quantities of Mesolithic flints within the Stonehenge environs despite the large-scale fieldwalking and test-pitting exercises conducted by Julian Richards (1990), though it must be considered doubtful that the fieldwalking strategy adopted would have successfully recovered much material of this period. John Wymer (1977) records about 30 artefacts from the area though in view of more recent studies of surface chalk assemblages (eg Gardiner 1988) at least one of the finders now considers that some of these artefacts are likely to be of Late Neolithic–Early Bronze Age date (M Green, pers comm). The predominant tool

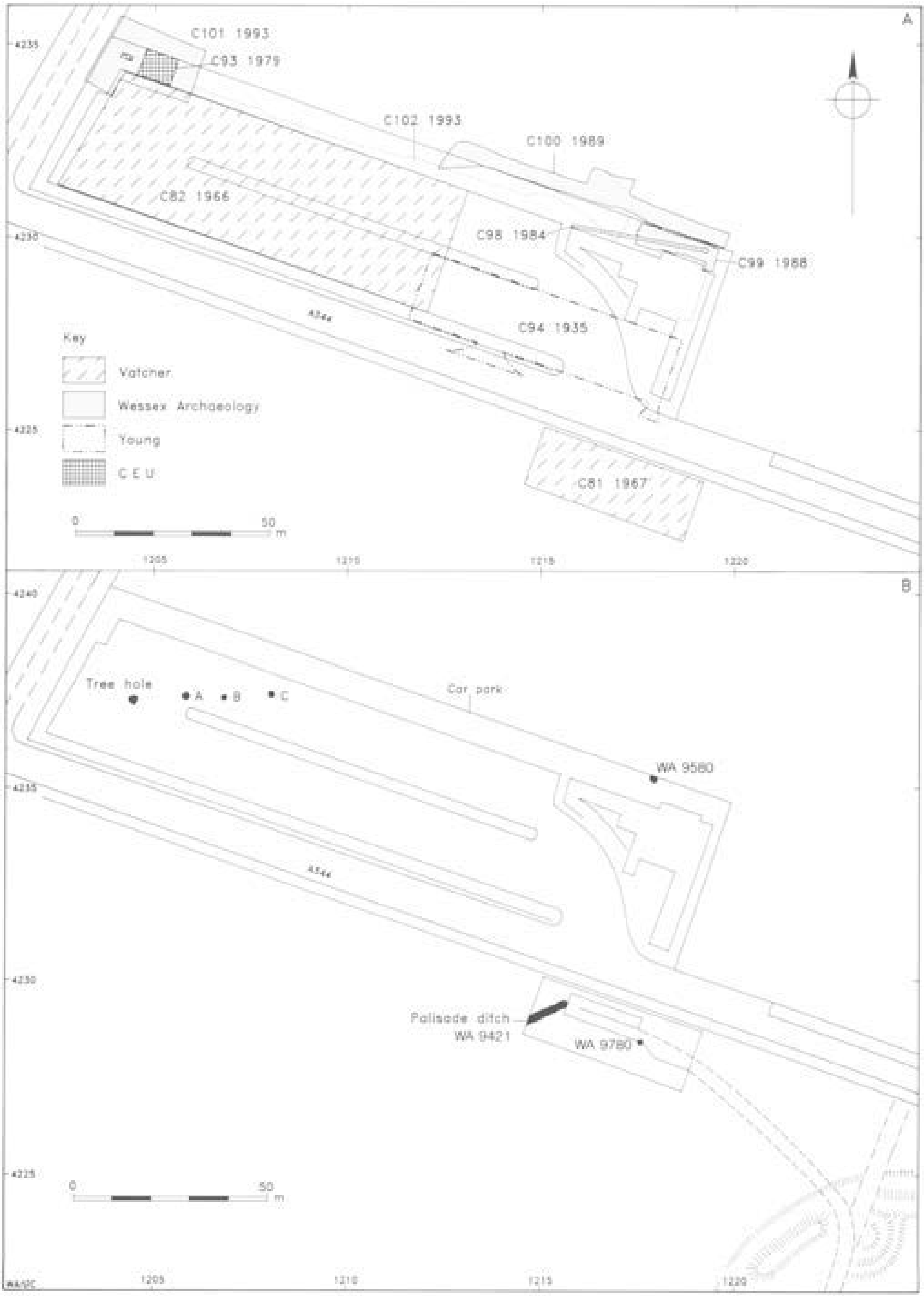



*Fig 24 Plan of excavations in the Stonehenge car park (above) and of major features discussed in text (below)*

types are large artefacts such as axes, maceheads, and picks and these are widely and thinly spread.

This low density of Mesolithic flint artefacts is typical of the downland elsewhere in southern England (Wymer 1977; Gardiner 1988) though it is unlikely to be a true reflection of Mesolithic distributions, as the flake and core component is extremely difficult to identify on the surface of flint-laden soils even during controlled field-walking (*ibid*; Boismier pers comm). However, it at least indicates the presence of Mesolithic communities on the chalkland even though it provides little information on the nature of those activities.

The series of three large pits excavated in the Stonehenge car park (Vatcher and Vatcher 1973) is, therefore, most significant and unexpected. They were subsequently dated from charcoal (*Radiocarbon* 29, 79; Pitts 1982, 128, table 4) to 8820–7730 cal BC (9130±180 BP; HAR-455) and 7480–6590 cal BC (8090±140 BP; HAR-456; *Tables 3 and 4, below*). In view of more recent discoveries in the car park, discussed below, these pits are reviewed here.

# Mesolithic features in the car park

## Excavations in the car park, 1966 (C82)

Excavations in the Stonehenge car park by Faith and Lance Vatcher in 1966 revealed few features with the exception of three large pits and a possible treehole (Fig 24). The pits were relatively large, *c* 1.5–2m diameter and *c* 1.3m deep (Table 3). They all produced convincing evidence of having held large posts of about 0.75m diameter which had rotted *in situ* leaving post shadows; pit C did not contain such clear evidence of a postpipe (Figs 25 and 26). A post may have been 'slipped out' when the timber was largely rotten causing little disturbance to the pit fills. Carefully positioned 'wedges', apparently of wood, as well as other traces of 'decayed wood', were reported in pits B and C and were thought to have been used to support timber uprights (Fig 25); this material unfortunately does not survive in the collections. Apart from a single piece of burnt bone and quantities of charcoal they were devoid of artefacts and thus were, reasonably enough, assumed to be Late Neolithic (Vatcher and Vatcher 1973). Identification of the charcoal by Susan Limbrey was surprising as all of the material submitted to her was pine, a species thought not to have grown on the chalk and one that certainly should have been rare, if present at all, in the Late Neolithic and Bronze Age (Sub-boreal) of southern England. This identification prompted the submission of two pieces of charcoal which produced Mesolithic radiocarbon dates (*Radiocarbon* 29, 79) which are in accordance with the known presence of pine during the Boreal (Godwin 1975).

The fourth excavated hole from the same area (Fig 27) was shallower (only *c* 0.7m) and irregular in plan. It did not contain the postpipe characteristic of the other three features and was interpreted by the excavators as a treehole. There is no indication of the age of this feature, or whether it is contemporary with the postpits.

## Excavations in the car park, 1988–9 (C99)

Wessex Archaeology was engaged by English Heritage in 1988 to undertake archaeological investigations of areas affected by the alteration and construction of the visitor facilities opposite Stonehenge. Martin Trott reported (unpublished notes) that these investigations revealed a series of periglacial stripes and solution hollows but little of archaeological significance except a single pit (WA9580; Fig 28) in the area of the current ticket offices and access ramp.

### Pit 9580

The pit was *c* 1.9m in diameter and *c* 1.3m deep (Fig 29). At about half its depth the diameter rapidly reduced to *c* 1m, which was coincident with a layer of compact, redeposited chalk (context 9587; note that this feature has been assigned new context numbers within the overall sequence of WA context numbers for the Stonehenge excavations). Both the shape of the feature and its fills indicate that it was recut and modified, enlarging the upper profile of the pit (Fig 28).

**Table 3 Finds from the Mesolithic pits**

| *Feature* | *Diam (m)* | *Depth (m)* | *Flint* | *Rhyolite chip* | *Charcoal* | *Decayed wood* | *Burnt bone* | *Antler pick marks* | Lab no | *Radiocarbon dates* |
|---|---|---|---|---|---|---|---|---|---|---|
| *Treehole* | 2.5 | 0.71 | – | – | – | – | – | – | – | – |
| *Pit A* | 1.93 | 1.34 | – | – | Yes | Possibly | – | Yes | HAR-455 | 9130±180 BP; 8820–7730 cal BC |
| *Pit B* | 1.27–1.47 | 1.27 | – | – | Yes | Yes | Yes (1) | Yes | HAR-456 | 8090±140 BP; 7480–6590 cal BC |
| *Pit C* | 1.52–1.77 | 1.55 | Yes | – | Yes | Yes | – | Yes | – | – |
| *Pit 9580* | 1.9 | 1.3 | Yes (4) | Yes (1) | Yes | – | – | – | | *See Table 4* |

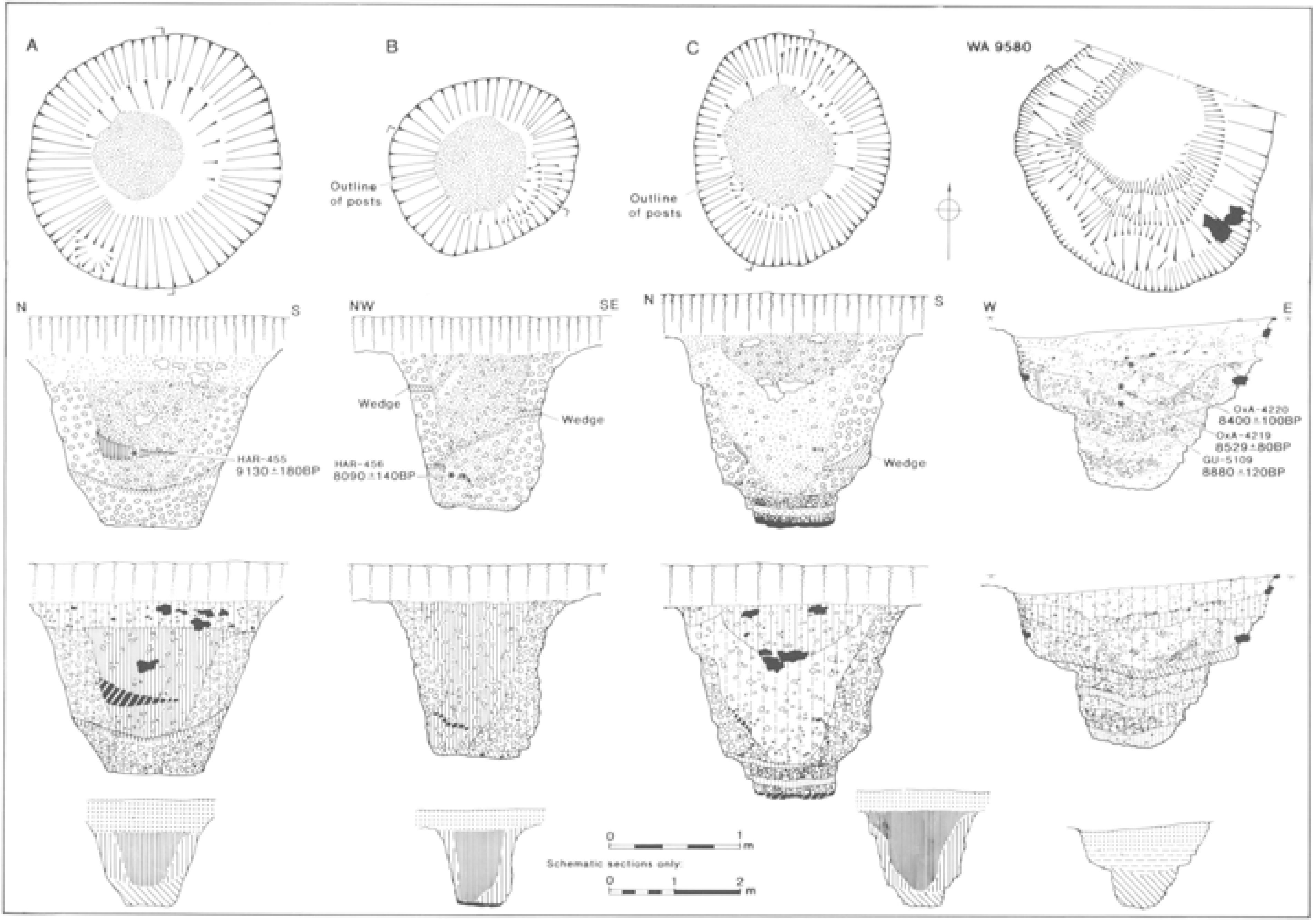



*Fig 25 Plans and sections of Mesolithic features in the car park. Scales 1:40 and 1:80 (schematic sections only)*

*Fig 26 Pit A after excavation (Vatcher archive: V12/2)*

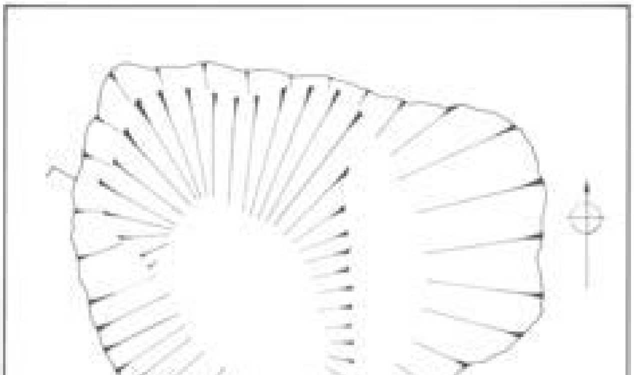



*Fig 27 Plan of 'treehole'. Scale 1:40*

The pit profile takes the form of a circular hole cut into soft weathered chalk, about 1m in diameter and 1.3m deep (Fig 28), filled with horizontally bedded layers of clean chalk rubble (contexts 9587–9592). The horizontal and clean chalky nature of the fills indicates deliberate backfilling rather than natural primary fill. At a later date the pit was widened (?recut) producing a broad (*c* 1.9m), shallow pit only 0.7m deep.

In contrast to the original feature, this shallow pit has a more typical sequence of primary (context 9588), secondary (context 9585), and tertiary (contexts 9581–2) fills (Fig 28). It is likely that this feature was originally dug as a postpit and was therefore similar to the other features in the car park. However, unlike the other postpits, in which the timbers rotted *in situ* (pits A and B), or from which a rotted post was removed (pit C), this feature was partially backfilled, altered, and redesigned as a broad shallow pit, though for what purpose we do not know. One possibility is that it had simply been decided to remove a post erected in this hole and that it was necessary to enlarge the pit in order to to free it, and that it was then partially backfilled, creating the 'recut'.

The fills are summarised below (no Munsell colours were recorded):

**Recut tertiary fills**

Context 9581 Dark reddish brown calcareous silty clay with occasional patches of common small chalk fragments, sparse flints, not uniformly distributed. Some flints at horizon boundary.

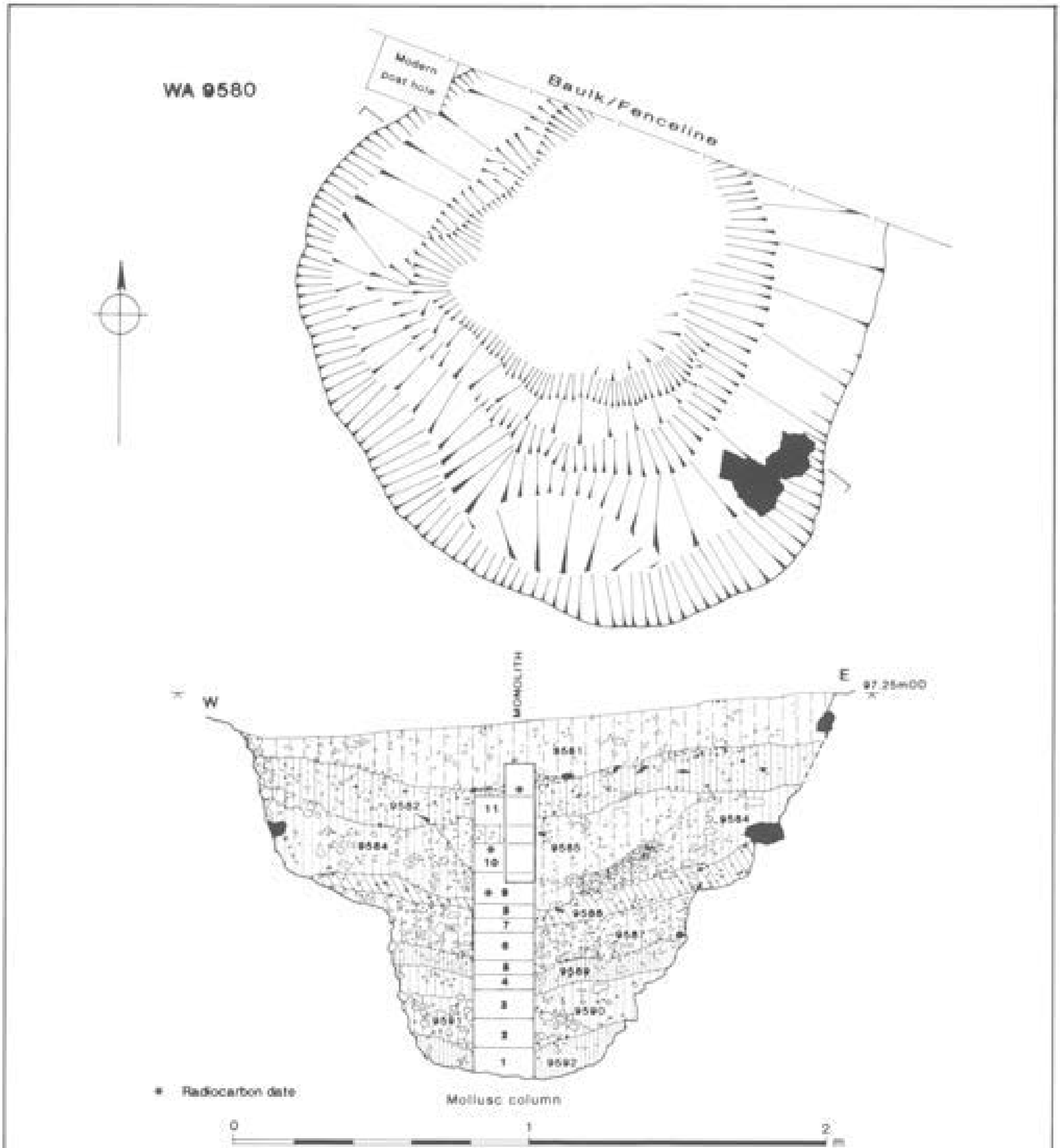



*Fig 28 Plan and section of pit 9580, column of mollusc samples, monolith tin, and radiocarbon samples. Scale 1:20*

Context 9582 Brown silty clay uniformly distributed abundant small chalk pieces.

### Recut secondary fill

Context 9585 Dark grey silt with abundant chalk small and medium pieces with sparse charcoal fragments.

### Recut primary fills

Context 9584 Buff/pale yellowish brown compact calcareous silty clay in chalky matrix.

Context 9588 Pale yellowish grey/greyish buff silty clay with common small and medium chalk pieces and many large chalk pieces.

### Backfilled clean chalk layers

Context 9587 Compacted redeposited/dumped chalk with little soil matrix.

Context 9589 Very pale grey brown matrix with common very small and small, many medium chalk pieces.

**Table 4 Radiocarbon dates for pit 9580**

| *Fill* | *Context* | *Depth (m)* | *Lab ref* | *Determination* | *Calibration* |
|---|---|---|---|---|---|
| *Tertiary* | 9582 | 0.25–0.35 | OxA–4220 | 8400±100 BP | 7580–7090 cal BC |
| *'Recut': secondary* | 9585 | *c* 0.40 | OxA–4219 | 8520±80 BP | 7700–7420 cal BC |
| *'Recut': base of secondary* | 9585 | 0.57 | GU–5109 | 8880±80 BP | 8090–7690 cal BC |

Context 9590 Pale yellowish grey/greyish buff deposit with common very small and small, many medium and large chalk pieces.

Context 9591 Pale yellowish grey/greyish buff deposit with common very small and small, many medium and large chalk pieces.

Context 9592 Yellowish grey/pale yellowish grey silty clay with abundant very small and small chalk pieces, occasional larger chalk pieces.

**Radiocarbon dates**

Three samples of charcoal (all *Pinus*), all taken from the soil sample as indicated in Figures 28 and 30, were submitted for radiocarbon dating (Table 4). These dates span nearly one millennium but the charcoal fragments from the base of the secondary fill of the 'recut' (context 9585) were significantly larger (up to 60mm) than the others from the secondary and tertiary fills. Both the size and the quantity of this charcoal may indicate that it is contemporary with this fill and may represent a former pine post. The charcoal from the secondary and tertiary fills in the 'recut' were finer comminuted fragments (<2mm) and may have been residual. Nevertheless, it dates clearance and human activity in the vicinity, but need not necessarily date the deposit from which it originates. All the dates are stratigraphically successive (ie the older date is from the lower fill) but they are statistically different at the 95% confidence limit (Ward and Wilson 1978).

**Finds**

Few artefacts were recovered from the pit (Table 3); four flint flakes from the tertiary fills which are unremarkable but consistent with the assemblage from the monument (Harding pers comm) and a single piece of rhyolite (62g) at 0.2m in the upper tertiary fill (context 9581). This latter find is of some significance as it indicates that this layer was not earlier than, and was probably contemporary with, the dressing of the Bluestones (phase 3).

**Charcoal**

*identifications by Rowena Gale*

Charcoal was noted in the base of the 'recut' and was identified as *Pinus.* Further small comminuted charcoal fragments extracted from samples of the secondary and tertiary fills were also identified as *Pinus.* Pine charcoal is unusual, especially from the chalk, but all three previous postpits produced pine (Limbrey 1973a). Pine has also been recorded at Woodhenge, however, in the form of charcoal both from the base of the henge ditch and from an Iron Age buried soil (Woodhead in Cunnington 1929, 74), and as a single grain of pollen from the subsoil hollow sealed beneath the old land surface which was preserved under the Neolithic bank. A Mesolithic flint core was also recovered from the same feature (Evans and Wainwright 1979).

Elsewhere in Wiltshire pine charcoal has been recovered and dated to 8920–8080 cal BC (9350±120 BP; OxA–3040) from a ditch at Strawberry Hill (Allen 1994). The significance of this is discussed below (*Chapter 10*). As all the charcoal was pine and no other species were present this strongly suggests that the wood was specifically selected and possibly therefore represents a post or artefact, rather than a representative collection of available timber from the woodland (*see below*) for firewood.

The large fragment (60mm) of charcoal from the base of the secondary fills of the 'recut' (context 9585) may therefore indicate the burning of a pine timber which was probably associated with the pit and could have been procured from the open pine and hazel woodland (*see below*). The nature and function of this feature, unlike the definite postpits excavated by the Vatchers, remain ambiguous, but the presence of pine charcoals and the associated radiocarbon dates indicate that it was part of the same complex of features.

## Boreal and Sub-boreal environment: evidence from pit 9580

Before discussing the contents of the pit in terms of environmental stratigraphy it is imperative to comprehend the origin and nature of those deposits and indicate where samples were taken.

During excavation in 1988 a column of 14 small contiguous soil samples was taken at 50mm intervals through the layers of backfilled coarse chalk rubble and the 'recut', but samples of the upper tertiary fill were not taken (context 9581; Fig 28). The finer soil fills (the secondary and the entire tertiary fill sequence) of the 'recut' were sampled as a monolith tin of undisturbed soil by M Canti of the Ancient Monuments Laboratory. This therefore provided samples of the entire pit sequence. Only 0.4m of the monolith contained undisturbed deposits and these sampled fills are depicted on Figures 28 and 30.

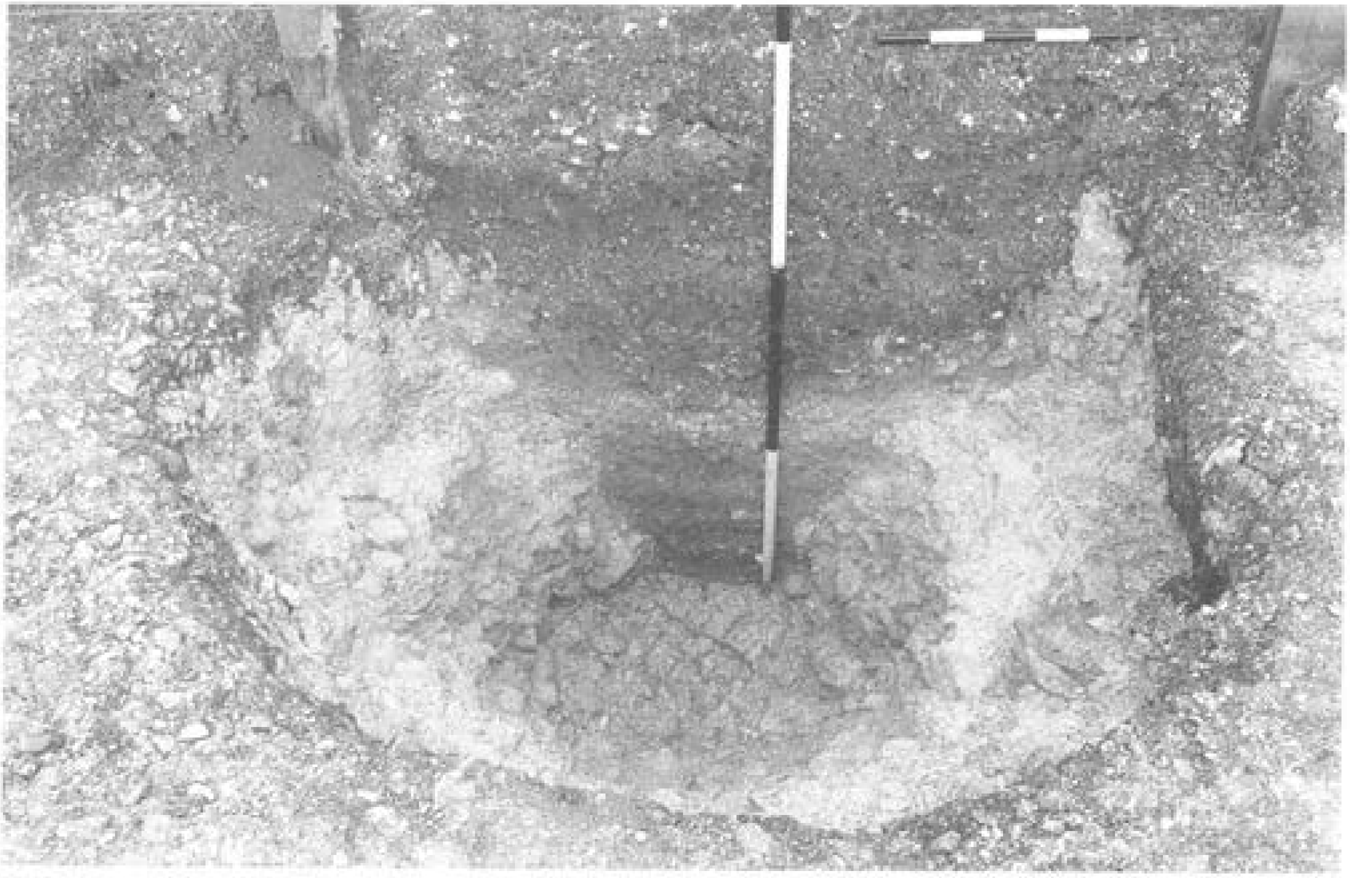


*Fig 29 Pit 9580 after excavation (Wessex Archaeology)*

Environmental data (both faunal and floral) from pits are notoriously difficult to interpret. The snail assemblages, for instance, may include faunas derived from the soil through which the pit was cut, species living in the feature, and snails contemporary with the fills (*cf* Thomas 1977; Shackley 1976). However, it is considered that the chalk rubble layers (contexts 9587–9592) represent deliberate and rapid backfilling and thus the shells and pollen probably derive from the contemporaneous environment and from the soil through which the pit was cut. The same applies to the clean chalk (primary fills) of the 'recut' shallow pit (contexts 9584 and 9588). The flora and fauna of the secondary fill of the 'recut' (context 9585) reflect the environment which was broadly contemporary with the pit, but the tertiary fills (contexts 9581, 9582) above them reflect a later environment and in view of the inclusion of a piece of rhyolite in the upper tertiary fill (context 9581) their deposition is considered to be contemporary with phase 3 of Stonehenge itself.

## Boreal and Atlantic chalk landscape: land molluscan evidence

The 14 soil samples (taken at 50mm intervals) were considered too small for land snail analysis and were bulked where appropriate into nine samples of 100mm intervals, taking care not to amalgamate samples from more than one context. Two spot samples were also taken from the secondary (context 9585) and tertiary fill (context 9582) of the 'recut'. This sequence was augmented by a series of four contiguous samples taken from the soil monolith tin after sampling for pollen. Analysis of the samples followed procedures outlined by Evans (1972) and detailed by Allen (1989; 1990). All samples were processed; initial identifications were made by Sarah Wyles and were checked by the present author.

The combined results of both sequences are presented in a standard mollusc histogram (Fig 30) and in Table 5. Details of molluscs from the two duplicated samples are presented in archive. All samples, and those from the monolith tin, are measured from the top of the soil which is at 0.1m below datum (Fig 28).

The main column of 11 samples was taken through the coarse chalk rubble backfill and the lower fills of the 'recut'. The secondary and tertiary fills of the 'recut' were sampled from the monolith tin which was also sampled for pollen. Shell preservation was good and even in the coarse rubble moderate numbers of shells were recovered (Table 5).

The mollusc assemblages can be divided into three local mollusc zones which broadly equate with the main

**Table 5 Land molluscan data from pit 9580**

| *Sample* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *12* | *13* | *14* | *15* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Context* | *9592* | *9591* | *9590* | *9589* | *9587* | *9587* | *9588* | *9588* | *9585* | *9585* | *9585* | *9582* | *8581* |
| *Local mollusc zone* | *1* | *1* | *1* | *1* | *1* | *1* | *1* | *1* | *1* | *2* | *2* | *3* | *3* |
| *Depth (cm)* | *110–120* | *100–110* | *90–100* | *85–90* | *80–85* | *70–80* | *65–70* | *60–65* | *50–60* | *45–55* | *35–45* | *25–35* | *15–25* |
| *Mollusca* *Wt(g)* | *1149* | *1096* | *1000* | *1500* | *1500* | *1500* | *1256* | *930* | *1500* | *1175* | *842* | *675* | *714* |
| *Pomatias elegans* (Müller) | – | – | – | – | – | – | – | – | – | – | – | – | + |
| *Carychium tridentatum* (Risso) | – | – | – | – | – | 1 | 1 | – | – | – | – | – | – |
| *Cochlicopa lubrica* (Müller) | – | – | 2 | 1 | 4 | 1 | – | 1 | 2 | – | – | – | – |
| *Cochlicopa lubricella* (Porro) | – | – | – | 1 | 1 | 1 | – | – | 1 | – | – | – | – |
| *Cochlicopa* spp | 2 | 4 | 10 | 15 | 34 | 4 | 9 | 9 | 14 | 5 | 3 | – | 1 |
| *Vertigo* spp | – | – | – | – | – | – | – | – | – | – | – | – | 1 |
| *Abida secale* (Draparnaud) | – | – | 1 | 1 | – | – | – | – | – | – | – | – | – |
| *Pupilla muscorum* (Linnaeus) | 2 | 1 | 3 | 1 | + | 1 | 5 | 11 | – | 12 | 21 | 21 | 50 |
| *Vallonia costata* (Müller) | 3 | 2 | 5 | 7 | 43 | 26 | 15 | 9 | 26 | 13 | 7 | 3 | 1 |
| *Vallonia pulchella* (Müller) | – | – | – | – | – | – | – | – | 1 | – | – | – | – |
| *Vallonia excentrica* Sterki | – | – | 1 | – | – | – | 2 | – | – | 1 | 2 | 1 | – |
| *Vallonia* spp | – | – | – | – | – | 4 | 4 | 3 | 3 | 2 | 1 | 2 | – |
| *Acanthinula aculeata* (Müller) | 3 | 2 | 4 | 10 | 44 | 30 | 12 | 7 | 18 | 7 | – | – | – |
| *Ena montana* (Draparnaud) | – | – | – | – | 3 | – | – | – | – | – | – | – | – |
| *Ena obscura* (Müller) | – | – | – | 1 | 1 | 2 | 2 | – | 5 | 2 | – | – | – |
| *Punctum pygmaeum* (Draparnaud) | 8 | 4 | 9 | 25 | 45 | 20 | 13 | 17 | 40 | 10 | 12 | 1 | – |
| *Discus rotundatus* (Müller) | – | – | – | – | – | + | – | 1 | 1 | – | 2 | – | – |
| *Vitrina pellucida* (Müller) | 1 | 1 | 2 | 2 | 8 | 6 | 3 | – | 12 | 1 | – | – | – |
| *Vitrea crystallina* (Müller) | 2 | 2 | 1 | 2 | 2 | 2 | – | – | 6 | – | – | – | – |
| *Vitrea contracta* (Westerlund) | 2 | 2 | 5 | 7 | 18 | 11 | 7 | 16 | 48 | 7 | 9 | 2 | – |
| *Nesovitrea hammonis* (Ström) | 3 | + | 2 | 7 | 15 | 11 | 8 | 3 | 11 | 4 | 3 | 3 | – |
| *Aegopinella pura* (Alder) | – | – | 2 | 3 | 6 | – | – | 3 | 2 | – | – | – | – |
| *Aegopinella nitidula* (Draparnaud) | 4 | – | 6 | 10 | 15 | 15 | 9 | 12 | 12 | 5 | 5 | – | 1 |
| *Oxychilus cellarius* (Müller) | – | – | – | – | 2 | – | – | – | 1 | – | – | – | – |
| Limacidae | 6 | 3 | 7 | 4 | 18 | 6 | 4 | 1 | 3 | 8 | 8 | 5 | – |
| *Euconulus fulvus* agg (Müller) | 1 | – | 4 | 14 | 13 | 13 | 7 | 2 | 4 | 2 | – | – | 3 |
| *Ceciloides acicula* (Müller) | – | – | – | – | – | – | – | – | – | 2 | 2 | 4 | – |
| *Cochlodina laminata* (Montagu) | – | – | – | – | – | – | 2 | – | – | – | – | + | – |
| *Clausilia bidentata* (Ström) | 1 | + | – | 2 | 1 | 3 | 6 | + | 32 | 6 | 5 | 1 | – |
| Clausiliidae | – | – | + | – | – | – | – | – | – | – | – | – | – |
| *Helicella itala* (Linnaeus) | – | – | – | 1 | – | – | – | – | 1 | 2 | 3 | 2 | 3 |
| *Trichia hispida* (Linnaeus) | 2 | – | 5 | – | 6 | 1 | 4 | 3 | 6 | – | – | – | 1 |
| *Cepaea/Arianta* spp | – | 1 | – | 1 | 5 | 4 | + | – | 5 | 2 | + | 1 | + |
| Taxa | 14 | 12 | 17 | 19 | 20 | 19 | 18 | 14 | 21 | 16 | 13 | 11 | 10 |
| Shannon index (*H'*) | 2.45 | 2.19 | 2.62 | 2.50 | 2.49 | 2.51 | 2.69 | 2.38 | 2.56 | 2.59 | 2.26 | 1.78 | 0.80 |
| Total | 40 | 22 | 69 | 115 | 284 | 162 | 113 | 98 | 254 | 89 | 81 | 42 | 61 |

*Nomenclature follows Waldén 1976 and totals exclude* Cecilioides acicula

classes of fill. In the mollusc histogram (Fig 30) the results are presented as relative abundance, and although the Zonitids include both *Vitrea contracta* and *V cystallina*, *Aegopinella nitidula* and *A pura*, and *Oxychilus cellarius*, the majority are *V contracta* and *A nitidula* (Table 5). The Clausiliidae include both *Cochlodina laminata* and *Clausilia bidentata* and the *Punctum* group (Evans 1972, 195) comprises predominately *Nesovitrea hammonis* and *Punctum pygmaeum* but both *Vitrina pellucida* and *Euconulus fulvus* are present (Table 5).

**Local mollusc zone 1 (chalk backfill and primary fills of 'recut')**

The assemblages from the coarse chalk rubble primary fills were dominated by shade-loving species, especially the Zonitids and the *Punctum* Group (*cf* Evans 1972).

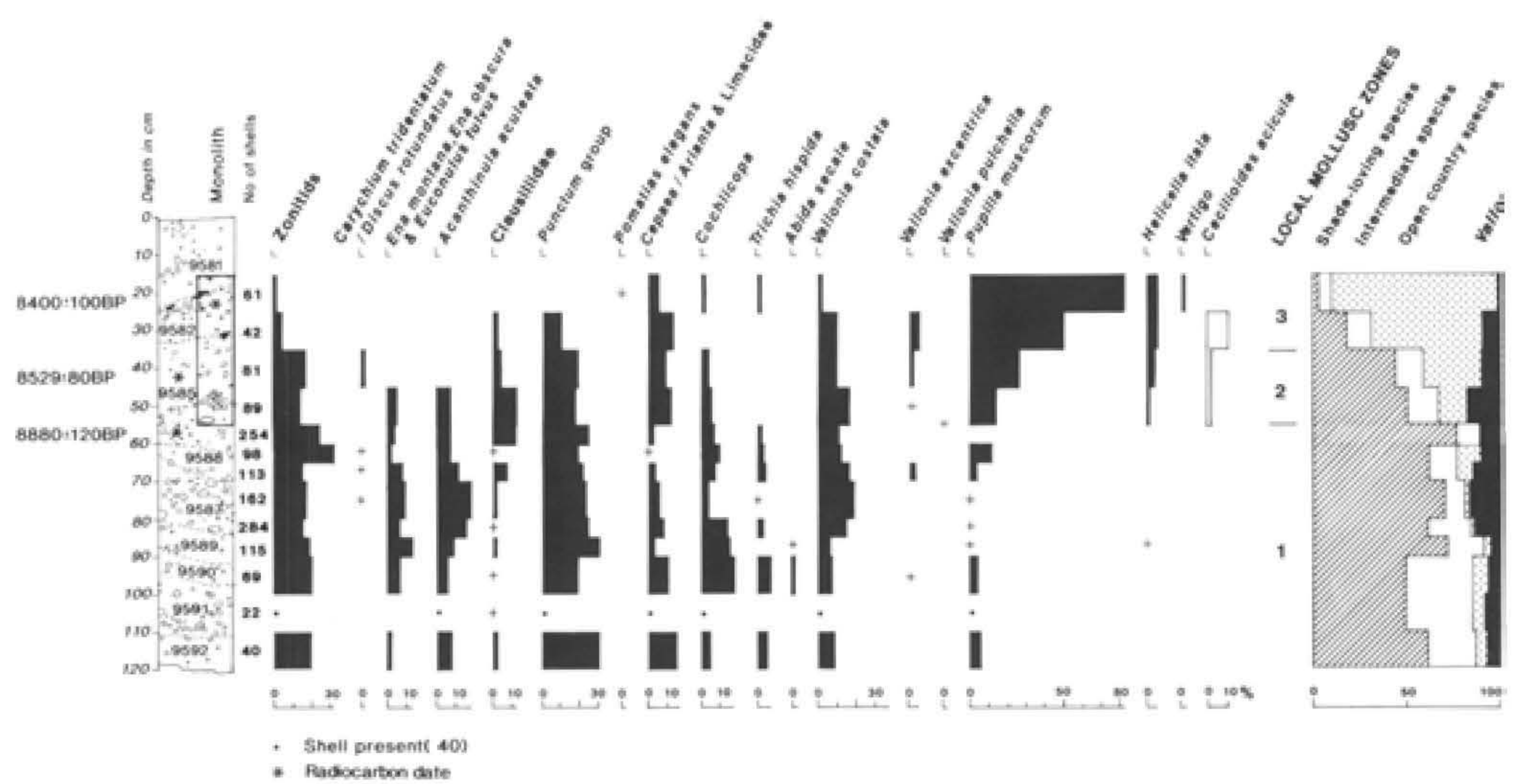


Fig 30 *Land molluscan assemblage from pit 9580 (see text for laboratory reference numbers of radiocarbon dates)*

The Zonitids are largely *A nitidula* and *V contracta* although two samples contained a total of three small apices of the later introduction *Oxychilus cellarius*. *Carychium tridentatum* and *Discus rotundatus* occur in low numbers throughout; *Discus* is represented only by single apices or the diagnostic non-apical fragments (Table 5). Of particular significance is the occurrence of *Ena montana* and *Euconulus fulvus* agg. *E montana* is comparatively rare, but is recorded in old-established woodlands where there is little human activity and *E fulvus*, also a shade-loving species, is more common in more mature woodlands. In archaeological samples it is usually not very abundant, but here represents up to 12% of the assemblages. Also of significance is *Abida secale*, which has a relict distribution today. It occurs in light, open woodlands and is also recorded in woodland habitats dated to the Boreal elsewhere on Salisbury Plain, at Strawberry Hill (Allen 1994). Shannon diversity indices were calculated for these assemblages (*cf* Evans and Williams 1991; Evans 1983; Allen 1994) and were high (Table 5), suggesting a mature mollusc assemblage. At the top of this zone, where there is some evidence of natural primary fills rather than deliberate backfill, more open conditions are inferred; *Vallonia costata* increases. This is also recorded in open woodland (eg at Ascott-under-Wychwood; Evans 1972, 251–6). The *Punctum* Group simultaneously starts to decline. The single apex of *Helicella itala* at 85–90cm is small and might well be intrusive here. However, there is no obvious reason on the basis of shell preservation why the three specimens of *Vallonia excentrica* should be intrusive, though it is possible that they may be. The apices of *Pupilla muscorum*, however, seem from shell preservation to be contemporarenous. All three species are present, though not frequent in the earlier Holocene.

From this assemblage we can infer a mature ancient but open woodland possibly with some leaf litter as indicated by the presence of the predatory Zonitids and other species. The paucity of *Carychium tridentatum* and *Discus rotundatus*, which are common in these environments, is not explained.

Notably, modern assemblages from chalkland coniferous plantations seem to contain few of these species in favour of the rupestral species (*Clausilia* and *Acanthinula*) and Zonitids (Allen unpublished data). The absence of the rare Vertiginids recorded in other ancient woodlands (*cf* Evans *et al* 1978) is also curious. Some indication of more open woodland may tentatively be indicated by the increase in *V costata*.

### Local mollusc zone 2 ('recut')

The secondary fill of the 'recut' changes significantly from chalk and soil to a mainly soil deposit. The assemblages, however, do not reflect such a distinct change. They are characterised by a gradual increase in open country species, a decline in *E fulvus*, the absence of *E montana* and a slight rise in the Shannon (*H'*) species diversity index (Table 5). In particular *P muscorum* and *H itala* are present, species typical of short grassland and bare soil. The continued presence of the Zonitids and Clausiliidae indicates some local shady refugia.

It is perhaps surprising that no *Lauria cylindracea* were present in view of their abundance in the lower fills of the Stonehenge Ditch in Evans's zones C and D (Evans

1984, fig 8). This indicates either local faunal diversity or that *Lauria* occurred sporadically both spatially and chronologically, as it occurs in none of the zones in the car park postpit.

The environment here was one of open woodland and some grass and the relatively high species diversity (Table 5) may reflect this mixed environmental mosaic.

**Local mollusc zone 3 (tertiary fills)**

Although the physical characteristics of the secondary 'recut' fills and tertiary fills are broadly similar (dark grey to brown and reddish brown silty clays with abundant small chalk pieces) the molluscan assemblages show a distinct break rather than the transition of assemblage types seen earlier.

The mollusc assemblages from the tertiary fill are markedly different in character, revealing a rapid increase in open country and a marked decline in shade-loving elements. *P muscorum* increases dramatically and becomes superabundant (82%), which detracts from the trends of relative occurrence in the remaining assemblage (Thomas 1985). Nevertheless, absolute numbers of all other species decline. The specialised nature of this assemblage is also reflected in relatively low species diversity.

**Discussion**

It is presumed that the assemblages from the backfill and the primary fills of the 'recut' eroded from the soil and surface through which the pit was cut and, therefore, represent the environment prior to and contemporary with the feature. Here the assemblages indicate that the postpit was constructed in an existing or only recently cleared mature ancient woodland which may not have been significantly altered by human interference.

This is in agreement with the Boreal radiocarbon date from large charcoal pieces from the 'recut' (GU-5109; 8880±80 BP). It is evident that the woodland did not have a dense canopy and is likely to have been a light and open but mature Boreal woodland consisting partly of pine (charcoal). The significance of this evidence and the nature of the woodland are discussed further in Chapter 10. The postpit was modified resulting in a shallow pit which infilled in a more open landscape. The base of the 'recut' indicates that a clearing, at least, had become established and was beginning to be colonised by open country species.

The change in environmental conditions depicted by assemblages in the tertiary fills is so striking as to suggest a hiatus in the recorded sequence (*see also pollen*). Open short-turfed, possibly grazed, grassland existed, and there is little evidence of any woodland surviving in the immediate vicinity.

This evidence would fit the supposition that these deposits belong to phase 3 (2550–1600 BC) and confirm a hiatus in the environmental record of about five millennia. More specifically, the superabundance of *Pupilla muscorum* here is mirrored in Evans's ditch zone F (Evans 1984, figs 8 and 9), which is also stratigraphically phase 3 within the Stonehenge Ditch (*Chapter 7*).

We can conclude that at the time of construction of the pit the local environment was one of open woodland. Although the woodland had been completely removed by the time of the erection of the first stone monument deposits had not accumulated during the intervening (Atlantic) period and there is therefore no record of this period in either the molluscan or the pollen assemblages from the pit.

## Boreal and Sub-boreal chalk landscape: pollen evidence

*by Robert G Scaife*

The monolith sample from fine-grained, calcareous, secondary and tertiary fills of the pit was subsampled at Wessex Archaeology for both pollen and molluscan analysis. A total of 14 samples has been examined with the aim of elucidating the character of, and human impact upon, the vegetation of the Mesolithic and Neolithic periods. Earlier work in Wessex (Dimbleby and Evans 1974) has shown that useful information can be obtained from the study of such calcareous soils. Although pollen preservation was marginal, it was considered significant here in view of the molluscan spectra and radiocarbon dates obtained (*see Fig 267*). A detailed palaeo-environmental picture of the chalklands in the Mesolithic would be a major contribution to our understanding of the chalkland landscape in the Boreal.

It is generally accepted that pollen is usually poorly preserved in calcareous chalk and limestone soils and that caution must be used in the interpretation of this pollen data. It has, however, been demonstrated that pollen can be preserved in such soils and can provide useful data on past vegetation and environment. This has been the case in the chalklands of southern Britain (Dimbleby and Evans 1974; Scaife 1990) and the analysis of the experimental earthwork at Overton Down, Wiltshire, is attempting to understand the processes operating in calcareous soils (Jewell and Dimbleby 1966; Bell 1990; Crabtree 1990). Given this research, the archaeological importance of this pit, its proximity to Stonehenge, and recent molluscan analyses concentrating on chalkland palaeo-environments (Allen 1994), pollen analysis of these unlikely contexts was undertaken because any results were considered to be potentially highly significant.

Pollen and spores were extracted, albeit in small numbers, reflecting the low absolute pollen frequencies present. APF values ranged from 500 grains per ml at 440–60mm to 4700 grains per ml at 180mm. Preservation was in general poor but typical of pollen from calcareous soils, with crumpled and degraded grains (*sensu* Cushing 1967). There is undoubtedly differential preservation in favour of those taxa with robust exines (for example Lactucoideae (Liguliflorae)) and of fern spores (typically *Pteridium aquilinum*). In a small number of cases pollen of *Pinus* was relatively well preserved. This is possibly indicative of some contamination from recent plantation growth. It does, however, raise the question of whether other pollen, especially the degraded pollen in the upper levels of the pit, may also be contaminant. This is discussed further below.

Contiguous 20mm samples were taken from 160–400mm. These were augmented by samples of soil material from the interstices of samples examined for snails from the backfilled chalk layers of the pit.

All material examined was largely mineralogenic and highly alkaline containing much chalk rubble. A total of 14 samples of 6ml volume was examined. Extraction procedures in general followed those outlined by Moore *et al* (1991) but with the addition of micro-mesh sieving (10μm) for removal of the clay fraction. Samples were decalcified with 10% HCl and deflocculated with 8% KOH. Coarse debris was removed through sieving at 150μm and clay by micromesh (10μm). Remaining silica was digested with 40% hydrofluoric acid. Erdtman's acetolysis was also carried out.

The concentrated pollen and spores were stained with safranin and mounted in glycerol jelly. Absolute pollen frequencies were calculated using Stockmarr *Lycopodium* tablets (Stockmarr 1971). These techniques were successful in extracting small numbers of pollen grains and spores of ferns. Because of the small absolute pollen frequencies present, pollen sums of between 100 and 200 grains per level were counted using an Olympus biological research microscope with phase contrast facility at magnifications of x400 and x1000. Pollen data are presented in diagram form (Fig 31) with pollen calculated as a percentage of total pollen and spores as a percentage of total pollen plus spores. Taxonomy follows that of Stace (1991) and Moore *et al* (1991).

### Results

A total of 33 pollen and spore taxa was recorded (Fig 31). The diagram has been divided into two broad pollen assemblage zones which are also coincident with context and fills boundaries. The pollen assemblage zones are characterised as follows:

**PAZ 1:460–350mm:** This zone is characterised by relatively higher values of tree and shrub pollen than are present in the upper levels of the pollen profile. Trees are represented by *Betula* (birch), *Pinus* (pine), *Ulmus* (elm), and *Quercus* (oak), which make up to 20% of total pollen in the basal sample. *Corylus avellana* type (hazel) is the only shrub, with highest values present in the lowest sample (27%) and declining upwards. Herbs are dominated by Lactucoideae (Liguliflorae: *Sonchus*, *Taraxacum*, *Leontodon*) and Poaceae (grasses) with sporadic occurrences of other taxa including *Ranunculus* type (buttercups), *Sinapis* (charlock), *Chenopodium* type (here goosefoots/oraches), *Plantago lanceolata* (ribwort plantain), and *Centaurea* (knapweed). There is a general increase in diversity upwards in the pollen profile. Spores of *Pteridium aquilinum*, *Dryopteris* type, and *Polypodium* are present. Unidentified/degraded pollen is most numerous in the lowest sample (440–460mm).

**PAZ 2: 350–160mm:** The upper half of the sequence shows a reduction in arboreal and shrub percentages and an increase in herb pollen. Most significant is the progressive reduction in *Corylus avellana* type from values noted in PAZ 1 to absence in the upper levels. *Betula* and *Pinus* similarly show some reduction in numbers. A small but significant number of well preserved *Pinus* grains and a single *Abies* may represent contamination through downwash or through worm mixing from the surface levels. Herbs are dominated by Asteraceae (Compositae) including *Taraxacum* type which attains very high values (to 72% at 220–240mm). *Plantago lanceolata* (to 16% at 160–180mm) and Poaceae (10–20%) are also important elements. There is a small but consistent record of cereal type (identification of which is based on size and morphological characteristics) and sporadic records of herbs which may be associated with arable cultivation (*Sinapis* type, *Chenopodium* type, *Fallopia convolvulus*). Spores of *Pteridium aquilinum* increase progressively upwards through the profile to 66% in the top level (160–180mm). A small number of *Sphagnum* spores (not considered to be contaminants) are present and along with similarly sporadic records of Cyperaceae are enigmatic, representing wetland habitat.

### Interpretation: the vegetation history

As noted, some well preserved *Pinus*, *Abies*, and cereal pollen grains were recorded. The numbers of these 'well' preserved grains are small in comparison to the majority of the 'normal', poorly preserved pollen grains present. Since these grains occur in the uppermost levels in particular, it is possible that there has been some downward movement of recent pollen through downwashing or faunal/earthworm mixing. In the case of *Pinus* this possibly derives from recent pine plantations. Two factors should be pointed out. First, if this has occurred in recent years there is also the possibility of post-depositional contamination (from other taxa) at any time during the period since the infilling of the pit. However, the pollen would also be degraded and thus appear to be contemporary with the pit fill. Second, Dimbleby (1985) and Scaife (pers obs) have noted that some pollen grains are in fact remarkably well preserved in calcareous soils. This phenomenon is still not fully explained but may relate to the rapidity with which the pollen was sealed in old land surfaces. Thus it is possible that the pollen is in fact contemporaneous with the pit fill and represents pollen which was rapidly incorporated into the pit.

Charcoal from the context at the base of the monolith (context 9585) was dated to 8090–7690 cal BC (GU-5109; 8880±80 BP) and places these fills in the Mesolithic (Table 4). Further dates of fine charcoal from tertiary fills range from 7700–7090* cal BC and all, without exception, come from *Pinus* charcoal. The presence of pine is commensurate with the dating of the pits as Boreal (Mesolithic), since it is known that this was the dominant tree in southern England from *c* 9500–8500 BP (*eg* Seagrief 1959; Scaife 1980; 1982; 1987). This dominance was progressively diminished by the incoming migration of *Quercus* and *Ulmus*. *Corylus avellana* was similarly an important element of the environment throughout this early Holocene phase (the often quoted Boreal pine–hazel period). Molluscan analysis (*above*)

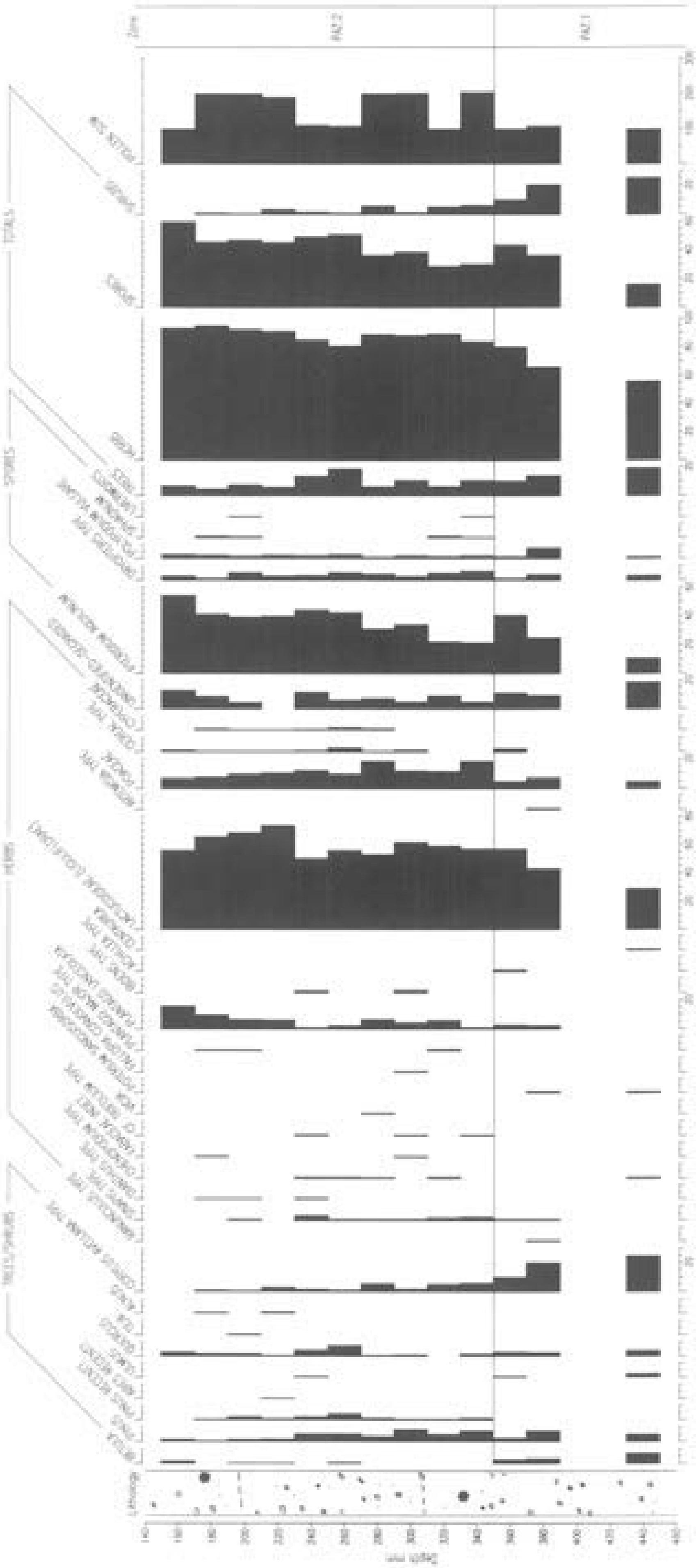


*Fig 31 Pollen diagram for pit 9580. The asterisks mark the positions of the radiocarbon samples*

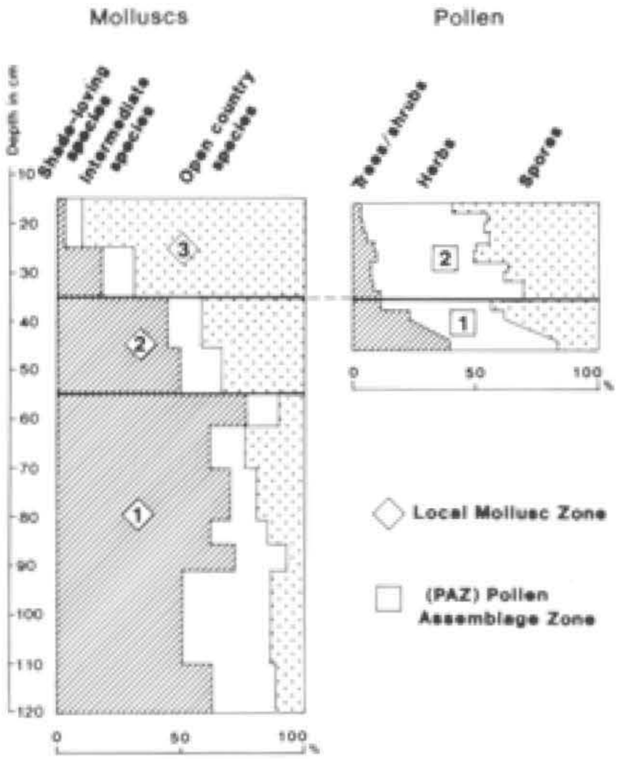



*Fig 32 Pit 9580: summary diagram of pollen and molluscan data*

has similarly yielded Boreal indicator taxa in the chalk backfill and 'recut' of the pit to 360mm (Fig 30). This upper limit is the point where the tertiary fills start and where a change in pollen content occurs; that is, between PAZ1 and PAZ2.

Pollen obtained originated from the former soils which had become incorporated in to the upper fills of the 'recut'. Pollen assemblage zone 1 has higher numbers of tree pollen, being characterised by *Betula*, *Pinus*, and *Corylus avellana* type, with lesser numbers of *Quercus* and *Ulmus*. This is typical of early Holocene (Flandrian chronozone Ib) sequences from southern England where pollen sequences show evidence of an early Holocene *Juniperus* and *Betula* expansion from *c* 10,000 BP to *c* 9500 BP being replaced by *Pinus* and *Corylus avellana* which were dominant at 9000 BP over large areas (Scaife 1980; 1982). Later Boreal (Flandrian chronozone Ib/c) sites, although showing continued importance of *Pinus*, typically illustrate expansion to dominance of *Quercus* and *Ulmus* woodland. It appears, therefore, that the vegetation of this area was the pine/hazel woodland characteristic of the early Boreal period.

This is the first pollen evidence for the character of woodland actually on the chalklands. Other pollen records from which interpretations of the flora have been inferred are from peat sites on adjacent but different lithologies. Arguments (see Godwin 1975) about whether or not the pine–hazel community existed on chalk soils seem to have been clarified. Given the ability of pine to grow in recent plantations in this region this is not, however, surprising.

In pollen assemblage zone 2, from 360mm upwards, the interpretation of the pollen spectra is less certain. As noted above, there is a change in pollen and molluscan content from this level (Fig 32). Both spectra show a change to more open conditions with grassland prevailing. Herbaceous pollen takes over from arboreal taxa with Lactucoideae, *Plantago lanceolata*, and Poaceae (Gramineae) being dominant. As is common in the analysis of pollen from calcareous soils, absolute frequencies are small, reflecting the harsh pollen-preserving environment. Here, the disproportionately high values of Lactucoideae (Liguliflorae) and the spores of ferns (especially *Pteridium aquilinum*) are strong indicators that differential preservation in favour of pollen with more robust exines and spores has taken place with resultant skewing of the pollen data. Because of the proximity of the top of this section to the present land surface it is likely that some downward mixing of pollen grains through worm action has taken place and as noted above this may have been responsible for contamination by recent *Pinus* pollen. A fragment of rhyolite was recorded in context 9581 at the top of the pit (at *c* 0–200mm) indicating a date for this layer contemporary with phase 3 of the monument itself (2550–1600 cal BC). However, as with the molluscan analyses, it is clear that there is evidence in the stratigraphy for the change to open grassland conditions which pertain today. It is not possible to state when this phase of open grassland occurred although it seems likely that at least some of the pollen present, especially the degraded Lactucoideae, may be contemporaneous with the open short-grazed grassland discussed by Allen.

Dimbleby (in Dimbleby and Evans 1974) has drawn attention to the high values of *Pteridium aquilinum* spores which may often be found in prehistoric chalk soils as for example at South Street, Avebury, and Windmill Hill. Although there is certainly over-representation of bracken spores due to differential preservation, such high values are interesting because, as Dimbleby (1982) points out, there are few sites today where bracken grows on pure chalk rendzinas. Furthermore, the combined studies of molluscan and pollen assemblages at South Street, for example, are incongruous, with the former indicating grassland whereas the latter produced large numbers of bracken spores, the latter thus being 'regarded ecologically extraneous' (Dimbleby and Evans 1974, 132). This situation also exists at Stonehenge with strong molluscan evidence for open grassland in the upper part of the profile whereas high values for *Pteridium* as well as grassland taxa are recorded in the pollen/spore analysis. Although there may have been colonisation by bracken scrub after woodland clearance, the possibility of human introduction of bracken to the site, in the form of litter mucked out onto arable land, may also be considered. This problem remains unsolved. It seems likely, given the widespread geographical occurrence of this phenomenon and the overall pastoral character of these sites, that the bracken was a local element of the vegetation community. There is little doubt that it was prized as valuable source of plant material for bedding and building in the past (Rymer 1976) and its growth may have been promoted.

Another point of interest is the occurrence of sporadic spores of *Sphagnum* and Cyperaceae. Care was taken during pollen preparation to avoid any contamination from peat-based laboratory research work and the state of preservation of these elements was comparable with other taxa identified. These elements must also be seen as ecologically extraneous, representing wetland habitats (although it is noted that *Carex flacca* is an important element of mature chalk grassland). Interpretative possibilities include i) airborne transport from wetlands growing at some distance ii) introduction to the land in the same manner as *Pteridium ie* as mucked out animal bedding to manure the land or iii) derived from animal dung, possibly with bedding, or directly where animals had previously been feeding or grazing on wetland rough pasture. This is another enigma. Similar occurrences are recorded from a buried Bronze Age soil from Newbarn Down, Isle of Wight (Scaife 1984).

#### Conclusion

Pollen analysis appears to corroborate the view that the pit is of early Holocene date. The pollen recovered from the 'recut' fills contains taxa (pine, birch, and hazel) typical of the early Boreal Flandrian chronozone Ib. This confirms earlier discussion of the status of *Pinus* on the chalklands in the early Holocene/Boreal. It is likely that this pollen has been preserved through its rapid incorporation into the pit fill and subsequent burial.

These data compare favourably with information derived from molluscan analysis by Allen and the identification and radiocarbon dating of pine charcoal (*see Fig 267*). In the tertiary fills there is evidence for open grassland with some cereal cultivation. This evidence is skewed in favour of those plants whose pollen have thicker and therefore more robust exines. The change in environment is also demonstrated in the molluscan record (*see Fig 32*) but there is no clear indication from this profile of the date of woodland clearance. It is noted that there is no pollen evidence for typical mid-Holocene (Flandrian chronozone II) Atlantic vegetation of the Neolithic. This is perhaps surprising, since *Tilia* is considered to have been a widespread, perhaps dominant, element of the mid-Holocene flora and has pollen grains which are resistant to decay and are easily recognised in degraded form.

As with other similar prehistoric sites in the Wessex chalklands region, large numbers of bracken spores have been recovered. The interpretation of these is problematic and interpretations range from 'manure' from mucked-out animal bedding being put on the land, to promotion of bracken growth for human/animal use in areas where it is not found today.

## Summary discussion

#### Mesolithic environment (Boreal) at Stonehenge

The features discussed here were dug in the early Mesolithic (*8500–7650 cal BC*) in an open mixed pine and hazel woodland which it is assumed was cleared locally prior to and perhaps for this activity. The open nature of this woodland is indicated by the presence of hazel, one of its main constituents, which requires sunlight in order to flower, and also by the composition of the mollusc assemblages. Local clearance is reflected in the assemblages (both pollen and molluscs) in the base of the 'recut' shallow pit (Fig 32). The clearance within this woodland for the excavation of the four postpits must have been large enough to enable a new mollusc fauna to start to become established. This indicates that there was open country in the vicinity from which this fauna originated and it seems that the open nature of the woodland itself could have provided such habitats.

There is a major hiatus in the environmental sequence; both the snails and pollen from pit 9580 indicate a Boreal woodland (confirmed by radiocarbon dates), but both spectra from the tertiary fills are consistent with a Sub-boreal (*ie* Late Neolithic–Bronze Age) environment (Fig 32). Nowhere in this sequence is the Atlantic (later Mesolithic) represented. It is possible that the soils were stabilised by vegetation which prevented soil/sediment movement into the depression.

In the later episode, open, well established and probably grazed grassland consisted of herbs, bracken, and plantains. These tertiary fills represent a dramatic change and it is argued that they relate to the period of dressing of the Bluestones and construction of the stone monument (phase 3; 2550–1600 BC), some 5000 years later than the Mesolithic activity. This is based on both molluscan and pollen spectra as well as the presence of a rhyolite fragment. (Further pieces of both bluestone and sarsen, including several mauls, were also recovered from the car park by Young in 1935; *see Chapter 9 and archive database*.) This environment generally equates with Evans's interpretation of material from the Ditch (zone F) at Stonehenge (Evans 1984).

#### Mesolithic activity at Stonehenge

The three postpits excavated by the Vatchers contained definite evidence of having held large pine posts of 0.60–0.80m diameter which probably rotted *in situ* or were removed when rotten. These therefore contained large upright pine timbers which must (as the excavators appreciated) by virtue of their spacing have stood without horizontal members spanning them (Vatcher and Vatcher 1973). They are likely to have been individual uprights, perhaps reminiscent of those of the hunter-forager communities of the North-West American Indians (totem poles). Pine timbers of this size would take about 70 years to grow, but could have lasted centuries once erected, as did the upright poles of American Indian communities.

The only other feature recorded by the Vatchers was interpreted as a treehole (Fig 27). Although this feature was less regular in plan than the others, the excavators did admit to the possibility that the 'treehole' was dug as a hole for a post and that the soft deeper deposits were subsequently exploited by trees or bushes (*ibid*, 61). If the bottom of the treehole contained compacted chalk rubble, it is conceivable that this was unexcavated backfill mistaken for weathered chalk, in which case its broad plan and suggested profile would mirror that of pit 9580 (*compare Figs 27 and 28*).

If the treehole is accepted as a dug feature and all the car park features as broadly contemporaneous (which cannot be confirmed on radiocarbon grounds) then there is evidence for a series of five pits, three of which certainly held pine posts or poles. This suggests a degree of planning, that is of conscious actions resulting in the erection of a related group of poles rather than the occurrence of several pits, unassociated except in terms of their close proximity to one another. As the Vatchers discuss (*ibid*), they cannot represent a single 'structure' because their span is too great to have supported horizontal timber members. The 'line' of poles may therefore represent some formal display such as a series of totem poles or other possibly symbolic or ceremonial posts which pre-date Stonehenge by over four millennia. The possible nature of this activity is discussed more fully in Chapter 10.

## Earlier Neolithic

### Environment: landscape and landuse

The landuse and landscape evidence for the earlier Neolithic in southern England is pitifully sparse, even in an area which has been as exhaustively studied as Salisbury Plain. There is no environmental evidence for the later Mesolithic except the broadly dated pollen sequence from alluvium in the Avon Valley at Durrington (Scaife forthcoming) and sparse pollen evidence from the old land surface at Durrington Walls (Dimbleby in Evans 1971) discussed above. Little additional analysis has been undertaken since the reviews presented in the Stonehenge Environs Project (Allen *et al* 1990; Maltby 1990). As we have seen, the later Mesolithic and earlier Neolithic periods are notably absent from the palaeoenvironmental sequence from the fills of earlier Mesolithic postpits in the car park. Detailed evidence for the earlier Neolithic landscape is therefore largely inferred from evidence elsewhere.

Although we have to begin by assuming that in the later Mesolithic/earlier Neolithic much of the area was under woodland of one form or another, the presence of sites of the earlier Neolithic (the first half of the fourth millennium cal BC), such as the Coneybury 'Anomaly' (Richards 1990), the causewayed enclosure of Robin Hood's Ball, and the various long barrows (Fig 33), indicates some clearance at these locations. The environmental evidence from the Coneybury Anomaly comprised one mollusc sample from which Bell and Jones concluded that there was 'no evidence that the early Neolithic environment was dramatically different from that of the later Neolithic and Beaker period' (Bell and Jones 1990, 157) and that areas of shade were likely to have existed. However, the nature of that woodland as indicated by charcoals suggested mixed woody and shrub vegetation including oak, hazel, elm, and other woody species (Gale 1990, 252–3), contrasting significantly with Scaife's pollen evidence for the early Mesolithic (Boreal) vegetation presented above. Unfortunately, the scanty nature of the molluscan and charcoal evidence does not allow comment on the extent of the earlier Neolithic scrubby woodland, nor does it provide an indication of other more substantial woods in this landscape.

Denser woodland probably would not have contained settlement activity and there would be no archaeological evidence to recover or sample for environmental data. By the middle of the fourth millennium the presence of long barrows, such as Netheravon Bake and Amesbury 42, and the pits at Robin Hood's Ball and King Barrow Ridge (*see below*), provide a picture of wider use of the area, but environmental data are still sparse. Nevertheless, when this evidence is brought together (Allen *et al* 1990, fig 155) it indicates that comparatively large areas of the Stonehenge landscape had been cleared to varying degrees. We can suggest that the earlier Neolithic shrubby vegetation was a result of significant human interference. This impact is seen not only in changes in the composition and nature of the woodland but also in the mollusc analysis of the Amesbury 42 long barrow. Here Entwistle has demonstrated that it was constructed in an established grassland or downland and that the Early Neolithic soil buried beneath the barrow was a rendzina (Entwistle in Richards 1990, 108). This either challenges the hypothesis, presented above, that the earlier soils were appreciably thicker (*cf* Limbrey 1978; Allen 1994) or indicates that extensive erosion and soil degradation had already occurred as a result of clearance and possibly other activity.

Cultivation is certainly evident, as carbonised cereal grain (emmer) was recovered from the Coneybury Anomaly (Carruthers 1990), but the open, possibly shrubby vegetation seems predominately to have been used for pasture and browse for cattle; there is little evidence for sheep. Roe deer, red deer, and pig were hunted in this woodland (Maltby 1990).

In the earlier Neolithic, therefore, the Stonehenge landscape was largely cleared of any dense forest and by inference from Scaife's (forthcoming) Durrington pollen diagram was probably open mixed woodland. We should probably envisage a coarse mosaic of large glades, open light woodland, and shrubs in grassland. The diverse habitat created largely by clearance of the oak, lime, elm, and hazel woodland provided suitable habitats for wild animals, browse and grazing for cattle and pigs, and the possibility of localised garden or plot cultivation of cereals.

There is slightly more environmental data for the second half of the fourth millennium upon which to draw. Most of this is from occupation and other activity sites and is consequently biased to areas of clear-fell woodland and open country. Nevertheless, evidence from the sequences of data from the Netheravon Bake (Entwistle pers comm), Amesbury 42 long barrows, and the Lesser Cursus (Entwistle in Richards 1990), indicates that these were constructed in open downland pasture and existed for some time in grazed downland. However, as Bell and Jones (1990) point out from their mollusc analysis of the ditch fills of the Coneybury Henge, it is evident that this reflects 'a complex mosaic of vegetation types on the chalk' and that there is considerable landscape diversity (*ibid*, 158).

This diversity is, on the other hand, suppressed by the inherent bias of data obtained from archaeological sites which, by their very nature, predominantly record the open environment created for the purpose of on-site activity or monument construction. Maltby's review indicates the predominance of pigs and cattle, supporting the idea of a diverse mosaic of local habitats. Similarly there is evidence of cultivated cereals (emmer and barley) but also of wild food resources such as the ubiquitous hazelnuts as well as sloes and tubers (Carruthers 1990).

The diverse landscape therefore offered areas for cultivation, woodland with enough light for hazel to flower, and sloes and presumably other soft fruits. Woodland probably also supported pigs and deer.

## Archaeological landscape

*by Julie Gardiner and Rosamund M J Cleal*

The large pit known as the Coneybury Anomaly provides the earliest radiocarbon date in the area to be associated with Neolithic artefacts and can be placed within the first quarter of the fourth millennium cal BC (4000–3750). It is in a sense, therefore, the first 'visible' Neolithic activity. It does not, however, represent the very earliest use of 'Neolithic' artefacts in the area and the period preceding the construction of Stonehenge to which the practices and artefacts traditionally designated as 'Neolithic' are assigned may be envisaged as of at least a thousand years' duration.

This millennium of use is not marked by any apparent indication that the site of Stonehenge is special, but within this period the seeds of later practices may have been sown. Whether the building of the first monument represents a break with the past, or was a development of patterns of behaviour and use which had existed over many generations, this pre-monument period cannot be ignored in any consideration of the monument itself. The distribution of known Early Neolithic assemblages and monuments is shown in Figure 33; a summary of pre-monument sites in the area is given in Table 6. This section will describe briefly the principal finds of the fourth millennium; their significance in relation to the monument is discussed in Chapter 10.

The Coneybury Anomaly (Richards 1990, 40–61) is a pit of *c* 1.9m diameter with a depth of 1.25m below the present chalk surface. Its primary deposit, which contained very high phosphate levels, consisted of a decayed, organic-rich layer with a high density of charcoal (*see above*), animal bone, pottery, and flint artefacts. It produced almost 15kg of pottery of the South-Western Style of Neolithic bowl, including at least one large carinated vessel. The sherds were generally in a fresh condition. Over 200 bone fragments were found, dominated by roe deer and cattle, with some pig, red deer, and beaver. Of particular note is the fact that although all the major species present had been subject to major butchery, only the roe deer and pig bones seem to be waste from consumption: the cattle and red deer elements suggest that joints of meat were removed for consumption elsewhere (Maltby in Richards 1990, 60–1). There were no sheep bones in the primary deposit. A small amount of poorly preserved cereal grain included wheat, probably emmer. Flintwork associated with this deposit seems to be essentially Early Neolithic in character and included two leaf-shaped arrowheads and a fragment of polished flint axe; earlier Neolithic elements were also present in surface scatter material on Coneybury Hill. Overall, this unusual feature suggests a midden deposit or the remains of a major feast held in summer. The associated radiocarbon date is 4040–3640 cal BC (OxA–1402, 5050±100 BP).

Excavation at the causewayed enclosure of Robin Hood's Ball, *c* 3km to the north-west of Stonehenge, in 1956 (Thomas 1964), was limited to sections across the two ditches and a causeway. The site lies on a hilltop and encloses a total area of just over 3ha. It is just intervisible with Stonehenge. Over 200 sherds of pottery were recovered, of which most were Neolithic bowl material, including one carinated vessel and three lugs; one sherd bore the impression of a grain of emmer wheat. No radiocarbon dates are available but it is likely, by analogy with other causewayed enclosures, that the site was used over several hundred years during the fourth millennium.

There are at least ten long barrows in the Stonehenge area (Fig 33) which vary in length between *c* 30m and *c* 80m, the majority being of 'medium' size for long barrows generally (30–60m). All seem to have possessed side ditches (RCHM(E) 1979, ix). With the exception of Amesbury 42, which lies beyond the end of the Stonehenge Cursus but effectively across it, none of the long barrows is sited in a position where it could be considered to have reference to, or is intervisible with, either the monument site or other monuments in its close vicinity. The 'long barrow' (Amesbury 10a; Colt Hoare 1812) marked on old OS maps within the Stonehenge Triangle just west of the monument is not so accredited by RCHM(E) (1979) and did not register in

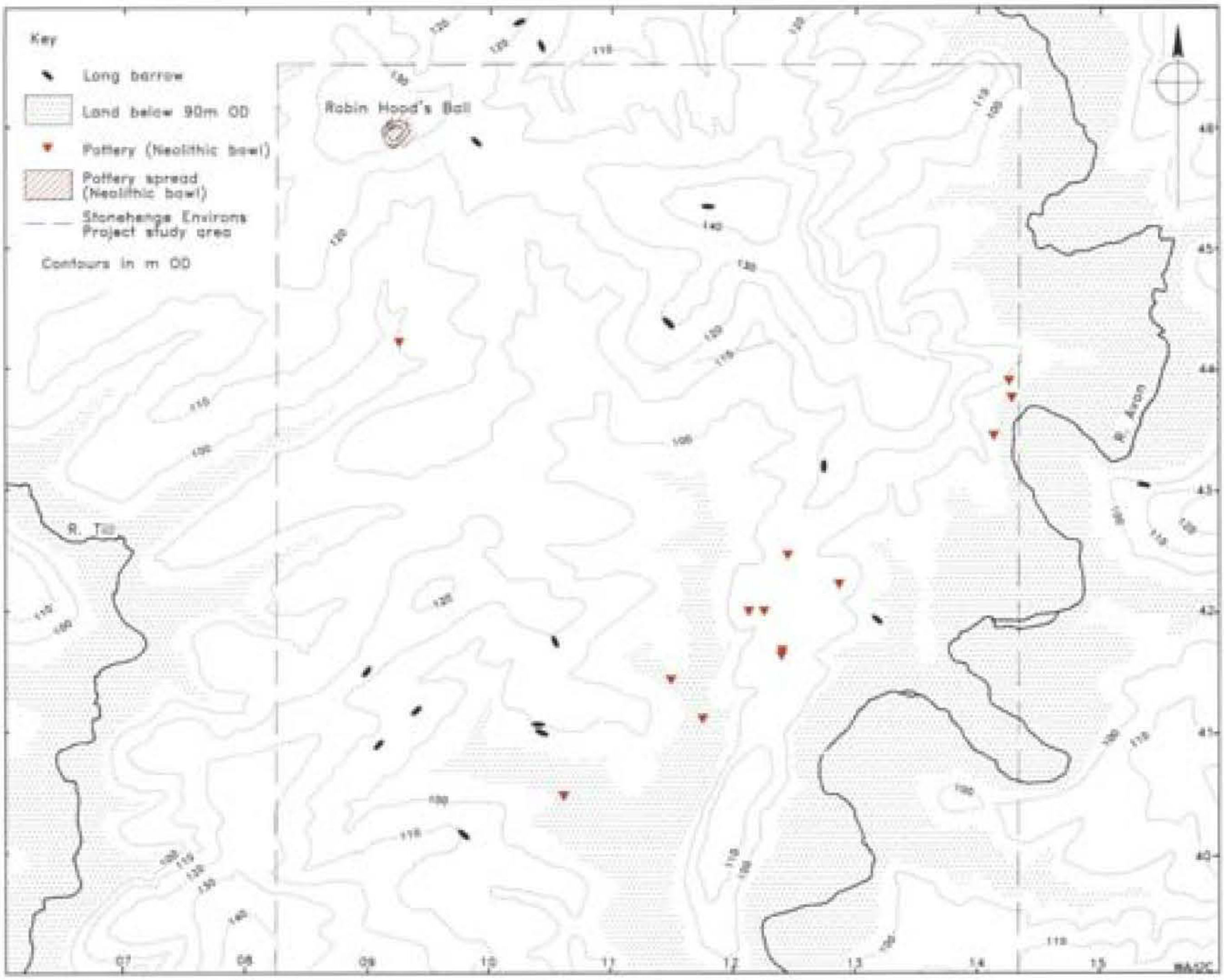



*Fig 33 Early Neolithic sites in the Stonehenge area*

the geophysical surveys carried out in 1993–4 (*see Payne, Appendix I*).

Direct dating evidence for the long barrows is slight. It is possible that one or more belongs to the earlier part of the fourth millennium but the only radiocarbon date available, from an antler in the phase 1 ditch at Netheravon Bake (Richards in prep), is 3780–3350 cal BC (OxA–1407, 4760±90 BP). At Amesbury 42 a two-phased ditch was also indicated but produced no dating evidence from primary levels (Richards 1990, 96–109).

The long mortuary enclosure on Normanton Down excavated by Faith Vatcher in 1959 (Vatcher 1961) was *c* 36 x 21m in extent with discontinuous ditches and remains of a possible structure at the east-south-east end. Peterborough Ware was recorded high in the ditch but antler picks and cattle and sheep/goat bones were also recovered and a radiocarbon date obtained of 3510–2920 cal BC (BM–505, 4510±103 BP).

Middle to later fourth millennium dates have also been obtained from other sites in the area. A group of pits found adjacent to Robin Hood's Ball was investigated during the Stonehenge Environs Project (Richards 1990, 61–5). Surface artefact collection here produced a cluster of flint scrapers. On excavation this area revealed the presence of five pits. Flintwork from the pits appears to be knapping waste of Early Neolithic date using local chalk flint nodules and including scrapers, two leaf arrowheads, a fabricator, and four ground tool fragments. Animal bone from the pits is again dominated by cattle, here with sheep/goat and pig.

The pottery is largely similar to that from the Coneybury Anomaly with the addition of sherds with a gabbroic temper. One vessel seems to be in the Abingdon Style. Two radiocarbon dates were obtained, 3800–3190 cal BC (OxA–1400, 4740±100 BP) and 3510–2920 cal BC (OxA–1401, 4510±90 BP).

Extensive fieldwalking on King Barrow Ridge just north of the northern ditch of the Stonehenge Avenue (*ibid*, 109–23) recovered largely Late Neolithic–Early Bronze Age flintwork. Sample excavation, however, uncovered stakeholes and pits, in one of which was a primary deposit very similar to that of the Coneybury

**Table 6 Summary of pre-monument sites in the Stonehenge area**

| | | |
|---|---|---|
| 4000 cal BC | 3750 3500 | 3250 2000 |
| First half fourth millennium | | Second half fourth millennium |
| | Middle fourth millennium | |
| **Coneybury Anomaly** | **Netheravon Bake**<br>**Robin Hoods Ball pits**<br>**King Barrow Ridge (OxA–1396)**<br>**King Barrow Ridge (OxA–1397)** | **Robin Hoods Ball pits**<br>**King Barrow Ridge (OxA–1396)**<br>**Lesser Cursus**<br>**Durrington Walls pre-bank**<br>**Normanton Down Long Mortuary Enclosure**<br>**King Barrow Ridge (OxA–1397)** |
| long barrows<br>Robin Hood's Ball causewayed enclosure | long barrows<br>Robin Hood's Ball causewayed enclosure | |

*Sites dated by radiocarbon shown in bold; others are supposition*

Anomaly. A radiocarbon date of 3790–2940 cal BC (OxA–1396) obtained from bone from this deposit provides additional evidence for middle fourth millennium activity. A further cluster of four pits nearby may have included deliberate deposits. Like the first pit, the upper levels contained Grooved Ware and Peterborough Ware. Below these fills, in at least one pit, was a dark organic material lying above the primary fill, containing articulated cattle vertebrae, sheep/goat, pig, red deer, and wild cat bones. This produced a radiocarbon date of 3610–2900 cal BC (OxA–1397, 4500±120 BP).

Round barrow Amesbury G39, offset from the main group of barrows on the ridge known as New King Barrows, was excavated by Ashbee in 1960 (Ashbee 1981). Attention has recently been drawn (Cleal and Allen 1994, 62–4) to the presence of a small number of rim sherds and a quantity of plain body sherds of Neolithic bowl material from this excavation which were recorded but not illustrated in the original report. This material was clearly incorporated in the turf and topsoil used to construct the barrow. The rims include heavy forms which are unusual in the Stonehenge area (*ibid*, 69), though a few occur in the pre-Bank assemblage from Durrington Walls (*below*), and no forms diagnostic of either the Decorated or the South-Western Styles of pottery are present. The flint assemblage from the barrow (*ibid*, 74–5) includes a proportion of blades, bladelets, and core rejuvenation flakes, suggesting an earlier Neolithic element to complement the pottery.

Work by Faith and Lance Vatcher in 1967 included investigations on King Barrow and Vespasian's Camp Ridge during the road improvements for the A303. An earlier Neolithic pit was recorded on each. The surviving finds from these features (Cleal 1990, 65–6) included flintwork and at least five vessels of plain Early Neolithic pottery, including a lug, in similar fabrics to the material from the Coneybury Anomaly and from King Barrow Ridge. They also include some animal bone and a broken polished axe from Vespasian's Camp Ridge.

The Vatchers' excavation of the SEB cable trench (C83) between King Barrow Ridge and Stonehenge also produced sherds of Early Neolithic bowl pottery from a posthole or small pit (feature B). The vessel is a small carinated bowl or cup decorated with impressed round pits on the upper body and shallow oblique incisions on the interior rim. It is comparable to examples from Windmill Hill (Cleal and Allen 1994, 64, 67, fig 8, P42).

Limited excavation at the western terminal of the Lesser Cursus (Richards 1990, 72–93) indicated a two-phased complex of ditch segments. An antler from the base of one of the phase 1 ditches produced a date of 3630–2920 cal BC (OxA–1404, 4550±120 BP) and an antler pick lying on the base of the phase 2 ditch provided a date of 3640–3040 cal BC (OxA–1405, 4640±100 BP). There was no associated pottery but bones of cattle, including a possible aurochs metacarpal, sheep/goat, pig, and red deer were recovered.

At least 21 vessels are represented by Early Neolithic pottery from a restricted area of the old land surface sealed beneath the bank at Durrington Walls (Wainwright and Longworth 1971, 53–5). Some 800 flint artefacts were also recovered from the old land surface, including a leaf arrowhead and a rechipped but almost complete polished axe (*ibid*, 156, fig 65), and a small quantity of animal bone. A radiocarbon date obtained from charcoal associated with this material calibrates to 3500–2610 cal BC (NPL–191, 4400±150 BP).

Fieldwalking for the Stonehenge Environs Survey recovered small quantities of flintwork of probable earlier Neolithic date including scrapers, leaf arrowheads, polished axe fragments, and stone axe fragments. The distribution is widespread and fairly sparse (Richards

1990, fig 157), particularly if scrapers are removed (the relative dating of scraper forms is still open to debate) and indicates little more than that there was some activity in the area in the fourth millennium over and above the digging of pits.

As elsewhere in southern England the visibility of the Early Neolithic in the Stonehenge area is, in archaeological terms, considerably lower than for later periods. The presence of pits containing Neolithic bowl pottery, long barrows, and the widely and sparsely scattered nature of identified flint assemblages can be paralleled in many areas. This inevitably gives the impression of sporadic activity, since the total volume of material evidence is, as elsewhere, very slight considering the millennium or more over which it may have been deposited.

Full discussion of the earlier Neolithic cultural background to the monument and its surrounding landscape is presented in Chapter 10 and it is enough to comment here that there is evidence for considerable activity in the area. Material from the King Barrow Ridge–Coneybury area suggests some concentration of domestic activity with evidence for domestic farm animals and cereals, with other possible, but more ambiguous, concentrations of material, for instance around Wilsford Down and north of the Cursus.

The presence of long barrows and the causewayed enclosure at Robin Hood's Ball provide familiar evidence both of a funerary element in the landscape and of communal building programmes, with hints of the presence of structured deposits, for instance within the Coneybury Anomaly.

### The monument site

There is very little evidence at the monument site to suggest activity before the monument was constructed. Only one rim sherd, from the Bank of the phase 1 monument, and one piece of bone, from a stonehole of the Sarsen Circle, are datable to the earlier Neolithic. The bone is clearly residual, and it is likely that the sherd is also redeposited. The rim clearly belongs to an earlier Neolithic bowl, and shows a similarity in form and decoration to rim sherds from King Barrow Ridge and Fussell's Lodge in the local area, as well as to vessels from more distant sites such as the causewayed enclosure of Windmill Hill (*see Chapter 10*). The bone, which was identifiable only as a cattle-sized fragment, was submitted for radiocarbon dating on the grounds that it was one of the few pieces of bone from a stonehole of the sarsen settings of phase 3. Unexpectedly, it produced a radiocarbon date which calibrates to 4360–3990 cal BC (OxA-4902, 5350±80 BP) ( *Appendix 2*).

## Immediate pre-monument environment

The immediate pre-monument environment (ie prior to 3050 cal BC) is described above as a landscape composed of a diverse mosaic of vegetation types. Locally,

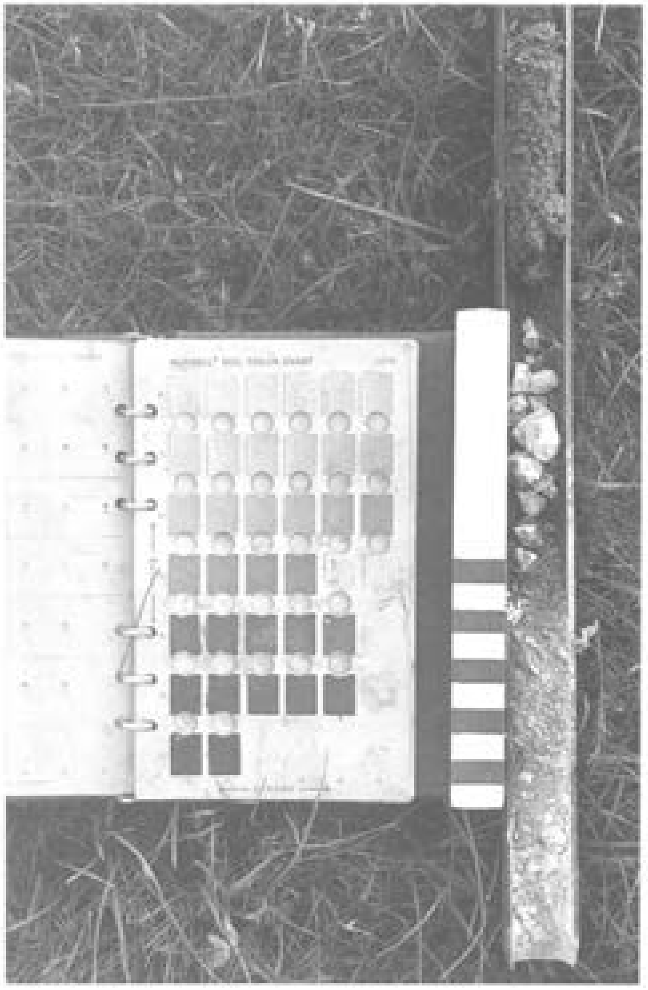


*Fig 34 Auger profile showing modern turf, the Bank (chalk lumps), and Neolithic buried soil beneath. Scale in cm (Wessex Archaeology)*

perhaps the most obvious source of environmental data is from the pre-monument buried soil (*below*). Elsewhere it can be inferred that substantial tracts of open downland existed but that shrubs and localised stands of woodland survived.

At Stonehenge itself earlier Mesolithic clearance may have left its mark; it is quite possible that regeneration of any secondary woodland, although some three millennia earlier than the monument, may have left a local variation in the vegetation composition in the general area of the Stonehenge Triangle. By the later Neolithic, however, it was probably an unremarkable part of the downland vegetation mosaic.

## Pre-monument soil

Previous excavations at Stonehenge failed to record a buried soil, or recorded only a thin layer that was 'poorly differentiated' and 'lacking clear horizons' (Evans 1984, 7). Augering was conducted in August 1994 using a 25mm diameter gouge auger with a 1m chamber to test for the presence of a buried soil and the implications of preservation of palaeo-environmental information under the unexcavated portions of the bank (Wessex Archaeology 1994a). One auger hole was positioned in the approximate centre of the remaining Bank in the western part of the monument, in an area not known to have been disturbed (*see Plan 1*). The augering certainly revealed a stone-free layer with the appearance of a buried soil, which here would be of Middle–Late Neolithic date. The buried soil was recorded 0.21m below the present land surface and sealed by the Bank, represented in the auger profile by 0.12m of chalk rubble (archive no 15). The buried soil was 0.10m thick and clear horizons were noticed (Fig 34). The auger profile is described below.

| | |
|---|---|
| 0–0.09m | Stone-free humic loam, calcareous downland turf. |
| 0.09–0.21m | Chalky rubble comprised of medium (and larger) chalk pieces within a calcareous silty loam matrix. Bank material. |
| 0.21–0.28m | Stone-free pale brown (10YR 6/3) fine calcareous silty loam. Relict buried old ground surface (Ah). |
| 0.28–0.31m | Brown (10YR 5/3) silty (clay) loam, with rare very small chalk pieces, sharp boundary. Buried old ground surface (A). |
| 0.31–0.36m | Chalk lumps. |
| at 0.36m | Chalk and compacted chalk rubble, probably weathered natural regolith. |

The Neolithic buried soil was rapidly sampled with four contiguous samples taken from the gouge auger. Shells were noticed in the calcareous soils but, as a result of the narrow diameter gouge auger employed, the samples removed were too small for mollusc analysis, though they were suitable for a rapid assessment of the pollen.

## Pollen from the buried Neolithic soil

*by Robert G Scaife*

Four samples of the pre-monument soil were taken from the buried land surface beneath the bank at 0.21–0.31m below the present land surface. Pollen extraction procedures followed those of Moore *et al* (1991) with 6ml volume samples analysed. The uppermost level of the buried soil (the stone-free, brown calcareous loam from 0.23–0.25m) contained most pollen (1700 grains per ml) and is reported here.

Although pollen was successfully extracted, it is clear that the results are severely skewed in favour of those taxa with robust exines. This is due to the differential preservation of those taxa (eg the Asteraceae group Lactucoideae) in an obviously marginal pollen-preserving environment. Furthermore, there are strong indications that there is contamination from modern/recent taxa (*Pinus*) which is attributed to the shallow depth of the buried pre-monument soil below the present land surface and the rapid augering procedure adopted. It is likely that earthworm working of the soil may have carried pollen down the profile and hence much of the remaining and poorly preserved pollen, although older, may also post-date the Neolithic soil. Although it seems likely that at least some of the pollen may be of Neolithic date, this cannot be stated with certainty.

**Table 7 Pollen and spores from the top of the buried Neolithic land surface**

| *Taxa* | *No* |
|---|---|
| ***Trees*** | |
| *Betula* | 1 |
| *Pinus* (degraded) | 1 |
| *Pinus* (?recent) | 22 |
| ***Herbs*** | |
| *Sinapsis* type | 1 |
| *Poterium sanguisorba* (?Recent) | 1 |
| *Plantago lanceolata* | 6 |
| *Bidens* type | 1 |
| Lactucoideae | 38 |
| Poaceae | 15 |
| Cyperaceae | 3 |
| ***Spores*** | |
| *Pteridium aquilinum* | 34 |
| Monolete (*Dryopteris* type) | 5 |
| Total identified | 89 |

A total of 104 pollen grains and 39 spores was recovered, comprising 11 identifiable taxa. These data are given in Table 7. High values of Lactucoideae (Liguliflorae) are characteristic of buried chalk soils where long-established grassland exists. This reflects growth of a number of typical grassland members of the Asteraceae (Compositae) including *Taraxacum* and their robust pollen grains (that is, the exine), which remain for greater periods in such poor pollen-preserving environments. Although it is tempting to interpret this skewed pollen assemblage as evidence of grassland during the Neolithic period, it must again be considered that it includes more recent intrusive pollen carried down to the old land surface by earthworms.

Relatively small numbers of Poaceae (Gramineae) grains similarly indicate a pastoral environment. This contrasts with the small representation of tree species which excluding *Pinus* show only a small number of *Quercus* grains. This in turn contrasts with the lower levels of Mesolithic postpit 9580 (*above*) which has indications of Boreal woodland. The pollen spectrum is, however, similar to those found in the upper tertiary fills of the postpit which have been attributed to the phase 3 of the monument. If the pollen spectra are Neolithic, palynological inferences tend towards an open grassland environment at least in the locality of the site.

## Conclusion

Dr Scaife reports that pollen was preserved in the buried land surface, but unfortunately shallow burial and sampling with the gouge auger in pollen-poor contexts had led to modern contamination. The pollen spectra included Poaceae (grasses) and *Poterium sanguisorba* (salad burnet), indicating open grassland. The presence of pollen is significant and the coincidence of preserved snails and pollen (*cf* Dimbleby and Evans 1974), as already seen from the Mesolithic postpits in the car park, has again been demonstrated. The pollen and soil data presented here indicate an open grassland prior to the construction of the Bank. Further environmental sampling of this soil would provide information of the immediate pre-monument and earlier environment not available from any other context.

Augering of the Bank to determine the presence and preservation of a buried land surface not recorded in previous excavations was successful. This is a most important finding. It is recommended that in formulating future research at the monument consideration should be given to obtaining both a mollusc and pollen sequence from the old land surface by means of keyhole excavation.

## Summary

The unprecedented occurrence of the postpits in the Stonehenge car park provides a unique glimpse both of Mesolithic activity and of the early Mesolithic environment in the immediate area around the monument site. The postpits were dug in the early Mesolithic (*8500–7650 cal BC*). An open mixed pine and hazel woodland was cleared locally prior to and perhaps for this activity. It is clear that the pits held large, upright pine posts, though whether singly or in a group and for what purpose is not clear (*Chapter 10*). Most unusually, and very significantly, we have been able to coordinate the environmental data from both pollen and molluscan evidence.

A major hiatus is indicated in the environmental sequence, again from both the snails and pollen evidence: nowhere in the sequence is the Atlantic (late Mesolithic) represented. Similarly, there is a complete absence of datable late Mesolithic activity in the area, though it must be borne firmly in mind that this may be a product of the nature of fieldwork in the area rather than a true reflection of past human activity.

The Early Neolithic has provided considerable, if scattered, evidence for occupation, funerary activity, and the construction of at least one causewayed enclosure. Available radiocarbon dates span the whole of the fourth millennium cal BC but the detailed sequence of activities is difficult to piece together. By combining the evidence from the upper fill of one of the Mesolithic pits and from various Early Neolithic sites we can see the presence of domestic animals and some cereal cultivation, the surrounding landscape consisting of a mosaic of open downland with some cultivated areas and open woodland. The environmental sequence in the tertiary fills of the Mesolithic postpit certainly indicates that by the time the stone monument was begun, the surrounding landscape was one of open, well established and probably grazed grassland.

# 5 The first monument, phase 1

*by Rosamund M J Cleal*

## Summary

### The period

This phase lies mainly within the Middle Neolithic, a period during which causewayed enclosures and the long burial mounds typical of the Early Neolithic were going out of use and before the large-scale construction of henge monuments. It is a period of transition, in which early Stonehenge shares a place with other monuments which do not fit neatly into the monument categories of either the Early or the Late Neolithic.

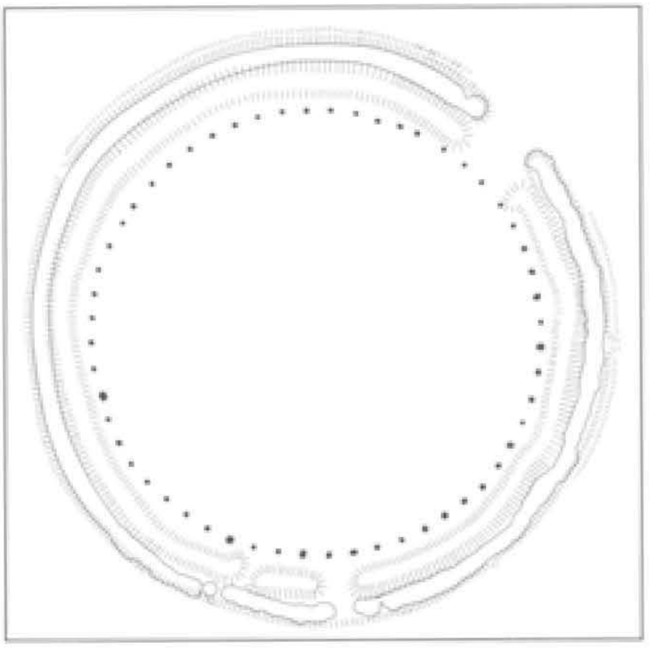
### Outside the monument

In the area immediately around Stonehenge the numerous round barrows so characteristic of the present-day landscape had yet to be constructed. To the north of the monument the great Stonehenge Cursus was probably constructed during this period. It runs for *c* 2.7km as a long narrow enclosure with chalky bank and shallow ditch across the undulating landscape. Small episodes of settlement were taking place in various localities, in particular on King Barrow Ridge and Wilsford Down. Much of the landscape we know to have been open at this time, with short, grazed turf interspersed with tracts of woodland.

### Inside the monument

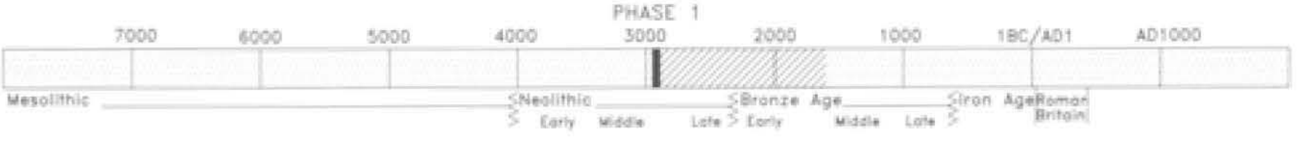
The main enclosure Ditch was dug as a series of segments with an internal Bank and a slight exterior 'Counterscarp' Bank. Deposits of animal bone were placed on the bottom of the Ditch in some areas, with a particular emphasis on the entrances. These deposits included cattle jawbones and at least one ox skull and may also have included other bones and objects.

**Dating**
*c* 2950 BC to 2900 BC



Some of the bones were already of considerable antiquity before they were placed in the Ditch. The ring of Aubrey Holes was dug inside the Bank and wooden posts were erected in them. An organic dark layer formed over the primary silting in the Ditch.

- Ditch and Bank with Counterscarp Bank
- Primary filling of Ditch
- Deposition of artefacts
- Aubrey Holes as a ring of posts
- Formation of organic 'dark' layer in Ditch



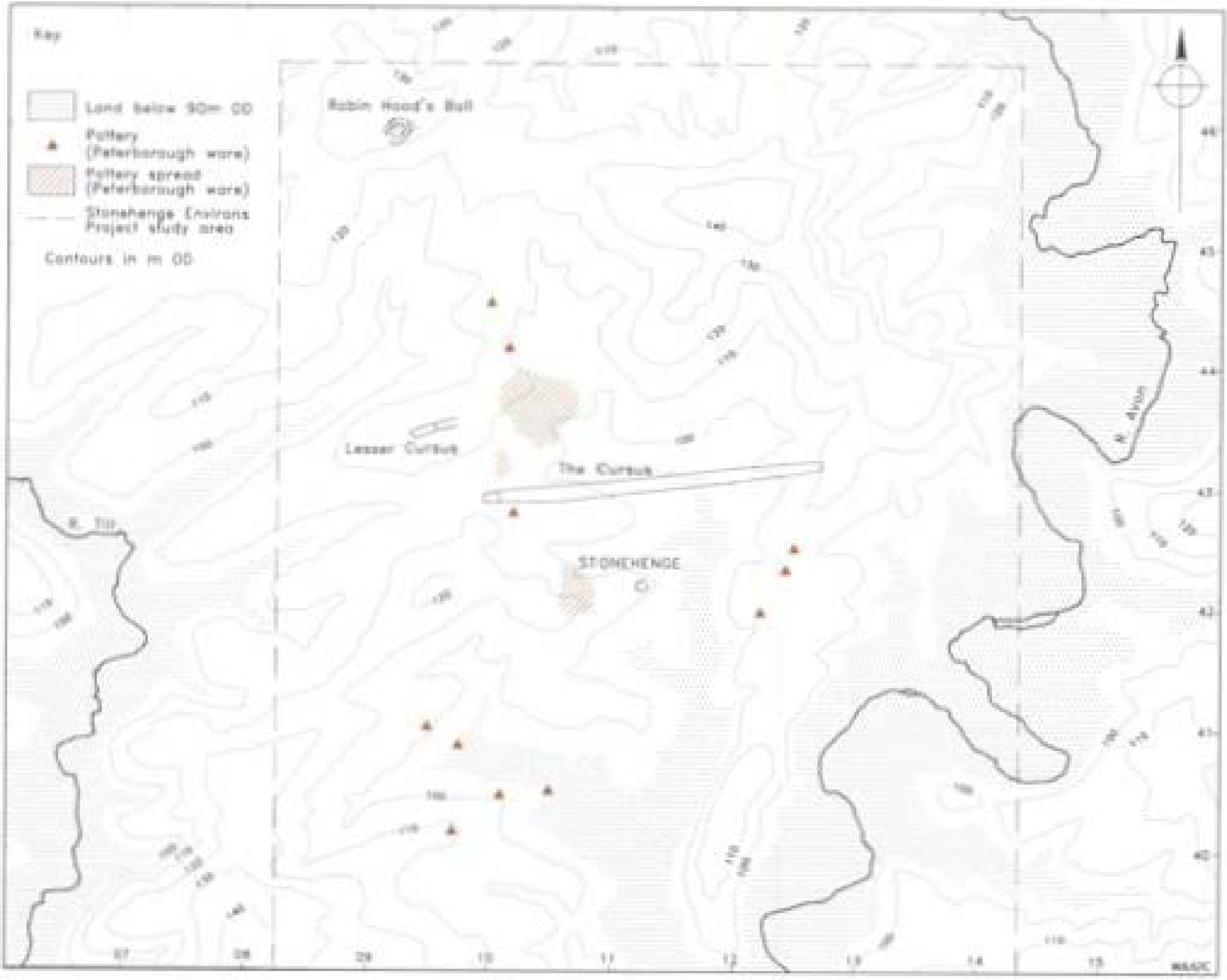



*Figure 35 Middle Neolithic sites in the Stonehenge area*

## Summary: landscape and monument

Phase 1 sees the construction of the earthwork enclosure of the main Ditch, Bank, and presumably Counterscarp Bank, the primary filling of the Ditch, and the construction and primary use of the ring of pits known as the Aubrey Holes.

The early monument was not constructed in an empty landscape. There is evidence for at least a millennium of activity during the Neolithic, activity which included the construction of the causewayed enclosure at Robin Hood's Ball, 3km to the north and of at least ten long barrows in the immediate area. Activity was not confined to the construction of monuments, however, as there is evidence of animal husbandry and limited agriculture within a diverse mosaic of habitats in the local area (Fig 35).

Construction of the Ditch can be seen to have been the first major event of phase 1, radiocarbon dates indicating that it was dug over a limited period of time. The Ditch was dug in segments, a practice reminiscent of causewayed enclosures, although in this case the segments are less clearly separated. Structured deposits, certainly of animal bone but probably also involving artefacts of various other categories, were placed on the bottom of the Ditch in several places, with an emphasis on the entrances. Some of the items involved were curated, ie they had been kept for some time before being deposited. For instance, radiocarbon dates indicate the inclusion of ox skulls which could have been 300 years old by the time they were placed in the Ditch.

The Aubrey Holes, which form a circuit within and concentric to the Bank and Ditch, probably belong to this phase. Their original purpose is not clear but there is some evidence that they held timber posts.

## Environment: landscape and landuse

*by Michael J Allen*

Much of the environmental evidence contemporary with the first monument indicates open grazed grassland. At Stonehenge itself, Evans's detailed mollusc analysis indicates that the primary fills accumulated in an established open grazed downland (zone A). A molluscan sequence from the Stonehenge Cursus also indicates established open grassland (Allen unpublished data), as do the buried soils sealed under the Bronze Age barrows on King Barrow Ridge (Allen and Wyles 1994) and beneath the henge monuments of Durrington Walls (Evans 1971) and Woodhenge (Evans and Jones 1979). All these data, however, are biased towards centres of known archaeological activity, where one would expect a more open environment, and it is not surprising that open downland is evident; what is more noteworthy is that there is evidence of woodland prior to monument construction in only one instance (at Woodhenge).

This picture is therefore biased toward clearfelled and grazed areas by the nature of the acquisition of environmental data from defined archaeological sites. Nevertheless, as indicated for the earlier Neolithic (*Chapter 4*), the Stonehenge landscape comprised a rich and diverse mosaic of habitats. The scant charcoal record includes oak, hazel, *Prunus*, Pomoideae, and maple (Gale 1990), indicating wood obtained from an open woodland. This is possibly confirmed by the presence of hazelnuts at Wilsford Down, King Barrow Ridge, and Coneybury (Carruthers 1990), since hazel requires light, as opposed to dense, woodland conditions in order to flower and fruit. Even the animal remains are sparse, but are largely restricted to pig, deer, and cattle including aurochs, all animals that browse in open woodland.

The environmental evidence may be biased towards open grazed grassland, and it cannot be denied that large tracts of the Stonehenge landscape were clearfelled, though by no means all of it. However, much of the chalkland and river valleys would still have been considered as 'wildscape'.

## Component parts of the monument

### The Ditch

It is accepted here that the construction of the Ditch marks the beginning of use of the monument site in a way which differed markedly from what had gone before. There is no indication that the site was marked out as special, or selected for particular use in any way prior to the excavation of the Ditch. In only one cutting (C44; *see below*) was there even a hint that there may have been pre-Bank features and the evidence here is slender and may be accounted for by other explanations. It should, however, be noted that there have been only three excavations of the Bank and the area investigated is therefore small in comparison with the Ditch. It is possible that future excavation could prove the assumption that there was little or no pre-Bank activity to be incorrect.

Almost half the Ditch circuit was excavated by Lt-Col Hawley in his campaign of excavations between 1919 and 1926 and two further trenches were cut in 1954 by Atkinson *et al.* One of these was later reopened by J G Evans in 1978 (Evans 1984), and this has provided the only environmental data from the feature. The large-scale excavation of the Ditch has enabled a treatment of it which would be impossible if only short lengths had been excavated. Although the level of recording is poor by modern standards, the extent of the information available enables a general picture to be drawn of a very large proportion of the Ditch, even if the detail is often hazy.

To consider the excavated length of Ditch as a single phenomenon would clearly have been possible only if a very general approach had been adopted; there is too much information to be easily assimilated. Treatment by excavation trench would have been reasonable but would have ignored the advantage of having such a long stretch of excavated ditch to study. It is rare to have a chance to view a prehistoric monument on such a scale and as much as possible should be made of the opportunity, however flawed the site recording. Because of this the approach adopted here has been to attempt to view and discuss the Ditch in units which may have had some reality at the time the Ditch was constructed. This is clearly an ambitious and possibly presumptive approach, the success of which is perhaps difficult to measure, but it has the merit of using divisions which are only potentially artificial instead of certainly so.

When the plan of the excavated Ditch is viewed as a whole its irregularity is immediately apparent, and this view is strengthened if the ditch profiles are also considered. Lt-Col Hawley noted the irregularity of the Ditch in plan and section and he also drew a distinction between what he termed normal 'ditch' and 'craters'. The latter were rounded segments demarcated by changes in depth of the Ditch floor, usually including a ridge of chalk between each crater and the next, or between the crater and the ditch. These ridges did not usually reach the level of the stripped chalk surface but could reach a height of several feet (eg the ridge between Segments 16 and 17 is 3ft/0.9m high). Some lengths of Ditch, particularly those around the southern part of the circuit, have a markedly more segmented appearance than others and some at least of the terminals are clearly bounded in this way. It was initially considered that a division following Hawley's into bounded segments and unbounded lengths of Ditch would be a workable method of separating lengths for discussion, reflecting real differences in the way the feature was dug. Once this was attempted, however, it became clear that the lengths of Ditch not designated as craters by Hawley were also irregular and showed signs of having been dug as discrete lengths rather than in a single operation.

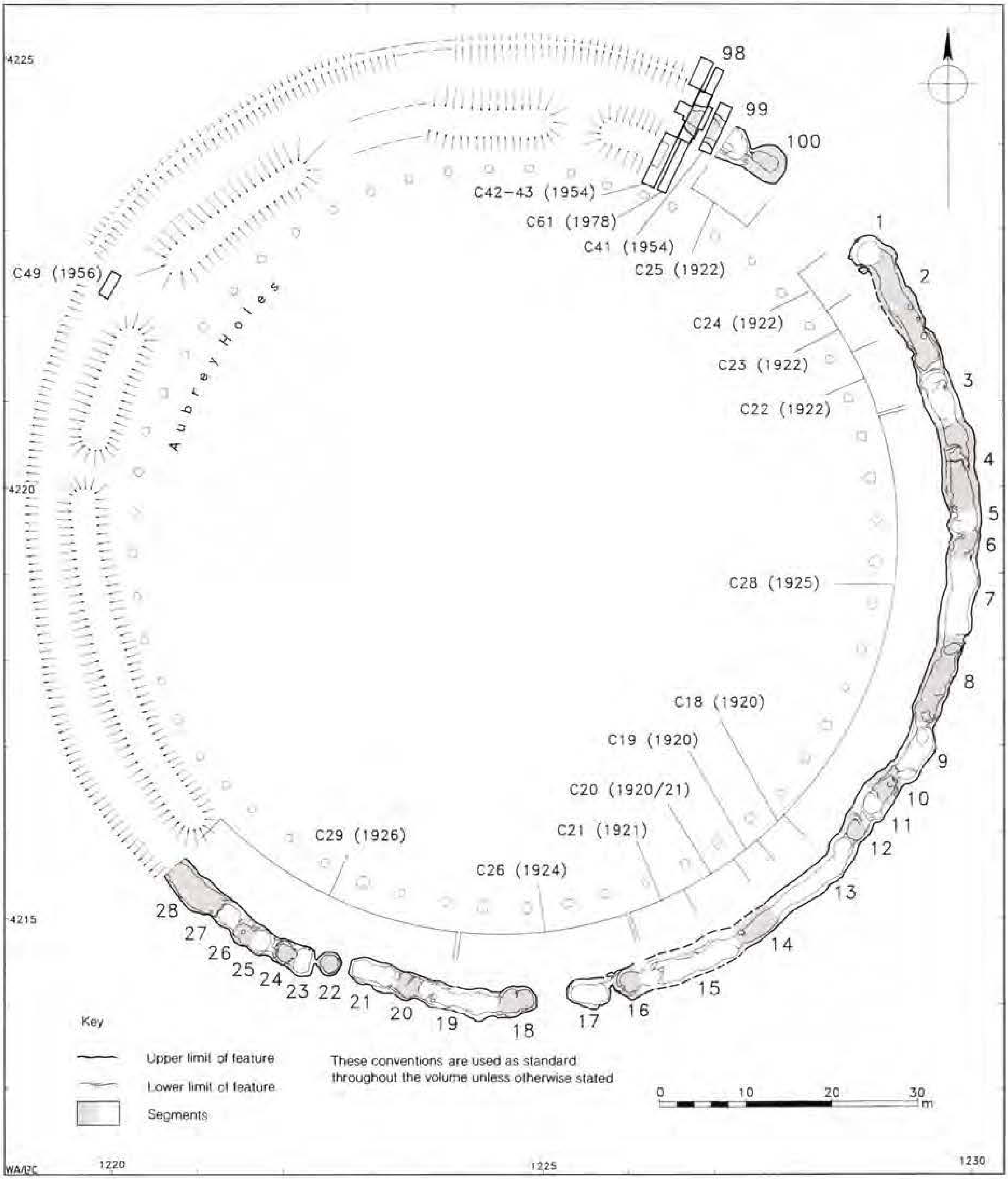



*Fig 36 The Ditch: correlation of segments and cuttings*

The Ditch is therefore considered in short lengths throughout, with the term 'segment' used both for the very clearly demarcated sections – Hawley's craters – and those less clearly demarcated (Fig 36). Descriptions of the segments, and the criteria used for distinguishing each one, are given in the extended captions to Figures 37–47. The Ditch is described from the most northern trench, C42, excavated in 1954, clockwise to the last length excavated by Hawley in 1926, C29, in the south-western part of the circuit. The segments are numbered consecutively from the eastern terminal of the north-eastern entrance clockwise to C29 but in reverse from

100 from the western terminal of the north-eastern entrance. This was to avoid beginning the numbering at an arbitrary point, (ie cutting C42). The only exception to this is C49, the small trench on the western side of the circuit (*see Plan 1*). This is not assigned a segment number because unlike C42 and C41, for which it is possible to reach at least an approximation to the segments in which they lie, it is not possible here, nor would it be possible if other isolated trenches were excavated through the Ditch in the future. The identification of segments is possible only because of the large scale on which Hawley worked, a scale unlikely ever again to be considered for the monument, and it therefore seems unlikely that it will ever be necessary to extend the numbering sequence. All cuttings and segments are shown in Figure 36.

**Lt-Col Hawley's excavation of the Ditch**

Between 1920 and 1924 Hawley excavated and recorded the Ditch using a grid method based loosely on that previously used by Gowland for the interior (*see Chapter 2*). The Ditch was excavated in cuttings which were usually 26ft (7.9m) long to enable division into 1ft (0.3m) strips running from side to side of the Ditch and lettered alphabetically. These were sub-divided into numbered 1ft lengths, resulting in a grid of 1ft covering the cutting. Later Hawley worked in (usually) 5ft (1.52m) lengths as he moved along the Ditch, and he refers to these lengths in his Diaries and publications as 'Sections'. Where these are referred to in this report they are indicated on the appropriate segment plan (Figs 37–47) and numbered as sub-divisions of the cutting (eg C18.1, C18.2). Details of Hawley's Ditch excavations are in Appendix 4.

The finds were recorded and observations made using a combination of the alpha-numeric coordinates and the depth, usually expressed as BGL (Below Ground Level). This would have enabled three-dimensional location of finds if the sections had been drawn showing the ground level and layers, and if the layers in which the finds lay had been recorded; because this was not done it is impossible to reconstruct the filling of the Ditch or to place finds within layers with absolute confidence. The lack of sections is particularly unfortunate because if they had been drawn as each 1ft strip was excavated the recording of the Ditch would have been exceptionally detailed. The relatively high quality of the few sections which were drawn (probably all by Robert Newall, *see Chapter 2*) is a tantalising glimpse of what might have been. It is possible in some cuttings to reconstruct the profile of the Ditch in each 1ft strip using the depths as given for each 1ft square, and some indication of the depth and nature of the primary and secondary fillings can usually be gained from a combination of the published reports, Hawley's Diary, and photographs. These sources have been used to assign finds to phase and to describe and phase the Ditch fillings. It should be noted, however, that there remains in the archive more detail concerning the location of finds than it is possible to give here even in the segment descriptions (in particular the plans of the grid at different depths which have not been reproduced here). The results presented here are necessarily an interpretation which in some lengths of Ditch is based on firmer evidence than in others. Specific problems relating to particular segments are addressed in the relevant segment description in the extended captions.

It should also be noted that in most lengths of the Ditch excavation does not appear to have covered its entire width. In most cases the inner edge lay outside the grid and remained unexcavated. In some cases small triangular extensions were made in order to complete the profile of the Ditch, but this was not always done, and in the Ministry of Works (MoW) series of ditch profiles an unexcavated portion of ditch is often shown. Presumably these narrow unexcavated parts of the filling were never taken out and remain in place.

**The Ditch: general description**

As described above (*Chapter 3*) the Ditch is a feature 110m in diameter on its approximate centre line and of irregular form both in plan and depth. Lt-Col Hawley gives many measurements of the Ditch in his excavation reports, mostly referred to as BGL (Below Ground Level). There are in addition numerous profiles of the Ditch drawn by the MoW after excavation. Some of these are illustrated in Figures 37–47 of the segments but there are many others in the archive. These, with the MoW plan, give the most detailed picture of the physical characteristics of the Ditch as it must have been when originally dug, although there may have been an earlier stage in which there were ridges of chalk dividing it into clearly separate segments.

Lt-Col Hawley descibes the Ditch as being on average *c* 5ft 6in (1.68m) deep BGL, and as the 'top layer' of humus and rubble was generally between 15in and 20in (0.38–0.51m) deep this gives an average depth to the cut feature of *c* 1.2–1.3m, a depth corroborated by the drawn profiles. The maximum depth of Ditch was encountered in the western terminal at the north-eastern entrance where the Ditch floor was 7ft 6in (2.29m) BGL, and the shallowest long length of ditch (ie as distinct from discrete 'ridges' which occasionally occurred) was the most south-westerly length (C29) which abuts the unexcavated part of the circuit, where the Ditch floor averaged *c* 1.2m. The width of the Ditch varied considerably, the maximum cited by Hawley being *c* 14ft (4.27m) in the shallow, south-western part of the circuit (C29, Segment 28). Excavation of the Ditch did not always include full excavation of both upper edges of the cut and it is not clear from some lengths of the MoW plan whether the upper edge was ever excavated.

The segmental nature of the Ditch was recognised by Hawley who discussed the likely methods by which it could have been dug. In the report on the excavations around the southern part of the circuit Hawley noted that:

> The portion of the ditch excavated [ie C29, in 1926] was unlike any that had previously been encountered. The frequently occurring bays with lateral projections were more emphasised on the south than in any other area, the change appearing to begin at 40ft (12.2m) on the east side of the new causeway and to be continued on the west in a more or less marked manner up to where the excavation of this season ended.
> (Hawley 1928, 165)

(ie probably from Segment 16 to the western end of Segment 28; 40ft east of the south entrance causeway is actually within C21 (Segment 15), but from Hawley's description of that cutting it does not seem likely that he intended to include that length of Ditch in the highly segmented part and it is more likely that he meant to indicate Segment 16 and the Ditch west of that segment).

> The bays or recesses had always been difficult to account for. At first I was inclined to believe that they had been dwelling-places intercommunicating but with some artificial partition between them; this idea, however, no longer seems tenable, for had they been occupied there would have been a great deal of black refuse, animal bones, pottery and marks of fires. Throughout the excavations hardly any instances of fires actually on the bottom occurred, and the only two of any consequence were those in the craters at the main entrance. From what was observed in the excavation last finished [ie C29], I am inclined to think that the bays were the result of the method of digging, which would also account for the roughly straight lines before alluded to [ie an observation that the Ditch does not form a smooth curve, but runs in a series of straight lines] ... At first digging would not be difficult, as the chalk near the surface is loosely laminated and could be easily removed with horn picks. Lower down the stratification gradually disappears and the chalk becomes very solid, although advantage can still be taken of some irregular lines of stratification ... The diggers probably concentrated on certain spots, making round holes, which, gradually increasing in size, became the craters or bays referred to above. Between the holes there would be a certain amount of disturbed soil, forming barriers which it would be easier to dispose of than to excavate the whole area at once. It was not deemed necessary to remove these barriers entirely, so small portions were left adhering to the sides and on the bottom, forming the side projections and low wavering lines on the floor so often noticed. For some unknown reason three of the barriers were left, one of them, as before mentioned, being intact.
> Hawley 1928, 165–6)

(These are probably the ridges between Segments 16 and 17, 21 and 22, and 22 and 23). Two of these have partial cuts through them but one (21/22) was left completely intact (although is is suggested here that this is not a ridge but a blocked entrance, *see below*). That Hawley was aware of the Neolithic parallels for this type of ditch construction is illustrated by his citing Alexander Keiller's work at the causewayed enclosure of Windmill Hill which was excavated from 1925: 'standing barriers seem to be peculiar to ditches of Neolithic circles, as found by Mr. Keiller in his excavations at Windmill Hill, and frequently noticed by Mr Crawford in the Neolithic forts of Germany' (*ibid*).

The fact that some lengths of Ditch were markedly more segmental than others, or at least retained more evidence of the original segmented form, could be taken as an indication that the later history of the Ditch varied around the circuit. This is discussed further below (*Chapter 6*).

The filling of the Ditch, although varying around the ditch circuit, has some recurrent features (*see Figs 37–47* for segment by segment descriptions of phase 1 fills, and Chapter 6 for phase 2 fills). Major features and presence/absence of finds categories are shown in Tables 8–9 for phase 1 and Tables 12–13 for phase 2.

The earliest deposit on the Ditch floor was a layer occasionally mentioned by Hawley which he interpreted as foot-trampled mud on the open ditch floor, below the chalk rubble primary fill (*eg* in Segment 3). According to his description of Segment 3 this deposit was often associated with the 'layer' of struck flint which he found in many segments (Table 8: Ditch phase 1). Deposits of chalky mud are not uncommon on the bases of chalk-cut ditches, and appear to be the product of the first winter's weathering (*Chapter 1*). The association of struck flint with this deposit suggests that the flint could represent opportunistic knapping of flint encountered during the digging of the Ditch. Harding (*Chapter 9*) suggests from his analysis of the little surviving flint assignable to the Ditch that some nodules are likely to have been encountered during its construction and that some of the cores from phase 1 contexts in the Ditch had been made from 'fresh' flint. This is also indicated by the presence of flint nodules in the Counterscarp Bank (Hawley 1923, 14).

A primary filling of chalk rubble is identifiable in most segments although it varies in depth around the Ditch circuit. In one or two instances it is is arguable that there has been some recutting of the Ditch fill as there is much less primary filling than is usual. This may, for instance,

**Table 8 Phase 1: characteristics of Ditch deposits (other than normal primary fill of clean chalk rubble)**

| *Segment* | *Silt beneath primary chalk rubble* | *Organic horizon above primary chalk rubble* | *Wood ash, charred wood and/or burning in organic layer* | *'In situ' burning on bottom* | *'In situ' burning directly on chalk rubble* | *'Second floor' (compact surface to top of primary chalk rubble)* | *Deliberate backfill in primary chalk rubble* | *Features cutting solid chalk of bottom* | *Clay or clayey 'compo'* |
|---|---|---|---|---|---|---|---|---|---|
| 98 | – | X | – | – | – | – | ? | – | – |
| 99 | X | X | – | – | – | – | ? | – | – |
| 100** | X | X | X | X | – | – | – | – | – |
| 1** | – | X | X | – | – | – | ? | – | – |
| 2 | X | – | – | – | – | – | – | X | – |
| 3 | ? | ? | X | – | – | X | – | X | – |
| 4 | – | X | X | – | – | X | – | X | X |
| 5 | – | – | – | – | – | – | – | – | – |
| 6 | – | – | – | – | – | – | – | – | – |
| 7 | – | – | – | – | – | – | – | – | – |
| 8 | ? | – | – | – | – | – | – | – | X |
| 9 | – | – | – | – | – | – | – | – | – |
| 10 & 11 | ? | ? | – | – | – | – | – | – | X |
| 12 | – | – | – | – | – | – | – | – | – |
| 13 | ? | ? | – | – | – | – | – | ? | ? |
| 14 | X | X | – | – | – | – | – | – | – |
| 15 | X | – | – | – | – | – | – | – | – |
| 16 | – | – | – | – | – | – | – | – | – |
| 17* | – | – | – | – | – | – | – | – | – |
| 18* | – | – | – | – | – | – | – | – | – |
| 19 | – | – | – | – | X | X | – | – | – |
| 20 | – | – | – | – | X | X | – | – | – |
| 21(*) | X | – | – | – | X | – | – | – | – |
| 22# | – | – | – | – | – | – | – | – | – |
| 23(*) | – | – | – | – | – | – | – | – | – |
| 24 | – | X | – | – | – | – | – | – | – |
| 25 | – | – | – | – | – | – | – | – | – |
| 26 | – | – | – | – | – | – | – | – | – |
| 27 | – | – | – | – | – | – | – | – | – |
| 28 | – | – | – | – | – | – | – | – | – |

*Key:*
** = Terminal of southern entrance*
*(*) = Terminal of putative south-western entrance*
*** = Terminal of north-eastern entrance*
*# = Blocking of putative south-western entrance*
*X = Certainly present; – = No mention in Diary or publication; ? = Doubtful presence (Diary and publication contradictory or obscure)*

be true of at least part of Segment 13 (Fig 42) but it is possible that the differing Ditch profile and orientation of the Ditch sides around the circuit could account for all the variation.

The positive identification of material other than flint as having been on the Ditch bottom is difficult in all but a few places but all the material treated here as phase 1 can be assigned with some confidence at least to the primary chalk rubble if not to the floor of the Ditch. It therefore belongs to an early stage in the Ditch's history.

The most numerous category of finds in the lower Ditch other than the flint (which was generally not retained) is antler. A large proportion of the antler was retained by Hawley and much of this has been examined by Serjeantson (*Chapter 9*). It is difficult now to distinguish what may have been deliberate deposition from casual discard and it is likely that both are represented. As Serjeantson points out, there is at least one 'heap' or 'stack' of antlers at the bottom of Segment 100, the western terminal of the Ditch at the north-eastern en-

**Table 9 Phase 1: finds from the Ditch**

| *Segment* | *Struck flint (occasional)* | *Struck flint (layer on bottom)* | *Chalk balls* | *Other chalk objects* | *Animal bone (domestic)* | *Animal bone (wild)* | *Antlers* | *Worked bone* |
|---|---|---|---|---|---|---|---|---|
| 98 | – | – | – | – | – | – | X | – |
| 99 | – | – | X | – | – | X | X | – |
| 100** | X | ? | – | – | – | – | X | – |
| 1** | – | X | – | – | X (or wild) | ? | – | ? (bone point) |
| 2 | X | – | – | X | X (pig) | – | X | – |
| 3 | – | X (part of segment only) | – | – | X (inc ox jaw) | – | X | – |
| 4 | – | X | – | – | X (inc ox jaw) | – | X | – |
| 5 | – | – | – | – | – | – | – | – |
| 6 | – | – | – | – | – | – | – | – |
| 7 | – | X | – | – | X (ox and pig) | – | – | – |
| 8 | – | X (part of segment only) | – | – | – | – | X | – |
| 9 | – | X (part of segment only) | – | – | – | – | ? | – |
| 10 & 11 | – | O | – | – | – | – | X | – |
| 12 | – | – | – | – | – | – | – | – |
| 13 | – | X | – | – | – | – | – | – |
| 14 | – | X | – | – | X (pig) | – | X | – |
| 15 | – | X | – | – | X(pig) | – | – | – |
| 16 | – | X | – | – | – | – | – | – |
| 17* | – | X | – | – | X (ox inc jaw, pig) | – | – | – |
| 18* | – | X | – | – | X (ox jaw) | – | X | – |
| 19 | X | – | – | – | – | – | X | – |
| 20 | X | – | – | – | – | – | X | – |
| 21(*) | – | X | – | – | – | – | X | – |
| 22# | X | – | – | – | – | – | X | – |
| 23(*) | X | X | – | – | X (ox skull) | – | X | – |
| 24 | – | – | – | – | – | – | – | – |
| 25 | X | – | – | – | – | – | X | – |
| 26 | – | – | – | – | – | – | – | – |
| 27 | X | – | – | – | – | – | X | – |
| 28 | X | – | – | – | – | – | – | – |

*Key:*
*X = certainly present*
*– = no mention in Diary or publication*
*O = certainly absent (absence mentioned in Diary or publication)*
*? = doubtful presence (Diary and publication contradictory or obscure)*

** = Terminal of southern entrance*
*(*) = Terminal of putative south-western entrance*
*** = Terminal of north-eastern entrance*
*# = Blocking of putative south-western entrance*

trance. This is one of only two patches of burning noted by Hawley as being actually on the Ditch bottom, the other being the terminal on the other side of the same entrance. Hawley noted also that some of these antlers were 'scorched by fire' (21/10/1922) and it is tempting to see this as *in situ* burning at the point of deposition rather than as the discard of pre-heated antlers coincidentally close to a fire.

Identifying the nature and frequency of finds of animal bone in phase 1 (and in later phases) is hampered by the considerable degree of selection exercised by Hawley. In contrast to the antlers, most of the animal bone was discarded. This has meant that Serjeantson is able to comment only very superficially on the general nature of the selected assemblage and that most of the details can be derived only from Hawley's own words. The reliability of Hawley's identifications is also uncertain, not least because it is not clear who made them. Certainly those in the Diary are likely to be his own, because they were made on a daily basis and there was no faunal specialist on site. These must be regarded as unreliable, given that Hawley was not a specialist.

Even with these provisos there are at least three instances of deposition of animal bone which it seems possible to identify as deliberate and structured. Two ox mandibles were found, one in each of the two terminals at the southern entrance in Segments 17 and 18, and in Segment 23, which may be the western terminal of a blocked entrance, a further ox skull appears to have been deposited on the Ditch floor. The symmetry of the deposition of the mandibles, the rarity of deposition of complete skulls, and the association of at least the mandibles with entrances, seems enough to warrant an interpretation of these deposits as structured.

It is difficult to extend this interpretation with confidence to other deposits of animal bone because of the nature of the record, but it is possible that there were further examples, perhaps in Segment 2, where Hawley notes a pig jaw, horse tooth, antler, and chalk balls (*see caption to Fig 39*). Hawley's bone identifications may not be correct but the occurrence of chalk balls in the same segment may indicate some non-functional activity. Against the suggestion of structured deposition on a large scale, at least of the animal bone, is Serjeantson's observation that apart from the skull and jaws most of the bones show traces of having been chopped and broken and in some cases gnawed. Although this does not exclude deliberate and/or structured deposition it indicates, at least in the gnawed examples, that some time had elapsed between use and deposition and that the final location of many bones could have been the result of animal rather than human agency.

Few other categories of finds were certainly recovered from the bottom of the Ditch or the primary chalk rubble but these appear to have included at least five chalk objects (*Montague, Chapter 9*). These comprise a chalk ball from 'ditch soil' on or near the bottom in Segment 99 (WA obj no 503), from which also came an antler pick, and three from Segment 2 (Hawley cat nos 4636a, 4676, 4677), from which a piece of worked perforated chalk was also recovered (WA obj no 505). The chalk objects in Segment 2 were found in three locations, two at the northern end of the segment in C23 and one in C22, towards the central part of the segment.

The northernmost find was Hawley cat no 4677, from the same depth BGL as an antler and at a distance of about 2ft (0.61m) from it. Seven feet from the ball was another (Hawley cat no 4676), also close to an antler (in the next 1ft (0.30m) square) and at the same depth. Approximately 3ft (0.91m) away was 'a small proportion of jaw of a large pig' (16/8/1922) and close to it a horse's tooth (both the identifications are Hawley's). The other find in this segment, excavated in C22, was of a chalk ball and perforated chalk object, both found within the circular features shown in the ditch floor in this segment (Fig 39).

The identification of these finds as special must rest on the nature of the chalk balls and perforated objects and for these a non-functional explanation appears most likely, although in the case of the associated chalk ball and perforated chalk object their presence in the unusual feature in the Ditch floor also suggests that these were deliberate deposits.

The only other category of find possibly represented in the primary Ditch fill is human bone and the context of this is not certain. One cremation is known to have come from the base of the Ditch, in Segment 13, and it is shown in one of the rare sections as having been overlain by chalk rubble. This is such an unusual context, however, that it must be considered probable that it was within a cut made from a higher level in the Ditch, the cut being refilled with chalk rubble. However, it must still be regarded as an early feature because of its depth in the Ditch and the fact that it is covered by chalk rubble and not by a mixture of primary and secondary fill. The fact that no cut is visible in the section neither refutes nor supports this interpretation because it is unlikely that such a cut would have been noticed. It is clear that Hawley encountered some difficulty in recognising cuts for cremations, since he occasionally changed his interpretation of the context of cremations, as for instance in Segment 4 (*Chapter 6*).

There was a dark soil layer above the chalk rubble primary fill in many parts of the Ditch. This is also taken to belong to phase 1 and to be connected with activity representing the early use of the site. Some of this soil may derive from the weathering of the turf and topsoil along the edges of the feature and some soil formation may have taken place (*see Chapter 1*). Layers of stabilisation are a feature of secondary and later ditch fills and in chalk-cut ditches may show as darker layers containing more soil than layers above or below. In this case the dark layer seems to show little soil development. It has only once been subject to evaluation by modern excavation and analytical techniques, when it was shown not to be a fully developed soil. It is described by Evans as a 'dark chalky loam .... without horizonation. Probably a weak soil combined with material derived from the original pre-bank profile' (1984, 10). If the observations by Hawley are also taken into consideration an anthropogenic element in its formation must be considered likely. He noted in several places that animal bones with wood ash and other evidence of burning occurred in it (Table 9).

*Fig 37 The Ditch, Phase 1, Segment 98*

Although the 1954 trenches excavated by Atkinson *et al* were separate from Hawley's C25 and from each other, it seems fairly clear that the easternmost part of C41 was part of Segment 99 and a segment break within C41 indicates that a large part of C41, and the whole of C42, must be within Segment 98. The segment is defined at its eastern end in C41 by a ridge of undisturbed chalk extending from the outer side. This survives as only a remnant ridge across the centre of the Ditch dividing this segment from Segment 99. There are three section drawings: both sides of trench C41 (sections KL and QR) and the western side of C41 (section EF).

This cutting was reopened in 1978 by Atkinson and Evans (C61), so that it provides the only recent examination of the Ditch. In addition it provides the only environmental data from the Ditch. It has been fully published (Evans 1984) and the results are not discussed in detail here.

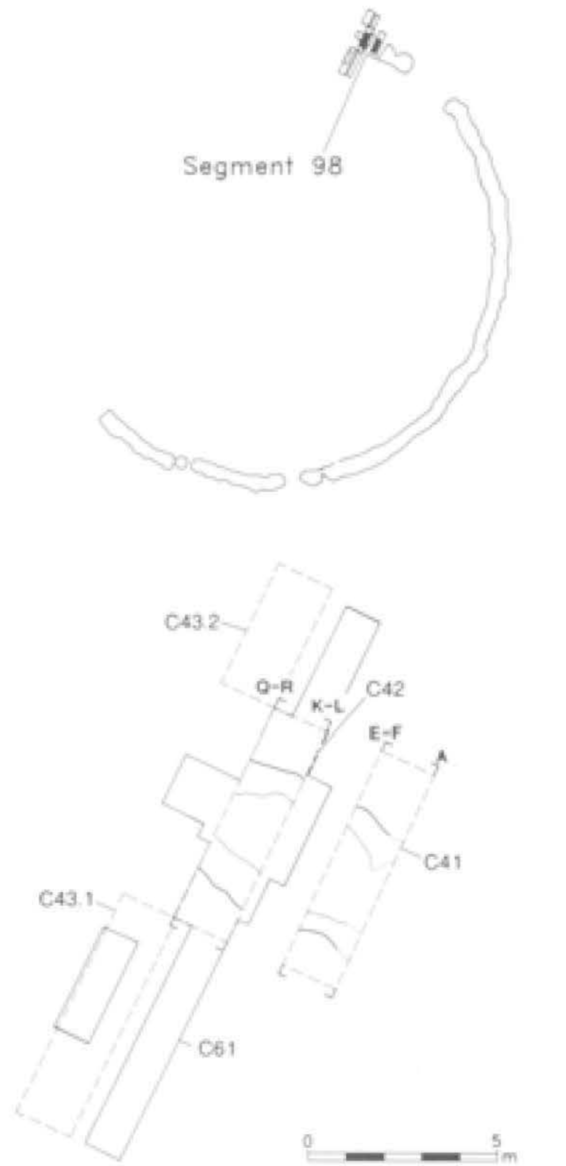
Apart from some areas of 'compo' (context 3054) (*see Chapter 1*) and 'fluffy chalk' (*sic*) (3052) the lower fill of the Ditch in C42 appears to be a normal primary filling of chalk rubble of varying coarseness, similar to most of the Ditch as described by Hawley. This is also true for that part of the segment lying within C41 (shown in section EF). In the latter small lenses of soil probably represent individual turves which fell into the Ditch from the eroding edge.

In the report on the 1978 excavations (C61) a rationalised version of the field section (Archive drwg no 716) is shown (section Q–R). (Wessex Archaeology numbers were assigned on the basis of the 27 layers identified in the field and do not correspond exactly with the published layers 1–10.) The primary fill is denoted as layers 9 (4019) and 10 (4022–6), the former comprising clean chalk rubble with layers of fine grey loam and the latter coarse clean chalk rubble. Evans noted that some of the coarse rubble in the centre of the Ditch (layer 10) may have been thrown back in deliberately but apart from this the filling is a standard Ditch filling (1984, 10). Very few mollusc shells were found in the primary fill and only a few from layer 9, the upper primary fill on the western section, from which the mollusc column was taken. This is termed Zone A by Evans, in which the surfaces in the Ditch were dry and unvegetated and generally hostile to molluscs (1984, 13).

The humic layer noted by Hawley above the primary filling was also observed both in the 1954 cutting (3049) and in the 1978 reopening of it (4011–13). In the 1978 section as in section Q–R in 1954, the layer was disturbed by a Beaker period grave (WA 4028). The layer is termed layer 8 in the 1984 report and described as a 'dark chalky loam ... Laterally variable, with darker and paler areas, and without horizonation. Probably a weak soil combined with material derived from the original pre-bank profile' (Evans 1984, 10). In the molluscan analysis this is denoted as Zone B, also, like the primary fill, containing few shells. The molluscan fauna is local and probably represents the colonisation of the Ditch by snails as the natural filling slowed down, vegetation began to be established, and conditions became less dry (*ibid*).

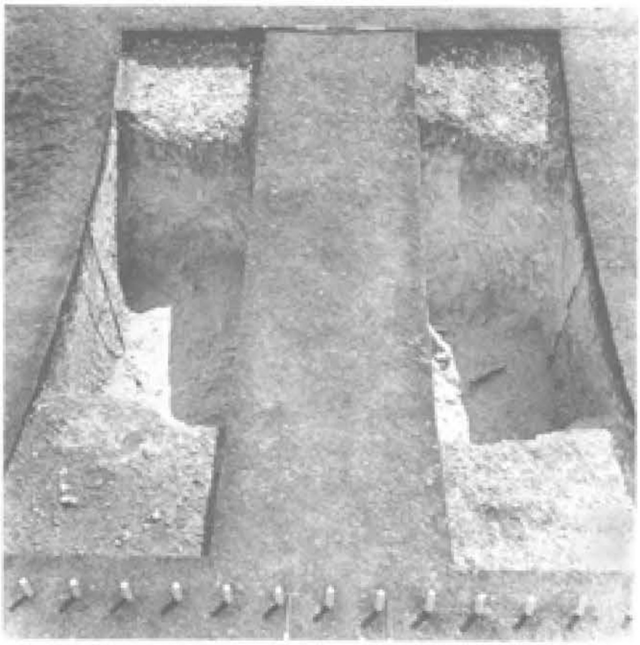
Radiocarbon dates were obtained from antlers found on the Ditch bottom in this segment, two from C42 (BM-1583, 4410±60 BP and BM-1617, 4390±60 BP, calibrated to, respectively, 3340–2910 and 3330–2910 cal BC). A further date, also on antler and from the Ditch bottom, was also obtained from this segment in C41, but has now been rejected as unreliable on technical grounds (I-2328, *see Appendix 2*).

Eighteen animal bones from C42 have been identified by Serjeantson (*Chapter 9*), of which only one, an adult pig metacarpal, was identifiable. A single sheep/pig-size splinter was also recovered from the Bank in the 1954 cutting adjoining the Ditch here (C43) and is also from a primary context. In the part of the segment lying within C41 a group of struck flint represents *in situ* knapping (*Harding, Chapter 9*).




Key to Layers in Section Q–R

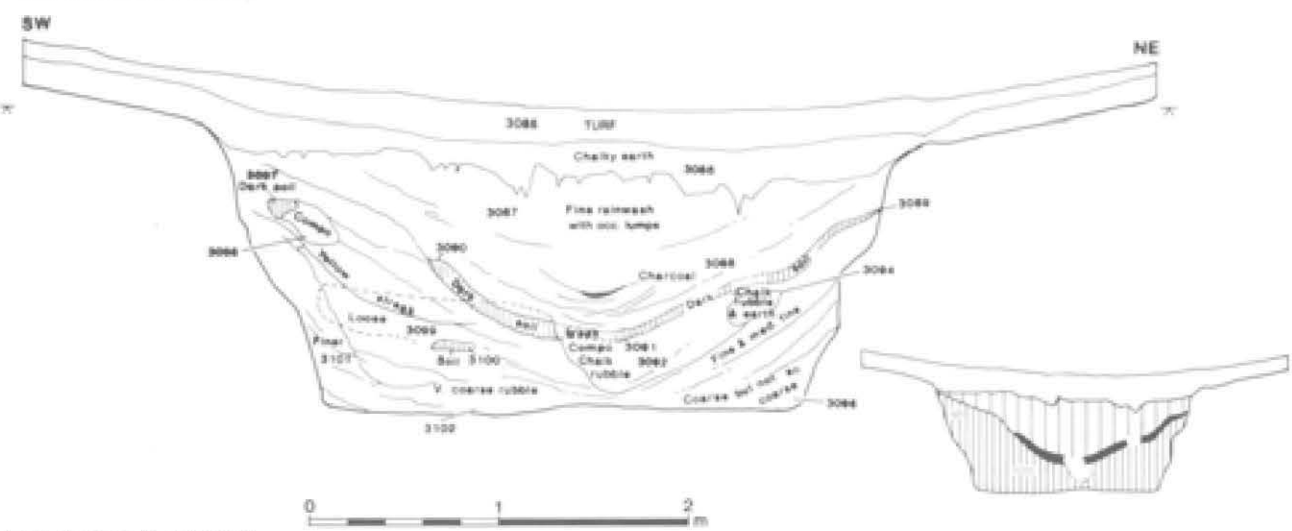
1 = modern turf
2 = flint horizon
3 = pea-grit horizon
4 = silt-loam, aeolian
5 = fill of burial pit
6 = fine chalky loam — secondary fill
7 = coarse chalk loam — secondary fill
8 = organic chalky loam
9 = coarse chalk rubble with layers of grey loam — primary fill
10 = coarse chalk rubble — primary fill



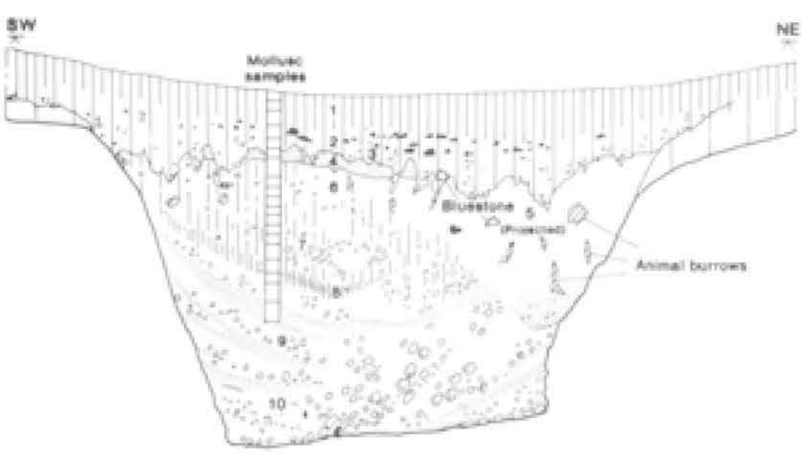
End of Segment 99 to left, rest of segment 98, looking towards interior (P50779)

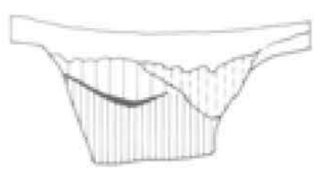
Segment 98 section K–L to left (no negative)

C41 Section E–F (1954)




C61 Section Q–R (1978)



Key to all mini Ditch sections in Phase 1 Ditch Segments

Primary

Secondary

Dark layer

Beaker period grave

Other soil

Deliberate backfill

See Figure 58 for sections K–L (1954) and Q–R (1954)

*Fig 38 The Ditch, phase 1, Segments 99 and 100*

***Segment 99***

This segment lies largely within Hawley's C25, excavated in 1922, although its western end was not excavated until 32 years later as part of cutting C41, with an unexcavated portion remaining between the two.

In the 1922 excavation Segment 99 was recorded as being, as far as Hawley could tell, similar to the western terminal at the north-east entrance (Segment 100), although smaller. The profile was also similar to that of the terminal although smoother in outline. The filling was the same, with two layers of chalk divided by a dark layer, as Hawley makes quite clear: 'this pit was as wide and nearly as deep as the first one [Segment 100] ... The contents were in every way similar to those of the first pit, the two chalk layers and intervening dark stratum [context 1564] being repeated' (1924, 33). The upper chalk layer (1563) is considered under phase 2 (*Chapter 6*). The profile is irregular on the interior side with a ledge of rock remaining which Hawley interpreted as a seat. He described it as smooth and worn on the upper side with toolmarks on the remainder; it extended into the unexcavated part of the segment. He interpreted the segment as a pit dwelling and his long description of how the feature would have functioned includes the comment that 'there was not a sign of pottery in either pit, and it seems hopeless to expect to find any' (1924, 34). This seems to be the only record of Hawley's belief, apparently related by Newall in later years, that he did not expect to find early pottery and therefore did not look for it.

There was 'dirty soil' (1561) near the bottom, which seems likely to have been beneath the primary chalk fill on analogy with other lengths of Ditch and with Hawley's description of Segment 100. In this soil were an antler pick and roughly rounded chalk ball (23/10/1922; WA obj no 503), although these were apparently on the lower slope of the profile rather than strictly on the bottom, as Hawley corrects the description in the next day's Diary entry: 'what was taken to be the bottom yesterday proves to be the sloping side' (24/10/1922). The dirty soil is probably best interpreted, at least in part and following Hawley, as trampled material. Hawley also mentions rather large fragments of burnt wood of a fire at the eastern end of this segment but it is not clear whether this was on or near the bottom or higher up in the fill, Hawley commenting that there was a 'similar indication of fire' to that in Segment 100 (1924, 34). There were the remains of many antler picks on the Ditch bottom, possibly as many as eight or nine, but only one was recoverable because they had been burnt and were largely decayed (*ibid*). The Diary also notes the pelvis of a stag (9/11/1922) identified as red deer, which has been both filleted and gnawed (*Serjeantson, Chapter 9*).

The lower layer of chalk (1565) described by Hawley is interpreted here as the natural primary chalk rubble, although it should be noted that Hawley thought that that this too may have been deliberately thrown in (8/11/1922). As he must by that time have been familiar with the normal lower filling of the Ditch it is not clear why he considered this to be thrown in rather than natural fill but the fact that Evans noted independently in his reopening of C42 in the neighbouring segment (98) that some of the chalk rubble primary fill may have been thrown in deliberately (Evans 1984 and pers comm) suggests that Hawley was probably correct.

*The 1954 excavation*

The 1954 section along section line A shows the filling of this segment only *c* 0.6m from its western end. The primary chalk rubble shows clearly and on the interior side lenses of rubble and soil are shown which are typical of primary fills in chalk-cut ditches and represent cycles of weathering. The difference between this part of the section and the rest may be largely the product of draughtsmanship, as the remainder may have been rendered more schematically. The rounded masses in the centre right of the section (3080/3081) are not annotated but appear to show chalk lumps in a matrix of unknown composition. In the original the matrix is shown as dark shading, but not of the same type as was used for soil. In both the 1922 and 1954 excavations of this and the neighbouring segment redeposited chalk has been noted, including some apparently puddled ('compo'), and it is possible that this is what is represented here.

The dark layer is also clearly visible above the primary chalk rubble.

***Segment 100***

This was a clearly defined segment excavated by Hawley in 1922 (C25) and described as a crater or pit 22ft 6in (6.85m) wide at the top and 7ft 6in (2.3m) deep (1924, 33). Between it and the segment to the west there was a gap 7ft (2.1m) wide, which obviously did not extend to the floor of the Ditch, because the next segment is described as entering the crater at a high level (19/10/1922). In profile the Ditch was slightly irregular on the interior side.

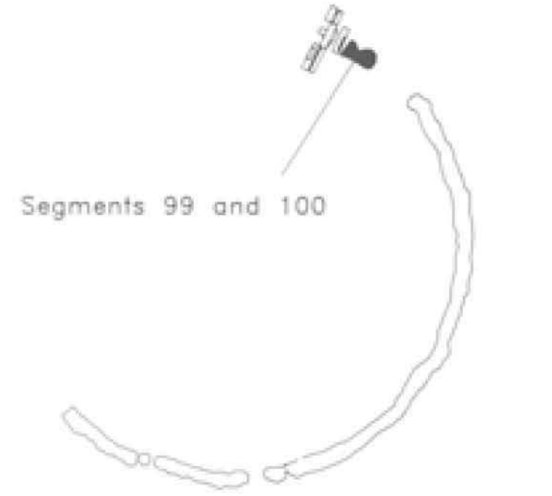
Hawley's method of excavating the Ditch changed between the excavation of the eastern terminal (Segment 1) at the north-eastern entrance and the western (Segment 100). For the eastern terminal the practice of using an alpha-numeric system of recording the location of finds and excavating in 1ft-wide slices had been followed; this was abandoned for the western terminal. Instead the segment was excavated more or less in two halves although the location of the cuts is not certain and they may not have divided it into equal areas. The first is noted as running from north-east to south-west across the crater and was only 5ft (1.5m) wide; the second was 15ft wide (4.6m) (17/10/1922). A baulk was probably left between them, as Hawley records removing the 'barrier' across the middle, his usual term for a baulk (20/10/1922). Finds were recorded and observations of the filling made only by descriptions, and it is therefore more difficult than in the cuttings recorded by grid to relocate finds and other features of the filling.

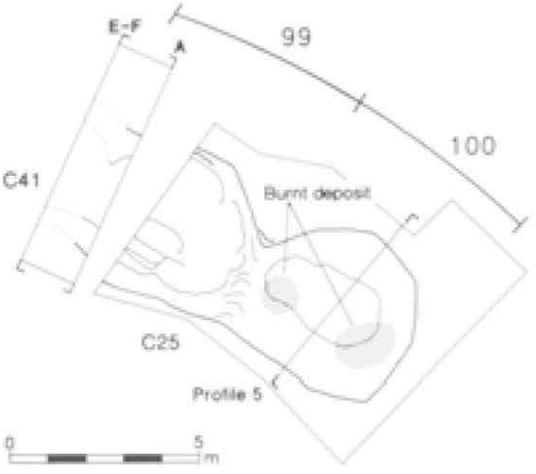
The filling of the segment consisted of two thick layers of clean chalk separated by a humic layer. In the phasing of the monument followed here, the lower chalk (1554) and the humic layer (1553) are considered to belong to phase 1, and the upper chalk (1552) to phase 2 (*see Chapter 6*). According to the published report the lower filling was of chalk with no finds (Hawley 1924, 33) over dirty soil (1555) which covered the bottom of the Ditch and on which there were seven horn picks, parts of antlers, and flint flakes, but no flint implements. There were signs of *in situ* burning which seemed to have burnt some of the antlers. In the Diary the antlers are described as lying on the bottom upwards for 9 inches to a foot (0.23m–0.30m) and as touching each other (10/10/1922). This suggests that they were a group placed on the Ditch floor fairly soon after it was dug. The depth of the soil on the Ditch bottom could have been as much as a foot (0.30m), since the published description is ambiguous: 'the lower layer of chalk contained nothing until it joined dirty soil covering the bottom of the Ditch to about a foot (more or less)' (Hawley 1924, 33); this could refer to the dirty soil or that and the lower chalk, although perhaps the former is more likely, particularly as there was a foot of similar soil at the bottom of Segment 1.

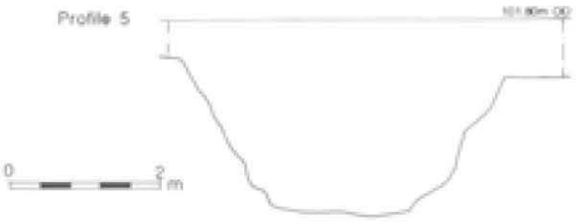
When the second (western) half of the segment was finally emptied, another antler pick was noted on the bottom with several flint flakes in the 'dirty foot trodden matter over the bottom (21/10/1922) and an antler (upper part) and two picks, with many flint flakes, mostly of dark flint, in the southern part of the western half' (20/10/1922). The entry for 21/10/1922 also observes that there were many antler picks 'scorched by fire on the bottom of the crater', a comment which is probably best taken as referring to the segment as a whole rather than just to the western half.

*The dark layer*

This lay directly on the lower chalk, that is, on the primary filling. It is described by Hawley as: 'a stratum of dirty matter (which) seemed to derive colour from wood ash, and contained many pieces of charred wood' (Hawley 1924, 33). Some human and animal bone occurred partly in it and partly in the chalk above (*Chapter 6*).




Segment 100 looking east across main causeway

© Society of Antiquaries of London

C41 Section A (1954)

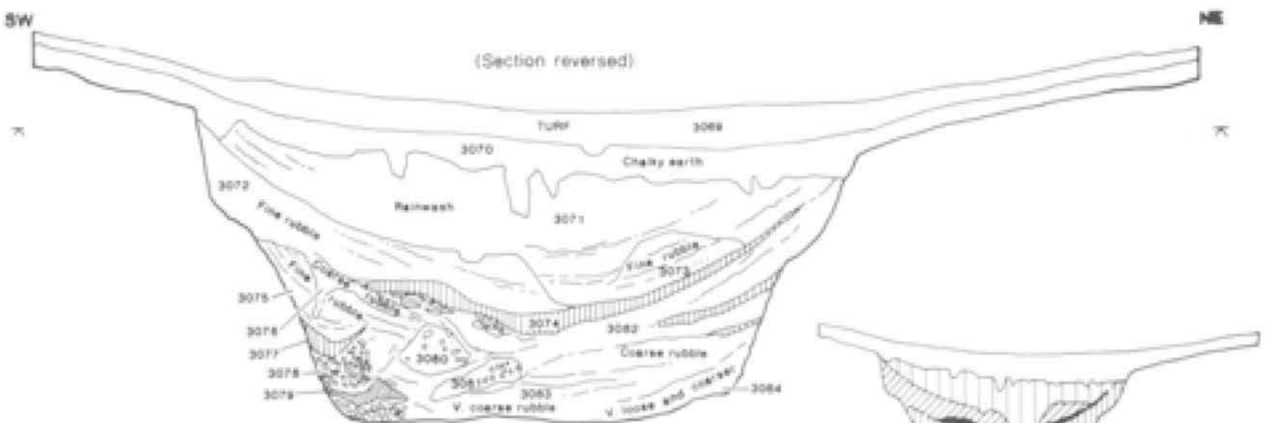


*Fig 39 The Ditch, phase 1, Segments 1 and 2*

***Segment 1***

The segment was excavated by Hawley in 1922 (C24) by use of the grid system. Hawley appears to have left a baulk in place after excavating the strips A–E, as he notes its removal on 28/9/1922.

This terminal of the Ditch at the north-east entrance was specifically termed a 'crater' by Hawley. Here 'the sides of the escarp (rampart side) and counterscarp had been cut to form a crater-shaped place entered from the part of the Ditch just excavated' (Hawley 1924, 32). The change in level of the floor was quite marked, as the diary records that the Ditch 'at E is 56" [1.42m below ground level] and at C is 48" [1.2m] so the dip is sudden' (12.9.1922). It seems that Hawley was not certain that there was a causeway across the Ditch at this point as he goes on to remark that this segment was almost in the middle of the Avenue and that as they were about to proceed further to the west 'we were stopped by a nearly perpendicular wall of solid chalk, 4ft 9in [1.45m] high, evidently a causeway across the Ditch' (*ibid*).

There is little description of the primary filling in this segment and there seem to have been relatively few finds. An exception, however, was a concentration of animal bones on the eastern side of the segment. The Diary records 'on bottom horn core of a bison, probably all the big bones and tooth belonged to the same animal' (11/9/1922).

It is possible that these lay within the secondary filling but the comment that they were on or near the bottom suggests a primary position. A bone point was near the bones, although its exact position was not noted (8/9/1922). More large bones were noted towards the middle of this segment, *c* 1ft (0.3m) from the bottom, but in this case they may have been lying within the dark layer (1426) (25/9/1922; 26/9/1922). They included three 'very large' animal vertebrae and other bone fragments probably of the same animal (25/9/1922), and 'a good many flakes of flint and several cores, one of which is kept' (*ibid*).

The only other description of the chalk primary filling (1427) is that 'the bottom consisted chiefly of chalk evidently excavated from some hole perhaps that of the Slaughter Stone'; two 'very rough' scrapers were noted among the chipped flints on the bottom (26/9/1922). No explanation is given for the suggestion that the chalk was derived from the Slaughter Stone hole rather than being simply the normal chalk rubble filling of the lower Ditch with which Hawley must already have been familiar, but it was perhaps cleaner and in larger blocks than normal. The entry also suggests that there was a layer of struck flint here similar to that noted in other lengths of the Ditch but not otherwise described in this segment.

In the published report Hawley describes traces of fire in this segment, both in the publication of that year (Hawley 1924, 31) and in his last report (Hawley 1928, 165), where he remarks that 'hardly any instances of fires actually on the bottom occurred, and the only two of any consequence were those in the craters at the main entrance'. In the Diary, however, there is no specific description of a fire in the bottom in this segment, Hawley presumably drawing on his memory or an alternative set of notes for the information.

The published account of this segment is difficult to separate from that of the adjoining segment (2), but Hawley does remark that, working anti-clockwise: 'soon a slight depression of the ditch floor was reached showing traces of fire. here there were more animal bones, amongst them several vertebrae, which although very large, belonged to a young animal, with the epiphyses detached from the main portion of the bone; also part of a pig's jaw with two very large teeth and an antler from a roebuck, the first yet found. There were a good many flint flakes in a foot of dirty soil at the bottom, and with them one or two very rough implements, including a scraper' (1924, 31–2). The slight depression is then described as being 'in the same place as a crater-shaped place', ie Segment 1, and the profiles show that the Ditch floor descended into Segment 1.

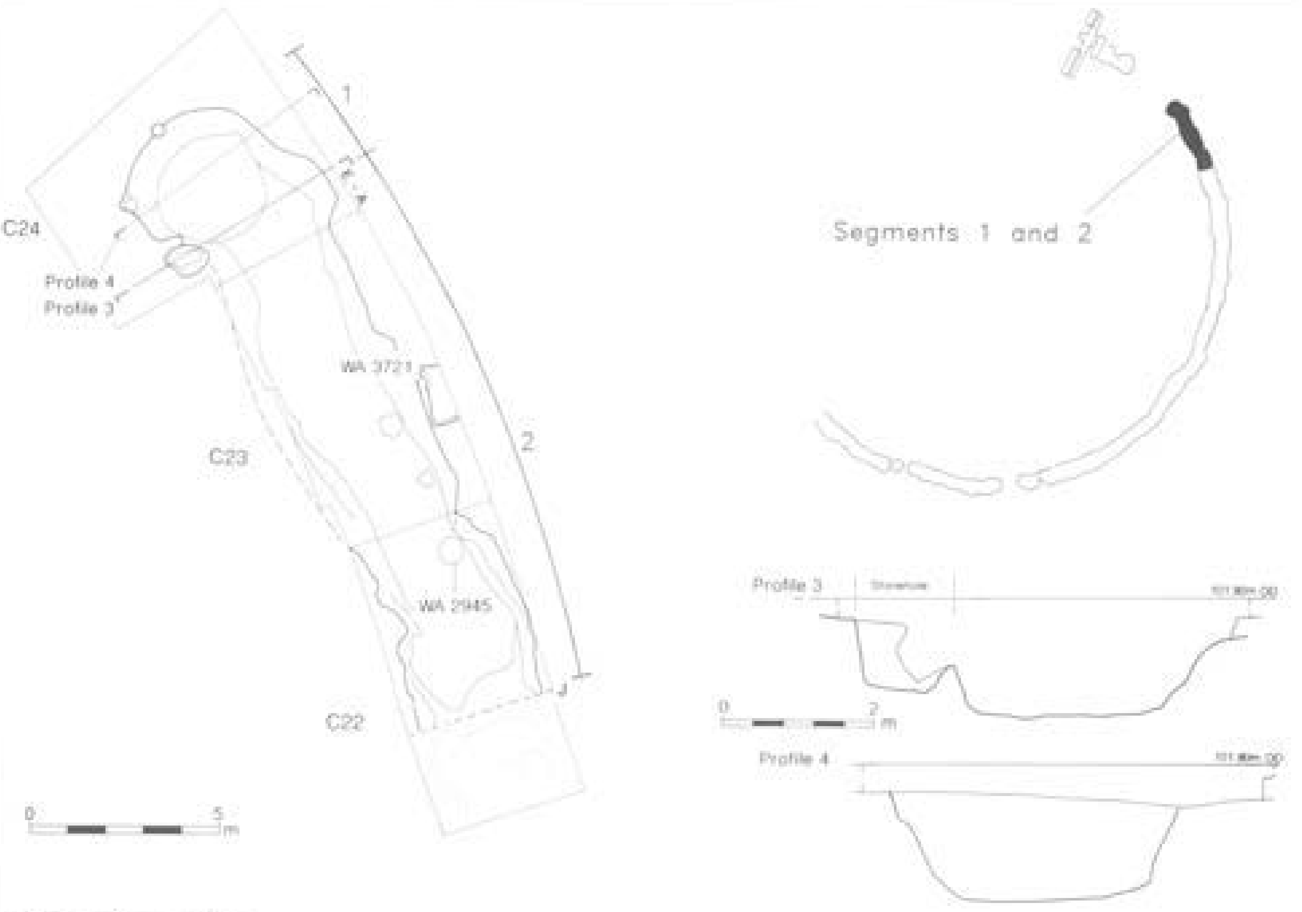
The dark layer (1426) which occurs here and elsewhere and which has been assigned to phase 1 is mentioned twice. It is first mentioned as being a layer in which animal bones had been found, although it is not clear which bones were recovered from it, and as containing 'a little black wood ash – all through its course. It comes downward but seems to end on edge of ditch on rampart side' (26/9/1922).

***Segment 2***

The segment was excavated by Hawley in 1922 (C24, C23 and C22). The north-western end of this segment was clearly defined by the south-eastern limit of the well-shaped segment (1) which formed the Ditch terminal at this point (Hawley 1924, 32). However, the segmental nature of this length of the Ditch was more apparent in plan than in section, although there was also a change in depth, the Ditch becoming shallower towards the terminal. A slight ridge between the lengths demarcated Segments 1 and 2 (profiles 2, 3, and 4). At the south-eastern end there was a marked rise in the Ditch, at around the grid line J (*see opposite*). There appears to have been a layer of silt or soil on the bottom, at least in the southern part of the segment, in C22 (1406), where it is noted as being 4in (0.10m) deep (6/5/1922).

Very few finds are noted in this segment but there was some struck flint on the bottom, though whether this constituted the distinct layer of flints noted elsewhere is not clear. Some occurred on the bottom and some in the loose chalk primary rubble (15/8/1922). They do not seem to have included recognisable implements. Other finds almost certainly from the primary filling include chalk balls, antlers, and a pig jaw and horse tooth (*ibid*), all from the length of the segment excavated as Hawley's VIth trench (ie C23). Two chalk balls were recovered, both on the bottom or in primary fill (16/8/1922; 1/9/1922).

In the southern part of the segment, excavated as Hawley's Vth cutting (ie C22), there was a feature in the Ditch floor (WA 2945, fill = context 2946) which contained two modified pieces of chalk (*Montague, Chapter 9*), one showing cutmarks and the other a perforation (Hawley cat no 4636A and WA 505, Fig 219); a rounded flint nodule was found nearby but it is not clear whether it was in the feature. The nature of the feature is not clear as it is described only as a 'depression' (22/5/1922).




© Society of Antiquaries of London

Segments 2 and 1 looking west across main causeway. In background section through Segment 99.

*Fig 40 The Ditch, phase 1, Segments 3 and 4*

***Segment 3***

The segment was demarcated at its southern end by a narrowing of the Ditch in plan and by a rise in floor level from 65in (1.65m) at the northern end of C28 to 52in (1.32m) at the end of the segment, where a slight ridge is marked on the plan. The southern part of the segment falls within the first section (*see main text for an explanation of Hawley's 'sections' within Ditch cuttings*) of C28 (Diary 1925, 27/4–18/5/1925, not written daily). The published report is difficult to follow at this point because Hawley describes the manner in which the whole length of the 1925 cutting was excavated and then reverts to describing the first section without further explanation, but the Diary account is clear and describes the successive sections in order.

The northern part of this segment was clearly distinguishable from the next segment by a ridge crossing the Ditch at Hawley's section line J in C22. The top of the ridge was 36in (0.9m) below ground level, compared with a depth of 60in (1.2m) for the Ditch base at section line D (29/3/1922; 12/4/1922).

For the northern part of the segment (in C22) there is little description of the primary filling and it is difficult to separate finds from the secondary and primary fillings. The few finds attributable to the primary fill consist only of two antler picks certainly on the bottom and possibly some flint flakes. The latter were not on the bottom but may have lain within the chalk rubble.

In the southern part of the segment (in C28) there were two 'pieces of tops of antlers' noted at the bottom and '3 or 4 worked flints also near bottom' (*ibid*). On this occasion there is more detail given in the published account than in the Diary, raising the possibility that Hawley had a source of information in addition to his Diary. He states that 'Flint chips were plentiful all along the bottom, but there were only four that showed definite signs of working and these were found in the stratum of flint chips which is nearly always present on the floor, generally in association with chalky mud. On the east side of the floor a small depression was noticed, looking like a small posthole' (1928, 150). 'The small depression' is mentioned nowhere else and is not shown on the MoW plan, possibly because the plan was drawn up when Hawley was not present and the feature was so small and ill-defined that it was not recognised as such.

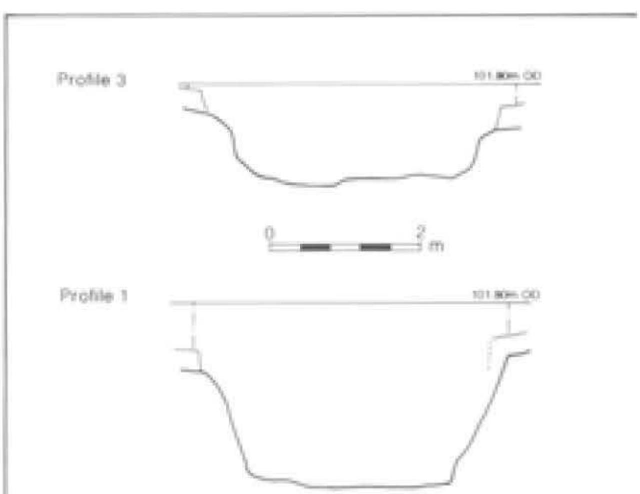
Within C22 a dark layer was noted (WA 1405): 'Dark earthy matter was observed on the bottom where it joins the south ascending side' (29/3/1922); the description is similar to that normally applied to the dark layer lying between the primary chalk rubble and the secondary silt and it is on the usual side for that layer, the interior side, but if it was directly on the bottom it must reflect a different process and period of formation from the dark layer.

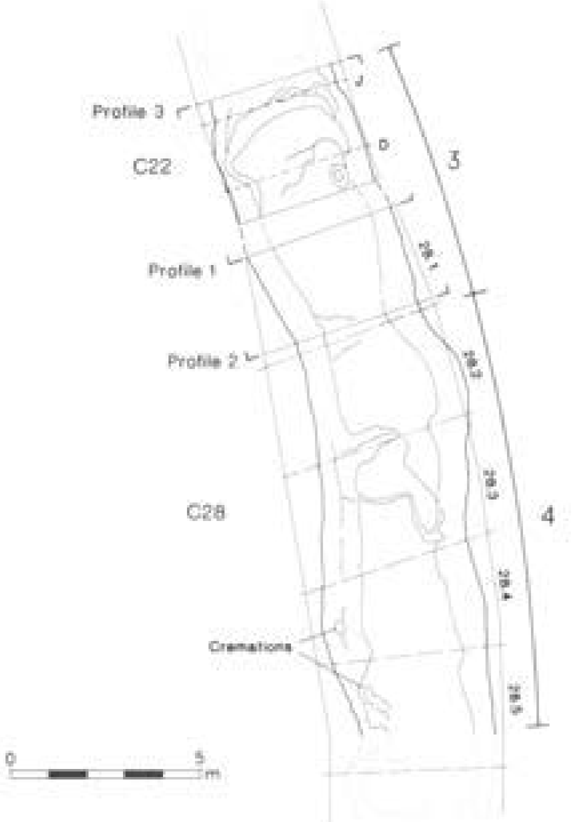
***Segment 4***

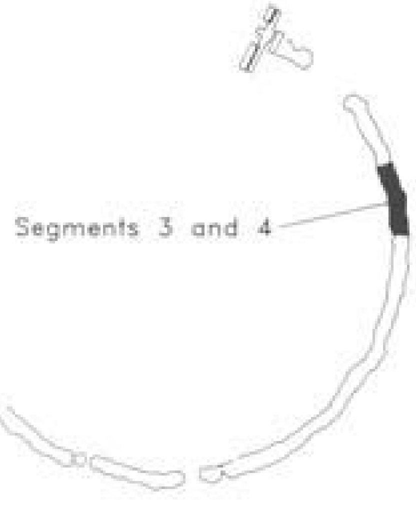
The division between Segments 3 and 4 seems to have been marked only by a low ridge, visible only on plan. The southern end of the segment seems to have been around the southern end of Hawley's 5th section of his 1925 cutting (C28), where 'at the bottom there was a thick layer of hard yellow chalky matter resembling compo extending from side to side where the recess in the last section ended; perhaps it had been a barrier afterwards removed' (1928, 151). It is difficult to identify the 'recess' with complete confidence as the descriptions do not tally with the MoW plan, but the likeliest point for this is either at the end of section 4, or the point at which there seems to be a slight ridge across the floor of the Ditch on the MoW plan (opposite). In the Diary it is noted under '4th section continued. Also 5th section that a layer of clay passes from side to side of floor where long pit ends – it had been placed upon the second floor. Second floor ends soon after the rise into the next section' (2/6/1925). In an earlier entry it had been noted that the level floor of the Ditch continued at least 3ft (0.9m) to the west of the cut, ie section 4; (presumably south-west is intended). Although the Diary and published accounts do not seem to agree they both indicate changes in the nature of the Ditch cut and its lower filling at around section 5, and this is taken as the southern end of the segment. The feature running obliquely across the segment is described as a 'recess about 9″ deep [0.23m] with a foot-pressed floor of muddy chalk with a similar layer over it, marking the actual floor of the ditch. Parts of five stag-horn picks and many smaller pieces of horn were found' (Hawley 1928, 150–1).

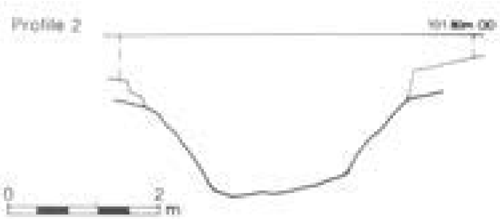
In the 4th of Hawley's sections in this segment he also notes a 'double bottom', a feature he notes elsewhere around the Ditch circuit. Here, as elsewhere, it seems to have comprised a compacted surface to the primary chalk rubble on the Ditch bottom which Hawley interprets as the result of trampling. It clearly lay immediately below the distinctive dark layer, which is also a frequent feature of the Ditch filling: 'There was a dark layer nearly on the bottom [2536] which was mostly humus with black ashes of wood in it. This layer rested upon a sort of double bottom, the actual floor of the ditch being 9″ [0.23m] below it' (1928, 150). Although the nature of the primary filling is not made clear in the published account, the Diary states that the dark layer lay directly on chalk (12–19/5/1925). The floor of this segment was more or less level for most of its length.

It is not possible to separate those finds which were directly on the Ditch bottom from those which were in the primary chalk rubble, on it, or in the dark layer, but those from the lower filling in general can be identified and occasionally their location is specified. In the northern part of the segment there were 'many flint chips on the bottom', in Hawley's second section, and 'some roughly worked light-coloured flints' in his third, also on the Ditch floor. In the southern part, in Hawley's fourth section, there were 'two decayed fragments of picks, five pieces of bone, including two from the jaw of an ox, and a few worked flint-chips on the bottom' (2626) (1928, 150), the worked flint not including any implements according to the Diary (12–19/5/1925).






Looking south from Segment 2 into Segment 3 at southern end of C22

© Society of Antiquaries of London

*Fig 41 The Ditch, phase 1, Segments 5–12*

***Segment 5***

This was a small segment, the Ditch here being described by Hawley as showing 'a slight curve with short projections on either side. The width at the bottom was 9ft [2.4m] and the sides were very steep' (1928, 151). The description in the Diary is more detailed, describing this length, 'instead of being part of another long pit it [ie section 6] has in it only a small one with a crater shaped end on the rampart side with projections of chalk on each side of it ... the bottom of the crater near rampart is deeper than the rest of the floor which rises considerably towards the south end' (3–9/6/1925)

***Segment 6***

This, like the segment immediately to its north (Segment 5), was small and apparently featureless. The northern end was defined by the projection which separated it, at least on the interior side, from Segment 5. At the southern end there was a distinct rise in the Ditch floor, in the middle of Hawley's 7th section: 'At the middle of the section the floor of the ditch rose to 2 feet 6" [0.76m] from the surface in the middle and began to dip towards the south ... Bottom is level (apart from the slight slope southwards [ie in Segment 7]' (10/6/1925). This ridge is also clearly visible on the MoW plan, and in the published account Hawley suggests that this could be a former 'barrier' which had subsequently been removed.

***Segment 7***

At the northern end of the segment it was divided from the previous segment by a distinct ridge, described by Hawley and visible on plan (*see Segment 6*). At its southern end, in Hawley's tenth section, there was also a large ridge extending from the side of the Ditch on the interior side into the middle. The floor of the Ditch seems to have been reasonably flat throughout most of the segment, with steep sides (Diary June 16th, June 22nd 'etc'). There was certainly loose chalk rubble primary fill, at least 10in (0.25m) deep (17–19/6/1925).

There appear to have been few finds from the lower fill in the segment (6), with only animal bones ('ox' and 'pig') 'near and on the bottom and three roughly rounded worked flints in the chip stratum' (1928,152). The latter were presumably the only retouched flints recognised, the mention of the 'chip stratum' suggesting that there was a concentration of struck flints in this segment, as in many others. Towards the southern end of this segment (2560) (or possibly in the next one, as there is a division between segments in the middle of Hawley's tenth section) were 'the blade bone of an ox and other small bone fragments, 2 worked flints, part of large leg bone probably of some animal' (Diary 1925, 27th June 'etc').

***Segment 8***

At its northern end this segment was separated from Segment 7 by the large ridge which Hawley came to in his tenth section. The Ditch floor is noted as continuing at a higher level beyond the ridge (Segment 8). Beyond this, however, and apparently visible on plan, the Ditch bottom deepened and formed 'a rounded cavity against the escarp which contained two antler picks' (Diary 1925, 3rd July 'etc').

At its southern end the segment was marked by a very noticeable narrowing of the Ditch in plan, being reduced to only about 4ft 6in (91.4m) across the bottom compared to *c* 9ft (2.7m) in the middle of the segment. It is possible, however, that this segment should be sub-divided, as a lump of solid chalk passing from side to side is noted is Hawley's twelfth section and may have extended into his thirteenth (Diary 1925, 8th July 'etc' and 13th July). In plan, however, there is little indication of a former division at this point and although modification of the Ditch may have straightened out the original plan here the available evidence does not seem strong enough to establish beyond doubt the existence of a former division between segments at this point. Directly above this localised rise in floor level there was 'a great deal of light coloured clay mixed with chalk apparently purposely put there' (Diary 1925 8th July 'etc') (2571). This seems to have been part of the primary filling, but it is not clear what it represents.

There seem to have been very few finds in this segment and even the layer of struck flint, which is almost ubiquitous, is noted as absent from at least part of the segment (ie from Hawley's thirteenth section; 13/7/1925), although some flint was present, presumably as occasional finds rather than as the usual distinct layer along the bottom (1928, 153). The 'chip layer' did, however, occur within the northern part of the segment, where it is noted in Hawley's eleventh section, with 'foot trodden chalky mud' (*ibid*). The only other finds noted are from the southern end of the segment, in Hawley's thirteenth section, where there were a worn antler pick and a large antler tine (2575)(*ibid*).

***Segment 9***

The north-eastern end of this segment was clearly definable as a large low barrier of natural chalk 'extended across the floor' with, as Hawley excavated southwards, 'a crater-shaped recess beyond it, on the eastern side of the Ditch' (1928, 153). This appears to be visible on plan as a marked curvature of the Ditch on the eastern side. The Ditch was markedly deeper than in Segment 8.

In Hawley's fifteenth section and part of his fourteenth the Ditch was wide with a flat floor but towards the south-western end of the segment, in his sixteenth section, it became more irregular. The floor dips markedly halfway across the section, the inner side of the Ditch changes alignment towards the interior, and the exterior side curved inwards to form a sharp projection which caused 'a very narrow neck in the ditch' (Diary 1925, July 25 'etc'). These features appear to be visible on the MoW plan (reproduced opposite) and are taken here as the division between this segment and the next (10).

The primary fill is mentioned only once, in the fifteenth section, where the 'chalk debris on the side is normal' (Diary 1925, 22 July 'etc') but it does seem clear that there were few finds in it. Even the usual concentration of struck flints along the Ditch bottom was absent from the depression at the north-eastern end of the segment (Diary 19/22 July 'etc'), although it was present to the south of that feature. One scraper was recovered (1928, 154). Two antlers and some worked flints may have been from the primary filling as they are recorded in the published report as 'on the bottom at the side', but they are reported as being in the silt; since it is more usual for Hawley to record that objects were in the loose chalk on or near the bottom it is possible that in this case the bottom of the earthy silt is meant, rather than the Ditch bottom.

***Segments 10 and 11***

It is difficult to separate these segments as both fall within Hawley's seventeenth section. Hawley describes this section with his sixteenth section, which also formed the northern part of Segment 10. The Ditch appears to have been very irregular in this area but Segment 10 was clearly separated from Segment 9 by the changes in plan and Ditch floor described at the southern end of Segment 9. The southern end of Segment 10 was not clear but is suggested by the MoW plan, whereas the southern end of Segment 11 was clearer and marked by a distinct rise in floor level.

The dark layer occurs here and appears to have been particularly pronounced and very organic (2590): 'A stratum of dark, earthy matter occurred near the bottom varying from 3in [0.08m] to 8in [0.20m] in thickness, which had the appearance of decayed vegetable matter, possibly with some wood in it, and there was also a good deal of chalky clay compo. The dark matter contained no object [*sic*], and below it there was sedimentary chalky mud 6in [0.15m] thick, such as is usually found on the bottom but without the flint flakes' (1928, 155) (WA 2591). This may be equivalent to the dark layer found elsewhere in the Ditch, although here there is no mention of the primary chalk rubble and its stratigraphic relationship to it. The more detailed description in the Diary makes clear that the usual layer of flint flakes was entirely absent here, nor were there any recognisable antler picks, though three small points of tines were found (Diary *ibid*). Hawley speculates that the Ditch may have been disturbed but concludes that there was no evidence that the disturbance was recent and he notes that the very organic appearance of the dark layer was unusual in view of its apparent antiquity (*ibid*). He also makes the general comment, noted only in the Diary, that where there were recognisable barriers between segments they almost always had 'a layer of clay over and at the sides of them' (Diary 1925, July–August, A17–A18).

***Segment 12***

The northern end of Segment 12 was clearly differentiated from Segment 11 by a marked rise in floor level from Segment 11 into this segment: 'the floor took a sudden leap upwards onto a fairly level floor still sloping gently upwards. At the same time both sides were contracted, the rampart side less so than the one opposite and between them on the line there was a slight elevation of a barrier' (Diary August 13th, 1925, 'etc'). The MoW plan seems to show a slight ridge at the southern end of this segment and the northern end of 13, the latter lying mostly in the first excavated length of Ditch. There are no details of the primary filling and there is no note of any finds certainly from the bottom in this segment.

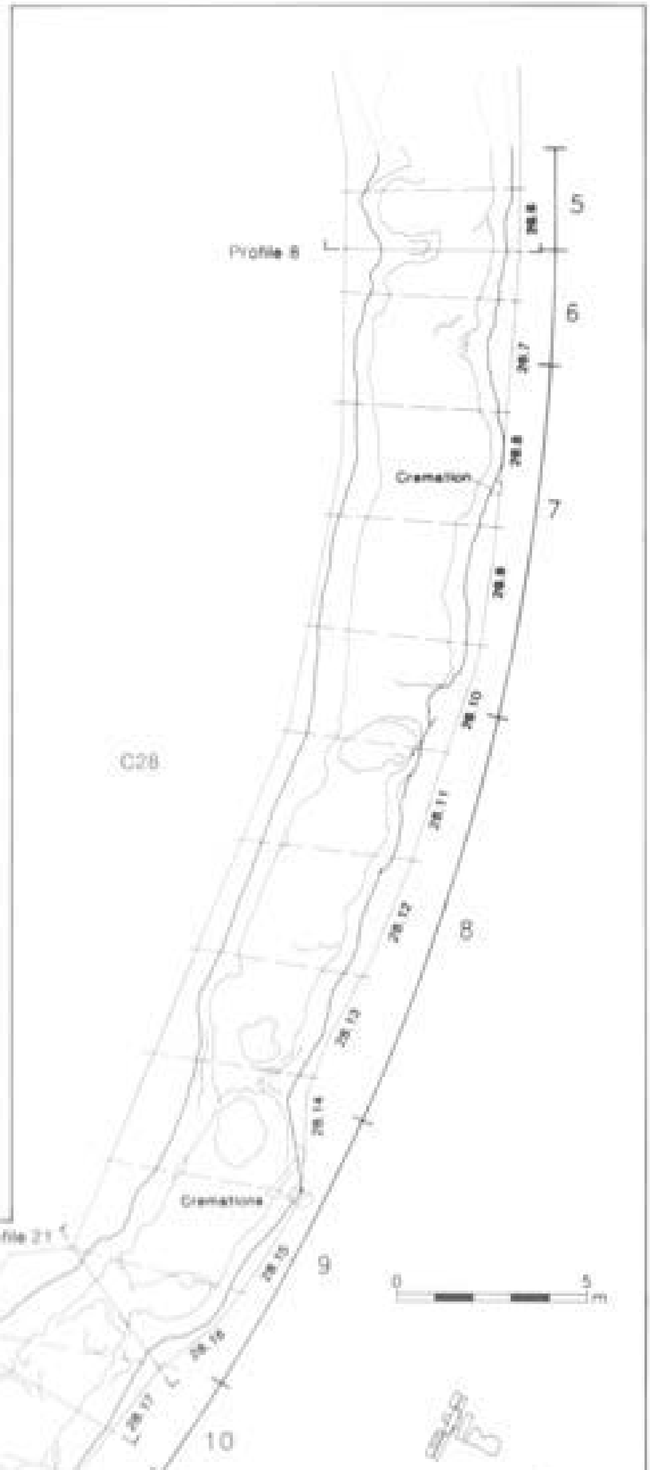



*Fig 42 The Ditch, phase 1, Segment 13*

This segment was excavated in the first two years of Ditch excavation, 1920 and 1921 (C18, C19), and in 1925, when only a short length at the northern end was excavated, in C28. The earliest excavation of the Ditch, C18, took place in three stages, first as an extension (3ft/0.9m wide) towards the ditch of a small cutting around Hole H (Plan 1) (C18.1) which was then extended by 12ft (3.7m) along the Ditch (C.18.2); excavation of both this and C18.1 took place on the 25/2/1920. Subsequently, in April 1920, Newall extended C18.2 longitudinally (7/4/1920), that is, along the Ditch (but not recording a longitudinal section (C18.3)). Two section drawings were made in C18, one of the initial cutting (C18.1) showing the Bank and Hole H as well as the Ditch (opposite; Hawley 1921, fig 12, section 1), and one at the western end of the cutting C18.3, showing a cremation on the Ditch bottom (*ibid*, fig 12, section 2).

Towards the southern end of C28 the Ditch had become shallow with a level floor, a major step in the floor occurring between Segments 11 and 12. It is clear from the MoW profiles that there was also a minor ridge at profile line 26, which is confirmed by the MoW plan, and this is taken here as the dividing line between Segments 12 and 13.

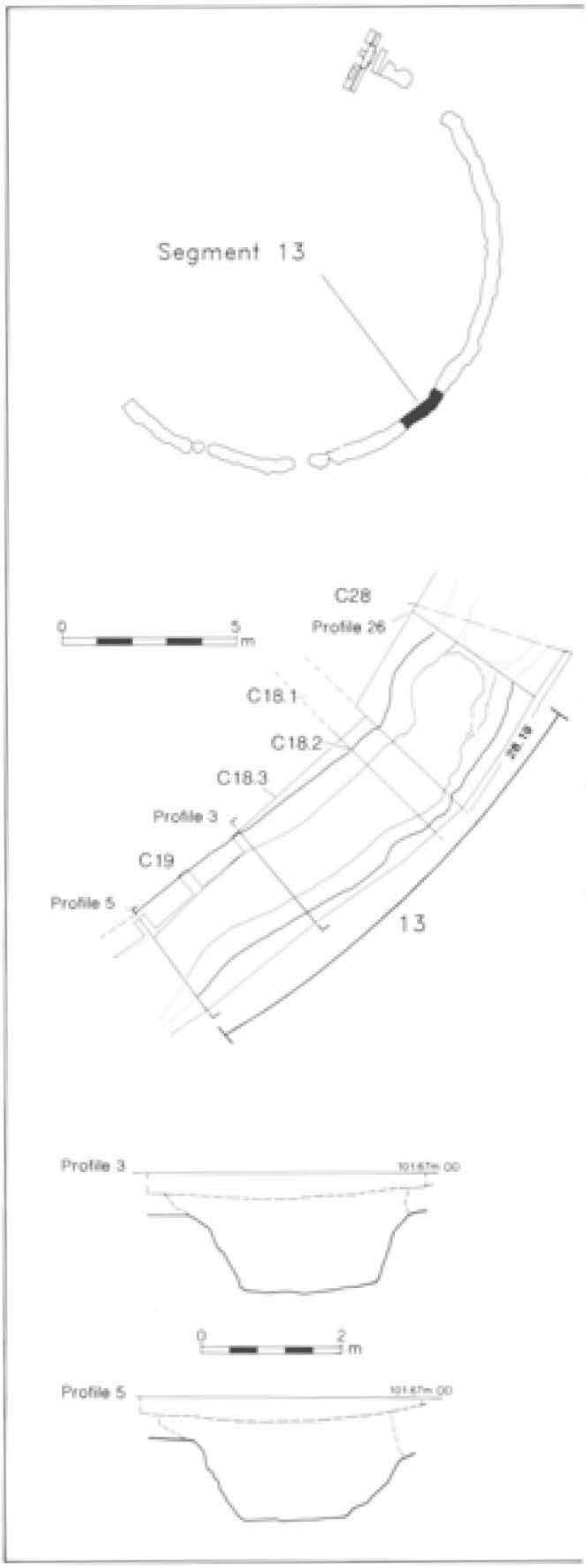
In the part of the segment opened in 1920 (ie C18) the floor was also shallow at the eastern end, at only 39in (1m) below ground level (1921, 33), although within C18 it deepened to 54in (1.4m). At the south western end of the segment (at the end of C19) Hawley notes 'The Ditch here widens out very abruptly on both sides and the sole [floor] descends slightly' (14/9/1920).

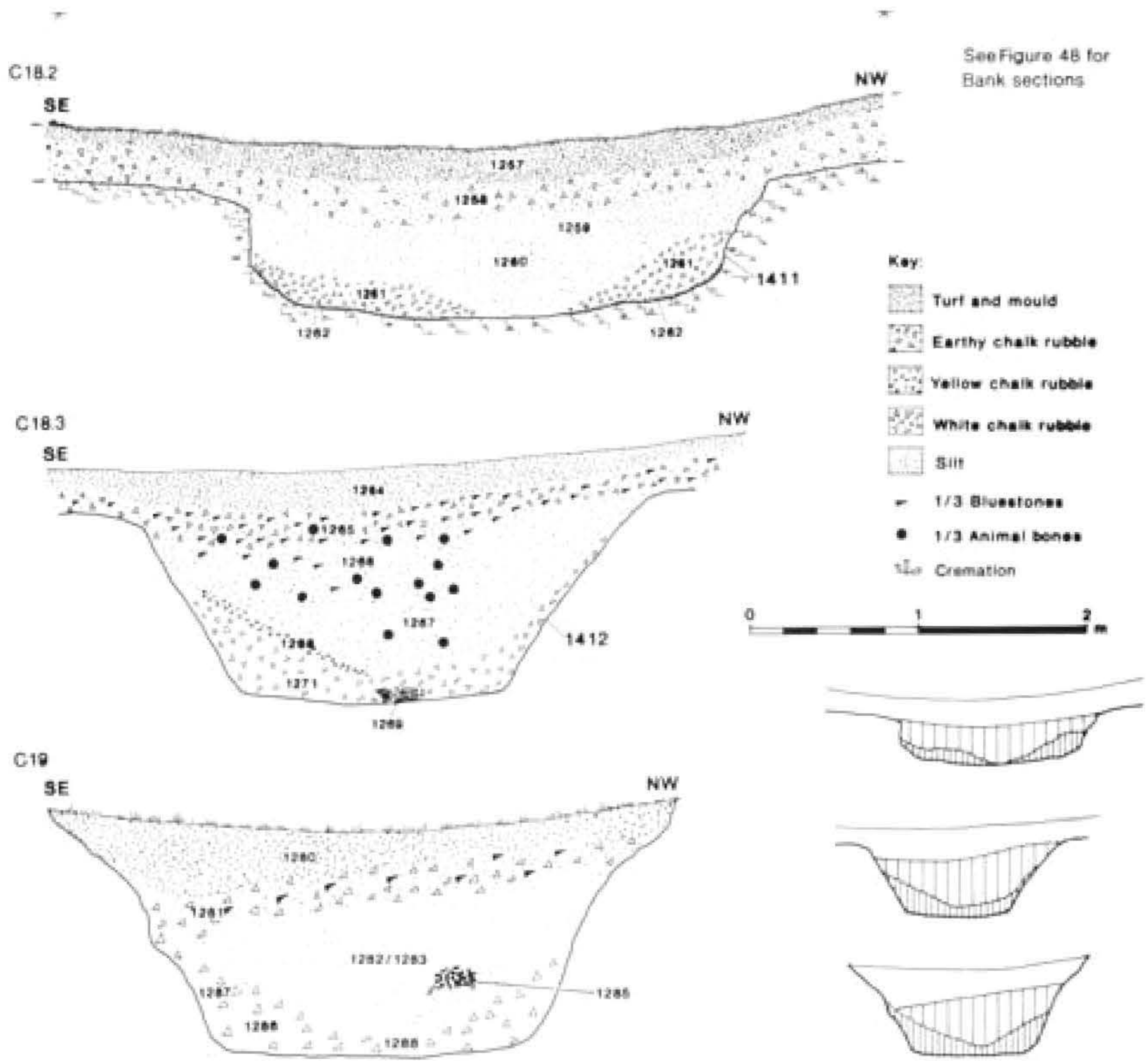
There is little description of the primary filling in this segment, although in C19 the lowest layer in the Ditch is described as 'loose white chalk with a very little earthy matter in it and some clayey stuff mixed with it in a layer near the rampart. Upon the sole of the ditch was a thin layer of dark earthy matter apparently blown in by wind and the commencement of what would have been humus had it been continued. This was from $\frac{1}{4}$ to $\frac{1}{2}$ inch [6–13mm] thick and may originally have been thicker before compressions by superimposed silt; finds were scanty' (13/9/1920).

There appear to have been few finds overall and in the north-eastern part of the segment, in C28, the usual concentration of struck flint along the bottom was certainly absent (Diary August 1925, sections 19 and 20). Flints were present, however, in the part of the segment within C18 and included retouched pieces as well as flakes. Other finds appear to have included animal bone and antler, but neither occurred in large quantities. In C18.2 'were a portion of the head of an animal probably deer. Also a phalanx which might or might not be human, both on the floor of the trench' (25/2/1920) (neither find extant).

The segment is notable, however, for the occurrence of a cremation burial apparently dating from an early period in the Ditch's history. It is shown (opposite) in one of the few section drawings of the Ditch as lying within the primary filling (1271). In the publication text it is described as a 'cremation in a bowl-shaped cavity in the solid chalk at the bottom on the side below the vallum' (1921, 34). The possibility that this was deposited in a feature cut from higher up cannot be entirely dismissed, although the depth suggests that it is unlikely to have been cut from as high as the top of the secondary fill. C18.3 seems to have been dug mainly by Newall, who seems to have been responsible for all the section drawings of the Ditch, and he notes no visible cut.

This, combined with the fact that the cremation is deep in the Ditch, does suggest that it was a very early feature in the Ditch filling, although the possibility that it was cut into the primary fill from low in the secondary fill cannot be dismissed.






Section within Segment 13
looking east

© Society of Antiquaries of London

*Fig 43 The Ditch, phase 1, Segments 14 and 15*

***Segment 14***

This segment lay within Hawley's third excavation (C20) which was begun in the autumn of 1920 but not finished until the spring of 1921, with a gap during the winter. The description of this length of Ditch is difficult to disentangle, but it seems that, unusually, Hawley worked anti-clockwise. The Diary entries make sense only if this was the direction.

At the north-eastern end of the segment the division between it and Segment 13 was marked by the widening of the Ditch in plan and a slight deepening of the floor from Segment 13 into 14 (14/9/1920), but the segment was also marked by a slight narrowing of the ditch. At the south-western end, at around strip 'S', the western end of the segment was marked by a considerable narrowing of the Ditch and a lowering of the floor level (24/3/1921; 30/3/1921, noted as a rise in level from Segment 15, since Hawley was working anti-clockwise at this point); Hawley notes also that 'the floor is very irregular here, and in marked contrast to strips T–Y' (in the north-eastern part of Segment 15) (30/3/1921). The plan of this length of Ditch is misleading as it shows only the lower edge of the Ditch cut. The top edges of the Ditch do not seem to have been excavated except perhaps in the asymmetrical extensions to some strips shown on the plans. Even the MoW profiles show Ditch fill still in place along the edges, and profiles reconstructed from the depths given for each foot square (in archive) show only the lower parts of the sides. The unexcavated fills presumably remain in place.

The dark layer was certainly present here as Hawley comments that during his third Ditch excavation most finds were below 40in (1.01m) below ground level and were either on the bottom or only slightly higher up where 'a dark stratum overlaid the fallen frosted chalk [1299]. From this it would seem that the ditch was used considerably before it was neglected and allowed to silt in from frost' (27/4/1921). This indicates that the majority of finds were within layers assignable to phase 1. The depth of the dark layer at the north-eastern end of the segment is given by the depth of struck flints found in it in strips A and B: 'worked flints occur at B.5.6. [ie strip B, squares 5 and 6] 42 to 44in [1.06–1.11m] BGL in brown soil above the fallen crumbled chalk stratum which is over the bottom, between them is a stratum of clayey soil [1304] washed down from above over the crumbled frosted debris' [1303] (26/4/1921). The Ditch in squares B5 to B6 is noted as 52–54in (1.27–1.37m) below ground level, giving a depth of about 10in (0.25m) for the primary filling.

At the north-eastern end of the segment there appears to have been a concentration of antler and animal bone in the primary filling on the bottom. It included an antler pick with part of the skull attached lying directly on the Ditch bottom, with at least three long-bones, four phalanges, and some other fragments. One of the long-bones was tentatively identified as human and two as pig (5/5/1921). The layer of struck flint was only just present in the most easterly strip of this segment, strip 'A', but was present westwards from 'B', and the concentration was particularly marked in strips C and D. Here Hawley notes that 'they are much trodden into the chalky mud about 1½" to 2" [0.04–0.05m] thick covering the chalk floor of the ditch [1301]. They are so thickly coated with hard mud that it is impossible to see if any are implements until they have been well soaked in water' (25/4/1921). The concentration continued into strip 'E' where Hawley notes that struck flints were found all over the bottom 'but chiefly in the centre' (in E4 and E5) (20/4/1921). There were fewer struck flints in strip 'G', but many in 'H' and this seems to have extended westwards at least as far as strip 'K', where 'many rough pieces of flint were found many of these are outside chips of stones' (13/4/1921), an interesting comment in view of the lack of surviving flint, as it suggests that there was a high proportion of cortical pieces.

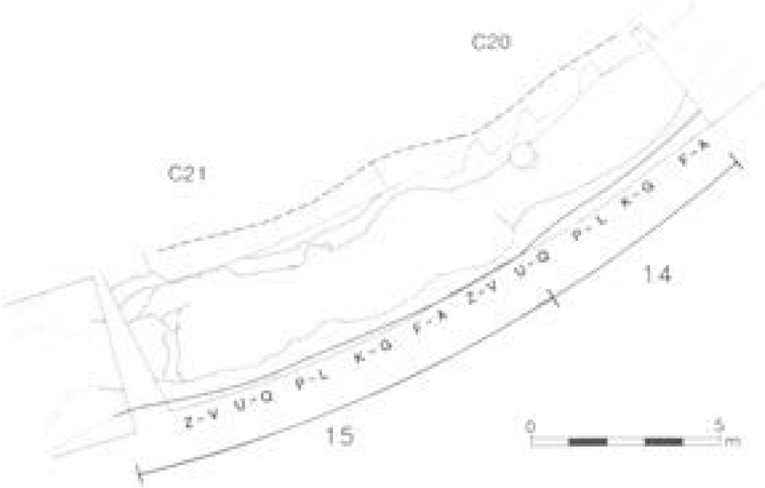
***Segment 15***

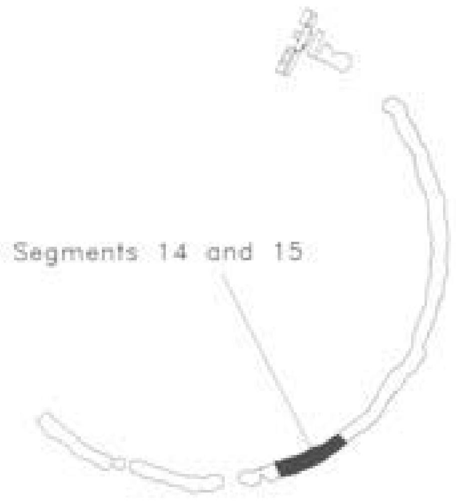
This was delineated to the east by a change in the nature of the Ditch floor and a narrowing of the Ditch in plan (see photograph from Segment 14 looking west into this segment). To the west of the segment there is a clearly defined segment (16) which was noted by Hawley as a pit similar to the ones on either side of the north-eastern causeway (18/7/1921).

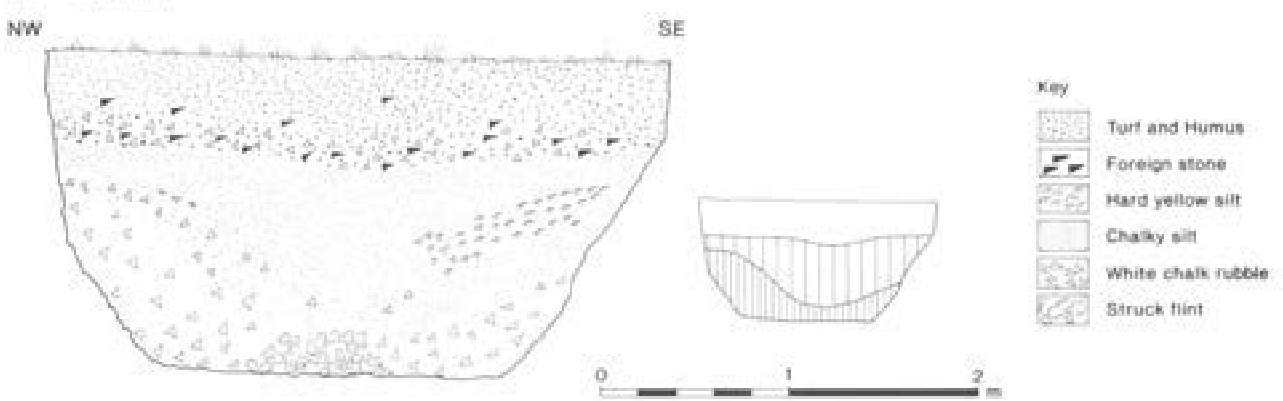
The segment falls within three of Hawley's Ditch cuttings, his IIIrd, IVth, and South (C20 1920–21, C21 1921, and C26 1924). He maintained the technique, first used in his second cutting, of excavating in vertical slices, lettered alphabetically, across the Ditch, each 1ft (0.3m) or sometimes 2ft (0.7m) wide and stretching across most of the Ditch (though not invariably reaching from one edge to the other), thus creating a series of vertical sections. These sections were not usually recorded but some, including some in this segment, were photographed. In C20 this segment takes up letters T to Z, and in C21 the whole length of the cutting.

Hawley remarked on the very flat and level nature of the Ditch floor in the eastern part of segment 15 (his IIIrd excavation sections U–Y), noting it as flatter than any length encountered up to that point (30/11/1920). Towards the centre of the segment (in Hawley's IVth cutting) the bottom was noted as 'very rough and irregular' (31/7/1921 [*sic* actually Thursday 21st July]). It is unfortunate that the Diary kept by Hawley is missing for the period during which most of this segment was excavated, but in the published report he comments that the Ditch was wider and deeper than it had been previously (1923, 13). The primary fill is not described but photographs almost certainly of this segment show the usual chalk rubble filling approximately a third of the height of the Ditch. At the western end, in the part of the segment excavated in 1924, it is clear that there was an initial silty fill, as is common within primary fills: 'A stratum of dirty soil [2468] covers the solid chalk from near the top and ends upon the bottom with many broken flints in it' (15/7/1924).

Because of the missing Diary entries a full picture of the finds in this segment of Ditch cannot be obtained; only those at the extreme east and west of the segment were recorded, mainly by Hawley's grid method. Struck flint seems to have occurred on and close to the bottom throughout the segment, within the primary fill. 'The bottom of the Ditch, which was flat and wide, had a great many flint flakes strewn over it and often many grouped together, and sometimes a few implements of a rough and rather doubtful description were found' (1923, 13). In a section drawing at the eastern end of the cutting (at C20 line Y) a cluster of irregular symbols on the bottom almost certainly represents struck flint. A grid plan in the archive records Y3–Y5 on the bottom and for a few inches above many flint flakes. Eleven antler picks were found, and one antler which was apparently not utilised (*ibid*). Animal bones also occurred in the primary fill at the eastern end of the segment, including four phalanges of unspecified species and possible pig bones (grid of third excavation in archive, finds noted as 'mostly near to or on the bottom').




Segment 14 looking west into Segment 15

© Society of Antiquaries of London

*Fig 44 The Ditch, phase 1, Segments 16 and 17*

***Segment 16***

This segment (excavated as part of the 1924 C26) was quite clearly defined as a pit 'similar to those found on either side of the N.E. causeway' (18/7/1924). On the western side of the segment Hawley notes a 'smooth incline with steep slope which seemed as if it might communicate with a pit beyond to the west' (*ibid*). In this he was correct, as it later became clear that there was another segment in that direction (ie Segment 17). The Ditch bottom in Segment 16 was 57in (1.44m) deep in the centre from ground level and it had risen from the depth in section 1 of this cutting (ie the western end of Segment 15). In section the Ditch is clearly wide and flat-bottomed; the published account describes this segment of the Ditch, which had previously been *c* 5ft (*c* 1.5m) below the surface, as rising to a higher level and 'entering a long and roughly oval-shaped crater with a smooth floor. The side was very steep, especially at the rampart, where it was almost perpendicular' (Hawley 1926, 3).

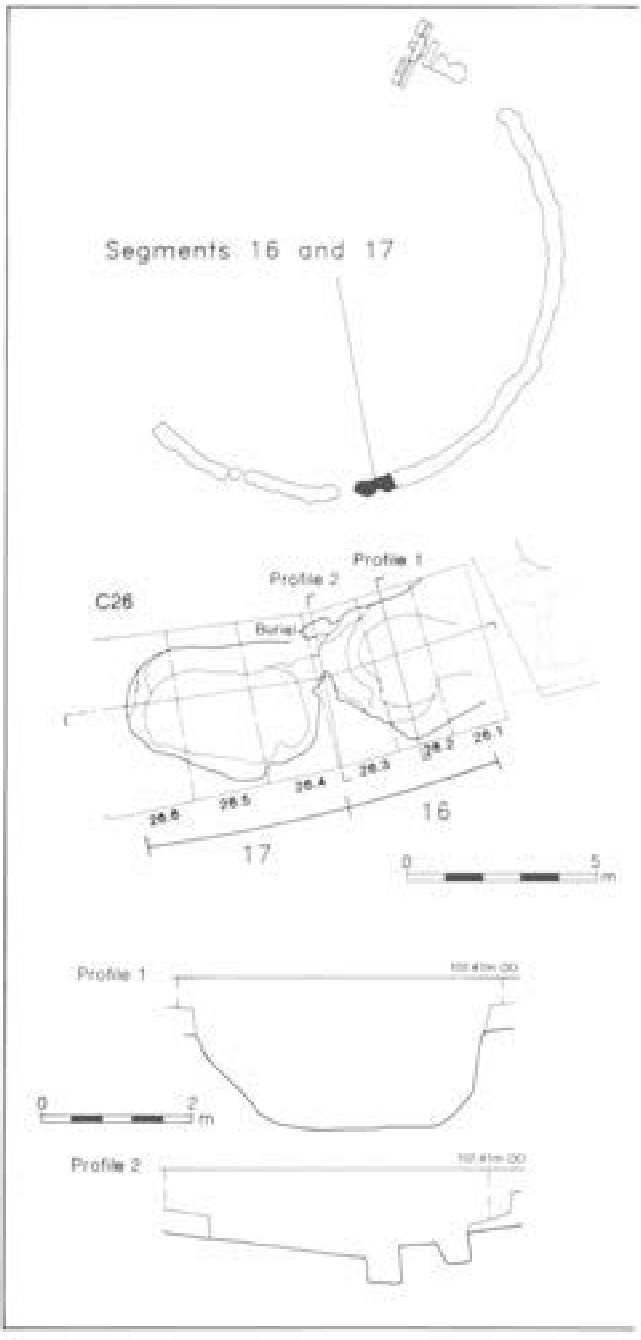
There is no description of a primary fill and finds seem to have been sparse. This cutting was not recorded with a grid and it is therefore even more difficult than in the gridded cuttings to assign finds to layers. It is likely that some, and possibly all, the flint described as on the bottom was within the primary fill, although the 'silt' (probably secondary fill) extended to the bottom, at least in the middle of the segment. Hawley notes 'a great mass of chips which covers it' [the bottom] (16/7/1924). Some of the antler recovered from this segment may be in primary fill but it cannot be assigned to it with confidence.

***Segment 17***

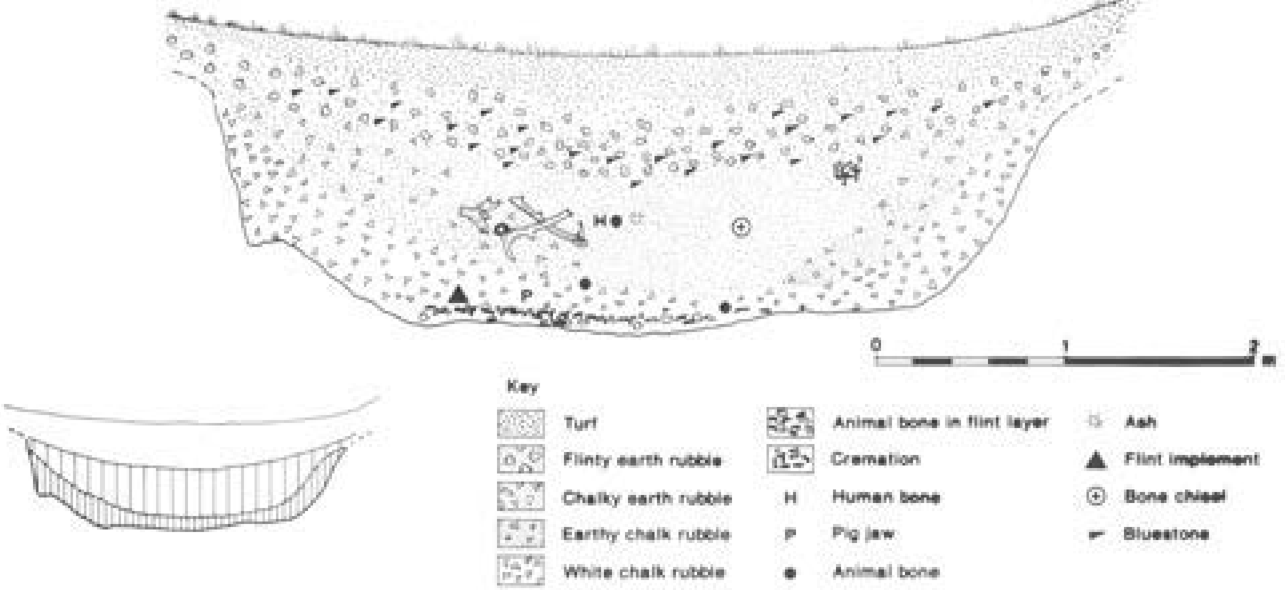
On the eastern side of this segment there was a clear dividing ridge between it and the previous segment (16) formed by a slightly curved barrier of chalk about 3ft (0.9m) high, extending across the ditch from both sides. 'There was a gap in the top of the barrier a short distance from the rampart side, the sill of it being 2½ft [0.76m] from the ditch floor' (1926, 4). The excavation of the segment seems to have been undertaken in three parts once the turf had been removed (sections 4, 5, and 6). This segment is referred to by Hawley as his 'second crater', and described as 'rather rounder in shape [than the previous 'crater', Segment 16], with a flat smooth floor, and a foot higher in level than the first crater' (1926, 4). This segment and the preceding one are illustrated empty in Hawley 1926 (plate iii, fig 1). Crater 2 is also illustrated in an unpublished section drawing almost certainly by Newall (see phase 2, Segment 17).

Clean chalk rubble (2473) was noted at the sides of the segment, contrasting with loose dirty chalk rubble (2472) in the middle, the change between the two being noted as abrupt (21/7/1924). This contrast may be taken as an indication that the segment was disturbed during or after the formation of the secondary filling with the dirty chalk rubble being redeposited primary fill. The clean chalk rubble at the sides is clearly undisturbed primary fill. In addition a more compacted earthy chalk rubble (2474) was met with along the east 'all along from the sides to middle without change except at the extreme north side' (*ibid*); this refers to the first section opened, as illustrated. It is difficult to reconcile these descriptions with the section drawing which seems to show a more silty upper fill, the convention for chalk rubble not being used in the upper fill in the middle, although it is shown mixed with the silt convention at the sides.

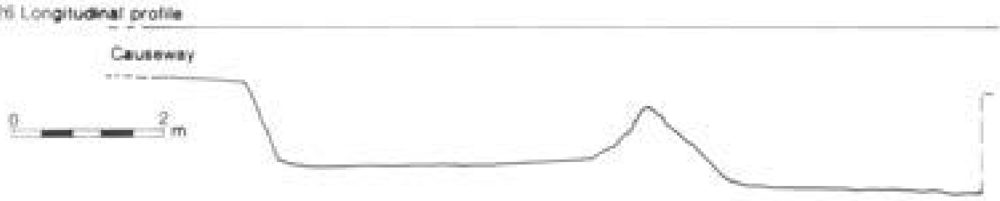
Finds seem to have been more frequent than in the previous segment although it is again difficult to assign finds to specific fills with confidence. The layer of flint 'chips' which Hawley notes as a usual occurrence in this length of Ditch was present in the eastern part of the segment (3670) but became 'very attentuated' towards the terminal (24/7/1924). It is illustrated in the section drawing as lying on the bottom, beneath primary chalk rubble. Animal bones which seem to have been in the primary fill include a 'large ox bone and portions of a pig jaw with teeth at 43 [in] below ground level' [1.09m] (21/7/1924), probably in the eastern part of the segment, and 'a large jaw bone of an ox with teeth was found on the bottom of the north side' (*ibid*). The latter is dated by radiocarbon to 3350–2920 cal BC (OxA–4834, 4460±45 BP). Hawley suggests that it might belong to the same animal as the bones found previously (*ibid*), which suggests that they were not in very different fills. The jaw bone was found while finishing the segment, implying that it was close to the causeway (24/7/1924).



C26 Section 26.5




C26 Longitudinal profile




Segment 16 looking west towards Segment 17 and southern causeway

© Society of Antiquaries of London

*Fig 45 The Ditch, phase 1, Segments 18–20*

***Segment 18***

This segment (also excavated as part of C26) was similar in depth and shape to the eastern terminal of the Ditch on the opposite side of the southern causeway. Its floor is noted as particularly flat and wide (29/7/1924).

Coarse chalk rubble (2480) is noted on the bottom but the concentration of struck flint which Hawley usually terms the 'flint layer or chip layer' was not as clearly defined here as it was elsewhere, although it did occur. An ox jaw is noted on the bottom and this has now produced a radiocarbon date of 3340–2920 cal BC (OxA-4835, 4455±40 BP). The only other finds which can certainly be assigned to the primary filling are two antlers (29/7/1924).

***Segment 19***

This segment was excavated in two seasons, in 1924 as part of C26, and in 1926 as part of C29. In the published account of the 1924 excavation there is little description of this segment, Hawley noting only that to the west of the western terminal of the Ditch (Segment 18) the Ditch continued its 'normal course' (Hawley 1926, 5). The photograph of this length of Ditch after excavation confirms that it was relatively undifferentiated west of Segment 18 (Hawley 1926, pl III; opposite). The longitudinal section also illustrated in the published report shows a very slight rise in the Ditch floor in the area between Segments 18 and 19 but there is no distinct ridge such as that between Segments 16 and 17.

A published section drawing from the end of the excavation in 1924 shows a section towards the western end of this segment. It shows an apparently natural undisturbed primary filling of chalk rubble below undisturbed secondary filling.

The features of this segment which have been taken to demarcate it from the length of Ditch to its west are the fact that the Ditch narrows markedly in plan and that there appears to be a step in the Ditch bottom on the MoW plan; the line of the putative step curves markedly and this increases the impression that this was the end of a segment. Although Hawley also comments that the floor in this section is fairly level the plan shows that there was a clearly recognisable change in the Ditch floor at around MoW profile line 3 and this, combined with the difference in depth between profile 3 and profile 4 in the next segment, hints that there was a step at this point. Hawley notes that the sides 'are rather steep' (1/7/1926) and this is borne out by the MoW profiles (2 and 3).

The other notable feature of this segment is what is termed a 'recess' by Hawley (2853), and described as 2ft (0.6m) wide and recessed 20in (0.50m) into the exterior side of the Ditch (1928, 160; 1/7/1926). In front of it in the floor of the Ditch was an irregular feature (WA 2855) 1ft wide (0.30m) and 8in (0.20m) deep.

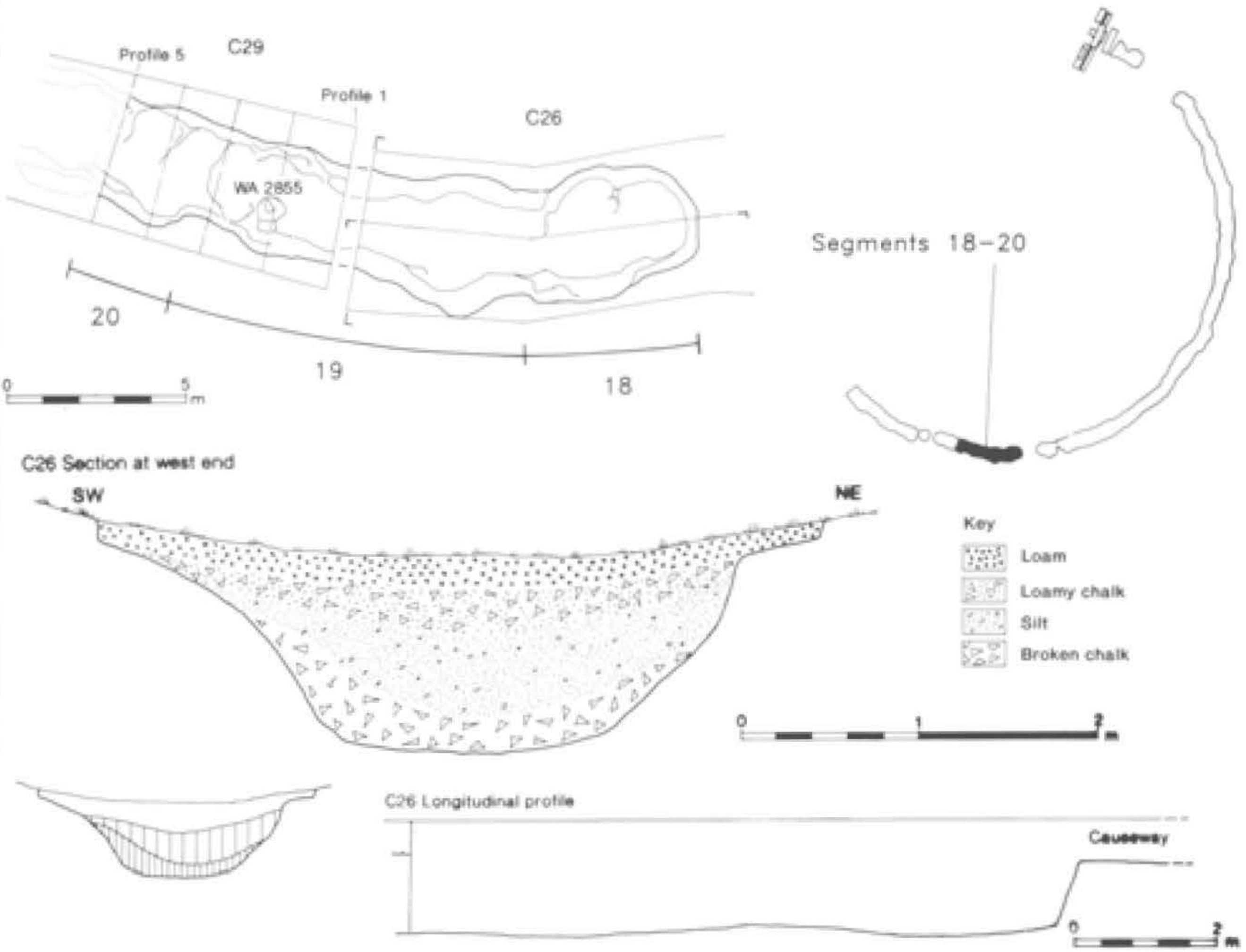
Within this segment, and probably extending some way into Segment 20, a fire stain (2850) was found on a hard chalk surface (2852)which was initially taken as the Ditch floor (but is not visible in the drawn section). It was 2–3in (0.05–0.08m) thick and 4ft (1.2m) by 2ft (0.6m) in plan, lying diagonally across the Ditch. Its exact position is not certain, but as it was *c* 5ft (1.5m) north-west of the recess it must have lain at least partly in the segment, probably extending for a short distance into the next (20). Half a flint axe was found about 2ft (0.6m) from the northern end of the fire stain and in the primary chalk below it were '2 rough flint cores, also a roughly made, rather round, implement' (1/7/1926; 1928, 160). This may have been in this segment or in Segment 20. The fact that this feature may have extended into more than one segment does not militate against the reality of the segments, as by the time the burning took place the primary filling had already formed, indicating that some years had passed since the segments had been dug. Hawley comments that the hard chalk layer on which the fire stain lay was so compact that it was at first taken as the Ditch bottom, the real base of the Ditch being found later a further 9in (0.23m) below it (1/7/1926; 1928, 160). Within the chalk rubble underlying the 'fire stain' was a void 2–3in (0.05–0.08m) in diameter and a minimum of 55in (1.39m) long, interpreted by Hawley as the hole left by a stick which had decayed. It passed out of this section of the excavation into the next (and must therefore have lain partly in Segment 20) but is not mentioned in the following section, which was excavated subsequently. A similar void was noticed running away from the fire stain, also within the chalk, but it extended for only a short distance (1928, 160). It is impossible to be certain of the nature of these features, but it is possible that Hawley's interpretation is correct.

Either in this segment, or in Segment 20, or more probably in both, Hawley recorded six antler picks and two upper parts of antlers from the Ditch bottom. There does not seem to have been the usual spread of struck flints along the bottom although Hawley notes that there were some 'in the silt a little above it' (1928, 160). 'Silt' is usually used to indicate the earthier upper fill, but occasionally Hawley seems to use it to mean any Ditch fill and it may have that meaning here. It seems safer to conclude, however, that there was little or no struck flint in the primary fill, with the exception of the pieces mentioned in connection with the fire stain.

***Segment 20***

Excavated as part of C29, this segment comprised the short length of Ditch bounded to the east by the possible step at the end of Segment 19, which is suggested by the MoW plan and by the slight rise in the Ditch floor shown in the MoW profiles (3 and 4). To its west, the Ditch is described as having a semicircular recess or bay 6ft 6in (2.0m) wide with [internal] projections on both sides (1928, 160) and this is taken as largely forming the southern side of this segment. The description of the Ditch is difficult to interpret along this length, particularly as the Diary appears not to have been written up while the excavation took place, most of the description occurring as a single entry (1/7/1926) which is given a date at the start of the excavation. The publication notes the first 'section' (which is *c* 20ft (6.1m)) as ending at a 'semicircular recess or bay 6ft 6" [2.0m] wide and with projections on both sides' which appears to fit the plan of the Ditch as indicated opposite, since the first section certainly ended halfway between profile lines 4 and 5.

The finds in the primary filling of this segment cannot be separated from those in the segment to the east, in the western part of Segment 19, but they seem likely to have included antlers.




Segment 18 and southern causeway looking east. In background section probably through western end of Segment 15

© Society of Antiquaries of London

*Fig 46 The Ditch, phase 1, Segments 21–23*

***Segment 21***

Excavated as part of C29, the eastern limit of this segment appears to have been at a slight step in the Ditch floor where the Ditch also narrows in plan; Hawley notes that there could have been a former 'barrier' separating segments at this point (1/7/1926). This change in depth shows in the difference between MoW profiles 4 and 5. Profile 6 indicates that Segment 21 was shallower than Segment 20. Hawley notes later in his description that 'the floor is wider and more level than in former excavations and the sides steeper' (1/7/1926). Near the middle of the segment depth is noted as 40in (1.02m) (1/7/1926). The bottom of the segment was covered by the layer of clayey silt (2868) or 'trampling' noted elsewhere and there was a concentration of struck flint within it. There appear to have been no other finds which can be assigned to the primary filling. There was a fire stain (2865) directly on the hard white chalk rubble (2867) of the primary fill. It is described as in brown chalky silt (2866) but resting on the chalk rubble. It was *c* 1ft (0.30m) wide and 1½in (0.04m) deep and contained no finds. It lay close to the northern edge of the Ditch at the end of the segment nearest the causeway. As its height above the Ditch floor is given as 7in (0.18m) this also provides the depth of the primary fill at this point.

***Segment 22***

Excavated in 1926 as part of C29, this segment was very clearly separated from the rest of the Ditch by a causeway of solid chalk 3ft (0.9m) wide to the east, and by a ridge of chalk as high as the chalk surface but with a narrow gap in it joining the two segments to the west. The gap was 3ft (0.9m) wide at the top and extended downwards for 18in (0.46m), ending 20in (0.51m) above the bottom (MoW, profile 10). The segment was circular and narrower than the Ditch to its west (Fig 36). It was 6ft (1.8m) in diameter at the bottom and formed a nearly circular hole from there to the top.

There is little detailed information about the filling of this segment except for the finds, and no description of any chalk rubble primary fill. The published account notes that 'on the bottom were a good many flint chips, and a well-formed flint implement 3½ [0.08m] long with a rounded front edge, the chipping along it continued along both sides. There were also two large pieces of the upper ends of antlers, one of which was patinated and a great deal burnt' (1928, 162). Neither the antlers nor the ?scraper or other flint remain in the archive. The Diary description of this length of Ditch is difficult to interpret and could be read as indicating that this segment held the ox skull which has produced a radiocarbon result (OxA-4842, 4520±100 BP). Careful reading of the Diary and the published account, however, makes it clear that the skull was from the next segment to the west (23).

***Segment 23***

This segment was excavated in 1926 as part of C29. Hawley's description of this segment and those following it to the west is more than usually difficult to interpret but it is clear that the Ditch seemed to have been dug in recognisable segments, indicated by Hawley's use of the term 'bays'. He noted this segment as a large wide bay. Its most notable aspect was a large feature cut down into the silt apparently containing a very large ox skull at its base (1928, 163). The feature ('cavity' in Hawley's description) was 'bowl shaped', extended almost to the bottom of the Ditch and contained nothing which could date it to what Hawley termed the 'Stonehenge period' (ie the period of the construction of the stone monument).

The early radiocarbon date which has now been obtained for the ox skull (OxA-4842; *see above*) raises the question of whether it could have lain below the feature, rather than within it. The exact description of the deposit allows this as a possibility but does not confirm it: 'At the bottom of the cavity, which was practically the Ditch bottom, there were many pieces of a very large ox skull. Some of them were put together by Mr Newall. Expert opinion identified them as belonging to an adult of *Bos primigenius* and a calf. Near the skull traces of fire [2881] were seen and in it fragments of charred wood, the black stain of it extending up the south-east side of the cavity' (1928, 163). It seems fairly clear that the burning and the feature were part of the same event but the condition of the skull hints at it not being *in situ*. Hawley's comment that Newall was able to put together some of the pieces indicates that it was a single skull represented by the 'many pieces'. The phrasing of the description implies that it was found in pieces rather than broken during excavation. Hawley generally appears to have been honest about damage occurring during excavation. It would seem then that the skull was discovered 'in many pieces', and the likeliest explanation for this would be that it had been disturbed by a later feature. The Diary entry adds the further detail that the cavity extended to within '2in [0.05m] of the bottom' (1/7/1926), which would certainly have been deep enough to disturb completely a skull in that position. A further indication is given by the description of the feature's fill as including a little chalk (1928, 163). The skull fragments have been identified (*Chapter 9*) as being from a young domestic bull; no calf bones are present in the surviving collection.

The remainder of the segment seems to have fitted the usual pattern with 'a good many flint chips in the usual muddy stratum and a large thick horn pick with the front side worn away.' The muddy stratum (2883) can be presumed to be the soil layer beneath the primary chalk rubble. The only Diary comment on the primary fill follows the descriptions of the 'cavity' containing the ox skull. Hawley here, as is characteristic of his writing, reverts to a feature he has mentioned earlier, the ridge of chalk with a small gap between Segments 22 and 23, and fills out the description: 'It is narrower than the first [that between Segments 22 and 21] and there is a narrow opening in it connecting it with the Bay East of it. The chalk is sloped up from the floor of the Bay towards the opening. A very thick ruined pick was found on the S side of the opening on the bottom of the Bay and there were a good many flint chips on the floor. There is but little stratification here and what there is appears horizontal. The soil is earthy chalk with clean chalk at the sides' (1/7/1926). Clearly the primary filling (2884) was, as usual, of clean chalk rubble.

The west end of the segment seems to have been marked by a slight ridge ('ledge', 1/7/1926), running diagonally, which seems to be more or less along MoW profile line 12. Hawley comments that this created a narrow 'bay which was actually a part of the big one' (1928, 163) but on the criteria for demarcation used here this is considered to mark the end of a segment, as it marks a change in the appearance of the Ditch and possibly a former dividing ridge between segments. This possibility is further supported by the published isometric drawing of this length of Ditch (Hawley 1928, fig 2), which shows Segments 22 and 23 empty, and Segment 24 half-empty. There is quite clearly a narrowing of the Ditch between 23 and 24 at the point at which the ridge also crosses the floor. It is also clear in the foreground of the original of the section by Newall, in which the section itself lies in Segment 24.

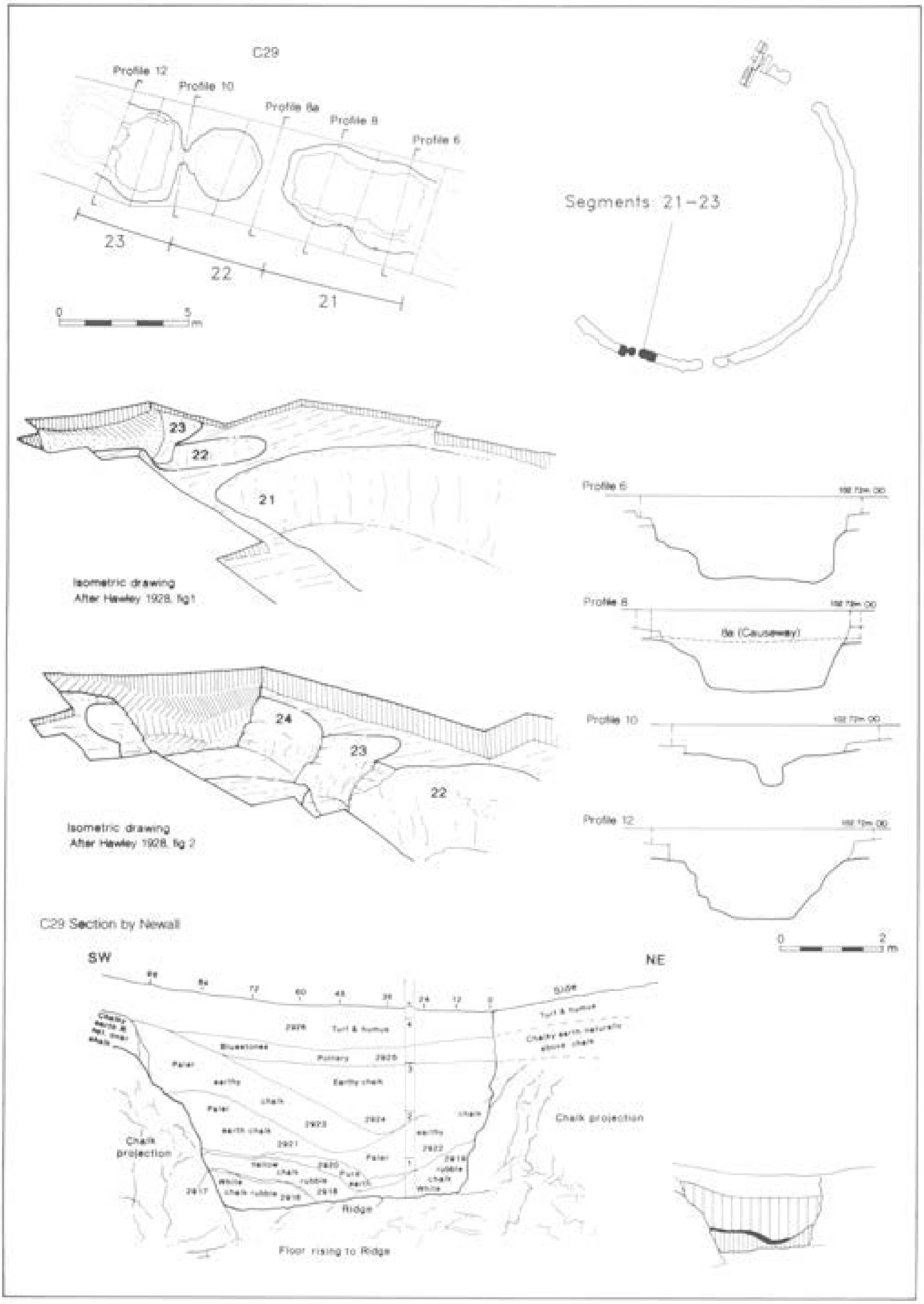

C29
Profile 12
Profile 10
Profile 8a
Profile 8
Profile 6
23
22
21
0
5
m
Segments: 21–23
23
22
21
Isometric drawing
After Hawley 1928, fig1
Profile 6
Profile 8
8a (Causeway)
Profile 10
Profile 12
24
23
22
Isometric drawing
After Hawley 1928, fig 2
C29 Section by Newall
SW
NE
0
2
m
Turf & humus
Bluestones
Pottery
Earthy chalk
Paler
earthy
chalk
Chalk projection
Chalk
projection
Ridge
Floor rising to Ridge

*Fig 47 The Ditch, phase 1, Segments 24–28, C49*

***Segment 24***

This segment was excavated in 1926 as part of C29 (Hawley's Bay 3). The description of the Ditch west of the segment with the ox skull is difficult to disentangle in detail though the general picture is clear. The division into segments is therefore tentative, although the segmental nature of the Ditch is beyond dispute as it is commented on by Hawley on more than one occasion.

This segment is illustrated partially emptied in Hawley 1928 (fig 2), where a section is also drawn.

The division between this segment and the one to the east also shows clearly in the original of the published section drawing by Newall, where the ridge and projecting sides can clearly be seen (opposite). The section also shows the typical primary filling, with the organic horizon ('pure earth' in Newall's annotations) above it, just as it appears in the section drawings of 1954 and 1978 from C41 and C42 further around the Ditch circuit (Fig 36). The diary also describes the organic horizon (2888) 'a black line of matter extending from side to side' (1/7/1926).

***Segment 25***

(Hawley's Bay 4). There is little detail about this segment (excavated in 1926 as part of C29) except for Hawley's comment that it was smaller than the one to the east (Segment 24). There is no explicit description of the primary filling, but 'the upper fragment of an antler was found on the bottom much burnt and there were 2 much worn picks and a few flint flakes' (1/7/1926). It is difficult to reconcile the published report and the Diary but the Diary account seems clear and it may be that in the published account Hawley simply overlooked this unremarkable segment.

***Segment 26***

(Hawley's Bay 5). This segment (excavated in 1926 as part of C29) is difficult to identify with certainty because the published account, the Diary, and the MoW plan are not in accord. As Bay 6 is the wider end of Segment 28, judging by the width given for Bay 6 (1/7/1926), Bay 5 must include 27 and probably 26, as it is described as longer and broader than the bays to the east. If the MoW plan is taken as an accurate portrayal of changes in the plan and floor level of the Ditch it is possible to identify seven segments westwards, counting Segment 22 as the first one. Hawley certainly counted the segment east of the ridge with a cut in it (ie certainly the ridge between Segments 22 and 23) as the first Bay (1/7/1926) (and therefore Segment 22 is Hawley's Bay 1), and the distinctively wide Bay 6 seems to be clearly part of Segment 28, so of necessity one of his 'Bays' must include two of the putative segments which can be identified in plan.

The most obvious Bay in which two segments can be suggested is the long 'hour-glass' section (here Segments 25 and 26), but Segment 25 can only be 'Bay 4', noted (in the Diary only) as smaller than the one before. In any case the first three Bays are fairly easily identified. Bay 5 would seem, therefore, to include two of the putative segments, as it was described as 'longer and broader than any of the former ones' (1/7/1926), and given that Bays 1–4 can be identified, it probably comprises Segments 26 and 27. There was a distinct rise in the Ditch floor between Segments 26 and 27 (compare profiles 16 and 17) and this may be the change in level which Hawley alludes to in describing 'a long bay, much higher than the last' (1928, 163).

***Segment 27***

There is little available detail for this segment, which was excavated in 1926 as part of C29. Its western end was marked by a 'low barrier across the ditch ... where there are slight projections on the sides' (1/7/1926). There was also certainly a difference in height between its floor level and that of the segment to its east (*cf* MoW profiles 16 and 17). There may also have been 'projections' from the Ditch sides at this point, as suggested by the MoW plan and Hawley's description (1928, 163–4). In addition it would seem to have been in this segment that 'on the bottom there was much burnt antler and two horn picks, but there were very few flint flakes in the lower stratum' (*ibid*).

***Segment 28***

The final segment to be excavated by Hawley (part of C29) is the longest in this sector of the Ditch and appears to mark a change in the way the Ditch was originally dug. The floor of this segment was level with the top of the step up from the segment to the east (27) and it continued more or less at that level throughout (profiles 18, 19, and 20). The sides were more or less vertical and the width was *c* 14ft (4.3m) in the east, contracting to *c* 9ft (2.7m) where the excavation ended in the west. It was also very shallow, only *c* 2ft 7in (0.8m) in depth towards its eastern end and about 18in (0.5m) at the end of the excavation.

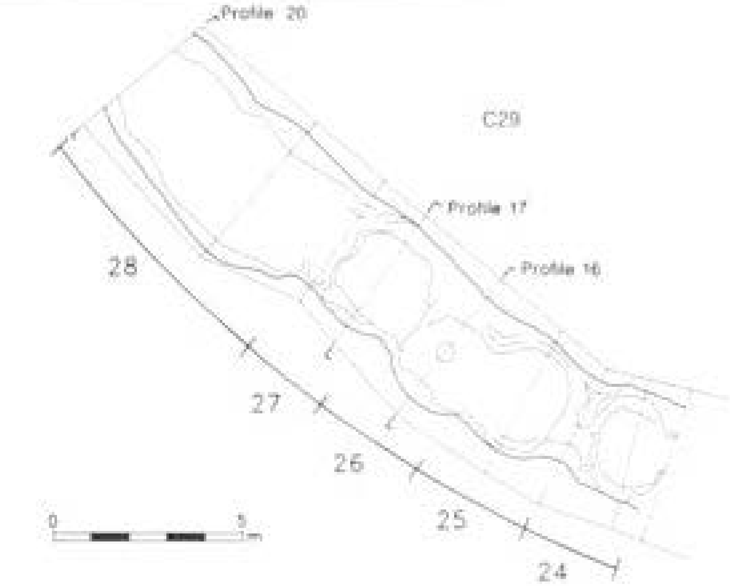
Hawley notes that where the Ditch passed out of the excavated area it appeared to be set to continue at the same shallow depth but that probing beyond the end of the excavation indicated that within a short (unspecified) distance it was of a more typical depth.

The Ditch underlay the former roadway through the monument, a fact which Hawley took to account for the great hardness of the Ditch filling here. There is little observation of the primary filling in either the Diary or the published report although he does note that 'the level chalk bottom looks as if it had been patted down by feet passing over it' and there were 'a few flint chips on the bottom', the latter throughout most of the length of the segment (1/7/1926; 1928, 164–5).

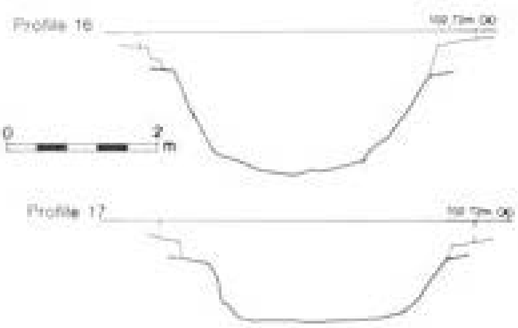
***C49 (not assigned a segment number)***

Cutting 49 was a small trench (Fig 36) 10ft by 3ft (*c* 3m by 0.9m) running longitudinally and excavated in 1956. The excavation was undertaken too late to be included in Atkinson's *Stonehenge* and is not mentioned in the 1979 Appendix on later work. There is no trench plan but a section drawing (Archive drwg no 256) survives. The section shows coarse rubble fill at the base, more compact coarse fill above, and rainwash, fine chalk rubble and earth, and turf above that.

The majority of the finds from this trench were recovered from the topsoil and Stonehenge Layer. A few appear to come from the secondary fill (*see Chapter 6*). Two fragments of antler are depicted on the section drawing within the coarse rubble fill (3248 and 3249). These do not appear to have been retained.

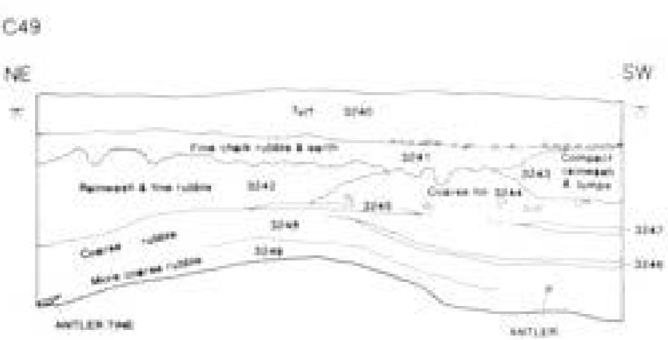


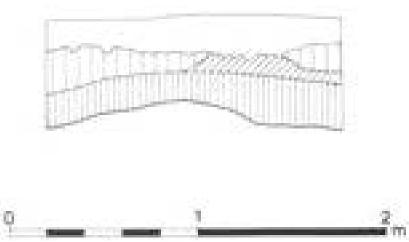



© Society of Antiquaries of London

Looking east along Segment 27 to Segment 22 and possible entrance causeway



**Stratigraphy**

The duration of phase 1 has been taken as the period during which the Ditch was dug, the primary chalk rubble filling entered the Ditch, and the organic horizon lying immediately above the primary filling formed. Any activity which took place on the upper surface of the primary filling is also within phase 1, and in particular any activity which would have inhibited the formation of the secondary filling, such as trampling and disturbance of the Ditch floor (ie the floor as it stood with the primary filling in place) or cleaning out the Ditch down to or into the chalk rubble. Phase 2 is marked by the changes in practice which led, in some lengths, to clean chalk rubble being deliberately placed in the Ditch and in others to the neglect of the Ditch which allowed the secondary filling to begin to form.

## The Bank and Counterscarp Bank

There is very little available information about the Bank because, unlike the Ditch, very little has been excavated (Fig 48). Hawley's trenching of the Ditch in C18 included a narrow extension (3ft (0.9m) wide) across the Bank from between Aubrey Holes 14 and 15 (Plan 1) and another narrow trench connecting C21 (Ditch) and C4 (South Barrow). Atkinson *et al* opened a wider section across the Bank here in 1954 (C44). Otherwise, the only decription of the Bank comes from John Evans's reopening of C42/43 (C61).

The extension to C18 (C18.2) in February 1920 indicated the Bank to be '18' 6" wide' [5.65m] and '3' 0" (about) high [91m]' (25/2/1920). A few fragments of sarsen and other stone and two pieces of 'B.A.' pottery were recovered. The Diary offers no description of the Bank and the published account (Hawley 1921, 33–4) differs from the Diary: 'We found the vallum to be a very low one of chalk and rubble, only 2 ft. 6 in. [0.75m] high from its crest to the chalk rock. Just under the humus were three sarsen chips, ten of foreign stone, and two small pieces of Romano-British pottery'.

There is virtually no information available for the trench across the Bank contiguous with C18 by Atkinson *et al* (C44). Photographs (Fig 56, *below*) show three possible postholes in the area of the Bank though the stratigraphic relationship is not clear. The presence of bluestone chips in the Bank rubble here seems to indicate some disturbance (*see discussion, below*).

The extension from C21 was made in order to examine the South Barrow. Neither the Diary nor the published account (Hawley 1922, 14) makes much comment on the Bank other than: 'the chalk bank appears to rise perpendicularly from the Ditch and the covering on the Slope is normal' (29/9/1921). Hawley notes in the published account that 'the trench was cut with the object of making certain that the solid chalk level was worked over, and also in case any stratum appearing in the ditch might be prolonged inwards, but they all stopped at the top of the ditch' (Hawley 1922, 14).

Evans describes the Bank sectioned in C61 thus (1984, 7): 'Below the modern turf was bank material (layer 11) to a maximum thickness of 0.15m; it consisted of chalk lumps loosely dispersed in a humic matrix (Fig 48). At its base was a prominent pea-grit horizon' (the buried soil).

Augering in 1994 (Wessex Archaeology 1994a, 6) indicated that the undisturbed Bank on the west side of the monument consisted of 0.12m of 'chalky rubble comprised of medium (and larger) chalk pieces within a calcareous silty loam matrix', again overlying a buried soil (*see Chapter 4 and Fig 34*).

The Counterscarp Bank appears to have been excavated only once by Hawley, in a small extension from C21. He comments that

> in some places the counterscarp [ie the Counterscarp side] has a raised appearance and this small excavation showed it to be due to the presence of large flints about a foot or 14" [0.36m] deep. Flints are nearly absent in the loose chalk of the rampart side, so these may have been discarded on the opposite side, but it is quite possible that they may have been intentionally put there to give a firm bedding to a quickset hedge to form a fence
>
> (Hawley 1923, 14).

The location of this extension is not recorded except that it was towards the end of the excavation (*ibid*) and therefore near the western end of C21.

The Counterscarp Bank was also examined by Evans (1984, 1) and by Wessex Archaeology (1994a, 5). Evans records 'intermittent patches of chalk lumps, not more than 0.03 to 0.05 m thick' with a 'faint suggestion of a buried soil'. The auger core taken in 1994 recorded 0.05m of 'compacted chalk deposit with common small and medium chalk pieces'.

## Cut and primary fill of the Aubrey Holes

*by K E Walker*

In his *Monumenta Britannica* the antiquarian John Aubrey (1666) noted a number of cavities situated at 'intervals inside the circular earthwork' of Stonehenge. Hawley wrote that it was this clue which led hima and Newall to search the area inside the bank for holes, probably using an iron bar (1921, 30). Hawley initially named the holes discovered in this area 'X holes'. His later term 'Aubrey Holes' (after their 'initial discoverer') has become the accepted nomenclature and for ease of reference has been retained for this volume. Pitts has, however, suggested that the cavities noted by Aubrey do not tally convincingly with the Aubrey Holes and pointed out that neither Stukeley nor Cunnington noted their presence (1981, 47).

The Aubrey Holes lie in a circular setting within the monument, roughly 4.9m (16ft) in from the medial line

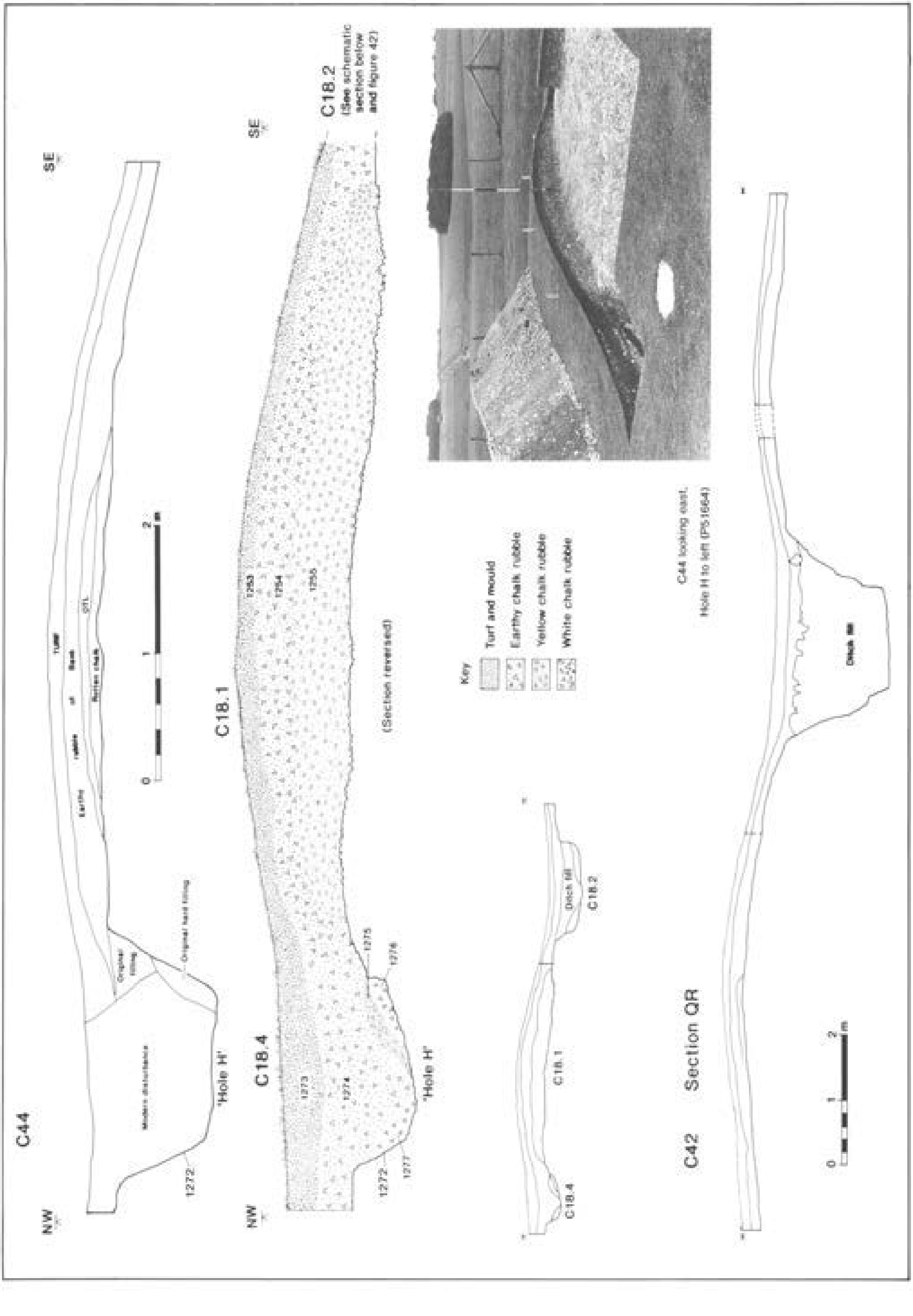



*Fig 48 C44, C18, and C44: Bank sections*

*Fig 49 Aubrey Hole 32 under excavation in 1950 (Atkinson archive, no negative)*

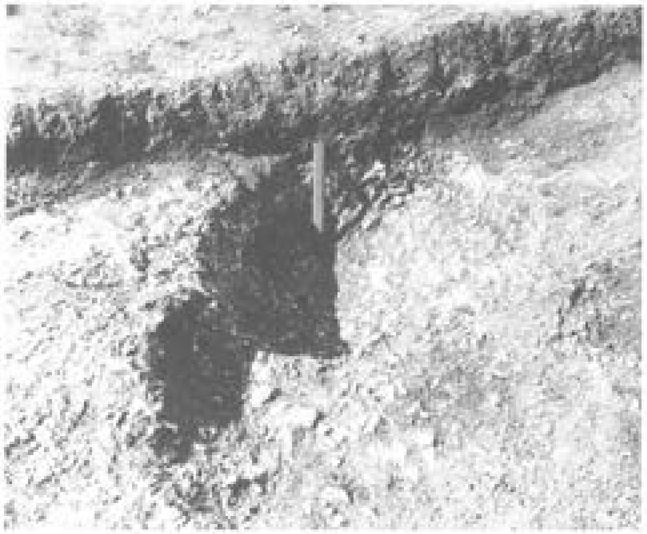


*Fig 50 Aubrey Hole 31 after excavation in 1950 (Atkinson archive, no negative)*

of the Bank. They consist of 56 approximately circular pits or postholes (numbered in the order excavated by Hawley but later renumbered clockwise from the main entrance; *see Fig 13*). The pits varied in size, profile, and depth, average dimensions being approximately one metre in diameter and 0.9m deep (*see below for details*). They were apparently laid out from the same central point as the Bank and Ditch, and lie at intervals of between *c* 4.5–4.8m measured centre to centre.

Thirty-four of the Aubrey Holes are known to have been excavated during the twentieth century. Between 1920 and 1924 Hawley, aided by Newall, emptied 32 of them (numbers AH1–30 and AH55–6). In addition to previously published material, the information presented here is culled from Hawley's Diaries, from an unpublished typed summary transcript ('supplement') probably prepared by Newall from the Diaries, and from those section drawings which survive (Figs 51–5). In 1950 Atkinson, Piggott, and Stone excavated AH31 and 32. The results were published in 1952. It has been suggested that a further Aubrey Hole, AH46, lying within the area enclosed by the North Barrow, may have been excavated in the early nineteenth century by Hoare, who is reported to have found a cremation when digging in the North Barrow (Newall 1929, 82). Summary details of the excavated holes are given in Table 10.

### Date of the Aubrey Holes

The rationale for assigning the digging of the Aubrey Holes to phase 1 is that the centre point of the circle is almost identical with that for the Ditch and Bank (centre point projected from the centre of the Aubrey Holes and approximate centre line of Ditch) but noticeably (if not strictly speaking statistically) different from that of the stone settings, and that it could not have been laid out with any accuracy if there were obstructions in the centre of the monument. It is also probable that the holes held posts rather than stones (*see below*) and they are therefore more likely to belong to an early phase than a later one.

There are no bluestone pieces in the primary filling and even in the upper filling of the holes most of the bluestone appears to be within intrusions. Since the only demonstrable stratigraphic relationship is with the two 'barrows' and there are no radiocarbon dates available from the primary fills (nor any material surviving from which, with present technology, a date could be obtained), it is acknowledged that this dating remains somewhat subjective.

### General description

The detailed descriptions and interpretation of the function and depositional history of the Aubrey Holes are hampered by the paucity of surviving records. Even the diameter of the circle on which they lie is open to differing estimates. It was estimated by Alexander Thom as *c* 86.4m (283.6ft) based 'on all the available holes' as ascertained by probing undertaken by Professor Atkinson and Lance Vatcher (comment by Atkinson in unpublished transcript by Ehrenberg). The published figure of 87.8m (288ft) (Atkinson 1979, 27) is Newall's calculation based on the excavated holes only. The computer-generated diameter is 87.05m. No section drawings have been identified for AH14, 18, 19, 27, 28, 29, 30, or 55. Only AH4 appears to have been planned in detail and only two photographs survive, from 1950 (as prints only; Figs 49 and 50). It should be noted that it is probable that some finds recovered from throughout the hole have been projected onto the section, making the relevant depths and the relationships between finds difficult to judge.

It has been established, however, that the excavated Holes were all approximately circular, though they varied in both depth and profile (Figs 51–5). The diameter of each when measured on the radius of Stonehenge was usually slightly greater (max 1.60m, min 0.74m, average 1.09m) than if measured at right-angles to the stones (ie, 'parallel' with the Ditch; max 1.57m, min 0.74m, average 1.03m). The depth varied between a maximum of

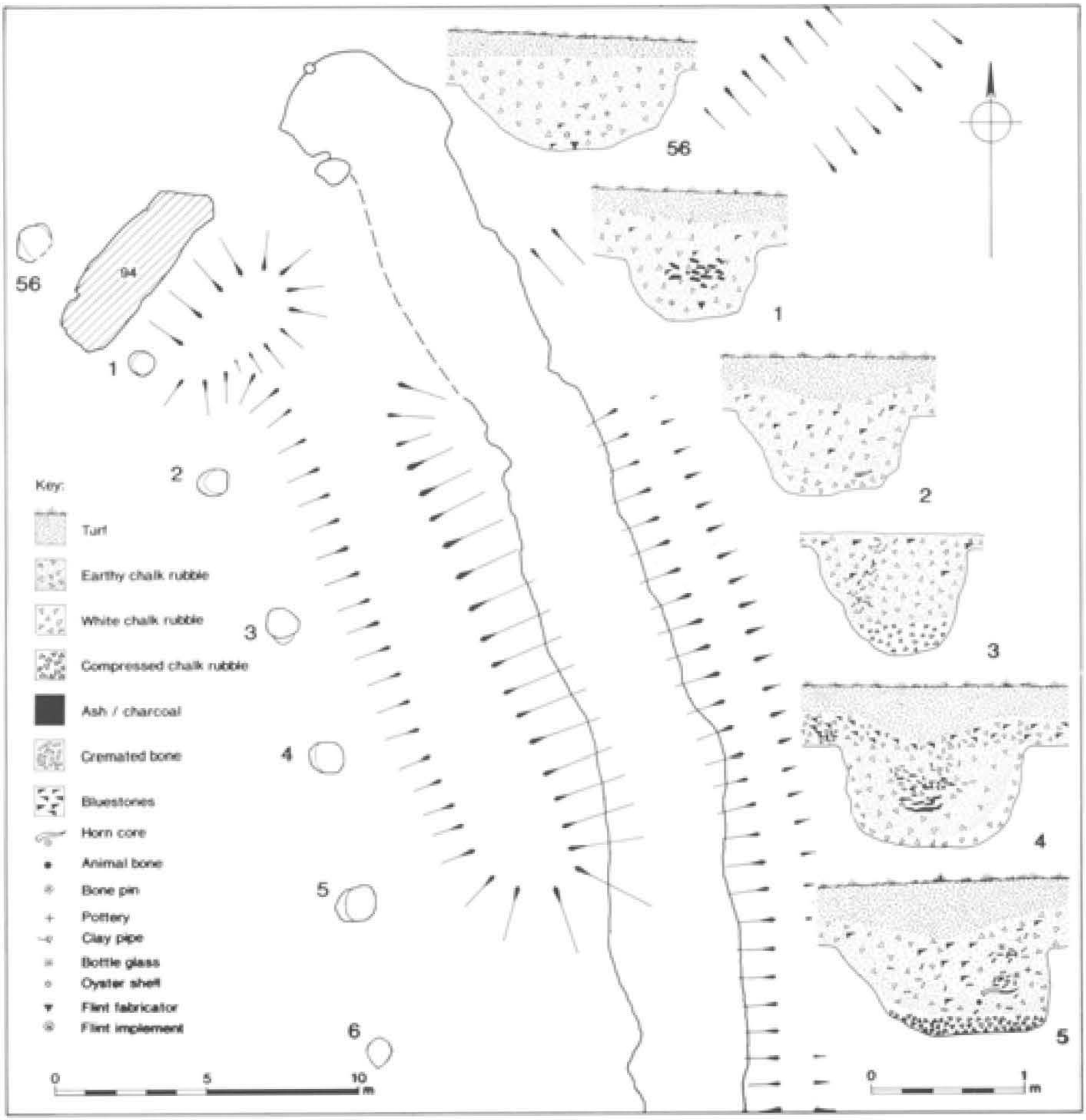



*Fig 51 The Aubrey Holes: section drawings for AH 56, 1–5. Scale of sections 1:40. Note that the orientation of the sections is not certain*

1.14m and a minimum of 0.61m with an average of 0.88m (Table 11). If both sides were not more or less vertical there was a tendency for the inner edge (ie that closest to the stones) to slope more than the outer one. Unfortunately it is not always possible to ascertain the orientation of the drawn sections so it is uncertain whether this was a consistent feature.

It should also be noted that a number of the Holes have been damaged by later activity. AH20 was cut by the ditch of the South Barrow and AH17 and AH18 are described as 'in barrow' (although as there seems to be no surviving 'barrow' mound they should perhaps be seen as enclosed within, rather than overlain by, that feature). AH9 was found to have been previously disturbed and contained modern finds and part of AH56 is recorded as being 'cut away'. Six of the Aubrey Holes (AH3, 6, 23, 27, 31, and 55) have been eroded by post-medieval trackways.

#### Fills

The descriptions of the fills excavated by Hawley show a marked degree of similarity. The lowest fills consisted

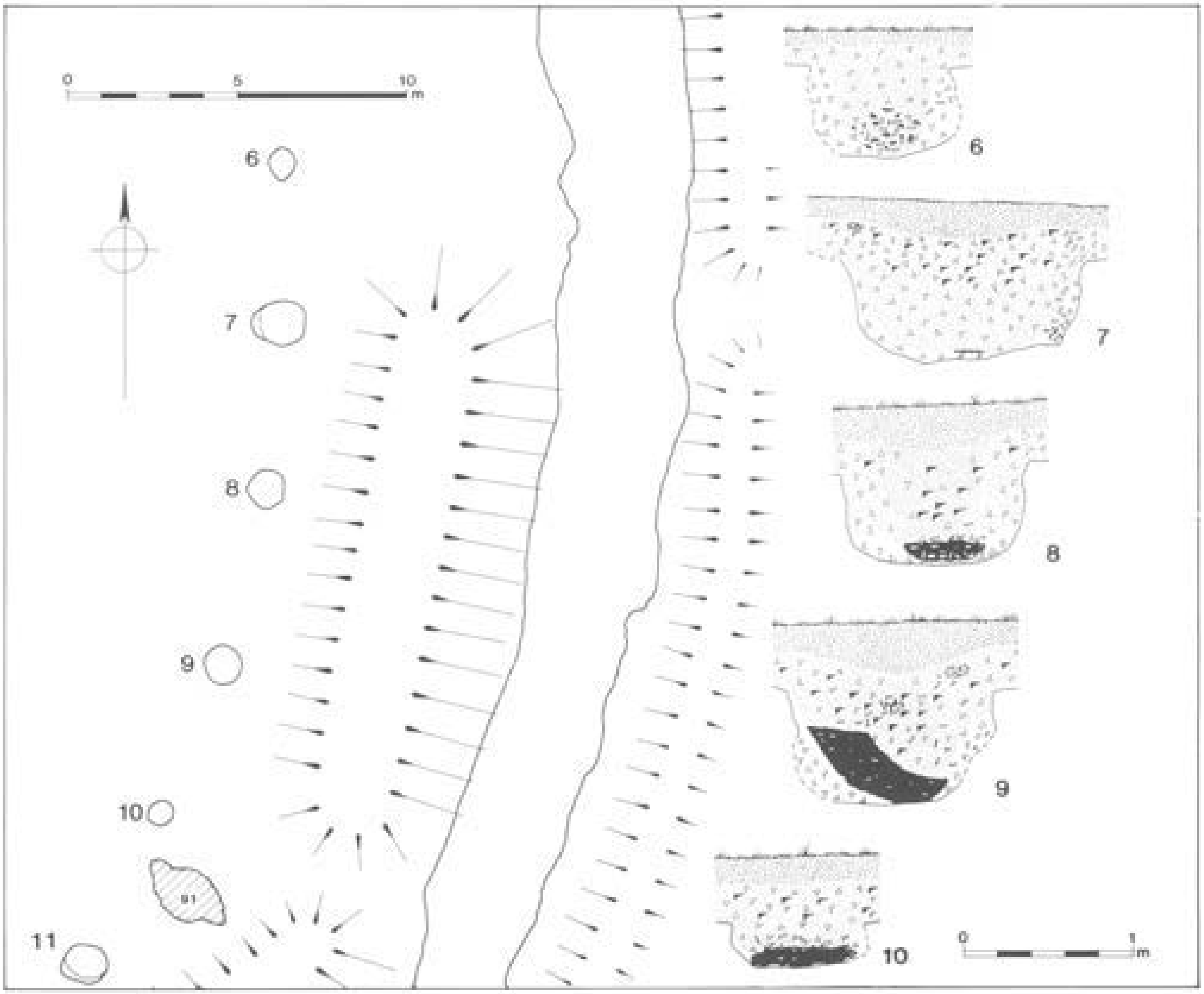



*Fig 52 The Aubrey Holes: section drawings for AH 6–10. Scale of sections 1:40. Note that the orientation of the sections is not certain*

of a (usually thin) layer of clean chalk rubble on the base and/or sides which was generally thickest on the Bank side. Occasionally a very thin grey layer (possibly a wash of chalk, dust, etc, after the first winter) was noted below the chalk rubble (*see below*). The descriptions of the main fills are also similar except where the Aubrey Hole had been previously disturbed; they are described by Lt-Col Hawley as earthy chalk rubble. Of the two holes excavated by Atkinson *et al*, AH31, although eroded by a cart-track, was similar to many of those excavated by Hawley. AH32, however, was rather different, being deeper and larger, with more brown earthy fill cut through a thick layer of the chalk rubble (Fig 49).

The primary fills and possible function of the Aubrey Holes are discussed below, and the secondary fills (*earthy chalk rubble*) and the cremations are discussed in Chapter 6.

**Primary fill:** Clean chalk rubble was recorded on the sides and/or base in AH2, 4, 6–13, 15, 16, 20–26, 31, and 32. If present on the sides it was generally thickest on the outer (Bank) side of the hole. It is possible that this chalk rubble resulted from natural weathering immediately after the holes were dug. It is also possible, however, that the rubble represents the remains of chalk excavated when the holes were dug and returned as packing around timber posts.

A noticeably different, hard, 'compressed' chalk rubble was recorded on the base of AH3 and AH5. Hawley believed this was indicative of rubble being deliberately returned to the hole and lying under a heavy weight (such as a stone or post). A thin layer of grey silt or earth (possibly rainwash) was noted on the very base of AH5 and 32 (and possibly AH29 though here it was described as 'sooty matter').

**Finds:** Very little artefactual material was definitely recovered from the clean chalk rubble and this is limited to antler picks and charred antler from the base of AH5 and AH29 and a fragment from AH2. it is possible that

**Table 10 Details of the Aubrey Holes**

| *No* | *Exc as no* | *Date exc* | *Con-text* | *Max diam (m)** | *Min diam (m)*** | *Depth (m)* | *Description* | *Wood ash* | *Crema-tion#* | *Finds* |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 23 | 29/4/20 | 170 | 0.84 | 0.91 | 0.81 | Regular upright sides filled with earthy chalk rubble | A little | ? | 1 unburnt animal bone, Flint: 3 cores & 2 flakes; Bluestone (20in BGL) |
| 2 | 22 | 13/4/20 | 171 | 1.06 | 0.96 | 0.89 | No description, section shows earthy chalk rubble with small amount of chalk rubble on base (?& side) | – | Y | Antler pick, flint flake, sarsen mauls & chips, RB pottery (22in BGL), bluestone |
| 3 | 21 | 6/4/20 | 172 | 0.97 | 1.01 | 0.76 | Eroded by cart-track. Earthy chalk rubble shown on section, above 'loose chalk returned to hole & compressed' | – | Y | Animal bone, sarsen maul, piece of chalk marked 17 |
| 4 | 5 | 3/3/20 | 173 | 1.14 | 1.06 | 0.99 | Earthy chalk rubble except at sides & base which covered with white chalk rubble | at 21–26in BGL | Y | Animal bone (dog jaw), flint, sarsen, bluestone, RB pottery in upper layer, BA pottery (24in BGL) |
| 5 | 20 | 31/3/20 | 174 | 1.34 | 1.14 | 0.99 | Earthy chalk rubble at 34in BGL above dense hard white chalk 'returned to hole and compressed'. Thin line of earth on base | – | Y | Sarsen, flint, antler, animal bone, bluestone, RB pottery to 24in BGL, burnt bone pins at 17 & 25in BGL |
| 6 | 19 | 30/3/20 | 175 | 0.79 | 0.86 | 0.76 | Eroded by cart-track. Small hole with disturbed upper levels. Earthy chalk rubble in middle, white chalk rubble on sides | A little at 18in BGL | Y | Bluestone over hole but not in it |
| 7 | 4 | 5/3/20 | 176 | 1.35 | 1.35 | 0.91 | Earthy chalk rubble, white chalk on sides | A little on bottom in centre | Y | BA pottery, RB pottery, sarsen flakes & mauls, bluestone inc axe fragment |
| 8 | 18 | 27/3/20 | 177 | 1.04 | 1.04 | 0.91 | Regular shape & upright sides. Earthy chalk rubble, white chalk on bottom rising higher on Bank side | at 27in BGL | Y | RB pottery, sarsen maul, flint core, bluestones to 24in BGL |
| 9 | 17 | 25/3/20 | 178 | 1.17 | 1.14 | 1.04 | ?Disturbed. Large, rectangular, decayed sides, brown earth to unusual depth & stone chips low down. Earthy chalk rubble, white chalk rubble on inner side under ash & some on outer side | Much at 24in BGL on inner side sloping downwards to bottom | Y | RB pottery, sarsen mauls, BA pottery, bluestone, modern bottle corks to 20in BGL |
| 10 | 16 | 24/3/20 | 179 | 0.76 | 0.74 | 0.61 | 'Smallest hole yet opened. Sides slightly decayed by the heat of the fire, the earth being burnt to redness' | *?in situ* burning | Y | Animal bone, antler, pebble, sarsen, bluestone |
| 11 | 15 | 24/3/20 | 180 | 1.22 | 1.09 | 0.91 | Regular with upright sides. Earthy chalk rubble, white chalk on sides | – | Y | Sarsen mauls, antler, flint core, horn core, bluestone |
| 12 | 14 | 23/3/20 | 181 | 1.04 | 0.99 | 0.98 | Earthy chalk rubble. 6in white rubble on side Bank side at bottom. Earth around lowest cremation burnt red | Ash in cup-shaped recess cut into chalk rubble | Y | Sarsen mauls & chips, bluestones, bone pin |
| 13 | 13 | 22/3/20 | 182 | 1.09 | 0.99 | 0.79 | Regular upright sides. White chalk rubble on Bank side | – | Y | Sarsen chips & mauls, bluestone, flint (inc 'fabricator'), bone pin, animal & bird bone |
| 14 | 14 | 22/7/20 | 183 | 0.97 | 0.94 | 0.99 | Regular upright sides | – | Y | Sarsen chips, bluestone, animal bone, flint |

**Table 10 (cont)**

| *No* | *Exc as no* | *Date exc* | *Con-text* | *Max diam (m)** | *Min diam (m)*** | *Depth (m)* | *Description* | *Wood ash* | *Crema-tion#* | *Finds* |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 12 | 19/3/20 | 184 | 1.17 | 1.12 | 0.86 | Regular upright sides, v flat bottom. Earthy chalk rubble, white chalk rubble on Bank side | – | Y | Sarsen chips & mauls, bluestone |
| 16 | 11 | 18/3/20 | 185 | 1.22 | 1.09 | 0.99 | Almost full of black ashy earth. White chalk rubble on Bank side. Base more pointed than usual | More ash than usual | Y | Sarsen chips & maul, bluestone, flint flakes & 'fabricator', BA & RB pottery |
| 17 | 17 | 11/8/20 | 186 | 0.74 | 0.74 | 0.94 | ?Disturbed, in S barrow | – | Y | Sarsen chips & maul, bluestone, flint, animal bone, RB pottery & poss earlier pottery |
| 18 | 19 | 10/7/22 | 187 | 1.09 | 1.07 | 0.89 | ?Disturbed, in S Barrow. Brown earth on top continued down centre of hole nearly to bottom | – | Y | Sarsen bluestone, animal bone, RB pottery, 'bronze' object |
| 19 | 20 | 8/8/21 | 188 | 1.09 | 0.98 | 0.72 | ?Disturbed, cut by S Barrow ditch. | Grey powdery chalk with some burnt wood 8in from bottom | No | – |
| 20 | 2 | 19/2/20 | 189 | 1.22 | 1.06 | 0.94 | Inner side sloping. Earthy chalk rubble, white chalk rubble on sides | – | Y | Bluestone, sarsen chips & maul |
| 21 | 6 | 9/3/20 | 190 | 1.60 | 1.14 | 1.02 | V sloping inner side, top oval, earthy chalk rubble nearly to bottom, chalk sides | Nearly on bottom but not with cremated bone | Y | Sarsen, bluestone, RB pottery, animal bone |
| 22 | 7 | 10/3/20 | 191 | 0.99 | 0.97 | 0.86 | Regular with sloping inner side. Brown earth near top | – | ?1 frag | Mass of 32 flint flakes, some conjoining, sarsen, bluestone, RB pottery, animal bone |
| 23 | 8 | 10/3/20 | 192 | 0.99 | 0.84 | 0.63 | Under cart-track & spoil from Gowland | | Y | Sarsen, bluestone, RB pottery, animal bone |
| 24 | 9 | 11/3/20 | 193 | 1.65 | 1.57 | 0.94 | Sloping inner edge. Lining layer of finely crushed chalk rubble on SW side 'as if subjected to great pressure'. V ashy hole as if fire in it, earth burnt red | Large quantity from 24in BGL to bottom (*oak*) | Y | Burnt animal bone (with cremation), unburnt animal bone, sarsen, bluestone, chalk ball, BA pottery, RB pottery, burnt bone pin |
| 25 | 10 | 12/3/20 | 194 | 1.04 | 1.04 | 0.97 | Regular upright sides. Earthy chalk rubble in middle, white chalk rubble on sides increasing in thickness to *c* 12in on outside | – | No | sarsen, bluestone, worked chalk, flint |
| 26 | 1 | 19/2/20 | 195 | 0.99 | 0.91 | 0.86 | Small, sides fairly regular but inner one sloping. Earthy chalk rubble. (Section shows thin layer chalk rubble on base) | – | ? | Sarsen, bluestone, flint, animal bone, ?bone pin described as queer fossil (*see Chapter 9*) |
| 27 | 27 | 12/7/21 | 196 | 0.86 | 0.86 | 0.74 | Disturbed, on cart-track & emptied earlier | – | – | Bluestone, shale, brick |
| 28 | 28 | 12/7/21 | 197 | 0.91 | 0.97 | 1.07 | Fairly regular. Sides seemed weathered as if left open. Inner edge slightly curved. Humus extended deeply into centre | Patch of burnt wood at 33in BGL, 9in wide & 2–3in thick | Y | Sarsen, bluestone, animal bone, RB pottery |
| 29 | ?29 | July-Oct 1921 | 198 | 1.02 | 0.94 | 1.09 | Deeper central humus. Earthy chalk rubble | Sooty matter at base | Y | Sarsen maul, bluestone, ceramic object, flint, antler, charred antler, animal teeth |

**Table 10 (cont)**

| *No* | *Exc as no* | *Date exc* | *Con-text* | *Max diam (m)** | *Min diam (m)*** | *Depth (m)* | *Description* | *Wood ash* | *Crema-tion#* | *Finds* |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 30 | 6/8/24 | 199 | 0.96 | 1.09 | 0.91 | Humus extended to 23in BGL, earthy chalk rubble to 29in. 'Hard mass of silt had come down SE side, probably from the rampart' | Much black ash on W side and across whole base | No | Sarsen, bluestone, shale, RB pottery, flint |
| 31 | – | 1950 | 200 | 0.76 | 0.76 | 0.69 | Worn by cart-track. Small, roughly circular, bowl-shaped. *See notes for fill descriptions* | – | No | Sarsen, bluestone |
| 32 | – | 1950 | 201 | 1.82 | 1.47 | 1.14 | Larger & more complex than 31. Bowl-shaped but steeper-sided than 32. *See notes for fill descriptions* | Burnt earth & charcoal | Y | Sarsen, bluestone, animal bone, flint, antler |
| ?46 | – | ?19th century(1) | 215 | – | – | – | No details | – | – | – |
| 55 | XX | 20/11/22 | 224 | 0.86 | 0.97 | 0.56 | Damaged by traffic. 7in of humus and & turf, 4in reddish brown rubble. Earthy chalk rubble in E half/fine dirty chalk in W to 9–10in but did not reach bottom. Dirty chalk rubble on base | Good deal of black wood ash in fine dirty chalk | No | Stone chips & RB pottery over hole |
| 56 | X | 12/5/20 | 225 | 1.32 | 1.07 | 0.71 | V disturbed, prob by Cunnington (1802). S side top cut away | – | – | Bluestone, sarsen, oyster shell, bottle glass, clay pipe, flint |

*Notes:*
*All descriptions are the excavators' own, sometimes abridged. Quotation marks are used to emphasise the excavators' own interpretations*
** = Maximum diameter is taken on the radius of Stonehenge; ** = Minimum diameter is taken at right-angles to radius*
*# = Details of cremations are presented in Tables 57 and 58, Chapter 9*
*(1) Possibly excavated by Colt Hoare in early nineteenth century. Supposed to have found a cremation in the middle of 'barrow 94' (North Barrow) (Newall 1929, 82).*

*BGL = Below Ground Level; RB = Romano-British; BA = Bronze Age*

*AH 31: Fill descriptions from Atkinson = 1) turf/cart-track filling; 2) mould & disintegrated chalk; 5) dark fill of earth, small stones & charcoal – a deliberate filling; 3) earth & chalk (?natural filling); 4) thin layer of compact chalk on the bottom at one side (?natural filling)*

*AH32: Fill descriptions from Atkinson = 1) turf; 2) earthy layer; 5) brown earth filling; 8) yellow stained cone of material (stakehole/solution stain) from (2) into (4); 3) softer chalk fill possibly redeposited material from layer (4) after disturbance; 4) compact light grey chalk rubble — texture suggests rammed when wet; 6) greyish silt on base & slightly up sides with (7) within; 7) chalky veins within (6)*

*AH 19 was incorrectly published by Hawley as no 20 (1923, 15), AH 22 as no 19 (1921, 32) & AH 24 as no 21 (1921, 31)*

two flint implements, from AH13 and AH16, may be from the chalk rubble, but this is not certain in either case as both are shown close to cremated bone in the section drawings (Fig 53). In only one case was cremated bone possibly from a primary context, in AH 32, but this too is doubtful. It is unfortunate that the two most recently excavated Aubrey Holes (excavated by Atkinson, Piggott, and Stone) seem to have been atypical, judging by the surviving section drawings of those excavated by Hawley (*and see Fig 49*). The 'very compact chalk rubble, light grey in colour and with a consistency suggesting that it had been rammed in when a wet pasty mass' (Atkinson 1952, 18, fig. 2, layer 4) from which cremated bone was recovered does not seem to be a similar deposit to the chalk rubble noted from the base of the Aubrey Holes excavated by Hawley. This being so it cannot be regarded as a certainly primary deposit. The separate cremation burial in this Aubrey Hole is not primary, as it lies within a feature cut partly into solid chalk and partly into the compact chalky fill.

**Land mollusca:** A series of hand-retrieved snails (identified by Michael J Allen) was recovered from AH16. A total of six land snails surviving in the archive came from the chalk rubble, primary or packing (context 1186): one example each of *Helicella itala* and *Trichia* *hispida* and four examples of *Cepaea* sp (three burnt). These shells are all species that could live in open country and *H itala*, a xerophile, is uncommon in long grass and shady environments.

**Interpretation**

Although there has been much debate concerning the primary function of the Aubrey Holes, re-examination of the original records has failed to resolve the problem and the evidence remains open to differing interpretations. The excavators themselves held both different and changing views which will be discussed below. The Aubrey Holes must, however, be considered within the wider context of the monument (and of contemporaneous monuments). It has been pointed out that we should not assume that there was a single body of beliefs or that meanings were static (Pollard 1994, 22).

Hawley at first proposed that the Aubrey Holes were stoneholes. In 1921 he was in little doubt as to their purpose, writing:

> From their appearance and regularity there can be little doubt that they once held small upright stones.

He noted that

> ... many have the edge of the chalk crater shorn away, or crushed down, on the side towards the standing stones of Stonehenge, this being apparently due to the insertion or withdrawal of a stone, probably the latter.
>
> (1921, 30–1)

Where present on the sides of the hole the thicker deposit of white chalk rubble on the outside edge (nearest the Bank) lent weight to this theory and was believed to indicate that the stone had been removed against the opposite side leaving this deposit undisturbed. The backfilled and compressed chalk rubble in the bases of AH3 and AH5 was thought to have been added to create the desired height for stones whose holes had been dug too deep. This view was accepted by Fellows of the Society of Antiquaries in the discussions which followed Hawley's annual reports (1921, 40–1; 1922, 51).

By 1928 Hawley had established that the Aubrey Holes were earlier in date than the stone monument. He suggested that they might have been dug when the Ditch had already silted up and that a chalk line visible in the Ditch could be upcast from them (though the edge of the Ditch is 6–8m (19ft 6in–26ft+) from them and on the other side of a (possibly) 2m high bank).

> ... if the shallow line of chalk occurring a little below the top of the ditch silt was discarded from them (Aubrey Holes) they would have been made when the ditch was nearly silted up and would antedate the monument by a short period
>
> (1928, 174–5).

The Diary Supplement for AH18, excavated in 1922, comments 'The brown soil on top was continued down the centre of the hole nearly to the bottom ... Also it suggests a decayed post'. This suggests that Hawley had considered the possibility that the Aubrey Holes held timber uprights (*ibid*).

The nearby excavations at Woodhenge undertaken by Mr and Mrs Cunnington between 1926 and 1928 may have helped to shape Hawley's opinions. M E Cunnington argued that there were a number of reasons for considering the Aubrey Holes to have been postholes, believing they were clearly the wrong shape and too small to have held Bluestones: 'Judging from the size and shape of the Aubrey Holes it seems not improbable that they once held timber uprights; the fact that no direct evidence of these timbers has been found is not at all conclusive against them, because in many of the holes at Woodhenge these traces were slight or non-existent' (1929, 29).

Other features of the Aubrey Holes can also be paralleled at Woodhenge. It has been suggested that the position of some cremations (for example in AH3) is indicative of material 'dribbling down' against a decaying post. 'If however, a wooden post stood there, its gradual decay would cause the cremation to dribble down, and the stones and earth at the top would fall in...' (Newall 1929, 83). A cremation in posthole C14 at Woodhenge (the only one from that site) was found in a similar position. Hard compacted chalk (similar to that in AH3 and AH5) was also encountered in posthole C14 but in none of the other postholes at Woodhenge.

Others have agreed with the posthole interpretation. Margaret Ehrenberg suggests (unpublished manuscript) that the Aubrey Holes held wooden posts which were subsequently removed. AH6, 21, and 25 are cited as showing a darker humic fill forming 'almost vertically sided holes, all of very similar diameter (21in/0.5m)'. The problem of the absence of direct evidence for these timbers has been addressed. Ehrenberg suggests that the removal of a post, for instance by rocking it back and forth or in a circular motion, would probably damage the upper profile of the postpipe, or would necessitate digging into the chalk rubble packing, thereby also destroying any profile. A further possibility, that of burning posts *in situ*, has also been discussed. AH10, 16, and 24 contained unusually large quantities of ash and Hawley believed that AH10 showed indications of *in situ* burning. 'Sides slightly decayed by the heat of the fire: earth burnt to redness, causing disturbance to side of hole all round' (24/3/1920). A possible parallel for this is found in the 12 rather irregular pits at Site 3, Dorchester-on-Thames, an egg-shaped circle of postholes, where well defined postpipes containing charcoal indicated that the timber uprights of this site were burnt *in situ* (Bradley and Chambers 1988). The Aubrey Hole section drawings are not particularly supportive of this theory, however, and it seems much more likely that the 'ash' represents pyre debris associated with the cremations (*see McKinley, Chapter 9*). Ehrenberg proposed natural

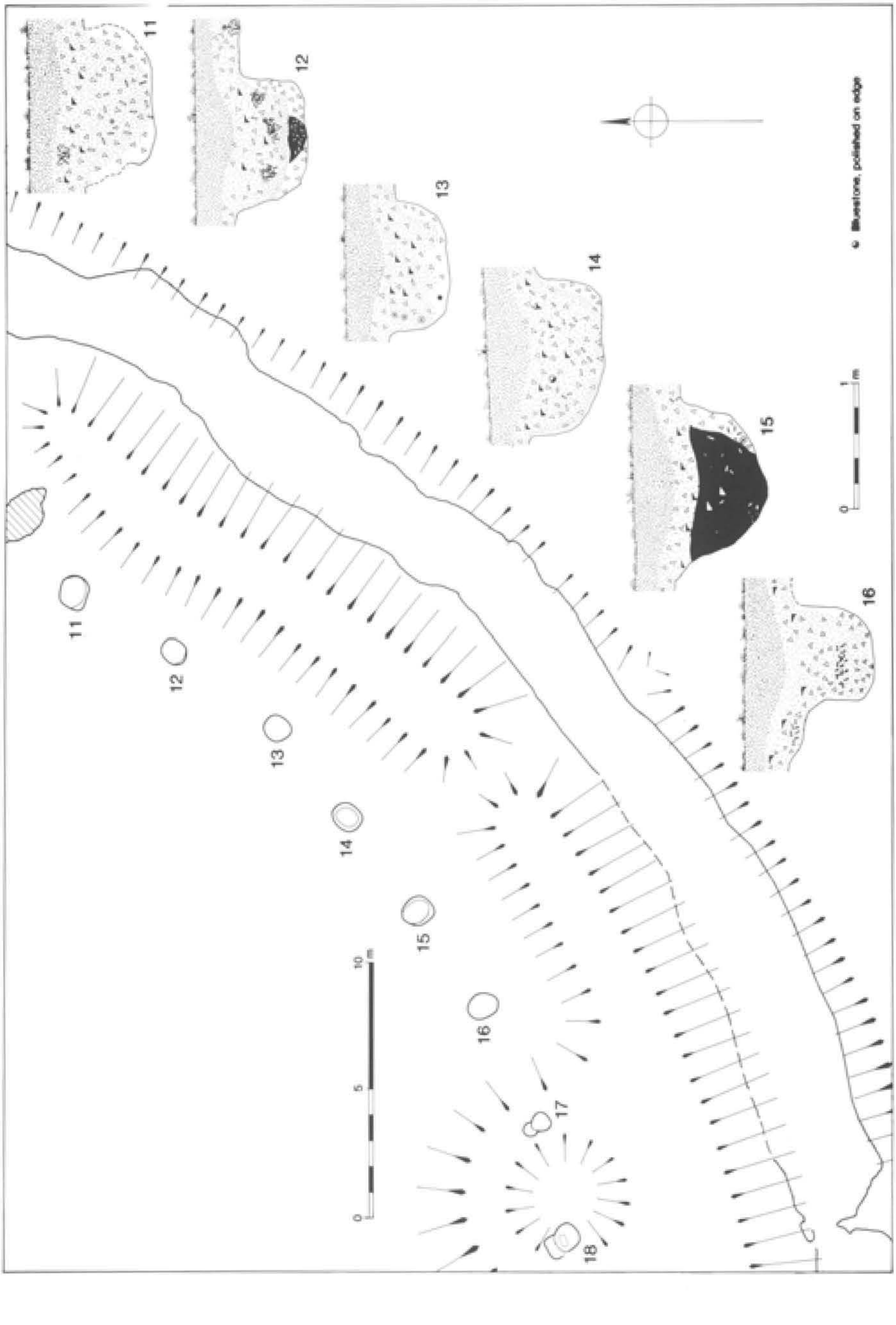



*Fig 53 The Aubrey Holes: section drawings for AH 11–13 and 15–17. Scale of sections 1:40. Note that the orientation of the sections is not certain*

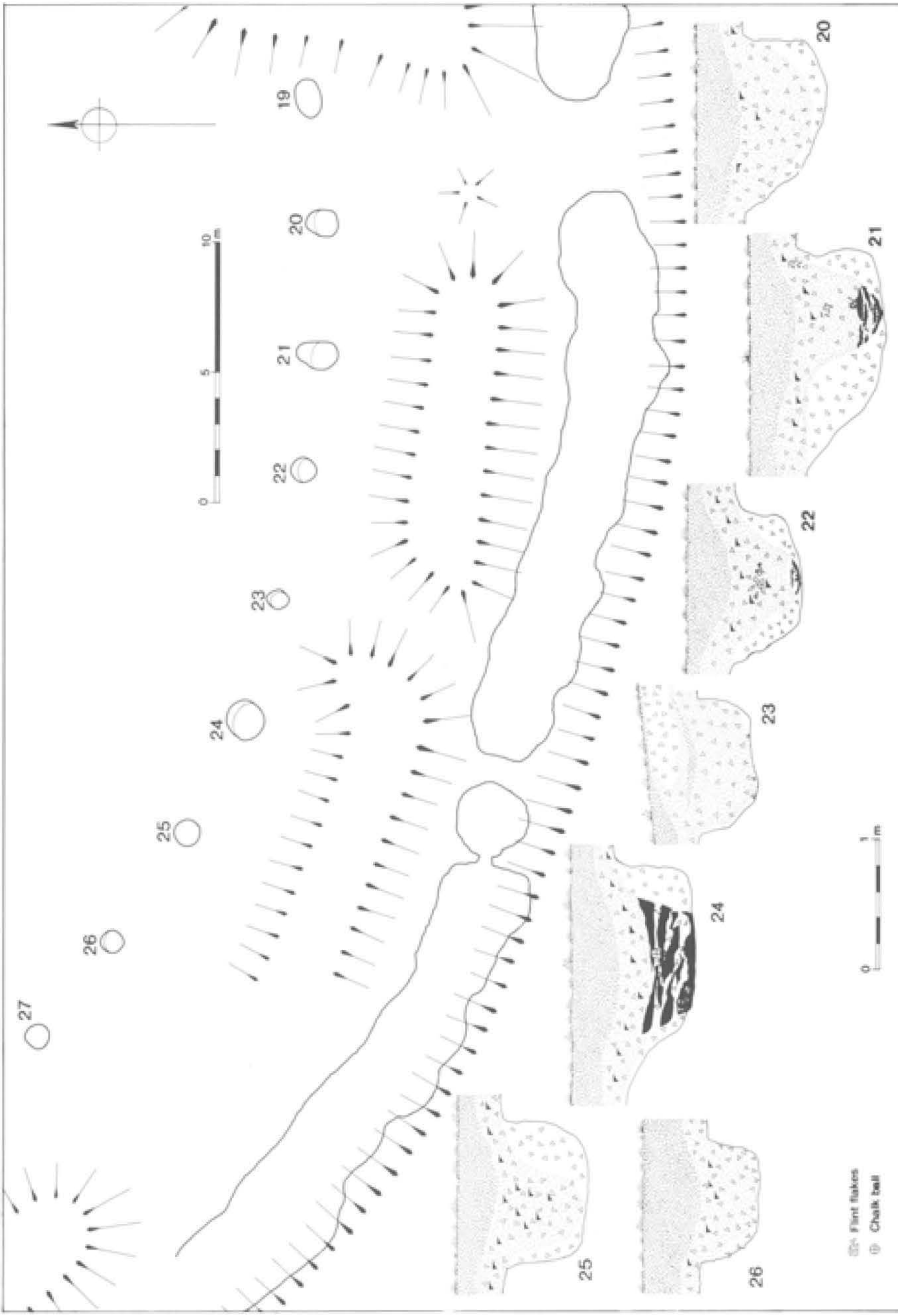



*Fig 54 The Aubrey Holes: section drawings for AH 20–26. Scale of sections 1:40. Note that the orientation of the sections is not certain*

**Table 11 Comparison between excavated and probed dimensions of Aubrey Holes**

| *No* | *Excav diam (inches)* * | *Excav diam (m)* | *Probed diam (m)* ** |
|---|---|---|---|
| 1 | 36 x 33 | 0.90 x 0.85 | 0.75 x 0.75 |
| 2 | 42 x 38 | 1.05 x 0.95 | 0.90 x 0.85 |
| 3 | 40 x 38 | 1.00 x 0.95 | 0.95 x 0.90 |
| 4 | 45 x 42 | 1.154 x 1.05 | 1.20 x 1.10 |
| 5 | 53 x 45 | 1.35 x 1.15 | 1.20 x 1.15 |
| 6 | 34 x 31 | 0.85 x 0.80 | 1.00 x 0.90 |
| 7 | 53 x 53 | 1.35 x 1.35 | 1.45 x 1.25 |
| 8 | 41 x 41 | 1.05 x 1.05 | 1.05 x 1.05 |
| 9 | 46 x 45 | 1.15 x 1.15 | 1.20 x 1.00 |
| 10 | 30 x 29 | 0/.75 x 0.75 | 0.90 x 0.90 |
| 11 | 48 x 43 | 1.20 x 1.10 | 1.15 x 0.95 |
| 12 | 41 x 39 | 1.05 x 1.00 | 1.10 x 1.00 |
| 13 | 43 x 41 | 1.10 x 1.05 | 1.15 x 1.00 |
| 14 | 38 x 37 | 0.95 x 0.95 | 1.20 x 1.05 |
| 15 | 46 x 44 | 1.15 x 1.10 | 1.15 x 1.15 |
| 16 | 48 x 43 | 1.20 x 1.10 | 1.35 x 1.10 |
| 17 | 29 x 29 | 0.75 x 0.75 | 0.90 x 0.70 |
| 18 | 43 x 42 | 1.10 x 1.05 | 1.20 x 1.20 |
| 19 | 43 38.5 | 1.10 x 1.00 | 1.10 x 0.80 |
| 20 | | | 1.00 x 0.90 |
| 21 | 63 x 45 | 1.60 x 1.15 | 1.15 x 1.15 |
| 22 | 39 x 38 | 1.00 x 0.95 | 1.05 x 0.75 |
| 23 | 39 x 33 | 1.00 x 0.85 | 0.80 x 0.70 |
| 24 | 65 x 62 | 1.65 x 1.55 | 1.60 x 1.55 |
| 25 | 41 x 41 | 1.05 x 1.05 | 1.10 x 1.05 |
| 26 | 39 x 36 | 1.00 x 0.90 | 1.05 x 0.95 |
| 27 | 34 x 34 | 0.85 x 0.85 | Omitted in 1973 |
| 28 | 38 x 36 | 0.95 x 0.90 | 0.95 x 0.95 |
| 29 | 40 x 37 | 1.00 x 0.95 | 0.75 x 0.70 |
| 30 | 43 x 38 | 1.10 x 0.95 | 1.05 x 0.95 |
| 31 | 30 x 30 | 0.75 x 0.75 | 1.10 x 0.80 |
| 32 | 66 x 54 | 1.70 x 1.35 | 1.55 x 1.35 |
| 33 | | | 1.20 x 1.45 |
| 34 | | | 0.70 x 0.70 |
| 35 | | | 1.20 x 1.20 |
| 36 | | | 0.65 x 0.65 |
| 37 | | | 1.40 x 1.10 |
| 38 | | | 1.05 x 0.80 |
| 39 | | | 0.90 x 0.90 |
| 40 | | | 'Not found owing to proximity of light & geophone electric cables' |
| 41 | | | 1.35 x 1.20 |
| 42 | | | 1.20 x 1.00 |
| 43 | | | 1.10 x 1.10 |
| 44 | | | ?1.30 'Very dubious on edge of trench' |
| 45 | | | 'Not found. On track' |
| 46 | | | 0.70 x 0.70 |
| 47 | | | 1.05 x 0.85 |
| 48 | | | 1.15 x 1.15 |
| 49 | | | 1.00 x 1.00 |
| 50 | | | 0.95 x 0.90 |
| 51 | | | 1.00 x 0.80 |
| 52 | | | 1.10 x 1.30. Not found in 1973, found 9/1/75 |
| 53 | | | 0.95 x 0.90 |
| 54 | | | Not found. On edge of entrance causeway, cut away by ruts |
| 55 | 38 x 34 | 0.95 x 0.85 | 0.85 x 0.80 |
| 56 | 52 x 42 | 1.30 x 1.05 | 1.15 x 1.05 |

*Information taken from Atkinson's Notebook* (Stonehenge 1954, 1973, 1978–9, -83)
* = *Used by RJCA (may vary from those quoted in Hawley's Diary)*
** *Measured in 1973 by RJCA and Thom*

silting of the holes after removal of the posts with occasional deposition of cremations, although the sections and fill descriptions do not suggest the formation of natural silt (Figs 51–5).

The views of Professor Atkinson also varied. In an early section of *Stonehenge,* the Aubrey Holes were described as part of a cremation cemetery (Atkinson 1956, 13–14). However, in only one case (AH32) is there any evidence for burial in the primary fill of one of the Holes and even this case is doubtful (*see above*). Atkinson (1956, 14; also 1979, 28–9) acknowledged that the cremations were not (with the exception mentioned above) in primary contexts but that they (our emphasis) 'must have been deposited within *two centuries at the most* from the inception of the cemetery, which seems to belong as a whole to the neolithic period and to the first phase of the monument'.

There is, however, a contradiction here. The position and nature of the cremations and the nature and composition of the fills lead us to the conclusion that the primary reason for the digging of the Holes was for some purpose other than disposal of the dead, but the implication of Atkinson's comment above is that the Holes were perceived at the time of digging to be for the receipt of human burials and must, therefore, have been left open for a considerable length of time (possibly several generations) before any burials were made. Atkinson contradicts himself again (1979, 171–2) when he suggests that the Holes were ritual pits and that their purpose may not have been 'primarily sepulchral, for in many cases the burned bones were deposited after the holes had been dug and refilled'. This aspect of the Aubrey Holes will be discussed in Chapter 6.

Leaving aside the question of the cremation cemetery, the argument against the posthole theory is led by Atkinson. As early as 1956 he had concluded:

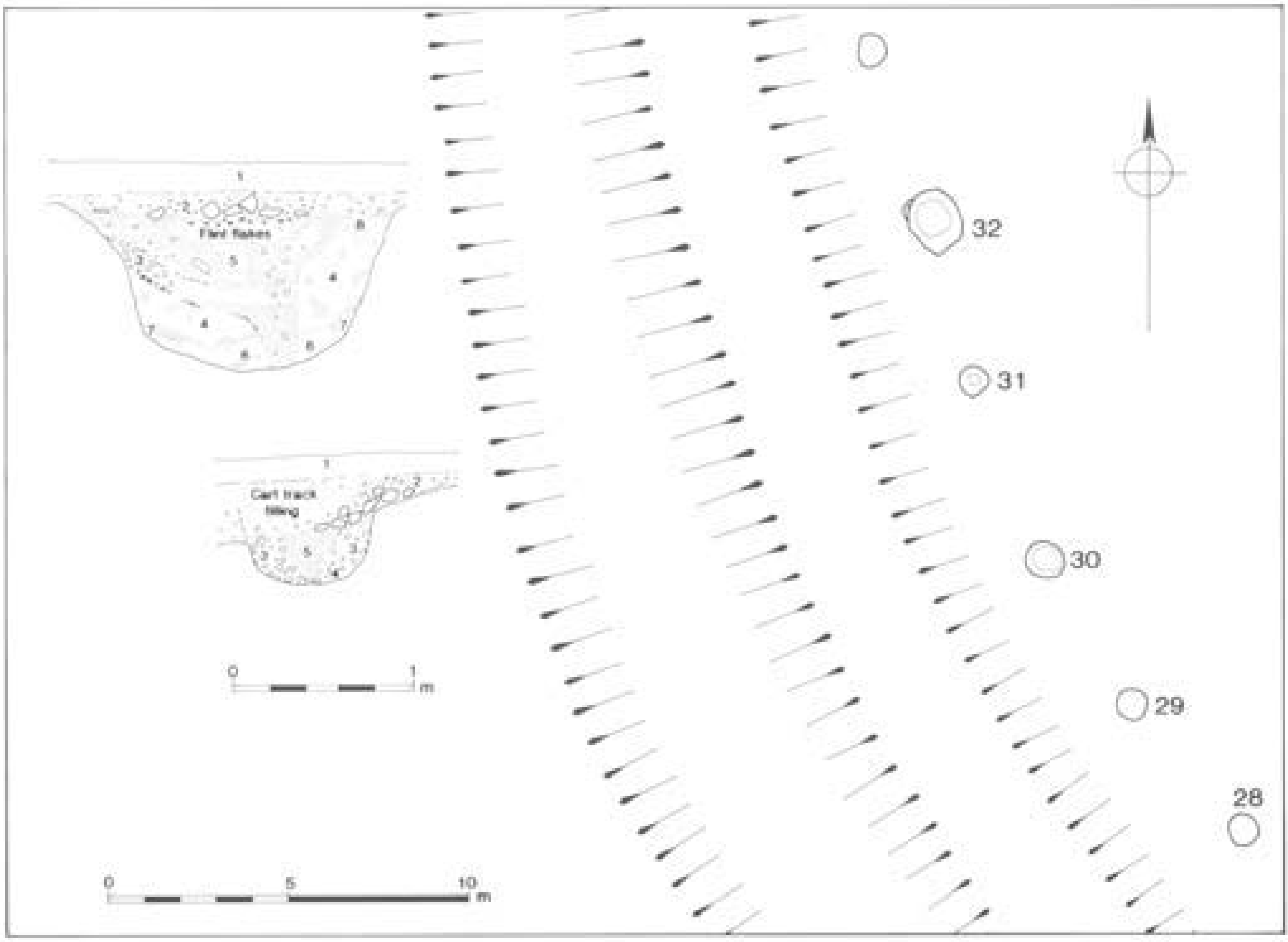



*Fig 55 The Aubrey Holes: section drawings for AH 31 and 32. Scale of sections 1:40. Note that the orientation of the sections is not certain*

> that they were never intended to hold any kind of upright, either the bluestones, as was supposed soon after their rediscovery, or wooden posts, a suggestion prompted by the later excavation of the near-by timber sanctuary of Woodhenge.
>
> (Atkinson 1956, 13)

He has argued (pers comm to Margaret Ehrenberg) that the Aubrey Holes did not resemble postholes, being too irregular in depth and size. Further, the bases of the Holes were not flat, and no impressions of posts have been recorded on them, the gap between any possible post and the edge of the hole was too big, and there was little evidence for posts being burnt *in situ*. In print he points out that the bowl shape of the holes contrasted with the cylindrical postholes of Woodhenge and the Sanctuary (1952, 19). In 1952, following excavation of AH31 and 32, it was suggested that the Aubrey Holes were deliberately refilled almost immediately with the chalk rubble which had originally been dug out of them.

Atkinson's argument in his discussion of the site (*contra* his chapter 2) was that the Aubrey Holes were simply pits which held neither posts nor stones but were symbolic (1979, 172). They were, he suggested, neither structural nor sepulchral in primary function, since the cremations which they held were deposited into the refilled holes (*see Chapter 6 for discussion*). He uses an analogy of ritual libations and pits as entrances to the underworld in classical Greece (1979, 171) and he cites the Dorchester-on-Thames pit ring Site XI which he had previously published (Atkinson *et al* 1951). Further excavation and a re-examination of the evidence from sites at Dorchester-on-Thames (Whittle *et al* 1992) have recently shown that there are indeed similarities between the Aubrey Holes and aspects of the Dorchester-on-Thames sites, although there are no exact parallels at any one site. Site XI consisted of a multiple phase ring ditch and a later pit circle. Animal bone, antler, and cremated bone were recovered from the pits, which were circular to oval and of varying depth and profile. The cremations in two of the pits, 6 and 13, 'seem to be primary' with the pit ring phase (*ibid*, 166). The interleaved and sometimes asymmetrical soil and gravel fills of the pits led Whittle to suggest that the pits were backfilled with varied materials rather than being allowed to silt up gradually (*ibid*, 163). Although there are some similarites, the pit sections of Site XI do not closely resemble the Aubrey Holes, and on the whole the pits are bigger, though how far this is may be attributed to the differing geology of the two sites (Dorchester-on-Thames is on gravel, not solid chalk) is difficult to ascertain.

The view of the Aubrey Holes as postholes has recently been reviewed. Pitts stated that 'despite protestations to the contrary (Atkinson *et al* 1952) an early interpretation as post holes still seems feasible for at least some of these pits' (1982, 127). Pollard suggested 'that the most economical explanation of the observed stratigraphy is that the Holes originally supported posts, the compact chalk rubble being packing material around a central post-pipe' (1993, 150). This interpretation is compatible with other later Neolithic ceremonial enclosures where internal timber or stone uprights have been found. Some examples stood alone, whereas others formed part of larger, complex monuments. Multiple rings of timbers include the South Circle at Durrington Walls, Woodhenge, the Sanctuary, and Site IV Mount Pleasant. Single timber rings include Arminghall, Norfolk, and North Mains A, Strathallan, Tayside, where 24 ramped postholes were situated just inside the ditch and blocked the henge entrances (Whittle 1992, 174; Harding and Lee 1987; Gibson 1994, fig 34). Gibson suggested that the most accurate dates for timber circles indicate a range between 2800–1500 cal BC (1994, 200–1). They began as small and simple early examples, increasing in size and complexity with time, and then declining in both aspects in the latest examples. Whereas few timber circles have primary associations with burials there are examples of secondary burial/cremation deposits.

Late Neolithic pits which held posts have also been found in non-henge contexts. Examples include two pits with well preserved postpipes found at Ridgeway Hill north-east of Upwey, Dorset, during archaeological evaluation in advance of improvements to the A354–A353 Dorchester–Weymouth road. The pits appear to have contained upright posts packed with chalk rubble. The contents of the pits, which included Grooved Ware pottery, worked flint, animal bone, marine shells, and a worked chalk lump, are seen as possible midden material derived from settlement activity. 'However the presence of the posts is seen as indicative of possible ritual significance, as is the burial of a polecat in one of the pits' (Wessex Archaeology 1994b).

There is probably an example of this much closer to Stonehenge. A possible posthole was excavated in 1968 by Major and Mrs Vatcher during their work on the SEB cable trench (C83) on King Barrow Ridge (Vatcher and Vatcher 1969; Cleal and Allen 1994, 60). This feature (feature A) was a small pit, 1.07m wide with a maximum depth of 0.81m from the top of the weathered chalk, sealed by ploughsoil. The only surviving finds are three sherds of Grooved Ware, possibly all from one vessel (*ibid*, fig 8, P41) from the 'post replacement'. Fragments of ox bones, decayed wood, potboilers, and charcoal are recorded in archive.

Although the evidence is inconclusive and will no doubt be the subject of continued debate, the authors are inclined to support the view that the Aubrey Holes held posts which were removed, rather than burnt *in situ* or left to decay.

## Discussion

The possibility that there was activity at the monument site before the construction of the enclosure cannot be entirely excluded, but the evidence is slight. There are three main elements of the monument which could, individually or together, represent pre-enclosure activity: the Aubrey Holes, the postholes in C44 which may be sealed by the main bank, and the timber settings (*see Chapter 6*, ie those in the interior, the southern passage, and at the north-east entrance, including the postholes at 'A'). The Aubrey Holes remain undated but are accepted here as having held timber posts in their primary phase. A timber circle pre-dating the Ditch would be earlier than almost every other datable example in the British Isles (Gibson 1994). The main argument in its favour is that the spacing of the circle takes no account of the north-eastern entrance (though the gap between AH 23 and 22 corresponds with that of the southern entrance, perhaps incidentally). The gap between individual Aubrey Holes (which varies between 4.5m and 4.8m) is quite wide enough to allow easy access. The buried soil identified beneath the Bank in the 1954 and 1978 excavations was poorly preserved and produced no useful environmental evidence, and no artefacts appear to have been recovered. Augering in the western length of the circuit during 1994 (Wessex Archaeology 1994a) indicated that preservation in this area was better, allowing the possibility at least of recovering more information about the immediately pre-monument environment from future research (*see Chapter 4*).

The evidence from the eastern Bank in trench C44 is also ambiguous. It is not now possible to establish whether the three features visible in photographs (Fig 56), which seem to have been postholes, were overlain by the Bank or not. Some, possibly all, may have lain within an area already excavated. C44 was a reopening and extension of Ditch cutting C18.2, which extended across the Bank (Atkinson pers comm). The fact that a considerable amount of bluestone was recorded as coming from the Bank rubble in C44 would seem to indicate that it may have been disturbed, and the postholes could have been cut through the Bank at any period after the introduction of the Bluestones. From the end of phase 2 onwards the Bank would not have been markedly higher that it is now, since the Ditch had filled almost to the top of its cut profile by then and the possibility of cutting features down through it and into the natural chalk beneath cannot be considered unlikely on practical grounds. It is perhaps more difficult to envisage reasons for posts being placed around the Bank circuit in any period after the construction of the Bank itself, but there

*Fig 56 C44, excavated in 1954. Postholes cut into or through the Bank. The photograph is looking north with the Heelstone in the background (P50794)*

are some possible explanations. Very little of the Bank has been excavated and it is unfortunately impossible to establish how much of its surface was stripped by Lt-Col Hawley. Some of his trenching within the interior certainly extended up on to the interior slope of the Bank but may not have uncovered the crest.

It seems unlikely that any postholes cut into or through the Bank around long stretches of the circuit would belong in phase 1 or phase 2. It is tempting to regard these postholes as belonging to the phase to which all the other postholes apparently belong. However, if this was the case then, by extension, the postholes in the interior would have to be considered to be contemporary with the majority of the cremation burials. Cremation burials occur on both sides of the Bank, which therefore seems to have formed part of a focus for burial activity. If the postholes in the area of the Bank represent a palisade which was contemporary with both the interior postholes and the cremation burials, then it cut across the area where many of the burials were deposited. Such a division seems inherently unlikely. In phase 3, however, perhaps after the introduction of the stones, an additional barrier to the much denuded Bank and filled-in Ditch may have been required. After this the only period when a circuit of posts would seem likely is during the Middle to Late Bronze Age, when there is some evidence for more domestic activity in the interior (*see Chapter 8*). In later periods activity seems to have been on a smaller and more casual scale, although that does not preclude the excavation of a few features. A very late date is also possible, although there were few post-medieval artefacts in this cutting (two pieces of iron only).

The argument that the postholes in C44 (Fig 56) represent pre-ditched enclosure activity is impossible to refute on present evidence, but it does not seem likely. A palisaded enclosure of late fourth millennium date (at the latest) is difficult to parallel in the region, the only possible parallels being with the palisades associated with some causewayed enclosures such as Orsett, Essex (Hedges and Buckley 1978, 237–9), Whitehawk, Sussex (Curwen 1936), Hambledon Hill main enclosure (Mercer 1980, 51), or, possibly, Briar Hill, Northamptonshire (Bamford 1985, 47). A 15m length of palisade, consisting of a slot trench with the remains of post-sockets in the base, was excavated at Orsett. It followed the line of the causewayed enclosure ditch closely. The palisade at Whitehawk was probably a bank revetment and at Briar Hill a series of small pits cut into the upper silts of the causewayed enclosure ditch may have held posts. At Hambledon, there is some indication that a palisade stood on top of the enclosure bank. Similarly, the timber settings in the interior would seem to fit much more comfortably into the third millennium cal BC than they would in the fourth, and even though it is argued in Chapter 6 that they did not belong with the ditched enclosure and could be either earlier or later, an earlier date is regarded as the less likely of the two.

## The Ditch

Given the lack of firm evidence of immediately pre-monument activity the construction of the Ditch must be seen as the first major activity in the site's history. The answer to the question of why it was placed here and not elsewhere in the landscape must remain elusive, although it may perhaps fall within the scope of future research into the monument site and its immediate surroundings to establish likely contributory factors.

The radiocarbon dates for antlers on and close to the bottom of the Ditch establish a time limit for its construction which is, in prehistoric terms, astonishingly narrow. It is established beyond reasonable doubt that it was dug within a short period of time around 3000 cal BC (*Appendix 2*). The dates from the two ox jaws, the ox skull, and a red deer tibia, all from the southern circuit of the Ditch, are significantly older than the antlers and, by implication, older than the digging of the Ditch (*Appendix 2*). It cannot be argued that these latter determinations date the Ditch itself and that the antlers relate to some later activity, because the antler picks were widely distributed in the primary fill around the Ditch and are functional, ie they were almost certainly used to dig the Ditch, whereas the bones are not functional in any utilitarian sense.

The nature of the Ditch when first dug is clear from the large-scale excavations of Hawley, which allow us to consider almost half the circuit of the Ditch. As outlined above, the easily isolated segments, referred to as 'craters' by Hawley, draw attention to the segmental nature of some lengths of the Ditch. In this study the analysis of the Ditch has concentrated largely on establishing the segmental nature of the entire Ditch and the fact that, as first dug, it was appreciably more segmented than it now appears. In several places around the circuit Hawley commented that he thought there had been a 'barrier' which had subsequently been removed, and these comments are included in the descriptions of the segment. These include one or two instances (*see captions to Figures 37–47 for examples*) where the present study has been more cautious than Hawley and a division between segments is not proposed where Hawley felt that there may have been one. Overall, and allowing that there are almost certainly instances in which segments have been incorrectly divided in this study, the total number seems likely to be reasonably accurate with a margin of error of perhaps plus or minus five segments. This indicates a total in the region of 60 for the whole Ditch.

Although the analysis of the Ditch demonstrates beyond reasonable doubt that it was constructed in segments, it is not possible to establish with the same degree of certainty that there was ever a period at which all the segments survived in place with the ridges between them, rather than the ridges between segments being removed progressively as Ditch construction proceeded. Neither is it possible to be certain that the segments were a purely functional means of digging the Ditch. The use of segments in causewayed enclosures, for instance, is generally now considered as being likely to relate to construction by family groups, lineage groups, or other meaningful social divisions. The fact that the segments on either side of the main entrance are fairly clear ones (ie Segments 99 and 100, and 1 and 2), hints that they may have been recognised as important in more than purely practical terms. Why else should these have been preserved when most other segments were amalgamated? In the southern part of the Ditch, on either side of the southern entrance, the terminals of the Ditch were also left as clearly defined segments (*ie* Segments 17 and 18). This is in contrast to, for example, the eastern length of the Ditch, where for most of the length from Segment 2 to Segment 16 the former existence of segments has to be postulated from changes in Ditch plan, combined with changes in the Ditch floor, and Hawley's observations of slight, remnant ridges.

## Entrances to the enclosure

In Atkinson's description of the early monument he describes only one 'intentional gap' in the earthwork (1979, 26), that at the north-east, which is *c* 11m wide. Lt-Col Hawley, however, recognised two: the main entrance at the north-east and a southern entrance, between Segments 17 and 18. In this study a third is also proposed, between Segments 21 and 23, later blocked by Segment 22.

### The north-eastern entrance

The gap between the Ditch terminals here is 11m; allowing for up to perhaps 1m erosion of each lip of the Ditch this would give an original entrance in the region of 13m wide. The earthworks visible on the early plans and around the entrance are at least in part the result of antiquarian activity around the Slaughter Stone. Both the stone settings and timber settings around the entrance which have traditionally been assigned to the early phase of the monument are not now considered to belong to the first phase and the entrance is envisaged as having been completely unencumbered with any standing features. Behind the entrance, within the interior, the Aubrey Holes were probably in existence from some time within this phase, although they cannot be tied firmly to it. If they held standing posts there would have been gaps of at least 4.5m between the posts standing immediately within the entrance (Fig 36).

The Ditch terminals on either side (ie Segment 99 to the west and Segment 1 to the east) were clearly defined segments. Hawley describes them as *craters*, which is his term for rounded pit-like lengths of ditch, in contrast to *the ditch*, which means the usual Ditch of irregular outline and depth.

It seems that there was probably a distinct ridge between Segments 99 and 100 although its height is not clear. When the western end of Segment 100 was approached the *ditch* (ie the next segment) was seen at a 'high [but unspecified] level'. As the profiles show Segments 99 and 100 as being of approximately similar depth there must have been an intervening ridge, which seems to be indicated on the MoW plans.

On the other side of the causeway the terminal segment (1) was equally well defined, although there seems not to have been a ridge between Segments 1 and 2, the division being marked by a sharp drop in the Ditch floor down into Segment 1 of about 8in (0.20m) (12/9/1922). Both Segment 100 and 1 are well rounded, and Segment 1 in particular deviates from the smooth curvature of the circuit, being slightly inturned. There does not seem to have been any attempt to smooth out the irregularity of the Ditch in this area or to disguise the existence of segments. As this, the widest entrance, must be seen as a major feature of the early enclosure this decision probably reflects the importance of the segments.

Lt-Col Hawley comments, in the passage quoted at length above, that the only evidence of major fires actually on the Ditch bottom occurred in the terminals at the main entrance, and this also seems to distinguish these segments. The number of antlers found on the bottom is also much higher here than elsewhere, at least in Segment 100 where at least five occurred, some of which were burnt. It is suggested by Serjeantson (*Chapter 9*) that heat treatment was used in the preparation of antler picks and rakes and that this might therefore reasonably be connected with fires on the Ditch bottom. This must be considered a possibility, but only two major instances of fire seem relatively few for treating the large number of picks represented in the excavated length of Ditch (over 130); a purely functional explanation for the burning would surely require both more instances of burning and a wider spread of fires throughout the segments. Hawley also records that several of the antlers in Segments 99 and 100 were damaged by fire, ie were excessively burnt, which again is at odds with the idea that the burning was intended as heat treatment to facilitate use of the antlers as picks, although clearly antlers were also heat-treated for functional reasons, presumably elsewhere.

Segment 1 does not appear to have been particularly rich in finds, but it did produce large ox bones including part of a scapula, possibly from the primary filling. This is of interest in view of the occurrence of ox in the terminals of the southern entrance. Segment 100 is also not markedly different from other segments in terms of finds other than antlers, although the concentration of these is certainly greater than in most segments.

The organic layer was noted in both segments and contained obvious traces of burning in both cases. In Segment 100 it was certainly overlain directly with clean chalk rubble which Hawley considered had been deliberately put into the Ditch. The organic layer in both segments appears to have included some finds, mainly of animal bone, although there may also have been human bone in Segment 100.

**The southern causeway**

This is flanked by Segment 17 to the east and 18 to the west. The gap between them is *c* 3m, which if erosion of 1m each side is again postulated, suggests an original causeway 5m wide. Atkinson considered that it was unlikely to have formed an intentional entrance to the monument (1979, 26), but Lt-Col Hawley did consider it to be an entrance. He commented that there was a matching gap in the Bank at this point. As a relatively recent track is known to have entered the monument at this point the gap in the Bank could be ascribed to this, but it is just as likely that the track crossed the line of the Ditch and Bank at a point where there was already easy access through those two features. The gap in the Bank has been altered in recent years; post-excavation plans of the monument show no gap though there is a clear break here today (*see Fig 13 and Plate 3.1*). It must be presumed that the original gap was masked for a time by spoil left by Hawley, who certainly did not return all the spoil to the Ditch after his excavations (1928, 167). The existence of a break in the Bank large enough to have provided a feasible entrance to the enclosure is indicated not only by the 1919 plan but by Hawley's acceptance of the southern causeway as an entrance: he would hardly have entertained the idea so readily if there had not been obvious access through the Bank. A clear break in the Bank also shows in the geophysical surveys (*Appendix I*).

There are few finds from these segments, nor was there *in situ* burning. Each segment, however, contained a single animal jaw bone now identified as cattle right mandibles, in both cases on the Ditch bottom. These have now produced radiocarbon date ranges of 3340–2920 cal BC (OxA–3835, 4455±40 BP) and 3350–2920 cal BC (OxA–3834, 4460±45 BP), which are statistically significantly earlier than the radiocarbon dates from the antlers which are taken as indicating the date of construction of the Ditch. It is difficult to accept these as other than cases of deliberate deposition and it must be assumed that they were associated with the use of the causeway and the recognition of it as a legitimate and important entrance to and/or exit from the enclosure.

Lt-Col Hawley also investigated the area outside this entrance, although it is difficult to establish exactly the size and location of his trenches. In the Diary he describes the excavation of a long trench

> to intercept a track which might lead from the south causeway 8[?]0 ft [c 24.4m] south from causeway 60ft [18.3m] 2ft [0.6m] from east to west. There was no sign of track or pathway ... Taking turf from the causeway. Solid chalk occurs immediately below but there are no postholes yet [and none were found].
>
> (1/8/1924)

In the published report the causeway and area beyond it is also described:

> the surface [of the causeway] presented no signs of postholes as did the other. It may possibly have had a surface of large flints, as some were found embedded in it, especially at the sides where it had escaped use, but there had been a modern trackway over it in use a long time, which must have worn down the original surface. There was no sign of a road leading from it beyond the rampart. I cut long trenches at three places in land beyond, in the direction it might have taken, but found no trace of it. The ground was very hard near the outside and also on the inside, from the causeway to where a line of postholes ended.
>
> (Hawley 1926, 5)

The gap in the Bank and the causeway were used by a track of post-medieval or earlier date which clearly had caused considerable erosion, but it seems likely that some trace would remain of postholes had they existed in this area, either as remnant parts of features, or as single features outside the main line of the track. It could be argued that the gap in the Bank is due to the track rather than the other way around, but the evidence for the unusual characteristics of the Ditch filling in this length seems so strong that the existence of an original entrance seems probable.

**The blocked causeway**

The original form of this entrance is postulated as a causeway 2m wide or perhaps 3–4m before erosion, flanked by Segments 21 and 23. Subsequently it was blocked by Segment 22, perhaps during phase 1, but more probably at its end or within phase 2. This causeway has not previously been suggested as an entrance but there are strong arguments for its consideration as such.

Segment 22 is clearly unusual; it stands out from all the other segments by its small size and near-circular shape. It is connected to the next segment to the west by only a narrow gap in a high ridge and to the east it is separated from Segment 21 by a narrow causeway of undisturbed chalk. Apart from the main causeway and the southern causeway there is no other example of the chalk remaining completely undisturbed between segments. The filling of the segment is not described in detail but appears not to have been exceptional in any way. The only finds noted from close to the bottom were flint flakes, one flint implement, and two pieces of antler, one of which was burnt. Neither piece of antler could be identified in the archive and the burnt fragment might in any case have proved unsuitable for dating as the collagen is likely to have been destroyed by burning. Without a radiocarbon date to compare with those from the Ditch it is impossible to establish that this segment is later than most of the Ditch but it must be considered a possibility. There is a gap in the Bank slightly to one side of the putative causeway but the spoil from Segment 22 would in any case have largely blocked any pre-existing entrance. The present state of the Bank in this area cannot confirm or refute this interpretation. The segment shows particularly clearly in the resistivity survey (Fig 263).

One further piece of evidence which strengthens the argument for a causeway at this point is that Segment 23 contained a damaged *Bos taurus* (domestic cattle) skull which has produced a radiocarbon date comparable to those from the two *Bos taurus* jaw bones flanking the southern causeway (3510–2920 cal BC; OxA–4842, 4520±100 BP). This skull was, according to Hawley, found in pieces at the bottom of a feature which was cut into Segment 23 to within 0.05m of the bottom of the Ditch. It would seem unlikely that a skull would have been deposited in fragments in a feature and a more reasonable explanation for this is that the feature disturbed a whole skull which had been deposited on the Ditch floor. The radiocarbon date is compatible with this explanation. The date at which this causeway was blocked cannot be established. As there were no bluestone chips within the fill it is unlikely to be later than phase 2. Since the southern entrance appears to have continued in use into phase 2 it is possible that the blocking took place towards the end of phase I or at the beginning of phase 2, when perhaps more emphasis was put on the southern entrance.

**Entrances and structured deposition**

A comparison of the form and primary filling of the two undoubted entrances and the putative entrance suggests a recognisable pattern. In particular it is noticeable that at both the north-eastern and southern entrances the segment on the right (as the entrance is crossed on entering) is a well formed segment isolated from its neighbour by a surviving ridge. Although many, and perhaps most, of the segments were defined by ridges at some stage, the important point must be that in only three cases were they allowed to remain in place and in two of those cases this occurs on the right hand side of an entrance. The third case, between Segments 22 and 23, is interpreted here as being of a slightly different nature and represents a remnant of an entrance causeway blocked at a late stage by Segment 22. The interpretation of this as an entrance is based on the occurrence of the ox skull in Segment 23 which it is difficult to envisage as other than analogous to the ox deposits in the terminals of the Ditch at the southern entrance, and on the atypical form of Segment 22. It may be objected that this interpretation is flawed by the fact that the putative entrance causeway is not entirely blocked, as there is a surviving gap of 3ft (0.9m) between Segments 21 and 22, and a similar gap in the Bank, albeit offset to the east.

Allowing for the fact that the segments will have been enlarged by erosion and the Bank spread by the same processes this is a feasible, though very restricted, entrance passageway. It seems unlikely to be an original feature – if only on the grounds of the ox skull in Segment 23 – but could perhaps be a later modification of the entrance rather than a blocking. If so, the likeliest period for this to have taken place seems to be within phase 2, when entrance to the enclosure appears to have become more restricted. At the north-eastern entrance this was achieved by the insertion of timber settings and at the southern entrance by the timber 'passageway'; in the latter a person entering the enclosure is deflected sharply to the right, as at the possibly modified entrance.

## The organic layer and the end of phase 1

It was not the intention of this project to impose a 'chest of drawers' phasing on what must be presumed to have been a long history of human actions taking place over many generations. To the creators and users of Stonehenge, or rather the series of different monuments which constitute the Stonehenge we see now, there was almost certainly no single point in time when they acknowledged that a first phase of use of the monument was over and a second had begun. That is not to deny the possibility of critical points at which the people involved did recognise that a tradition of performing certain activities at certain places was coming to an end and that new activities were taking their place. Some conscious decisions must have been taken.

The completion of the Ditch, for example, may have been such a point. In this analysis of the monument, however, the suggested 'phases' are periods of time characterised by activities which differed from those taking place before and afterwards. Thus phase 1 begins with the activities which created the Ditch and took place during the early stages of its filling, the phase being characterised by an emphasis on the Ditch and on activities still taking place within that feature. As it is known from experimental earthworks that the primary chalk rubble filling of chalk ditches can form to a considerable depth during as short a time as the first decade after construction (*see Chapter 1*), it seems reasonable to assume that activities taking place in and around the Ditch during the formation of that primary filling are likely to have been connected with the initial intention or intentions which led to the creation of the enclosure.

The end of phase 1 is more difficult to place but has been defined by the first clear episode of backfilling of the Ditch with chalk. Since there are very few section drawings this is difficult to pinpoint in the sequence of ditch filling. To the west of the main entrance, however, there is a clear description of the clean chalk rubble of the deliberate chalk backfill lying directly on a dark layer which in turn overlay the primary chalk rubble. This suggests a change in the nature of activities in relation to the Ditch early in its history, with the emphasis moving from the Ditch as an empty feature which may have been utilised in various ways, to the Ditch as an entity which might be filled in. This is taken to mark the end of phase 1.

The organic layer has been assigned to phase 1 as it almost certainly formed fairly quickly and does not in itself show any indication of a change in the nature of activity. On the contrary, the recurrent observation by Hawley of 'wood ash' in this layer would seem to indicate that burning was a feature of the activity associated with the Ditch at this point, as it already had been before and during the formation of the primary chalk rubble. The layer has only once been subject to evaluation by modern excavation and analytical techniques but that investigation has shown that it is not a fully developed soil. It is described by Evans as a 'dark chalky loam ... without horizonation. Probably a weak soil combined with material derived from the original pre-bank profile' (1984, 10). If the observations by Hawley are also taken into consideration an anthropogenic element in its formation must also be considered likely.

**The Aubrey Holes**

As illustrated in the tabulation of phasing criteria (*Appendix 8*), the phasing of the cut and primary fill of the Aubrey Holes to phase 1 must be regarded as weak, although there would seem to be little reason to doubt that they belong to an early phase of the monument's history. It is difficult to envisage the holes being laid out around such an accurate circle if there were standing timber or stone settings in the interior. Although it must be presumed that there was a period following the dismantling of the timber settings and before the erection of the first stone setting when such a circle could have been laid out, the apparently long history of the Aubrey Holes before the appearance of the Bluestones does not fit with an interpretation which would see them dug only shortly before the Bluestones were erected. It also seems unlikely that they would have stood at the same time as the timber or stone settings at the north-east entrance and they are therefore also unlikely to be late in the monument's history, when Stones D, E, and perhaps the Slaughter Stone were standing.

Assuming that the Aubrey Holes held timber posts which were removed rather than allowed to decay *in situ* the duration of the setting must remain unknown, although more than a century is possible and two hundred years not impossible. As described above, the size, shape and depth of the holes vary but dimensions average *c* 1m diameter by *c* 0.9m deep. As such they could have held posts of perhaps 0.4m diameter, but such is the disturbance to the fills of these features that no clear postpipes have been recognised.

The relatively shallow depth of the features, even allowing for some reduction of the surface level within the monument, militates against the timbers being very tall. At the timber monument at Greyhound Yard, Dorchester, the average diameter of the posts was estimated at 1m and the maximum length of the posts at 11m (Woodward *et al* 1991, 355). The postpits averaged 1.8m in depth but allowing for erosion Woodward concluded that the maximum height of the timbers above ground would have approached 8.25m (*c* 27ft), with approximately one quarter of the length earthfast. Perhaps more comparable with the Aubrey Holes are the posts of the Late Neolithic palisades at Meldon Bridge which were estimated to have averaged 0.4m in diameter, set in pits of 0.8–1.1m diameter and with surviving depths of 0.9–1.1m (*ibid*). These posts could have been 4.8–6m in length or 3.6–4.5m above ground. Posts of up to 0.6m diameter were also present at Durrington Walls and Woodhenge.

In the case of the Aubrey Holes it is difficult to be precise, but making some allowance for a reduction in the height of the ground surface, the maximum above-ground height of posts seems likely to have been of the order of 4m (13ft). The possibility that posts standing in the Aubrey Holes were joined by horizontal lintels cannot be discounted, but the horizontal members would have had to be over 4.5m (14ft+) in length and it is not clear whether the uprights would have been sufficiently large or stable to support the weight.

On present evidence it must be acknowledged that it is impossible to place the Aubrey Holes firmly within the sequence although there are strong hints to indicate their position. That position is taken here to be early in the monument's history, probably within phase 1. They are envisaged as standing posts which therefore date to very early in the development of timber circles (Gibson 1994, 200–2).

It would have been possible for them to have been laid out before the construction of the Ditch but as the dating of the Ditch is only just within the early end of the range for timber circles in this country a circle pre-dating this would lie outside it. This is therefore seen as unlikely. However, as Aubrey Holes have in the past yielded material which could be radiocarbon dated (*see*

*Appendix 2 for the exisitng radiocarbon date and its implications*) it is possible that future excavation could produce a date for this setting.

## General discussion

The main features of the first phase of Stonehenge may be summarised as:

1 a segmented Ditch,
2 a circular enclosure with at least two and probably three entrances in the excavated half of the Ditch circuit,
3 a substantial internal Bank,
4 a small external Bank, possibly not continuous (*but see geophysical results, Appendix 1*),
5 an internal setting of near-circular features, concentric with the Bank and placed just within it, which probably held posts, and
6 deposits of animal bone (ox) in at least three of the six Ditch terminals excavated.

The obvious test to apply to this summary is: given these points alone, and without the site being named, would it be classed as a henge monument? On the criteria usually used to define henge monuments the answer to this must be negative. If the Aubrey Holes are removed from the list the answer is even clearer and it must be stressed that the argument for the Aubrey Holes being assigned to this phase is not very strong, and is based largely on symmetry.

In terms of dating, phase 1 Stonehenge is now firmly established as dating to a period in which very few henges can unequivocally be placed. With the single exception of Coneybury, only 1km from the site, none of the Wessex henges can be dated as early as this. Further afield, Llandegai A has produced similar dates for primary ditch fill, but this too is a monument with an internal bank and is not a typical henge. Given the date of phase 1 Stonehenge before the *floruit* of henge monuments and its unhenge-like appearance, it is at least as valid to look to for comparisons in what went before as it is to look at the monuments that came after.

If the summary of features is again considered there is at least one class of monument which springs to mind as bearing comparison with phase 1 Stonehenge. Roughly circular enclosures with segmented ditches and internal banks in which there are deliberate deposits of animal bone occur earlier in the Neolithic over most of southern England and further afield and are generally termed *causewayed enclosures*, a classification which, like that of henge monuments, is a fairly broad church.

Most of these enclosures seem to have been constructed during the early to middle fourth millennium cal BC (say 3900–3400) and therefore pre-date by some centuries the construction of phase 1 Stonehenge. They certainly remained in use in some way, however, much later than this, as many of them show deposition of material and recuts in the upper ditch fills which are likely to date from the Middle Neolithic. These seem often to be associated with Peterborough Ware (as at Whitesheet Hill (Rawlings *et al* in prep), Windmill Hill (Smith 1965), and Hambledon Hill (Mercer 1980)).

This cannot be taken as an indication that the idea of causewayed enclosures was still current at the time when the Stonehenge Ditch was begun, but if causewayed enclosures were still being visited and used in some way it is not impossible that this tradition influenced the form of phase 1 Stonehenge. It should also be noted that the ox skull and mandibles which were placed on the Ditch bottom at Stonehenge appear to have been curated. No other explanation seems possible for the radiocarbon dates obtained from these bones, which are statistically highly unlikely to be other than substantially earlier than the Ditch. If these bones really had been kept for several generations prior to their deposition, perhaps for up to two hundred years before the Ditch was dug, this reinforces the impression that early Stonehenge owed more to the traditions of the preceding centuries than to a new and innovative 'henge' tradition.

The monument of phase 1 Stonehenge, however, is not a causewayed enclosure and to label it as such would be to fall into the trap of searching for a label at all costs. The differences between this monument and causewayed enclosures are almost as many as between it and typical henge monuments. Most notably, there is very little of the cultural material which is a feature of causewayed enclosure ditches. Although much artefactual and other debris in causewayed enclosure ditches occurs in layers above the primary fill, it appears generally that more material was deposited at the base of the ditches than is the case at Stonehenge. This implies not only that the treatment of the Ditch was different from that of the ditches of causewayed enclosures, but also that the activities within the enclosure were of a different nature. The segments, too, are generally more clearly demarcated in causewayed enclosures, with ridges of untouched chalk extending to the surface in most cases, and more than one circuit is usual. The emphasis on ox, however, in the wild or domestic form, does suggest a link between Stonehenge phase 1 and the causewayed enclosure tradition and differs from the preferences shown at henges.

If Stonehenge phase 1 cannot be comfortably classified as a henge monument nor as a causewayed enclosure, what can we call it, and do we need to call it anything at all? In its stone phase Stonehenge is undeniably a unique monument and it would not be unreasonable to argue that it was unique throughout its history, if it were not for the simple fact that there is at least one other monument of the same date and type. Indeed, there is no reason why, with further excavation and radiocarbon dating, more circular enclosures of the same type and period might not emerge, and the same problems of terminology would doubtless arise.

The monument already recognisable as overwhelmingly similar to phase 1 Stonehenge lies on the outskirts of Dorchester, Dorset. On the Alington Ridge, between

Mount Pleasant and Maumbury Rings henge monuments, there is a series of major Middle to Late Neolithic sites. Two of these, the Flagstones enclosure and the Alington Avenue long monument, can be placed in the period 3300–2900 cal BC on the basis of radiocarbon dates (OxA–2322, 4450±90 BP and HAR–8579, 4450±80BP respectively; see Lawson 1992 for a summary). Although the latter monument does not have an obvious parallel in the Stonehenge area – it is only 10m wide and 75m long – it is important to note that the date was obtained from an ox skull on the base of the ditch, indicating a use of ox head parts similar to that at Stonehenge. The date is statistically indistinguishable from that of the Flagstones enclosure (Healy and Smith forthcoming; Bellamy in prep).

The similarities between the Flagstones enclosure and Stonehenge phase 1 are clear from the briefest resumé of the main features of the enclosure:

1 both enclosures are circular and *c* 100m in diameter (Stonehenge 107m, Flagstones 100m),
2 both have a circuit of segmented ditch and may also have had multiple entrances,
3 in both enclosures the segments often intercut,
4 there is very little cultural material deposited in either ditch. The most common material, struck flint, is almost certainly derived at Flagstones from knapping flint that was encountered while digging the ditch and the same may be true of Stonehenge (*see Harding, Chapter 9*), though here it is impossible to be certain as most of the flint assemblage does not survive,
5 at Stonehenge there is no pottery assignable to phase 1, and
6 at Flagstones the ten sherds in the primary fill were almost certainly redeposited from earlier features, as there were earlier Neolithic pits on the site (Healy and Smith forthcoming; Cleal forthcoming). It seems safe to assume that both sites were kept clear of ceramics, and of most other material as well, although Stonehenge has more artefacts, and particularly more antlers, than Flagstones.

Other points which may also be cited are that there is a later element of funerary use at both sites, although at Flagstones the rite was inhumation and at Stonehenge mainly cremation. In both cases this mostly occurred after the primary filling of the ditch had formed, though there were burials certainly on the base of the ditch at Flagstones. At both sites there was reuse or continued use in the Bronze Age: at Stonehenge this is attested by the extraordinary stone monuments and at Flagstones by a burial within a circular ditched enclosure (incidentally of almost the same diameter as the Sarsen Circle at Stonehenge), the interior of which may have contained a mound.

The identification of a similar enclosure to phase 1 Stonehenge does not help to place these two monuments within a currently accepted, conventional classification: it simply increases the number of problem sites. It would be justifiable, perhaps, to term them protohenges, possibly along with Llandegai A, but it does not seem at all certain that they are on the same line of development as henges. It is not in fact argued here that Stonehenge is a typical 'henge' at any time in its history, and the nearest approach, in phase 2, may be due simply to the adaptation of an existing monument. It may, in any case, be too simplistic to rely on a classification of Neolithic monuments which admits only two forms. Since no clear evolution can be demonstrated within the Neolithic tradition from causewayed enclosure to henge, the possibility of intermediate or variant forms should not be discounted.

Since it could be argued that the removal of phase 1 Stonehenge from the class of henge monument is unnecessary on the grounds that the class is already broad and accommodates a wide range of monument types, the comments of Harding with Lee (1987, 41) in their seminal work on the subject are worth consideration: 'Over 90% of classic sites have an internal ditch. It would be convenient if this criterion was an absolute one, but this would have the disadvantage of excluding Stonehenge itself from the henge category. Stonehenge is admittedly a special case in many other ways, so that this is not necessarily a fatal objection, but it discourages confidence in the validity of the term and suggests that criterion may be unduly inflexible'. The removal of Stonehenge phase 1 from the henge class therefore has advantages for the class as a whole, as well as facilitating discussion of the monument itself.

# 6 A change of emphasis, phase 2

*by Rosamund M J Cleal*

## Summary

**Dating**
*c* 2900 to 2400 BC

### The period

This phase of the use of the monument falls within the Late Neolithic, a period when new monument types develop and new styles appear in pottery, stone, and other materials. The most dramatic development is the appearance of 'henge' monuments, often containing complicated arrangements of wooden posts. Alongside is the appearance of a new type of highly decorated pottery, Grooved Ware, and other items often associated with it, such as bone pins and particular types of flint tools

### Outside the monument

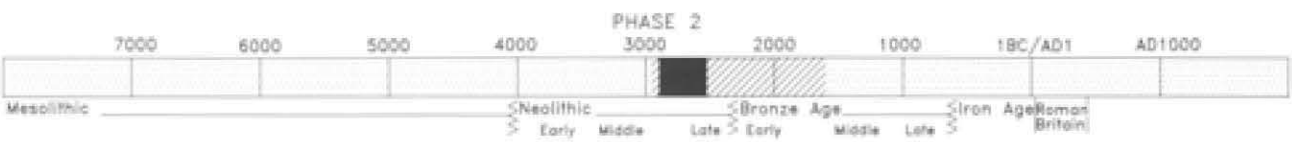
There is evidence for settlement of this period within 1km to the west of Stonehenge on Stonehenge Down, and to the east on King Barrow Ridge. At the latter there is a pit containing a deposit of decorated chalk plaques and a large spread of pottery and worked flint. The construction and use of Coneybury Henge, 1km to the south-east, is probably datable to this phase, as are Durrington Walls and Wodhenge. Closer to the monument there may have been a large wooden palisade running to the north with an entrance close to Stonehenge dividing the landscape into eastern and western parts.

### Inside the monument

This phase begins with the deliberate backfill of some parts of the Ditch with clean chalk. In other segments the Ditch is allowed to silt up naturally until it is almost completely full, and in yet other stretches chalk backfill is added when the Ditch is about three-quarters full. There is some evidence that small cuts were made into the Ditch fill and pottery and animal bone were placed in some of these. Others, cut from the top or very near the top of the filled-in Ditch, contain human remains, mostly deposits of cremated bone. It may be that the many cremations found around the Bank and inside the monument also date to this phase. In the interior there was a complicated structure of timber posts, with further post structures across the north-eastern causeway and running towards the southern entrance causeway.

The Aubrey Holes are now empty of posts and cremation burials are placed in the secondary fills of many of them.

- Ditch secondary filling forming naturally but with some areas of deliberate backfill of clean chalk
- Some features cut into Ditch during the formation of the secondary filling
- Aubrey Holes surviving as partially filled features
- Timber settings in the centre of the monument, at the north-eastern entrance and running towards the southern entrance
- Towards the end of the phase, cremation burials deposited in the Aubrey Holes, the upper Ditch, and around the circumference of the monument on and just inside the Bank



## Summary: landscape and monument

The landscape visible from the monument site may have witnessed little change in this phase, with the exception of the construction of a henge monument on Coneybury Hill (Fig 57). It is likely that the Stonehenge Cursus to the north was already passing out of use, or more probably, had already passed out of use, and that the emphasis was shifting away from linear monuments to return, as in an earlier period, to activities within enclosures. The Stonehenge segmental ditch enclosure of phase 1 may have led the way in this, but in the following period, in what in traditional terms is the Late Neolithic, a new tradition emerged. This brought with it, by whatever means, a wide repertoire of goods, including an exotic type of pottery known as Grooved Ware.

Sites which developed within this time period include the large classic henge of Wessex type at Durrington Walls and the small henge at Coneybury. Unenclosed sites in use at this time certainly include that surrounding Chalk Plaque Pit on King Barrow Ridge, for which there are radiocarbon dates (Cleal *et al* 1994) and probably include similar concentrations at Wilsford Down, and on Stonehenge Down.

At the monument phase 2 is represented principally by the silting of the Ditch, with some deliberate backfilling, the secondary use of the Aubrey Holes as a cremation cemetery, and the construction of a number of post structures. The appearance of the Bluestones and the beginnings of the complex of stone monuments are taken to mark the beginning of phase 3; in the wider landscape this is probably to be equated with the appearance of early Beaker pottery and other Beaker associated goods.

## Environment: landuse and landscape

*by Michael J Allen*

Much of the environmental evidence from monuments contemporary with phase 2 Stonehenge is derived from buried soils beneath their banks and thus pre-dates the construction of these monuments (eg Durrington Walls and Woodhenge). Nevertheless, there is a hint that the diverse landscape mosaic described in Chapter 5 was gradually becoming more homogeneous. As more of the woodland and shrubs were cleared to accommodate an increase in cultivation, indicated by the cereal remains at Coneybury Henge, the rich tapestry of local and varied habitats started to give way to a more unified picture. The evidence from Stonehenge itself (*Scaife, Chapter 4*) indicates open established grassland and seems to be confirmed by molluscan analysis from the Ditch, zone A (Evans 1984).

Open grazed grassland, however, was far from ubiquitous since woodland cleared for the henge at Coneybury later regenerated, covering the monument in scrub (Bell and Jones 1990). From Stonehenge itself Evans postulated regeneration within the secondary fills of the Ditch (his layer 7; mollusc zone C) from mollusc analysis and he argues for woodland or scrub cover which, even if only confined to the Ditch itself, indicates the presence of these habitats in close proximity to the monument (Evans 1984, 13).

All animals of woodland pannage, browse, and game are still present. Cattle are the most common species among the faunal remains; they are ideally suited to this mixed landscape of graze and browse. Pig remains were discarded on King Barrow Ridge where they may have had pannage along the ridge to Coneybury. Deer formed a supplement to the diet (Maltby 1990, 248). Sheep occur for the first time, albeit in low numbers, and exemplify the shift in emphasis explained below.

During the latter part of this phase there is more evidence for larger expanses of established grass downland. Indeed more extensive woodland clearance by the end of phase 2 is inferred by the distribution of Early Bronze Age barrows (eg the Beaker phase at Amesbury 71) which were all presumably built in locally cleared downland (eg King Barrow Ridge, Allen and Wyles 1993; Amesbury, Kerney in Christie 1967). There is a hint that within this expanse of pasture there were cultivated fields, rather than just plots of land set aside for growing cereals. The molluscs from the upper secondary fills of the Stonehenge Cursus are more indicative of cultivation rather than pasture and caryopses of *Triticum dicoccum* (emmer) were recovered from the mollusc samples (Allen unpublished data, identified by Joy Ede).

On the whole, therefore, this evidence seems to indicate a strong but gradual shift towards more control of livestock and greater animal husbandry and cultivation, possibly now in fields rather than small plots of land. The area by at least 2000 cal BC was beginning to take the form of a farmed, grazed downland with shrubs for browse, rather than the more extensive areas of 'wildwood' (phase 1) which seem by this time to have been almost wholly modified.

This decrease in local biodiversity may in part explain the concomitant decrease in the numbers and range of game species that were hunted, and of plant fruits to forage. Maltby's statement that deer were a dietary supplement, rather than being a part of the staple diet as in earlier periods, is important.

It is notable that sheep appear for the first time in this more open and modified landscape. This seems to reflect communities for whom farming was becoming an increasingly important part of their lifestyle and landscape, but who still required elements of the untamed environment (fruits, berries, and game). This dependence upon uncultivated food supplements is typical of many Neolithic communities in England (Moffett *et al* 1989). They are proto-farmers, foreshadowing the establishment in later times of larger farms where food is almost exclusively derived from domesticated animals

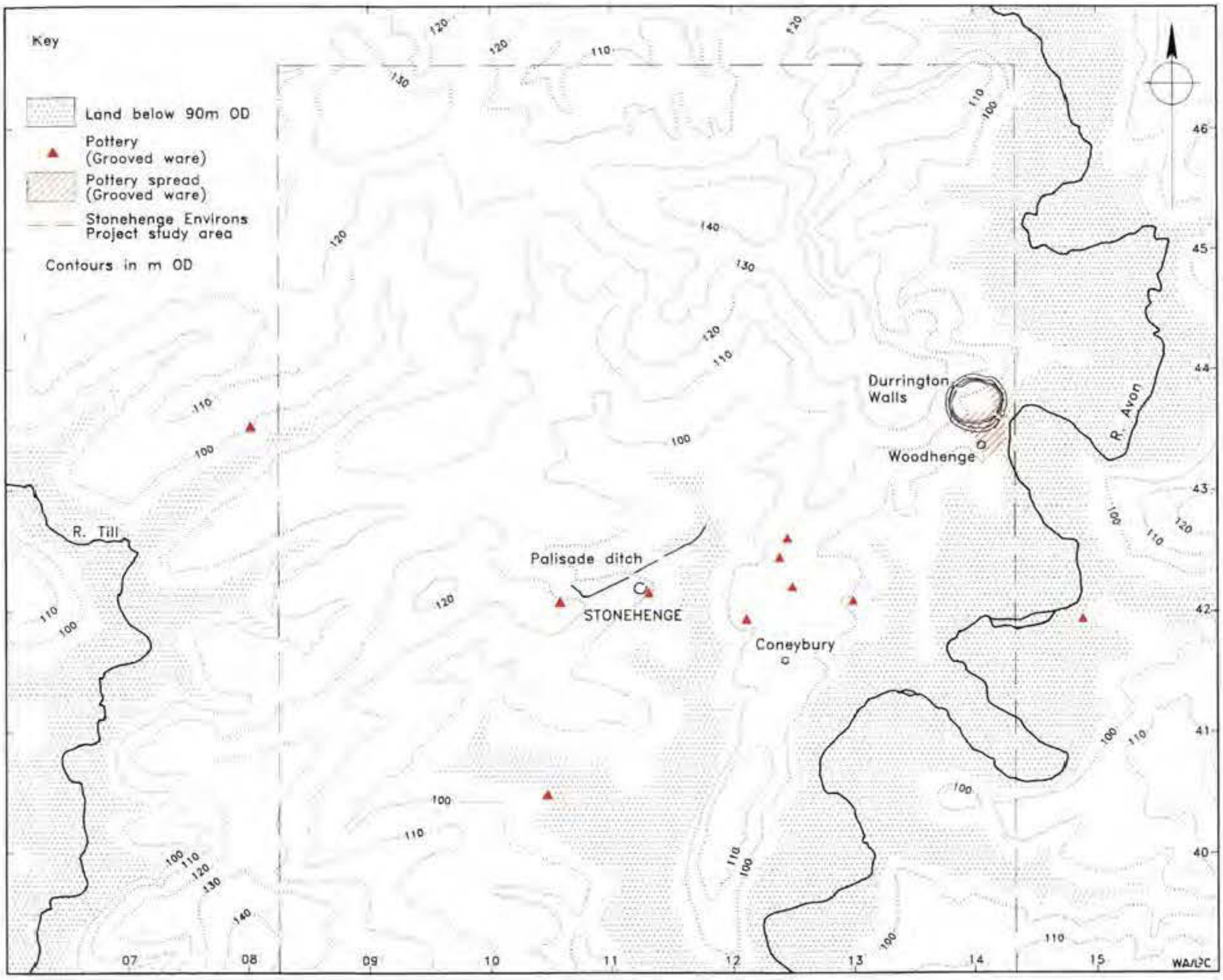



*Fig 57 Late Neolithic sites in the Stonehenge area*

and cultivated plants requiring considerable investment of labour, with delayed rather than immediate return (such as would be obtained from hunting and foraging economies).

## The component parts of the monument

Phase 2 is defined on the basis of the sequence in the Ditch and is bracketed by two major changes in use of the monument. After the formation of a considerable depth of chalk rubble in the Ditch which does not appear to have been inhibited or removed (ie it appears to be a naturally formed primary fill) some activity occurred on the 'new' ditch floor, that is on the chalk rubble surface. This may have continued for some time, and appears to have continued an emphasis on the Ditch floor which had been current since soon after the Ditch was first constructed. This is therefore seen as part of phase 1 (*see Chapter 5, above*). At some point this type of activity ceased and in some lengths of the Ditch clean chalk rubble entered it. The quantity and nature of this material led to its interpretation by the excavator (Lt-Col Hawley) and by others since as deliberate backfill. In other lengths the Ditch was allowed to silt up naturally, although there is some evidence for features having been cut into it during the formation of the secondary filling. The nature of activities relating to the Ditch appears to have changed from phase 1 and although it must still be seen as a component part of the monument, it would seem to have fulfilled a different role from that of the earlier phase.

Within the monument it is difficult to equate features in the interior with elements of the Ditch sequence, because of the lack of stratigraphic relationships. It was clear to Lt-Col Hawley, however, that at least two major sets of features, the postholes in the interior and the Aubrey Holes, were early in the history of the monument. These features do not as a rule contain bluestone fragments in their filling (or in their lower filling in the case of the Aubrey Holes), and the construction and early use of the Aubrey Holes are assigned here to phase

1 (*see Chapter 5*). The postholes occur in three major concentrations, around the north-eastern entrance, in the central area, and forming a 'passageway' leading from the southern entrance (*see Fig 66 below*). It is argued here on the basis of the plan at the north-eastern entrance that the postholes there were constructed during phase 2. Hawley observed that postholes in the interior, in the southern passageway, and at the north-east entrance were 'identical in method of making and in appearance' (1926, 3) and this, combined with the lack of artefacts, is taken as an indication that they are contemporaneous.

The fact that the Ditch filled virtually to the top of its cut before bluestone fragments entered it indicates that a period possibly of some centuries passed between the end of the formation of the primary filling and the appearance of Bluestones, and this hypothesis is supported by the radiocarbon dates (*see Appendix 2*). During this time activities around the Ditch appear to have developed and changed, an understandable process over such a long time period, and towards the end of phase 2 there appears to have been an increase in the deposition of cremated human remains, although some sporadic deposition was certainly earlier. This can be linked to the similar activity in the upper fills of many Aubrey Holes which must therefore have been at least partially filled by this time (*see below*). Unfortunately it did not prove possible to obtain radiocarbon dates for the bone pins deposited with some cremation burials because too little collagen remained. It was considered so vital to obtain dates for the cremations that the absence of collagen was not assumed but was established beyond reasonable doubt by the laboratory (Oxford Radiocarbon Accelerator Unit) before the hope of obtaining dates was abandoned (*see Appendix 2*).

The likely composition of the monument in phase 2 may be summarised as follows:

1 The Ditch – mainly filling naturally, but with discontinuous lengths backfilled deliberately with chalk rubble.
2 Features cut into the Ditch filling during its formation.
3 Settings of timber posts at the north-eastern entrance, in the interior, and the southern 'passageway'.
4 The deposition of cremation burials in the partially filled Aubrey Holes and elsewhere.

It may have been during this phase that an entrance in the south-west was blocked by Segment 22 of the Ditch (*see Chapter 5*), but this cannot now be tested, as the antler from this segment is not identifiable in the archive and probably does not survive.

## Upper filling of the Ditch

The Ditch here is accorded the same treatment as the phase 1 Ditch. It is described by the segments which are identifiable in its original construction, although this is intended to facilitate comparison with the phase 1 descriptions rather than to imply that the segments were still meaningful in phase 2. As the divisions between most of the segments were broken down during or soon after construction they are not likely to have been easily recognisable by the time the secondary filling was forming. In this chapter the descriptions are provided in text rather than as extended captions as fewer illustrations are required.

### Phase 2 Ditch filling: general description

As described in Chapter 5, the final stage of the phase 1 filling of the Ditch is taken to be represented by the stabilisation of the primary chalk rubble, by the use of that surface in some areas of the Ditch, and by the formation of the dark organic layer. The early stages of phase 2 (phase 2a) vary in nature around the Ditch circuit, but the beginning of phase 2 is characterised in one short length at least by a very distinct *event*: the backfilling of the Ditch with clean chalk rubble.

There is, then, a clearly defined beginning to at least one of the features of the upper Ditch filling, but there are also others which are less easily placed in the sequence. These features, in addition to the large-scale backfilling, can be summarised as: small lenses of clean chalk; small, localised cuts or disturbances in the filling; larger-scale areas of possible recutting of the Ditch; and the deposition of cremation burials and other occurrences of cremated and inhumed bone. The deliberate chalk backfill and layers interpreted as natural filling are assigned to phase 2a; recuts and other disturbances are assigned to phase 2b. This distinction is therefore essentially one of fill type, though logically phase 2a layers must exist in order for those of phase 2b to be cut into them. Because it is frequently impossible to determine from Hawley's site records the height in the Ditch from which cuts were made it is probable that in some areas there is a chronological overlap between layers of phases 2a and 2b. Phase 2b is, however, invariably later than the beginning of phase 2a. Details of the nature of the phase 2 Ditch fills and the occurrence of finds where known are tabulated in Tables 12 and 13.

The major episodes of backfilling seem to have occurred at varying points in the sequence around the Ditch circuit, and the implications of this for the phasing are addressed in the section discussing the stratigraphy, below. The most clearly described and the most extensive episodes are around the north-eastern entrance, and here the backfilling episodes on the western side of the causeway appear to have differed from those on the eastern, at least in date.

The main characteristics of the backfilling on the west, in Segments 99 and 100 and possibly also in Segment 98, are that it comprised clean chalk, that it lay immediately on top of the dark layer, that it contained human bone, both as cremation deposits and as isolated fragments of unburnt bone, and that it entered the Ditch from the interior side. Even if it is admitted that Hawley

**Table 12 Phase 2: characteristics of Ditch deposits (other than natural secondary filling)**

| *Segment* | *Chalk backfill* | *Disturbance (human)/ features cut into 2ndry fill* | *Possible recut of Ditch* | *Lumps of clayey compo* |
|---|---|---|---|---|
| 98 | X | X | – | X |
| 99 | X | X | – | – |
| 100** | X | – | – | – |
| 1** | X | – | – | – |
| 2 | X | – | – | – |
| 3 | 0 | X | X | – |
| 4 | ? | X | – | – |
| 5 | – | – | – | – |
| 6 | 0 | – | – | – |
| 7 | 0 | X | – | – |
| 8 | X | X | – | – |
| 9 | 0 | X | ? | – |
| 10 & 11 | 0 | – | – | X |
| 12 | 0 | X | – | – |
| 13 | 0 | X | – | – |
| 14 | ? | – | – | – |
| 15 | X | – | – | – |
| 16 | nd | X | – | – |
| 17* | 0 | X | – | – |
| 18* | 0 | – | – | – |
| 19 & 20 | 0 | – | – | – |
| 21(*) | 0 | – | – | – |
| 22(#) | 0 | nd | – | – |
| 23(*) | 0 | X | – | – |
| 24 | X | X | ? | – |
| 25 | ? | nd | – | X |
| 26 | nd | nd | – | – |
| 27 | ? | nd | – | X |
| 28 | ? | nd | – | – |
| C49 | X | nd | – | – |

*Key*
* = *terminals of southern entrance*
** = *terminals of north-eastern entrance*
(*) = *terminals of putative south-western entrance*
(#) = *blocking of putative entrance*

*X = present; 0 = absent; ? possibly present, ambiguous; nd = no details; – = real absence assumed but not clear*

may not have noticed cut features and some doubt is cast on the contemporaneity of the cremation burials with the chalk, it is difficult to explain the occurrence of isolated fragments of cremated and inhumed bone other than as having entered the Ditch at the same time as the chalk. An early occurrence of bone is also represented by the animal and human bones mixed with wood ash in Segment 100. The description indicates that these bones occurred both in the dark layer and in the chalk above it; if this was the case then it seems probable that their deposition was contemporary with or immediately preceding that of the chalk, so that they were still loose on the surface when the chalk was deposited. This mixture of human bones, animal bones, and wood ash must be one of the three such instances referred to in Hawley's description of a similar deposit near the southern entrance (Segment 17). The published description does not agree with the Diary account here, suggesting that the deposit was in the penultimate segment (16). It is quite clear from the Diary that this was not the case, since there is no mention of such a deposit in the day-to-day record for Segment 16, but there is in that for the terminal segment (17). If, however, the published record is taken to relate to Segment 17, then it adds to the description of that segment in the Diary. The Diary account only mentions briefly the bone deposit and wood ash, and it is also shown within the secondary filling in a section drawing (Fig 44), but the published account suggests that it was in or possibly only on the dark layer and extended in plan for about 3ft (0.92m) (Hawley 1924, 4). It is interesting to note that both this occurrence, at the southern entrance and that at the north-east causeway are on the same side of the entrance when viewed as if entering or exiting (ie the right hand side going in, the left hand side going out). The other occurrence of human and animal bones mixed together, bringing the total to the three cited by Hawley (*ibid*), is in the penultimate segment (99) to the west of the north-east causeway (Hawley 1924, 34).

The chalk backfill did not constitute the only upper filling, either in the Ditch to the west of the causeway or to the east of it. This is suggested by a remark of Hawley's that the chalk backfill followed the line of the loose chalk (ie the primary fill; 1924, 33) and by the fact that he also uses the term 'silt' for Segment 100. This is supported by two sections recorded in the 1954 cuttings C41 and C42 which show as accurate Hawley's observation that the chalk backfill lay directly on the dark layer. Section A in Segment 99 (Fig 60) and section K–L in Segment 98 (Fig 58) both show chalk rubble lying directly above the dark layer. In section A the 'fine rubble' also shows a concave upper surface as described by Hawley. In section K–L the chalk, which in this case is described as 'compact white chalky rubble', is very clearly asymmetrical and has a convex upper surface. In both cases the succeeding deposit appears to be a natural secondary filling which is almost certainly what Hawley would have termed 'silt'.

It is unfortunate that there is no similar recent corroborative evidence on the eastern side of the north-east causeway to support Hawley's description of the deposit as the Ditch sequence here appears to have been different. Since Hawley's observations seem to have been accurate for the western side of the causeway it is assumed here that they are also reliable for the segments to the east. The principle difference here is that although there was very clear backfill consisting of a very compact chalky material it was not deposited directly on top of the dark layer. The chalk backfill was first encountered

**Table 13 Phase 2: finds from the Ditch (records of presence only)**

| *Segment* | *Struck flint* | *Chalk ball* | *Other chalk object* | *Human bone (inhumed)* | *Human bone (cremated)* | *Animal bone* | *Antler* | *Worked bone* | *Grooved Ware* |
|---|---|---|---|---|---|---|---|---|---|
| 98 | – | – | – | X | X | X | – | – | – |
| 99 | – | – | – | X | X | X | X | – | – |
| 100** | X | – | – | X | X | X | X | – | – |
| 1** | – | – | – | ? | ? | X | X | – | – |
| 2 | X | – | – | – | – | X | – | – | – |
| 3 | – | – | – | – | – | X | X | – | – |
| 4 | – | – | – | – | X | X | X | – | – |
| 5 | – | – | – | – | – | – | – | – | – |
| 6 | – | – | – | – | – | X | – | – | – |
| 7 | – | – | – | – | X | – | – | – | X |
| 8 | – | – | – | – | – | – | – | – | – |
| 9 | – | – | – | – | X | – | ? | – | – |
| 10 & 11 | – | – | – | – | – | – | – | – | – |
| 12 | – | – | – | – | – | X | – | – | – |
| 13 | X | – | – | X | X | X | X | – | – |
| 14 | – | – | – | – | – | – | – | – | – |
| 15 | – | – | – | – | – | – | – | – | – |
| 16 | – | – | – | – | – | – | X | – | – |
| 17* | – | – | – | X | X | X | – | X | X |
| 18* | X | – | – | – | – | X | – | – | – |
| 19 & 20 | – | – | – | – | – | X | – | – | – |
| 21(*) | – | X | – | – | – | – | – | – | – |
| 22(#) | – | – | – | – | – | X | ? | – | – |
| 23(*) | – | – | – | – | – | – | – | – | – |
| 24 | – | – | X | X | – | – | – | – | – |
| 25 | – | – | – | – | – | – | – | – | – |
| 26 | – | – | – | – | – | – | – | – | – |
| 27 | – | – | – | – | – | – | – | – | – |
| 28 | – | – | – | – | – | X | – | – | – |
| C49 | – | – | – | – | – | X | – | – | – |

*Key*
** = terminals of southern entrance ** = terminals of north-eastern entrance (*) = terminals of putative south-western entrance*
*(#) = blocking of putative entrance*

*X = present; 0 = absent; ? possibly present, ambiguous; nd = no details; – = real absence assumed but not clear*

immediately under the layer of rubble which everywhere overlay the Ditch fill, and the chalk was so hard and compact that it could be cut out in blocks (Hawley 1924, 31). This deposit was about 15" (0.38m) thick, and the Diary entries seem to indicate that below this there was normal 'silt' and a dark layer (12/9/1922–2/10/1922).

Because Professor Atkinson suggested that this deposit was a deliberate filling-in of the Ditch in order to create an entrance which matched the width of the Avenue, the position of the chalk in the Ditch sequence and its extent along the Ditch to the east (ie the direction in which the Avenue ditch lies) are important. The most southerly occurrence of chalk backfill in the excavations of 1922 (ie the cuttings running towards the north-eastern causeway from the south) was within Segment 2, in C23, section A–D (ie a 3ft (0.9m) length of Ditch; below and Fig 61). This lies some 10ft (3.0m) south of the line at which the Avenue would have crossed the Ditch if it extended across it. The chalk backfill seems to have differed from that in Segment 1, being more like that in the segments to the west of the north-east causeway. It is described as extending from the interior side and 'sloping down the silt' and a 'fine silt' had settled 'over the middle of it' (15/6/1922). This would seem to indicate that it had not been deposited as late as had that in the terminal segment (1).

Further towards the causeway but still within C23, the compact chalk is noted to have become thinner (11/7/1922), but was certainly present in the section of Ditch at the point where the line of the Avenue ditch would have crossed it (ie section H–K). The entry for the following section, L–O, makes clear not only that chalk backfill was still present but also indicates its position in the Ditch (*see below, Segment 2*). The photographs of C23 confirm that some secondary filling had formed when the chalk entered the Ditch (Fig 61). From this point northwards the chalk appears to have been continuous but there are no more detailed descriptions.

There appears to have been at least one more area in which backfilling took place on a large scale, in Segment 15 near the southern causeway. Hawley recognised backfilled chalk in the part of the section opened in 1924, and presumably it may also have occurred in the part of the Ditch opened earlier (1921) when he was less familiar with the Ditch filling and may not have distinguished natural filling from backfilling.

The only other likely occurrences of major episodes of backfilling are in the southern length of the ditch west of the putative entrance terminal Segment 23, and in the small trench, C49, opened in the western part of the circuit. In Segment 24 (*see Fig 47*) Hawley describes clean loose chalk apparently above the dark layer, and also comments that the Ditch may have been recut because the stratification appeared to be horizontal (*see Segment 24*). In C49, which is recorded only in a longitudinal section (presumably because it was intended to prove or disprove the existence of a causeway at the that point), a convex layer of 'coarse fill' almost certainly represents a depsosit of deliberate backfill (Fig 47).

Minor episodes of backfilling may be represented by the narrow lenses of clean chalk noted at several points by Hawley and accounted for by him as being derived from the digging of the Aubrey Holes. This is a possible source of the chalk, although it is considered here to be an unlikely one, and would not be consistent with the preferred dating for the digging of the Aubrey Holes, which in the present interpretation is regarded as being earlier than this (ie phase 1). These thin layers of clean chalk seem to have occurred mainly on the eastern side of the Ditch circuit, for instance in Segments 3, 4, and 8. They are described variously by Hawley as, for example, a 'vein' (Segment 3) or a 'patch' of chalk (Segment 4) and seem to have occurred high in the Ditch fill; in places they lay directly under the rubble layer which in most areas overlay the Ditch fill, and in others was overlain by 'silt', indicating that the secondary fill of the Ditch had continued to form after the chalk entered it (eg in Segment 8).

It is possible that these occurrences are the result of some natural disturbance of the Bank, perhaps by burrowing animals, but as chalk backfilling certainly did occur it is considered unlikely that this would account for all of them. In contrast to the major episodes of chalk backfilling, these minor occurrences of clean chalk do not occur in any of the drawn sections and are not identifiable in the photographs. They were clearly not present in the two trenches excavated in 1954.

It is impossible now to ascertain whether the chalk was derived from the Aubrey Holes. As the chalk occurs high in the Ditch it can be assumed that, by this time, the Bank was not markedly higher than it is now, but if it was derived from the Aubrey Holes the chalk would have to have been basketed up to the crest of the Bank and tipped down the outer side. It is considered unlikely that the primary digging of the Aubrey Holes would have been this late in the Ditch sequence, but the period of the dismantling of the timber setting in the Aubrey Holes and the placing of the cremations in them could be as late as this.

In practical terms there seems little reason why chalk should be removed and basketed from the Aubrey Holes to the Ditch as part of those activities, but practical considerations may not have been the primary motivation for the action. It is difficult to envisage the large-scale backfilling of parts of the Ditch as having being undertaken for entirely practical reasons, and the same may apply to these minor occurrences. Aubrey Holes containing cremations occur along the lengths of Ditch circuit which were noted to contain sporadic layers of clean chalk, but there are many more occurrences of cremations in the Aubrey Holes than there are corresponding occurrences of chalk lenses in the Ditch. One minor feature which may suggest a link between the cremation burials in the Aubrey Holes and the Ditch is that in AH32 the chalk fill in the bottom of the hole is described as 'a thick layer of very compact chalk rubble (4), light grey in colour and with a consistency suggesting that it had been rammed in when a wet, pasty mess' (Atkinson *et al* 1952, 18). Not only does the description of this layer resemble that of the chalk backfill in the Ditch around the north-east entrance, particularly in the comment that it was probably put in wet, but it also contained 'a few scattered cremated bones' (*ibid*). This chalk appeared to have originally filled the pit, but had been subsequently dug into; a cremation burial was found in the top of the chalk layer and may have been disturbed by the digging (*ibid*). This at least suggests activity involving deposition of chalk, cutting of features, and deposition of human remains in a pre-Bluestone context, which is very reminiscent of the Ditch sequence.

A notable feature of the upper Ditch filling is, therefore, the addition of clean chalk rubble, in both major episodes of backfilling and minor occurrences which may or may not have been intentional and significant. Another feature of the upper fill is the cutting of features into the secondary filling as it formed and there is evidence for such actions in addition to those for the insertion of cremation burials. The cremation burials appear generally to have been inserted when the Ditch was full or nearly so. Finally, there is some evidence that deposits were placed within the fill as it formed, apparently without the cutting of features to contain them, and this is occasionally associated with burning.

The evidence from the Hawley excavations is not clear, as Hawley seems to have had difficulty in identifying cut features within the Ditch. This is indicated by his problems in identifying the cuts for the cremation burials (eg in Segment 4); this is perhaps not surprising given that, in 1954, the cut for the Beaker-period grave was not recognised because its fill closely resembled that of the Ditch fill. It is the section drawings from the 1954 excavations, however, that provide the firmest evidence for some features having been cut into the Ditch fill during the formation of the secondary filling.

In section E–F (Segment 98), for example, the dark layer is interrupted by what may be a cut (Fig 37), and higher in the fill a dark lens in the section is marked as charcoal, illustrating both these types of activity in the upper fill. In the other trench through Segment 98, both 1954 sections show some disturbance, but in the case of section Q–R this 'earthy stain' is in the area subsequently shown to be the fill of the Beaker-period grave. In section K, however, an area of earthy rubble apparently sealed by further secondary fill ('rainwash') is likely to be a similar, but earlier, disturbance, cut while the secondary fill was forming and cutting through the dark layer and into the primary fill. Some of that chalk subsequently formed part of the fill of the cut. Although it is possible that all the disturbances visible in the 1954 sections were the result of animal activity, the deposition of charcoal must represent human activity.

There are other, less easily interpreted, descriptions of the upper Ditch in the Hawley cuttings which also suggest this but there are no drawn sections through any of the areas concerned. There is also some evidence that deposition of animal bones and artefactual material was associated with some of these disturbances, as for instance in Segment 17 (*see below*).

The disturbances which were noted by Hawley appear to have been on a larger scale than being small cuts into the Ditch filling, and indeed it may be that he only noticed large-scale disturbance.

The context of artefacts within the secondary filling of the Ditch is more difficult to establish than in the primary filling, principally because descriptions of material as being on the Ditch bottom are easily interpreted, as are descriptions relating to the clean loose chalk on the bottom and sides, which is clearly primary chalk rubble. The positions of many of the finds from the Ditch are indicated by depth alone and are more difficult to interpret; for this reason they have often been ascribed only to 'phase 2 or earlier' ('2-' in the tables). In the final Ditch cutting excavated by Lt-Col Hawley (C29) in the southern part of the circuit the recording of finds seems to have been particularly poor, and although it is clear that there was a concentration of chalk objects in this area which were almost certainly not in the primary filling, their contexts are mostly unknown (Montague, Chapter 9). The occurrence of sherds of Grooved Ware in a possibly disturbed part of the Ditch indicates that objects may have been deliberately placed in some of the cuts at least.

The occurrence of human remains, generally as cremated deposits but occasionally as inhumed bone, is discussed in detail below in the section on the cremation cemetery. The main point of interest in relation to the Ditch sequence is that there are no certain occurrences of human bone in the primary fill, but that such deposits occur very early in the phase 2 fills and are also placed in features cut from the top of the Ditch fill. Thus this type of activity occurs throughout the duration of the secondary filling and after it.

## Segment descriptions

### *Segment 98*

This segment (C42, sections K–L and Q–R, Figs 58 and 59, and C41, section E–F, Fig 37), first excavated in 1954, was partially reopened in 1978 (C61) when the western section (Q–R) was cut back and a mollusc column taken. In the report on the 1978 excavations a rationalised version of the field section (Archive drwg no 716) is shown. This is reproduced in Figure 37, above (Wessex Archaeology numbers were assigned on the basis of the 27 layers identified in the field, and so may not correspond exactly with the published layers 1–10). During this excavation an inhumation was discovered cutting the upper filling of the Ditch, and accompanied by Beaker-period artefacts (*see Chapter 6*). The grave (WA 4028) and filling (WA 4005) were indistinct as a feature (Fig 59) and one end of the grave had been cut by the 1954 section Q–R but not recognised (Evans 1984, 13, 28).

The Ditch is described by Evans as showing a normal filling with the exception of some possibly deliberate backfill in the primary fill and the cutting of the grave (*ibid*, 10). The Ditch was, however, badly disturbed by animal burrows, and Hawley observed that the neighbouring segment (99) was disturbed by rabbits.

The upper filling of the Ditch in C42 varied considerably between section K–L on the east and Q–R on the west. In the published report of the 1978 excavation the secondary filling comprises the organic layer (layer 8, WA 4011–13) and the two subsequent layers, 6 (WA 4007) and 7 (WA 4009–10). Here, the organic layer is considered to belong in phase 1 (*see Chapter 5*).

Layers 6 and 7 on section E–F (Fig 37, above) are described as pale chalky loam and chalk rubble, becoming increasingly more stony with depth; almost no natural flint occurred (*ibid*, 10). The molluscan analysis showed a fairly high-diversity fauna with many shells. Evans argued that the fauna suggested woodland or scrub cover, and even if this occurred only in the Ditch, similar environmental conditions must have existed nearby to have acted as refugia in an otherwise open landscape. Evans suggested that this probably reflects human abandonment on a local scale at least. In the lower part of the secondary fill (layer 6) the diversity was slightly less than in the upper part, and there were slightly more open country species.

The eastern section, K–L, from the 1954 excavation shows a very different upper fill. Most of the filling is apparently normal secondary filling, noted here as 'rainwash' (WA 3044), but there is a considerable body of material annotated as 'compact white chalky rubble' (WA 3048) which it would seem reasonable to equate with the 'cast in chalk' observed by Hawley in Segments 99, 100, and in the eastern Ditch terminal. Like that material, it has come in from the rampart side.

In the centre of section K–L there is an area of earthy rubble (WA 3047) which must be either an episode of disturbance (ie phase 2b), or is animal disturbance. This almost certainly contained an ox vertebra (S54.834).

There is no layer which could be interpreted as chalk backfill in section E–F, which was towards the eastern end of the segment (in C41), and where the humic layer (WA 3089)

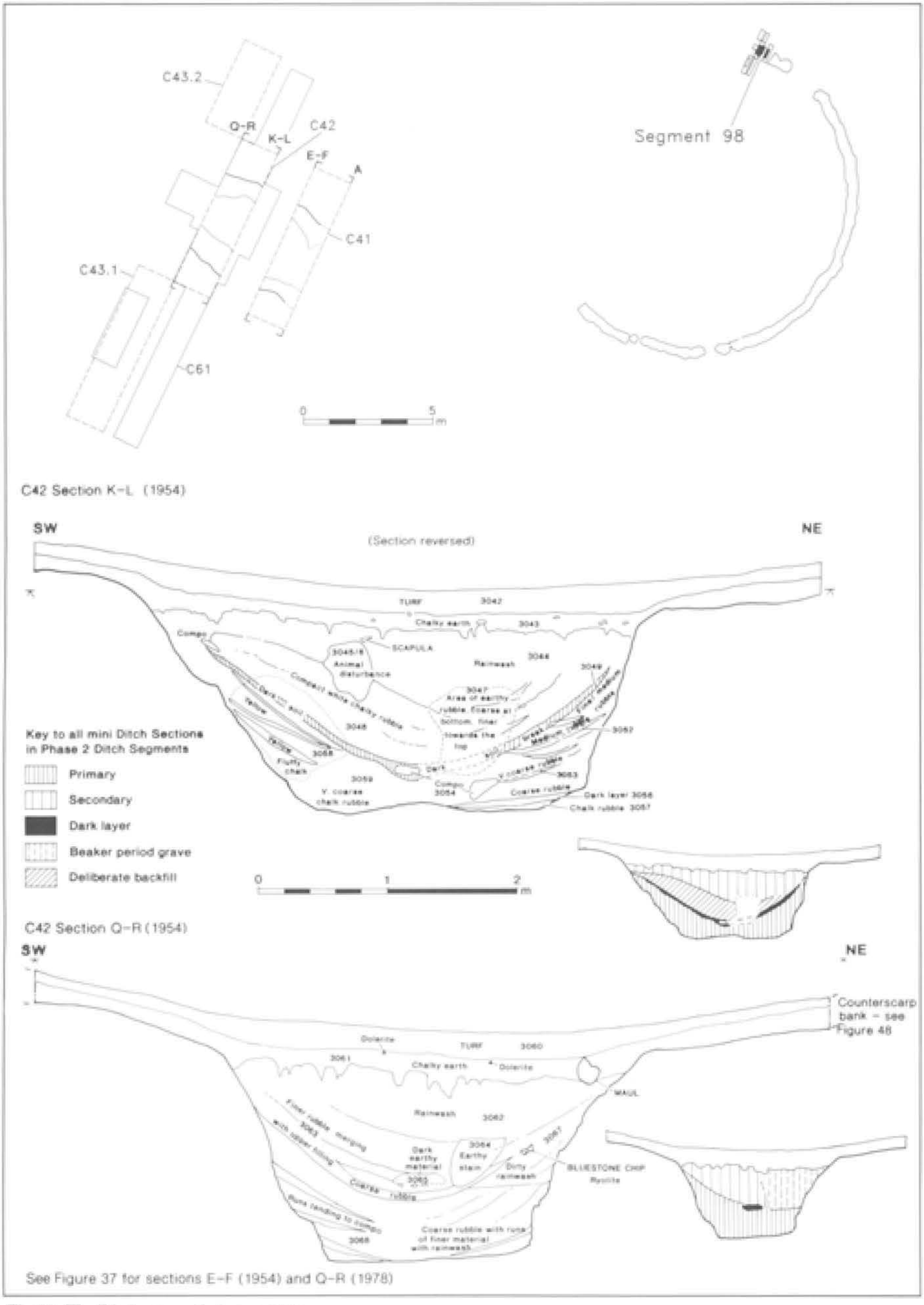



*Fig 58 The Ditch, phase 2, Segment 98*

*Fig 59 The Ditch, phase 2, Segment 98, section Q–R as re-excavated in 1978 (C42), showing cut of Beaker-period grave to the right (John Evans)*

is broken in two places and the primary fill apparently disturbed. The occurrence of charcoal (WA 3088) above the more central of the two breaks may indicate that the intrusion was from fairly high in the secondary fill, but the formation of secondary fill above would seem to indicate that it was not cut from the top. Towards the interior side of the Ditch the humic layer is absent, and the occurrence of 'compo' (WA 3098) and a soil lens (WA 3097) within what appears to be chalk rubble may be an indication that there was also disturbance here.

***Segment 99***

When excavated in 1922 (C25) the upper filling of this segment was found to be clean chalk deliberately placed in the Ditch (WA 1559, 1663, and 1565 'cast in chalk'). Hawley notes that this segment was identical in its fill to the one immediately to the east (Segment 100). Cremated bones were found dispersed within this chalk backfill (1663) in an area about 28in (0.7m) below ground level and 3ft (0.9m) from the rampart side. The remains took the form of 'a handful of ashes' in a dusty mass and probably marked the spot where all the bones had been deposited. The Diary indicates that this was only the most compact of several finds of cremated bone: 'There were odd pieces of cremated bone met with occasionally and at one spot about a handful in a small mass. They were in the loose chalk which had been thrown in and perhaps put in without being confined in anything' (7/11/1922). Several pieces of animal bone, a piece of human skull, and 'tines of horn' were found at 32in (0.8m) below ground level (1924, 34), indicating that there was inhumed bone in this deposit as well as cremated bone. Animal bones are also described as clearly within the 'cast in chalk: A rib of a large animal and a vertebra of same in the cast in chalk on the west side at 38" [0.96m]' (24/10/1922).

This upper filling of the segment was, however, badly disturbed by rabbits on the western side, which may have contributed to Hawley's reluctance to extend the excavation, although he states that it was because he had more work to do on the causeway which was being excavated at the same time (1924, 33).

The western end of this segment falls within C41, excavated in 1954 as Cutting A–E. The western section (E–F) is within Segment 98 (see above), but the eastern section, A, is within this segment, close to its western end. This section too has an upper fill which may be equated in part with Hawley's 'cast in chalk'. The layer marked 'fine R' (WA 3072–3) is assumed to be fine chalk rubble, since the abbreviation 'R' is used throughout that section to mean 'rubble'. Hawley's description of the 'cast in chalk', particularly in Segment 1, the eastern Ditch terminal, indicates that it did not have the appearance of the primary fill, but was finer, more compact, and in places gave an appearance of having been thrown in wet. This layer is overlain by 'rainwash' (WA 3071), which is the normal secondary filling of the Ditch (phase 2a).

The layer postulated as chalk backfill appears to be cut by a feature, or an area of disturbance, filled with 'rainwash' (not numbered on section), which may therefore represent one of

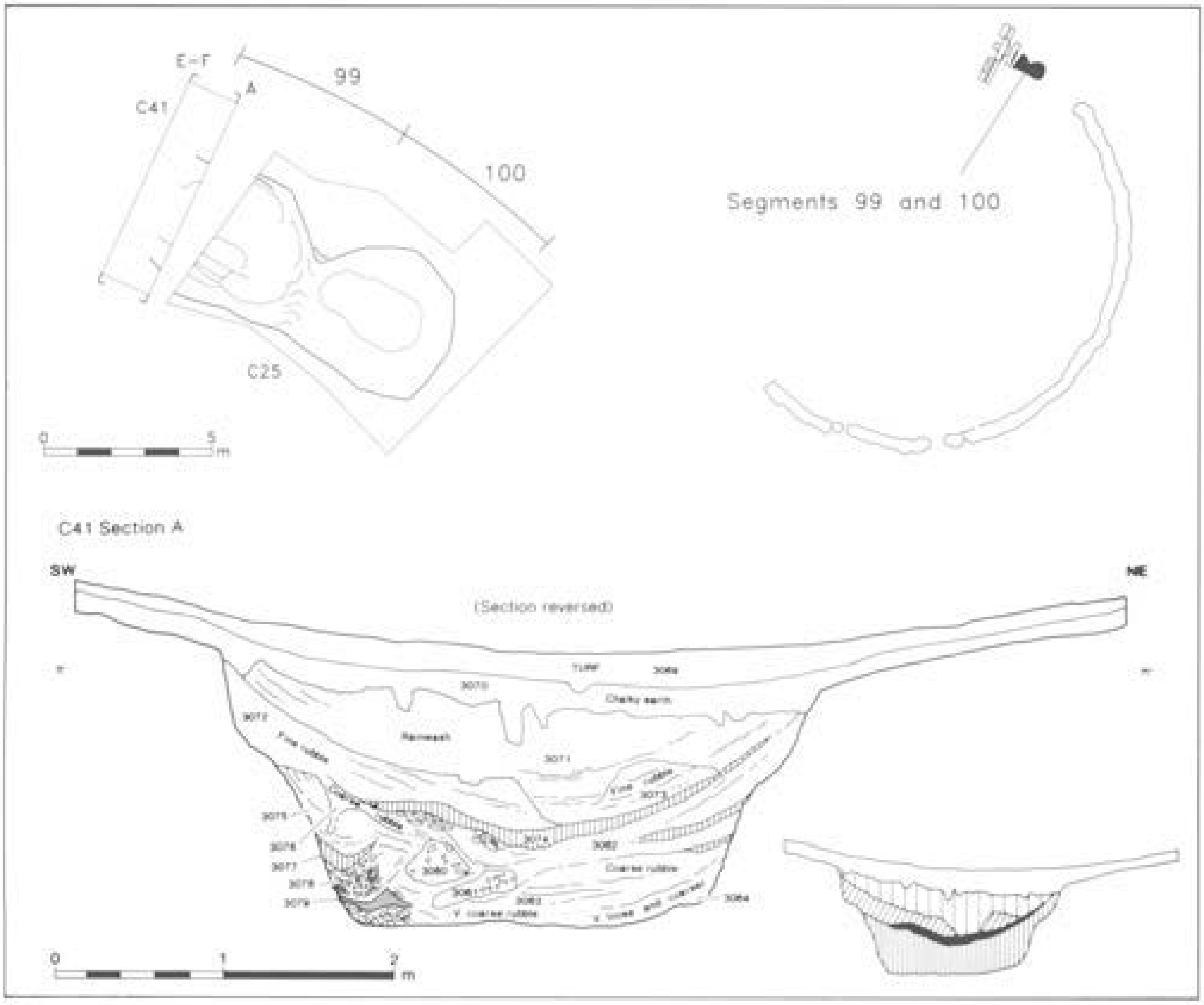



*Fig 60 The Ditch, phase 2, Segments 99–100*

the intermittent episodes of activity in the Ditch which seem to have punctuated its upper filling and have been termed phase 2b.

***Segment 100***

Excavated by Hawley in 1922 (C25), the upper filling of the Ditch in this, the terminal segment on the western side of the north-eastern entrance, was distinctive because it was made up largely of clean chalk rubble (WA 1552) which Lt-Col Hawley generally refers to as 'cast-in chalk' (Fig 60). This layer was c 3ft (0.9m) thick and 'ended upon a dark stratum' (WA 1553) (1924, 32). The latter is described under phase 1, above. Cremated bones were found within the chalk (WA 1552) at 38in (0.96m) from the surface and 15in (0.38m) from the interior side of the Ditch. They were in a compact mass, as if they had been placed there in a bag or other container. The remains are described by Hawley as being of a child and an adult, on the grounds of large bone fragments in the case of the adult and small bones and jaw in the case of the child, but the bones do not survive and these identifications must be regarded with caution (*see McKinley, Chapter 9*). The Diary description of the discovery of these bones makes it quite clear that they were within the clean chalk: 'they rested on the clean loose chalk 15" [0.38m] on the west [Stonehenge] side and were covered by more loose chalk thrown down over them' (9/10/1922). There were no signs of burning in the area of the bones, and only a few fragments of wood ash were noticed in their vicinity. From the date on which this was excavated it would seem that it would have been on the side of the segment nearest the causeway.

Hawley considered that the chalk had been thrown in and he notes in the published report that 'it took the same slightly curving slope as the loose chalk below it' (1924, 33), which would seem to indicate that it had a concave upper surface and did not fill the Ditch to the top of the cut. In the Diary he notes that the chalk appeared to have come in from the rampart (ie the interior) side, and that it was 'intensely hard' on its upper surface (7/10/1922). He also suggests that a likely source for this chalk was a stonehole along that side of the rampart, but none was found during his excavations. Finds certainly in this layer of 'cast-in chalk' include an antler pick, described by Hawley as a worn-out pick because of its broken brow tine (7/10/1922; SP105), and cremated bone.

The chalk lay directly on the dark layer (WA 1553), which seemed to be coloured mainly by charcoal and wood ash. In one area animal and human bones were scattered in the chalk, and also in the dark layer; partly in this dark layer, and partly in chalk above it, were

> several fragments of human bones including four pieces of skull and part of a jaw with two teeth. Associated with them were animal bones, including a large fragment of the skull with one horn core, and several vertebrae and other bones of an ox ... These remains occupied an area of about 3ft [0.9m] by 1½ft [0.5m] at 42" to 48" below ground level [1.06–1.22m] and among greyish dusty matter caused by decay of other bones. Near the spot were pieces of antlers and two decayed horn picks.
>
> (1924, 33)

From the Diary it is clear that much of this material came from the upper filling rather than from the dark layer, and the Diary also mentions 'silt', a term used elsewhere to describe the unmodified secondary filling of the Ditch and not used in the published description of this segment, perhaps because he confined the published description to what was unusual about the filling rather than to describing the more common layers. It is probable, therefore, that the chalk backfill was not the only upper filling of the Ditch, and it may have been followed by a natural secondary fill. It is impossible, however, satisfactorily to determine the stratigraphy in this segment, as the publication account and the Diary account are not in agreement. Hawley describes the largest group of material in the upper fill in the following terms in the Diary:

> a few human bones including a jaw with 2 teeth were found in association with a large fragment of an ox skull and a vertebra of same[;] the vertebra shows it to have been a young animal and the horn core bone is small. Associated also with flint chips in the upper silt at 30" [0.7m] to 42" [1.07m] B.G.L. and extending over an area of 4½ft [1.4m].
>
> (18/10/1922)

This group seems to have been found in the half of the segment furthest from the causeway, as it is noted as being from the second half of the 'crater' (except for a few pieces of human bone noted as coming from the baulk, 20/10/1922), but the main point is that it is clearly the same group as the bones described as being partly in the dark layer and at a depth of 42–48in [1.07–1.22m] below ground level, quoted above (1924, 33). If this is not simply a mistake on Hawley's part it suggests that he may have been drawing on a source in addition to the Diary when he wrote the 1924 report, and that in this source slightly different measurements were given. As the deposit appears to have been concave, which the dark layer certainly is in other segments, the difference in measurement may simply be a result of the vertical spread of the deposit having been measured at different points. It does at least seem to suggest that it belongs essentially to the fill of phase 2 rather to phase 1.

'Silt' is also mentioned in a general comment that the second half of the 'crater' was being removed (19/10/1922), and the likeliest location for this layer in the Ditch is above the concave upper surface of the 'cast in chalk', given that the chalk is noted as lying directly on the dark layer.

***Segment 1***

This segment was excavated by Hawley in 1922 (C24), and was approached from the south (ie anti-clockwise, from Segment 2). It presented a marked contrast to the lengths of Ditch he had excavated in the previous cutting (C23). He describes how

> In the previous ditch excavations there had been a fairly uniform deposit of silt below the top rubble layer, but in the present instance it was different. [describes profile of Ditch] ... The rubble layer on the top, containing Stonehenge chips etc., was still present and very definite, but under it, instead of silt, there was clean white chalk which had been brought from elsewhere and cast into the ditch [WA 1425]. Some of this chalk had been bruised and crushed to a fine consistency and had become set into masses so extremely hard that they could only be removed by undercutting the softer material below them and breaking the substance into blocks. They gave the idea of the chalk having been wet when cast into the ditch.
>
> (Hawley 1924, 30)

In the Diary description of this cutting the layer of hard chalk is given as 15in (0.38 m) thick, compared with an overall depth of 56in (1.42m) for the ditch, and a depth of about 1ft to 1ft 6in (0.30–0.46m) for the rubble and humus above the Ditch (as shown in the two profiles of this segment (profiles 2 and 3, Fig 39), which gives a depth for the primary and secondary filling of the ditch as in the region of 1m (about 40in) of which a little over a third at the top comprised the hard chalk layer.

The nature of the Ditch filling below this layer of hard chalk is not clear from either the Diary or the published account. There was certainly a dark layer (WA 1426), probably to be equated with that noticed in other segments (*see Chapter 5, Segment 1*), and it seems likely that there was some more normal secondary fill between this and the hard chalk. Part of the upper fill and the dark layer were both cut by a feature identified as a stonehole by Hawley (WA1429), and this casts some doubt on whether the dark layer was the same as that recorded elsewhere or a layer higher in the fill. The hole seems to have been cut mainly into the Bank and solid chalk, only clipping the fill of the Ditch on its inner side, but it is recorded that it cut the 'silt' (20/9/1922) and that 'the top of the hole had been cut through a dark vein of matter which shows as an inclined stratum on the face of the section' (21/9/1922). It seems likely that the stonehole was cut after the secondary filling of the Ditch had formed, although there is a further comment that 'The hole had been slightly cut into the silted soil in the ditch which may account for the extremely hard chalky matter which had been put in to make the stone firm' (21/9/1922). Finds in the secondary silts do not seem to have been very numerous but included animal bones, antler, and fragments of both inhumed and cremated human bone.

*Segment 2*

This segment was excavated in 1922 (C24, C23, and C22). The most notable feature of the upper filling was the very distinct layer of hard chalky deposit which ran down from the interior side of the Ditch, within the upper fill. The Ditch in this segment was excavated northwards. No chalk is noted in the upper fill in Hawley's Vth Ditch cutting (ie C22), but is noted in the first 4ft (1.2m) section of his VIth trench (C23) (WA 1418), excavated immediately afterwards. It is described as

> a very hard layer of white chalky matter extending from the escarp and sloping down the silt. It stops abruptly at the junction of Stratum of silt from counterscarp but the silt on that side [WA 1420] is very compact also. It was put in purposely I should imagine but before the Stonehenge period and fine silt has settled over the middle of it since it was put in.
>
> (15/6/1922)

The reference to the 'Stonehenge period' indicates that there were no sarsen or bluestone chips in it or below it, as Hawley took these to date from the introduction of the stones which form the settings in the interior. This layer of 'chalky matter' seems to have varied in thickness and there is no clear description of its composition, although its hard and compact nature is referred to several times. It proved possible to remove this material in large blocks, indicating that it was certainly not loose or rubbly (18/7/1922). Its stratigraphic position is made clear in an entry made during the excavation of the northern part of the segment: 'the Ditch was not entirely silted in when this was put in and the small quantity of silt present at the time has been compressed by the weight but not so in counterscarp side where there is no cast in chalk' (25/7/1922).

It is not clear whether this chalk layer continued to the northern end of the segment. Hawley notes, in his section I–O, that 'the white deposited chalk seems likely to disappear here', but it does not seem to have done, as it is noted further on, in section P–U (27/7/1922 and 15/8/1922). In C23 it is not mentioned north of section 'U', but the descriptions are short in the last entries, and Hawley may have failed to mention it only because he had already mentioned it in every other section of this trench. It is not specifically mentioned in the part of C24 which can be assigned to this segment, but hard chalk backfill did occur in C24 (1924, 31) and it seems reasonable to conclude that this deposit extended to the northern limit of Segment 2.

There seem to have been fairly few finds in the upper filling, and very few in the chalky material. In the latter there seem only to have been a few flint flakes (26/7/1992 and 15/8/1922), and in the silt a few animal bones and struck flint. In the southern part of the segment there were two disturbances in the upper fill which may date to phase 3.

The only feature within the upper filling (WA 1403), was a 'slight black smudge ... it might be remains of a small fire, but there are no charred pieces of wood' (22/5/1922). This lay towards the southern end of the segment, in trench C22, section 5–6, but its depth is not recorded.

*Segment 3*

This falls within two of Hawley's cuttings; the northern part is in Hawley's fifth excavation (C22) of 1922 and the southern in the long cutting C28, of 1925.

The upper fill in the northern part of the segment appears to have been a normal secondary filling with no indication of deliberate backfilling. The filling (WA 1405) is described as 'soft earthy chalk from the top nearly to the bottom and reaching about one third across South side of the Ditch' (29.3.1922). Hawley also comments that 'The silt of this portion of the Ditch appears more earthy than in the past on the south [ie cuttings C18–21]' (*ibid*).

The uppermost fill of the Ditch in this length was disturbed by a much later inhumation burial (grave cut WA 1398) probably of post-Iron Age date, which only just extended down into the ditch silt (24/3/1922).

There seem to have been few finds from this northern part of the segment, although Hawley notes an antler pick from the 'earthy silt and much higher up than usual' (29/3/1922). The fact of the filling being more earthy than usual, the earthy fill extending almost to the bottom, and the occurrence of an antler pick in the secondary fill could be taken together as an indication that this length of Ditch had been recut. The antler pick, a relatively unusual find in the upper Ditch fill, could be either a redeposited item from disturbed primary fill or one of the implements used for digging out the recut; that the date of this disturbance was prehistoric is suggested by the absence of finds.

In the southern part of the segment, in C28, the only feature of the upper fill noted by Hawley as being unusual was the occurrence of

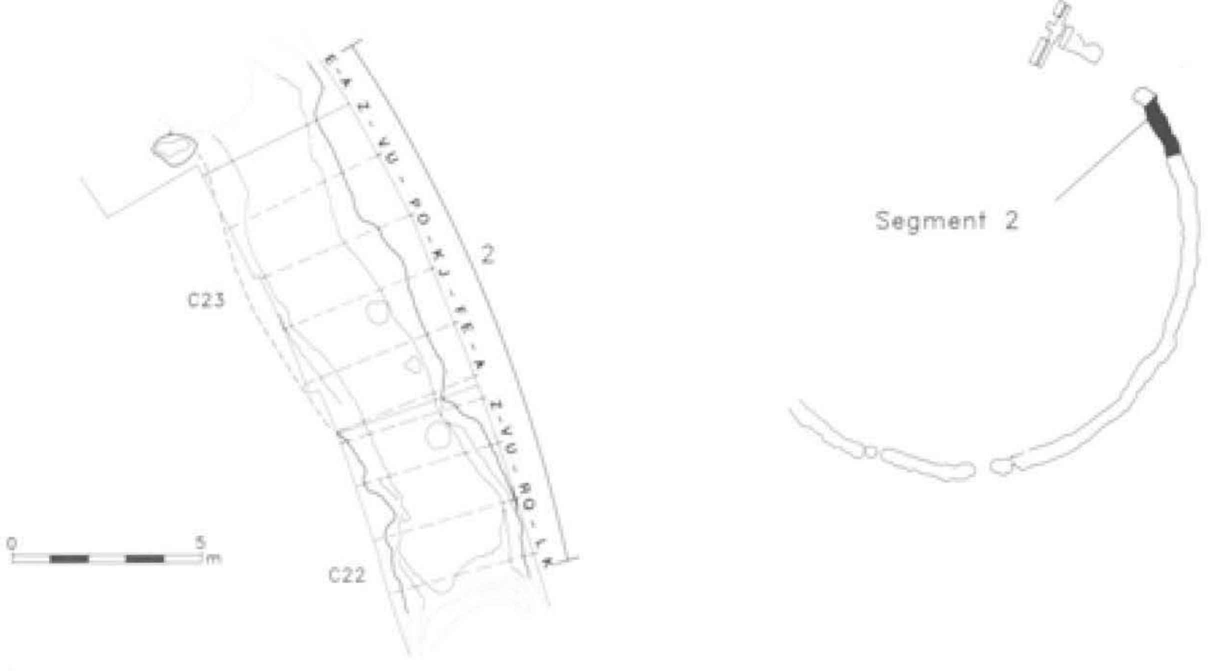
> a sloping vein of chalk [WA 2521] over some silt on west side [ie interior side] not far from the top which is covered with more silt [WA 2520] at the middle where it ends. At the west end it is immediately under Top Layer [ie the rubble and humus layers, post-Ditch; WA 2519]. It might be chalk cast in when making Aubrey Holes
>
> (Diary 1925, 27th April to 1st May, not written up daily)

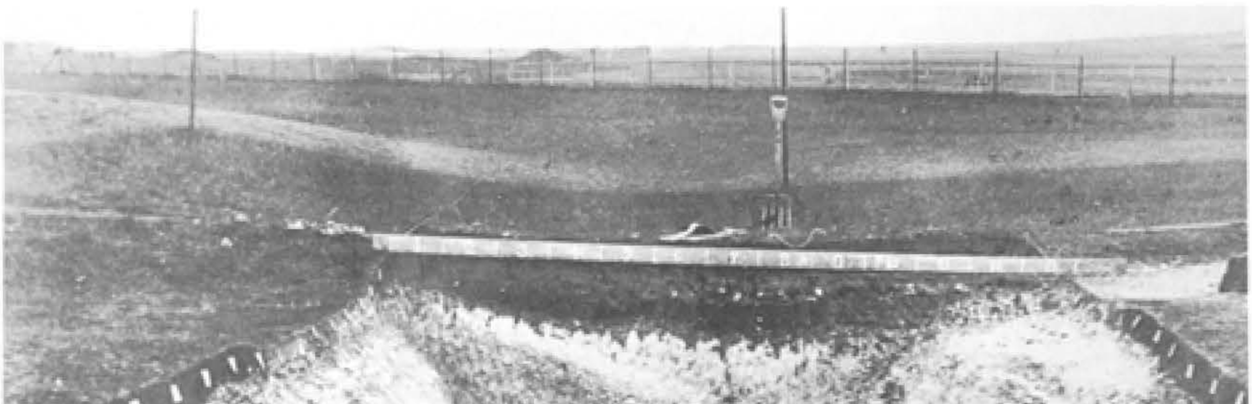
One antler and a 'few fragments of animal bones' were found at 33in (0.84m) below ground level (1928, 150; Diary 1925, 27th April–1st May), a depth which probably puts them *c* 0.5m above the bottom of the Ditch, and therefore within the secondary filling.

*Segment 4*

This segment was excavated in 1925 as part of the long Ditch excavation, C28. The upper filling of the Ditch is described by Hawley as the usual 'silt' in his second and third sections of 1925, but in the southern part of the segment there was a distinct difference, with deposits of clean chalk occurring within the silt.

In the fourth section 'silt' (WA 2533) had begun to form over the dark layer (WA 3536) which lies above the primary chalk rubble here, before the clean chalk entered the Ditch, and continued to form subsequently. The clean chalk (WA 2534) had entered the Ditch from the interior side (ie the Bank side): 'the silt was normal at the upper part, but a little below



Segment 2 looking north from line A of Cutting 23 showing compact chalk backfill at the top of the Ditch

© Society of Antiquaries of London

*Fig 61 The Ditch, phase 2, Segment 2*

it on the rampart side there was a descending patch of white chalk reaching to the middle, under which the silt again became normal' (1928, 150). As elsewhere where similar deposits occurred Hawley suggests that the chalk is derived from the digging of the Aubrey Holes, a suggestion which must be regarded as unlikely given the then height of the intervening Bank.

There appear to have been two cremations in this segment, as two are marked on the Ministry of Works plan (Fig 40), but it is difficult to identify the individual descriptions of these, and in one case Hawley seems to have changed his interpretion of the stratigraphy.

In the day by day section of the Diary for this year the cremation in the fifth section is described as

> In the fallen silt at the rampart side a cremation was found. It was in the layer of cast in chalk that covers the lower silt and over it silting was continued afterwards. I believe this layer was the chalk excavated when making the Aubrey Holes ... The cremation remains were very white and clean hardly a sign of burnt ash. No object with them except a large flint over them ... The soil over the chalk had not been dug down to from above. The cremation was deposited before silting began again. There can be little doubt that it was deposited from surface [*sic*, ie presumably from the then surface, before silting filled the Ditch up to the present surface]
> (2/6/1925)

In the published account this becomes (in the paragraph describing the 5th section)

> A mass of cremated bones was found on the rampart side of the Ditch about a foot above the bottom. The bones were in a bowl-shaped cavity excavated partly in the silt and partly in the solid chalk of the side. Later it was found that a cutting had been made at the top of the side 5ft [1.5m] long and 5ft [1.5m] wide, the dimensions growing less until the cavity below was reached ... The cutting being partly in the silt, showed that it had been made after the Ditch was filled up. There was a large rough block of flint placed over the cremated bones, but there was no object with them and but a few traces of burnt wood.
> (1928, 151)

There is no mention in either the day by day entries in the Diary, or in the published report, of a cremation in the fourth section, but one is shown in that position in the Ministry of Works plan (Fig 40). In a note appended to the 1925 Diary (28–29 in typescript in the archive) there is description of a cremation which must be this one. In this note Hawley describes how

> ... when the projecting mass against the rampart in sections 3 to 5 was dug into to find exact position of chalk side, a cremation was come upon in section 4. Like the others it had been dug from the top and was so low down as 4' 0" BGL [1.45m].
>
> The silt had been removed for from 2 to 3 feet [0.6m to 0.9m] in order to dig down to this level, probably the unusual depth was owing to their not meeting with the solid chalk of the slope at higher level and all the cysts were made in the solid chalk of the slope. It could be clearly seen by a very sharp cut how they had penetrated and removed the hard white stratum often noticed in the top of this silt and which might be the chalk discarded from the Aubrey Holes. The cuttings [ie of the cremations] begin in the silt and seem to incline obliquely to reach the solid chalk of the sloping side. The cremated remains were greatly calcined and blackened and there were very few. The small quantity would probably weigh not more than 3–4 ounces. Possibly remains of a child.

This must be the cremation indicated by 'A' on the plan but it does not appear to be mentioned at all in the day by day Diary entries or in the publication, both quoted above. The report was published after the MoW plan was drawn, although it may have been written before the cremation was discovered and the new find not incorporated.

Only in the third of Hawley's sections are any finds mentioned which are likely to have been within the secondary rather than the primary fill. In this, at 33in [0.83m] below ground level, animal bones and an antler were found.

***Segment 5***

This segment was also excavated in 1925 as part of C28. Very little is noted about the upper silt in this segment, except that it had been compressed by a modern trackway which passed across the Ditch at this point. A 'very slight stain of a fire' was noted at 32in (0.8m) below ground level, which here would probably have been 10–20in (0.25–0.5m) above the Ditch floor (3–9/6/1925).

***Segment 6***

Like the previous segment, this was excavated in 1925 as part of C28. The upper filling seems to have been an entirely natural sequence with no chalk backfill, cut features, or other disturbance. Only one find is noted, an animal bone at 22in (0.56m) below ground level in the centre of the Ditch (10/6/1925).

***Segment 7***

Excavated in 1925 as part of C28, there seems to have been no deliberate chalk backfill in this segment, but the natural secondary Ditch filling was disturbed in at least two places. In Hawley's eighth section, towards the northern end of the segment, a cremation burial had been placed in a 'bowl shaped' feature (WA 2818) which had been cut partly through Ditch secondary filling and partly ('three parts') through the solid chalk of the Ditch side on the exterior. The full depth of the feature is not given, but it is noted as being a foot wide (0.30m) at 22in (0.56m) from the surface (the Ditch here being 4ft (1.2m) deep) and the humus 15in deep (0.38m) (Diary 1925, silt on 17th–19/6/1928). The cremation is described as 'having in it apparently all the bones left of the burnt body: sometimes only a portion of them has been present ... A few charred teeth were present, but no object had been burnt with the bones' (1928, 152). It is also noted as being an adult, but whether this is Hawley's identification alone is not made clear and it does not survive.

The other intrusion may have been of more recent date and occurred in Hawley's ninth section towards the southern end of the segment (WA 2820). It is described as 'a deep irregularly formed cavity [which] appeared in the chalk on the side, extending to 2" [0.05m] from the bottom. It contained nothing but humus and dirty soil, and might have been made by animals or by the roots of a tree growing there' (1928, 152).

There seem to have been very few finds in the upper fill of this segment, partly due to the shallowness of the Ditch, which was only 4ft 6in (1.4m) deep overall, but it contained a single sherd of pottery. Hawley recovered very little pottery from the fill of the Ditch, although many sherds were recovered from the layers overlying it, and there is some doubt whether this sherd survives in the collection. The find is described in the Diary for Hawley's section eight as

> There was a very small piece of pottery in loose chalk 15 inches [0.38m] and 10 inches [0.25m] above the actual bottom of the Ditch. It was whitened by the chalk and was only detected by a small piece having been broken off. It is of soft fine black gritty ware surface brown[.] It would have been much more satisfactory if it had been found actually on the bottom. It might have slipped down the side amongst falling chalk quite a long time after the ditch was deserted and is certainly a little newer than the things on the ditch bottom. Again the silting here is shallow the ditch depth being only 4' [0.12m].
>
> (16/6/1925)

In the published account doubts as to the security of the context are further strengthened.

> This pot sherd may have descended from above, as it was not far from the side, and the descent may have been assisted by burrowing animals.
>
> (1928, 152)

A hand-written note in the typescript of the Diary points out that although the fragments with catalogue numbers 1616–1617 appear to fit the description, the date on a label with them ascribes their find to another year (1924). The description fits the fragments so closely (ie P2, *see Fig 65*), however, that they are considered very probably to be the sherd found on this occasion. It is possible also that the pottery was in the primary rather than the secondary filling, but in view of the reservations of the excavator this cannot be considered to be beyond doubt. P2 is identifiable as Grooved Ware, possibly of or related to the Woodlands sub-style.

***Segment 8***

Excavated in 1925 as part of C28, this segment certainly included clean chalk in its upper filling. Hawley first mentions this in his eleventh section, at the northern end of the segment, and notes that it appeared to be the same type of deposit as encountered earlier that season (in his first section, ie Segment 3). It is described as occurring 'in the same position along the rampart side but often in quantities hardly noticeable, and is occasionally absent' (1928, 153). This description suggests that the chalk was present more frequently than is noted in the Diary, but also indicates that the amount of chalk was sometimes quite small. The possibility that some non-intentional processes, such as erosion or animal burrowing into the Bank, may have caused some of the chalk to enter the Ditch cannot be dismissed.

Around the middle of the segment in Hawley's twelfth section the chalk may have lain high in the silt, as it is described as 'on the silt the line of chalk' [possibly from Aubrey Holes] passed across the Ditch to the opposite side and had a good deal of yellow hard chalk on the surface' (1928, 153), but further description makes it clear that some silt had formed over it.

At the southern end of the segment in Hawley's thirteenth section the description is difficult to follow, but the Diary makes it clear that there was 'a good deal of clean white chalk [WA 2575] in the rampart side' (13/7/1925). A feature may have cut the main bank at this point, as a 'groove' is described on the 'rampart side', but it is not clear from the description what or where this was (1928, 153, and 13/7/1925).

In the middle of the segment (in Hawley's twelfth section) a feature (WA 2569) was observed within the upper silt. It lay towards the southern end of Hawley's twelfth section and he describes it as

> an ancient excavation having been made in the silt, which had been removed and replaced by dirty gravelly matter. This disturbance must have taken place at an early date, as it began under the white chalk layer [WA 2567] near the top, and the silt [WA 2566] accumulated afterwards over both.
>
> (1928, 153)

There seem to have been no finds in the secondary filling in this segment, Hawley commenting at one point: 'nothing whatever in the silt. Like fishing in a pond where you know there are no fish' (13/7/1925).

***Segment 9***

Excavated in 1925 as part of C28, the upper filling of the Ditch in this segment was noted by Hawley as of an unusual dark colour, being 'very brown owing to mixture with humus and not of the light, grey chalky colour usually seen'. The appearance of the upper fill also appears to have differed in other ways, as Hawley also goes on to note that the silt 'lies horizontally without any very noticeable stratification but the chalk debris at the side is normal' (Diary 1925, 22 July etc, description of section 15). This seems strongly to suggest either the presence of a large intrusive feature in this segment, or a recut of the entire Ditch segment. Writing of his fourteenth section Hawley records that the clean chalk rubble 'at or near the top, usually found, is missing here' (23/7/1925). It is not clear from this whether it was present anywhere in this segment, which also includes Hawley's fifteenth and part of his sixteenth section, but it does suggest that it was more often present than he makes explicit.

Two cremations were recovered from the upper filling of this segment, both on the exterior side of the Ditch within a few feet of each other. Both were cut through the solid chalk of the Ditch edge, one of the cremations in this case only just clipping the Ditch filling. Neither survives.

The more northerly of the two, both of which were in Hawley's fourteenth section (see Fig 43) was in a feature (WA 2575) 17in (0.43m) wide at the base, which was 40in (1.02m) from the surface. It had clearly been cut from above, although the level from which it was cut is not specified. It contained

> a large collection of bones of an adult [which] were a good deal cemented together by liquid calcium carbonate which had percolated through them.
>
> (1928, 154)

There were no objects with it, nor any wood ash. Approximately half of it was cut through the Ditch filling and half through solid chalk. The second burial (WA 2816) was only 2ft (0.6m) south of the first, and had mostly been cut into solid chalk. The amount of bone was similar to that of the first burial, and was considered by Hawley to be an adult. No objects were found, and the cremations, or rather the ashy matrix they sometimes occurred in, appear to have been sieved after excavation as a regular practice, as indicated by a comment of Hawley's in the published report

> a few wood ashes were carefully sifted in case there might have been beads or anything not easily discoverable. This precaution is always taken after the removal of cists [ie cremation burials].
>
> (1928, 154)

The level from which the features containing cremations were cut is obviously of great importance in establishing the time period over which the Ditch was used for the deposition of cremation burials, but it is almost impossible to establish this beyond doubt. In the Diary there are observations which suggest that they were cut from very high in the fill, but the descriptions are difficult to interpret.

> Since the rain fell the digging down to the upper soil to the cysts can be easily seen and the soil filling the top of them cuts through the Stonehenge layer and even in the humus. There can be little doubt that the cremation in the fourth section on rampart side [Segment 4] was introduced from the top and that all belong to Bronze Age date and of the same period as those small ones on the inner Rampart slope and in the Aubrey holes.
>
> (22/7/1925)

Hawley considered that the Stonehenge Layer was contemporary with the introduction of the Bluestones to the monument (*see Chapter 8*) but even so doubt must be expressed about the nature of the 'cut' he was observing, as it is difficult to envisage how they could be cut through the humus unless they were of very recent date. It is perhaps possible that later material had slumped into the filling of earlier features as organic matter in those features decayed, but the observation remains difficult to account for.

### *Segments 10 and 11*

It is difficult to separate these segments as both lay within Hawley's seventeenth section excavated in 1925 (C28). The upper filling of the Ditch was noticeably different in this length from most of the Ditch. Hawley notes that it did not show 'the usual curved stratification, and indeed, there were hardly any curving lines in it' (1928, 155). He also noted that there were 'small masses of hard chalky clay compo' in it (*ibid*). Here Hawley appears to mean that the substance (WA 2590) was a chalky clay, with the major constituent being clay, since in the Diary it is described as 'much clay in detached pieces some of them more than a foot in size' (Diary 1925, July to August A17 to A18).

### *Segment 12*

This segment lies within the eighteenth and nineteenth sections of Hawley's 1925 cutting (C28). The upper fill of the Ditch seems to have been disturbed, possibly when a bluestone implement (described by Hawley as an 'axe-hammer') was deposited (*see Chapter 7*). Hawley notes that 'the soil of what should be hard silt is very loose [WA 3726] and is a mixture of humus and chalky matter [chalky humus]'. It appears to be unstratified and denotes a disturbance (WA 2594). There was a darkened fire spot at 32in (0.81m), below ground level, near the line separating this section and section 19, which would appear not to be deep enough to have occurred in the primary filling, although the distinction between the primary filling and the silt is not made by Hawley in this section. The only finds noted are 'a very few bones of a small animal' (13/8/1925), and Hawley states that 'the rest of the silt contained nothing'. There was also no 'white stratum at top of silt', indicating that there was no chalk rubble in the upper fill here.

### *Segment 13*

This was excavated in the first two years of ditch excavation (C18 and C19), and in the 1925 season (C28, the northernmost part of the segment). In C28 a cremation was found within 'a small bowl [WA 2600] scooped in the chalky loose silt at a depth of 17" to 20" [0.43–0.51m] below ground level.' The cremation was a small one, was covered with 'brown humus', and lay about 4 ft (1.2m) south of the line separating sections 18 and 19, in the centre of the Ditch (Fig 62). This could have been deposited at any time after the filling of the Ditch, although the fact that the feature seems to have been cut directly into the silt suggests that the time which had elapsed was not considerable. Hawley does not comment on the nature of the silt in this section (WA 2598), only noting that there was no chalk stratum (ie chalk rubble in the upper fill).

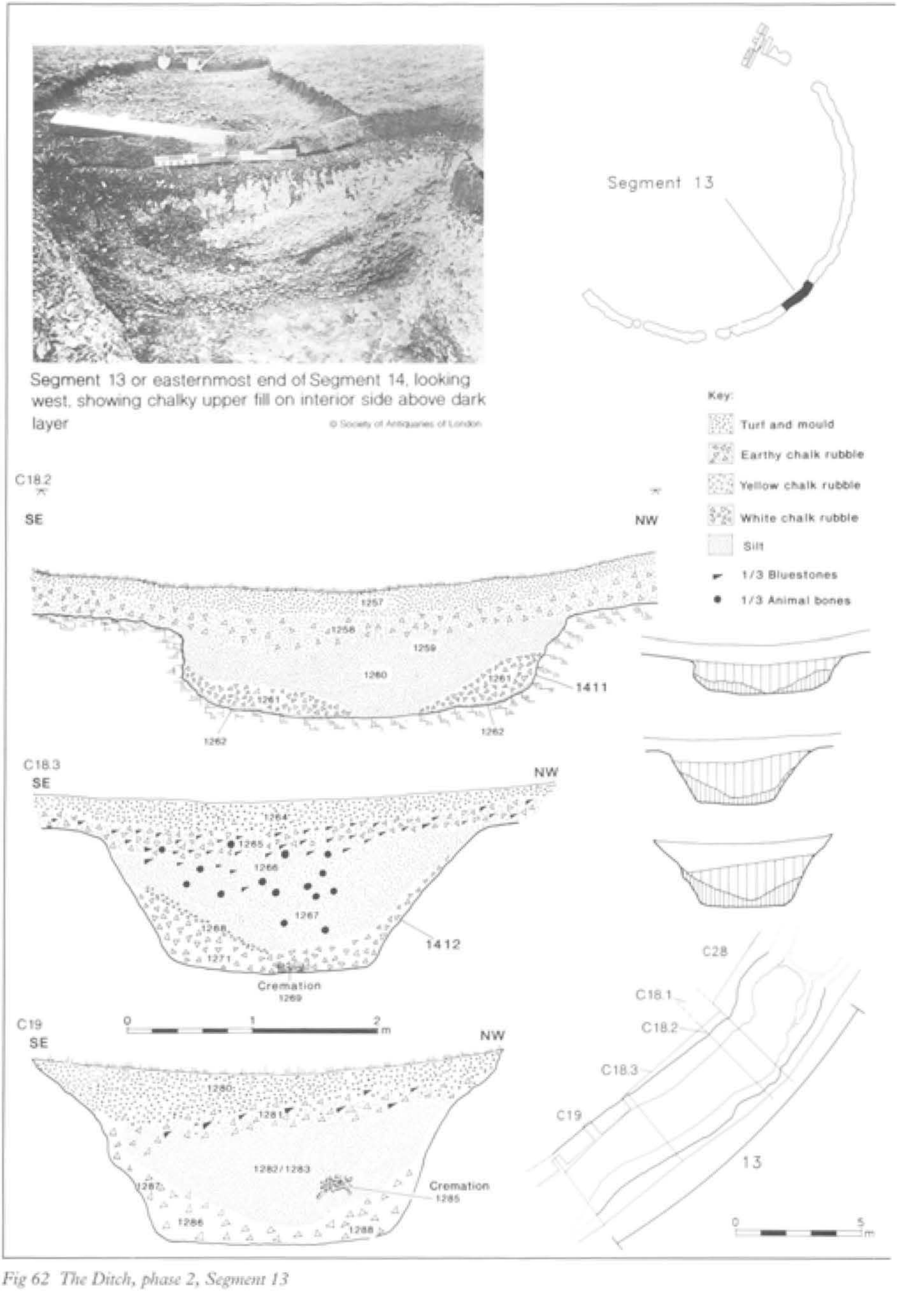
The central part of the segment was excavated in the first ditch excavation (C18) in 1920. There is little description of the filling, except that it was 'somewhat chalky at the sides' (25/2/1920), but there are two section drawings of this part of the segment (Fig 62).

No finds were recorded from the secondary fill, although the cremation found in C18.3 may have been cut from the secondary fill. It is shown as being covered by primary chalk rubble, but its primary position cannot be entirely accepted, as it seems unlikely that a feature cut through primary chalk rubble and backfilled with it would have been recognised (phase 1, Segment 13).

In the southern part of this segment, excavated in 1920 (C19), the upper fill appears to have consisted mainly of 'dirty grey chalky matter getting whiter towards the rampart and the same but less so towards the counterscarp'. Two pieces of human skull were found, apparently inhumed rather than cremated, in the centre of the Ditch close to the eastern end of the cutting, and at a depth of 29in (0.74m) below ground level. Slightly further on, close to line B, a cremation burial was found at 35in (0.89m):

> the bones thoroughly calcined to whiteness, there were 2 teeth amongst them, the crowns burnt away as usual. A little way from the spot, at C.f. 28–31, was a mass of burnt woody matter mixed with powdery black chalk. [The] cremation seemed to have been placed in a scooped out recess 10 wide by 7 deep [0.25 by 0.18m].
>
> (10/9/1920)

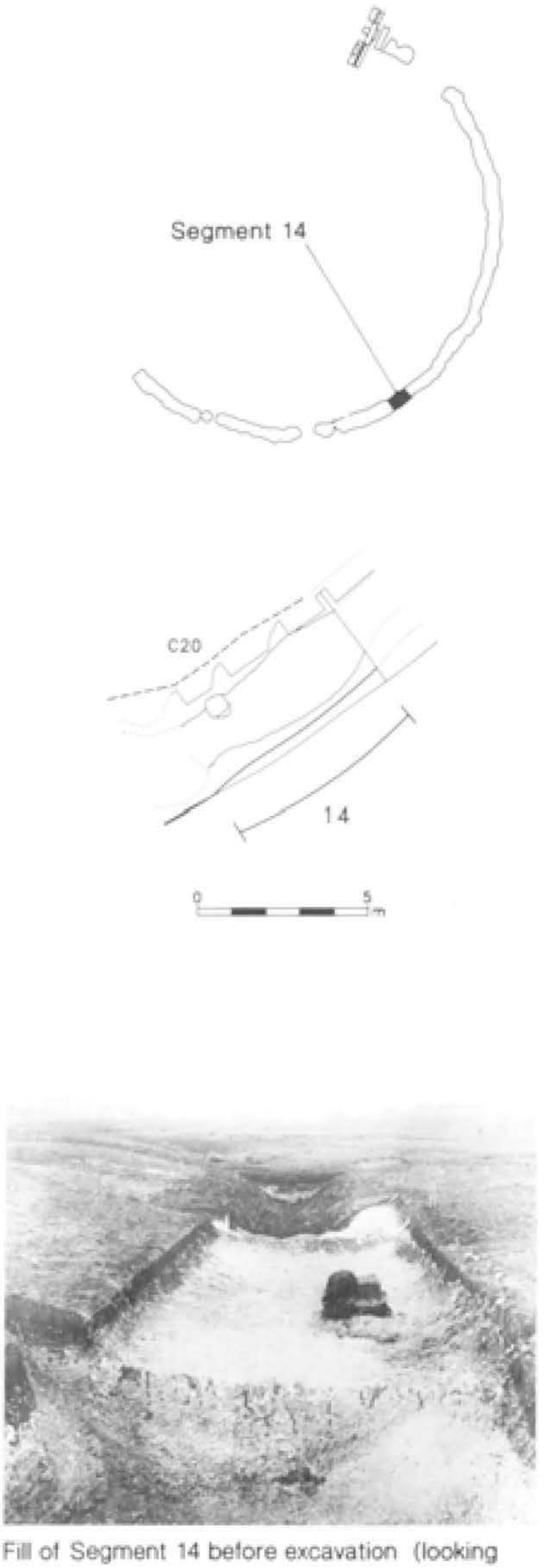
Further down in the fill, but possibly still within the secondary filling, was 'another black burnt mass' similar to the one




Segment 13 or easternmost end of Segment 14, looking west, showing chalky upper fill on interior side above dark layer

© Society of Antiquaries of London

*Fig 62 The Ditch, phase 2, Segment 13*




Fill of Segment 14 before excavation (looking east)

© Society of Antiquaries of London

*Fig 63 The Ditch, phase 2, Segment 14*

already found, and Hawley considered that the two were probably part of a single deposit (*ibid*). Finds included animal bones, fragments of antler, and an antler crown 'very much rubbed down, and two worked flints' (*ibid*).

***Segment 14***

This segment lay mainly within Hawley's third cutting (C20) and in the published report the upper fill is noted only as 'marly silt' (Hawley 1922). Hawley notes also that 'The silted marl did not produce anything and objects were not found until near and on the bottom' (*ibid*).

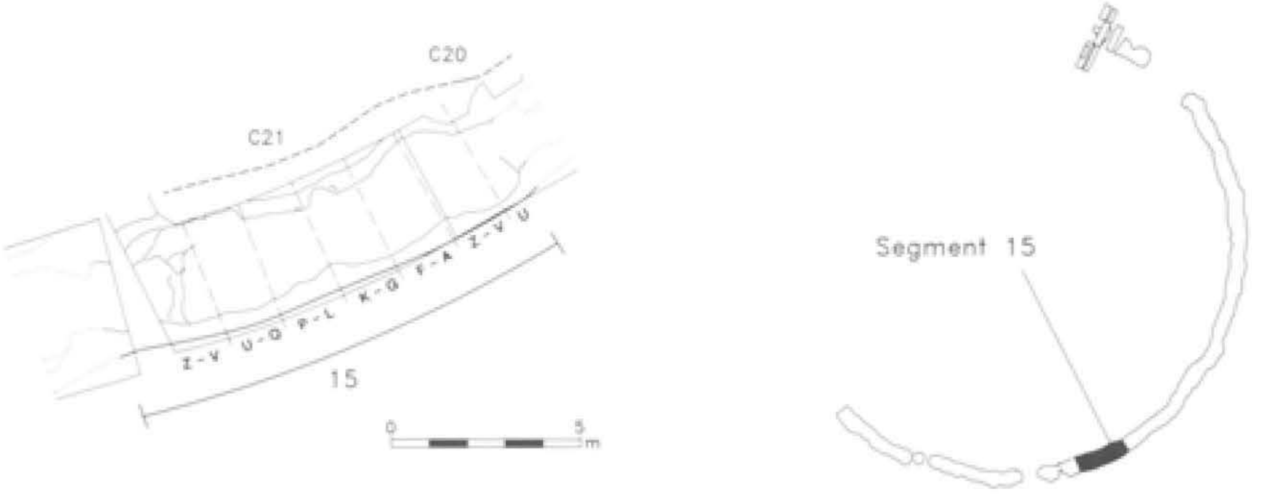
There is a photograph almost certainly of this segment showing a markedly chalky upper fill which seems not unlike the filling in the segments excavated around the north-eastern part of the circuit. This photograph is almost certainly of the western edge of C19 looking towards the south-west. It seems to show a normal primary filling of chalk rubble with a dark layer above extending from side to side (ie both of phase 1 in the present phasing). Above this is a pale, apparently chalky layer extending asymmetrically across the Ditch from the interior side. On the exterior side is a darker, apparently earthier, deposit. Together these account for most of the upper fill of the Ditch. The photograph must have been taken at the beginning of the excavation of C20 when the end of C19 was still open, as shown in another photograph taken from the opposite direction (Fig 63). It should be noted that there is no corroborative information in the Diary to show that this is chalk rubble, except that on the 18th November, 1922, Hawley notes that 'I began the second layer of the 3rd excavation of the ditch. So far the 1ft deep [0.3m] cutting reveals nothing but solid compacted chalk'. It is not clear here whether he is referring to the chalk rubble which usually lay under the humus, as that is not usually referred to as being compact, and a depth of 0.3m would probably have been deep enough to have reached the top of the Ditch silt. The photograph (archive no 1431a) suggests that it is possible that Hawley is referring here to chalky compact Ditch fill.

The photograph in Figure 63, taken at about line R in C20 and looking north-east, shows clearly the upper fill of the Ditch. Hawley was working anti-clockwise in this cutting, back towards the length of the Ditch which he had already excavated (C18 and C19). These appear in the photograph to be partially filled in and returfed, with the as yet unexcavated part of C20 already stripped, apparently down to the top of the silt. Here, the upper Ditch fill does not seem as chalky as in the section at the eastern extremity of the cutting, although whether the difference is simply due to different lighting conditions is impossible to establish.

***Segment 15***

This segment was excavated in three of Hawley's cuttings; most of it lies in C21, excavated in 1921, but the eastern extremity lies within C20 and the western in C26. The latter was not excavated until 1924. There are no Diary entries for most of the length of C21 (*see Appendix 4*), although it was excavated using the grid system, and there are photographs of this cutting (eg Fig 64).

For the easternmost part of the segment in C20 there is both a photograph and a drawn section, the former taken from within Segment 14, looking west (Fig 64). Neither the photograph nor the section shows any sign of features cut into the fill or of any other sort of disturbance. The photograph probably shows the western end of C20 (ie at line Z), while the section drawing is of line Y, both very close to the eastern end of Segment 15.




Looking west, Segment 15, probably at line G

© Society of Antiquaries of London

Looking west, Segment 15 line M

© Society of Antiquaries of London

*Fig 64 The Ditch, phase 2, Segment 15*

Little detail of the central part of this segment can be reconstructed, because of the lack of Diary entries, but two photographs are almost certainly of the central part of this segment, where it was excavated in C21. Both must be looking south-west, one clearly at line M (Fig 64) and one probably at line G. Both these are within the missing section of the Diary and so it is impossible to confirm that photographs were taken at these points.

The ditch filling appears to be much more chalky on the interior side than on the exterior, but it is impossible on this evidence to suggest that there was chalk 'rubble' in the upper fill. The only comment on the nature of the upper filling in the extant part of the Diary for C21 is in connection with a rabbit burrow, in which Hawley comments that

> the soil on top is no longer hard chalk silt and disturbance probably by rabbits has made it soft and earthy but the hard silt is still found at the sides and below the disturbance
>
> (7/8/1921, at line D in cutting)

This suggests that the upper fill, though chalky, was not of rubble.

In the short length of this segment excavated in 1924 (the 'South' cutting, C26), however, Hawley noted that the secondary silt which underlay the turf lay over chalk: 'The silt changes to chalky matter, some of it very hard and the filling resembles that found near the Avenue and does not appear to be gradual silting, but as if the matter had been intentionally thrown in' (14/7/1924), although next day he modified this a little: 'I am less inclined that it has been purposely filled, the rough dirty chalk could easily have come down from a steep rampart which must have been high before most of it went back into the ditch' (15/7/1924).

As the chalk in the upper part of the section entered the Ditch after the primary fill had formed it seems unlikely that the rampart would have been so unstable as to be still losing a large quantity of chalk by erosion; animal burrowing or chance human or animal activity might produce some loose chalk, but probably not on the scale observed here. It seems reasonable to accept Hawley's initial interpretation as the more likely. In any consideration of the upper fill in this segment it should be noted that between completion of the eastern end and central parts (ie in C20 and C21) and that of the western part (ie in C26) Hawley had excavated the Ditch at the north-east entrance where he had recognised deliberate chalk backfill. Some of this seems to have been in the form of chalk rubble, and some was more homogeneous and compact, as if it had been put in wet (Segment 1, phase 2), and it is after this that he recognised the possibility of the same type of fill being present in the southern Ditch. It was obviously not as clear as it was near the north-eastern entrance but his comments do suggest that there was deliberate backfill at the western end of Segment 15 at least.

***Segment 16***

This segment comprises a well defined 'crater', excavated by Hawley in his 'South' Ditch cutting of 1924 (C26). The published description and the Diary account appear to contradict each other in that the description in the Diary which clearly applies to the terminal Segment 17 (Hawley's second 'crater') is described in the publication as belonging to the first (ie to Segment 16). As the Diary description is clearly supported by a drawn section annotated as being of the second crater, this description is followed here.

If the published account of this segment is discounted there is little description of the upper fill available for this segment. The only details discernible are that a cremation lay directly on the top of the silt in the middle of the Ditch (17/7/1924), and three pieces of antler including one recorded as a pick occurred at depths which probably place them within the secondary rather than in the primary filling (*ibid*).

***Segment 17***

This segment, the eastern terminal of the Ditch at the south-eastern entrance, is one of the few for which there is a drawn section (Fig 44), although it is not clear where in the segment the section line lay as it is noted simply as '1924 2nd Crater' in Newall's handwriting.

The topsoil seems to have extended deeper into the Ditch than was usual over this segment (down to about 20in (0.5m) below ground level) and the upper filling seems to differ here from that in most of the Ditch, as Hawley describes the filling below the humus as

> no hard compacted chalk below it, as usually occurs, was met with but instead there was loose dirty rubble in the middle with rather an abrupt change to clean chalk rubble at the sides. A more compacted earthy chalk rubble was met with on the east all along from the sides to the middle without change except at the extreme north side. A small cremation was met with at 20" B.G.L. [0.5m] without a cist and in the ordinary humus with slightly chalky humus immediately under it ... A collection of human and animal bones was found from 30" to 33" B.G.L. in the middle. Black ash and signs of fire were close to them on the west side.
>
> (21/7/1924)

The section drawing shows the burning to be associated with the animal and human bone (Hawley's identifications) in the secondary fill, as it is with 'a fine piece of bone shaped like a gouge' ('or rather chisel' in Newall's handwriting) at B.G.L. 30" (0.76m). The published account, which appears to refer to Segment 16 but must, on the record of the Diary, refer to this segment, adds further details, suggesting that Hawley was also drawing on memory or on another source

> there were a few animal bone fragments in the silt, mostly in a dark stratum intersecting it, which began at the rampart side and extended down to the middle. It also contained some worked flints, including a scraper. Where it ended low down in the middle, there were black ashes of a fire, darkening an area which extended over a level surface for about 3ft [0.9m], and there were about 9in [0.2m] of silt between it and the bottom. Burnt animal bones occurred amongst the ashes and nearby was a collection of animal bones with a few pieces of human bone with them. This is the third instance of animal and human bones occurring together. A nice bone implement shaped like a gouge was found near this.
>
> (Hawley 1926, 4)

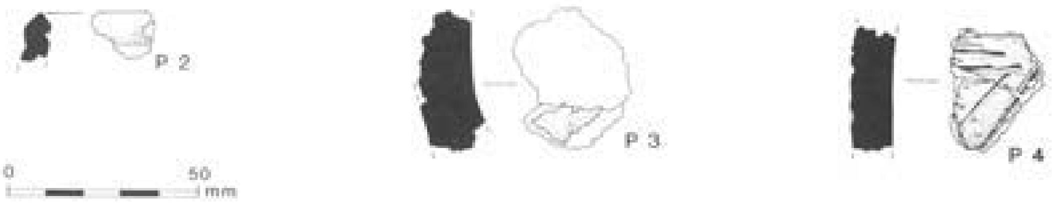



*Fig 65 Grooved Ware sherds from phase 2 Ditch silts in Segments 7 (P2) and 17 (P3 and P4). Scale 1:2*

This suggests that the burning may have occurred in or on the dark layer but this is not clear and appears to contradict the section drawing.

Two fragments of pottery are also recorded, from 32in below ground level, but are not marked on the section. These are illustrated as P3 and P4 (Fig 65) and are Grooved Ware. The 'gouge' has produced a radiocarbon date with a calibrated range of 3100–2700 cal BC (OxA–4883, 4300±70 BP).

In the drawn section the compacted earthy chalk rubble mentioned in the Diary (above) is shown on the exterior side, but the central part of the upper fill is not 'dirty chalk rubble' but 'silt'. It is difficult therefore to reconcile the drawn section and the Diary, but a possible explanation is that the dirty chalk rubble was within a feature which was large enough to draw Hawley's attention to the difference in fill, but did not recut the whole segment and therefore did not occur in the section drawn by Newall. The greater depth of humus in this segment could be partly the result of there having been a later feature cut into the Ditch, with a looser filling which had settled to a greater extent than that of the Ditch.

The evidence of burning and the associated bones, some of which may be human, may therefore lie within a localised cut feature (ie a phase 2b feature), or the upper filling of the Ditch in this segment may have been disturbed on a larger scale. It seems clear that the upper fill was not a natural undisturbed, secondary filling in this area and for this reason the occurrence of Grooved Ware at a depth of 0.76m within that filling cannot be taken even as an indication that this style of pottery appeared at the site during the early stages of the formation of the secondary filling. Two cremation burials were also found on the ridge dividing Segments 16 and 17 (WA 3905). The context of one is described thus: 'it had been made after the crater was filled up as the cist was partly in loose chalk at the side and partly dug into solid chalk' (21/7/1924), and the other, which seems to have been associated with a skewer pin, is described as being 'contiguous' with this (22/7/1924). In the published account this is described as

> at the side of the rampart bank and about midway between the eastern craters [ie Segments 16 and 17]. They were side by side and so near to one another that the ashes at the top of one blended with those of the other. The ashes were contained in bowl-shaped holes at the junction of the silt with the slope of the rampart and had been made after the silting in of the ditch had taken place, the upper part of the holes being in silt and the lower in solid chalk, extending down to 32 in from the surface.
>
> (Hawley 1926, 5)

Both were noted as representing adults and as probably being complete; the presence of some small bones and teeth in one of then was taken to indicate that a child was also represented. None of the bone survives. This cremation also contained a bone pin, also burnt, and broken in three pieces (WA obj 9).

***Segment 18***

The filling of the upper part of this segment is described by Hawley as: 'The humus which was very thick blended gradually with the grey silt which was continued nearly to the bottom'. He also notes that 'Flaked flints were met with generally in the grey silt and a scraper was found. 3 bones were found at 30 [ins; 0.76m] which was about the level the scraper came from' (25/7/1924), the Ditch here being around feet deep below ground level (*c* 1.52m; Fig 45).

The published account for this segment, as for the terminal segment to the east of the causeway, is short and no mention is made of the upper filling (Hawley 1926, 5).

***Segment 19***

The eastern part of this segment lies within C26 excavated in 1924, and the western within C29 excavated in 1926. There is a section drawing from this segment illustrated in the published report on the 1924 excavation showing the undisturbed filling at the western end of the cutting (Hawley 1926, pl 2). This shows an undisturbed apparently natural filling of 'silt'.

The general description of the eastern end of C29 indicates that the upper filling was much less chalky than usual: 'the top part usually whitish fine matter is much browner than usual and contains but little chalk' (1/7/1926). In the published account it is described as brown, but becoming lighter lower down as compared with the usual grey or whitish colour of the top part of the Ditch fill (1928, 160). It seems certain, therefore, that there was no deliberate chalk backfill in this segment.

***Segment 20***

There is little detail available for the upper fill of this segment but it seems that there was very little chalk in the filling and it may therefore be assumed that there was no deliberate chalk backfill. The descriptions quoted for Segment 19 also apply to this segment, as they cannot be distinguished in Hawley's accounts. Similarly, the only finds noted from the upper filling of the Ditch in this area are some fragments identified as 'probably ox', which could have come either from this segment or from Segment 19 (1928, 160).

***Segment 21***

The upper filling of the Ditch in this segment appears to have been a natural secondary filling of 'silt' (Diary, entry under 1st July, though excavated 13th–19th July). At around 30ft (9.1m) from the beginning of the cutting (and therefore close to MoW profile no 7) the overall depth of the Ditch is noted as being 40in (1.02m), in which the silt descends to 25in (0.63m) below ground level, and therefore c 0.39m above the bottom of the Ditch. A fire stain occurred directly on the chalk rubble surface of the primary fill (*see Chapter 5, Segment 21*). In the published account Hawley notes that 'The silt was rather earthy, but less so towards the bottom' (Hawley 1928, 162).

The length of Ditch in C29 produced a large number of chalk balls, most of which cannot be assigned to segment. At least one was found in this segment, almost certainly in the secondary silt (Chapter 9, Hawley cat no 2062a).

***Segment 22***

There is little description of the upper fill of this segment. The 'upper part of the silt' is noted in the published report as having produced only a few fragments of animal bone (1928, 162) and the Diary only amplifies this to include 'horn' (usually antler) (entry of 1/7/1926, though clearly written later). The only other point of difference mentioned between this segment and most of the others was that the humus overlying the upper silt filling was unusually deep (1928, 162).

***Segment 23***

This segment was first noticed as a 'large wide bay' over which the humus layer was deep, extending to a depth of 27in (0.69m) below the ground surface and containing numerous stone chips and late pottery.

The most notable aspect of this segment, however, was that a large feature had been cut into it, extending almost to the bottom and apparently containing an ox skull. The radiocarbon determination obtained from this skull (3510–2920 cal BC; OxA–4842, 4520±100 BP) combined with a careful reading of the description of its context suggests, however, that this was a primary deposit within the Ditch which must have been disturbed by the secondary feature rather than having lain within it (*see Chapter 5, phase I, Segment 23*).

It is important to establish that this feature was within Segment 23 rather than within 22 as the occurrence of an ox skull in Segment 23 is vital to the case made here for a third entrance to the enclosure (*see Chapter 10*). The descriptions of this length of Ditch are difficult to interpret and can be misleading.

The published description is the clearest although this should not be accepted without substantiation from the Diary, because it was written after the excavation and is less likely to be correct. The account describes the excavation in the sequence in which it took place, with an area of turf being stripped westwards from the circular hole which had been described previously (ie Segment 22). The turf was found to be thick over a wide 'bay' (undoubtedly Segment 23, which is much wider than Segment 22).

> Further excavation showed a bowl-shaped cavity to have been made in the usual silt filled with the brown matter just mentioned [ie earthy matter with a little chalk in it]. At the bottom of the cavity, which was practically the ditch bottom there were many pieces of a very large ox skull ... Near the skull traces of fire were seen and in it fragments of charred wood, the black stain of it extending up the south-east side of the cavity. The bowl shaped recess contained no mason's chips nor anything of the Stonehenge period [ie sarsen and bluestone fragments or anything contemporary with the stone settings], showing it to have been pre-existent, and as it had been dug in the silt it must have been made at a time when the ditch was either nearly or completely filled up.
>
> (1928, 163)

This is as clear an attribution to phase 2 as it is possible to make. The ridge between Segments 22 and 23 is then described, as it would not have been completely revealed until Segment 23, including the late feature, had been emptied.

The Diary description is more opaque and also appears not to be a contemporary account, since this section of the Diary does not seem to have been written on a daily basis, although it was probably written some time before the published report. The ridge between Segments 22 and 23 is at first described as 'apparently solid from side to side' (1/7/1926), followed by the most misleading part of the description

> Towards the barrier on the west the turf was very deep [further descriptions of the turf and humus]. Below the depth of 27 inches [0.69m] the soil was chalky and mixed with earth and the usual silt was not present. It afterwards could be seen that a large bowl shaped cavity had been excavated in the silt reaching to 2 inches [0.05m] from the bottom.
>
> (1/7/1926)

This is entirely consistent with the published account, apart from the phrase 'towards the barrier on the west', which seems to imply that the 'cavity' was in the western part of Segment 22, near the chalk ridge.

A feature of Hawley's writing, particularly in his Diary, is that his train of thought often jumps from one subject to another, often confusing the reader, although it is understandable in a document which was presumably intended as an *aide memoire* for the writer himself rather than as a source to be pored over by future researchers. This is a case in point, and Hawley has simply 'jumped' in his description to the other side of the ridge, so that the phrase should be read as meaning 'in the western part of the cutting, near the barrier', the jump appearing quite logical if the sequence of excavation is followed. This amended reading, combined with the published description, confirms that the deep feature must have been cut into Segment 23; apart from any other consideration, it seems unlikely that Hawley would have forgotten such a distinctive feature as Segment 22 so completely as to remark in print that it contained very little when it had in fact produced an ox skull.

Hawley also comments that 'the cavity having been left open accounted for the upper part being full of humus and with Stonehenge chips [ie bluestone and sarsen]' (1/7/1926), which may well be an accurate interpretation.

On the western side of this segment the filling of the 'cavity' seems to have extended further west, into Segment 24 (1/7/1926). This does not invalidate the division into two segments, because the event is clearly late in the history of the filling of the Ditch, when the segments would not have been clearly distinguishable. No bones of the ox skull were found in the western part of the feature (*ibid*).

***Segment 24***

This segment (Hawley's Bay 3) was at least partly disturbed by the same feature as that cut in Segment 23, as Hawley notes that the

> earthy chalk matter [ie its fill] was continued 4 feet [1.2m] into Bay 3 but there were no more bones of the ox-head found here.
>
> (1/7/1926)

He also notes (*ibid*) that

> the top soil is very hard but below it there is much loose clean chalk and below this again

> there is a black line of matter extending from side to side. Down as far as this black line the stratification appears to be horizontal as if the place had been dug out and filled in again and is quite different to other conditions of the ditch.

This does not seem to be in accord with the illustrated section, which shows neither loose clean chalk under the topsoil nor horizontal layers in the upper fill. There are four possible explanations for this discrepancy: the fill of the segment varies and Hawley's description and the section do not show the same sequence of filling; the section is inaccurate or illustrated in the wrong place; Hawley is inaccurate; or his description is not of Bay 3.

The likeliest explanation is probably that the description by Hawley does not refer to exactly the same part of the Ditch as the Newall section. He has already described 'Bay 2' (Segment 23) as having had a horizontal fill, and it may be that the description actually refers to that Bay, although this seems unlikely from the description. The horizontal stratigraphy and observation that it seemed to have been dug out and filled in again would be redundant if he is referring to an area he knew and had already described as having been dug out (ie the 'cavity'). The fact that this is a Diary description, however, may explain the repetition, as there often seems to be an element of 'thinking things out' in the Diary which is absent from the later and more crafted published account. In this case the published version does not shed any further light on the matter.

The possibility that the Newall section is wrongly placed in the publication – perhaps as a piece of artistic licence – has also to be considered, but it seems possible to reject this. It is true that there is no mention of Newall drawing sections until much further west, when Bay 6 (probably Segment 28) was under excavation and three baulks seem to have been left for him to draw (1/7/1926). These do not seem to have survived, and in any case the Ditch was much shallower in Bay 6.

The archive drawing of the published section is dated 28 July and 30 July, but both dates are well before the date when work on the Ditch finished (ie 19 August, 1/7/1926). There is also a comment that work on the Ditch was suspended during (or just after) the excavations of the segment with the intrusive feature (ie Segment 23, 'Bay 2') and carried on again between 26 and 30 July. It is unlikely that the excavators would have reached Bay 6 in four days but left the last few feet until nearly three weeks later, particularly as no work on other areas of the monument is noted during that time.

The section and the description therefore have to be taken as referring to approximately the same length of Ditch, if not to exactly the same section. The drawn section must in any case have been west of the part of the intrusive feature which extended into this segment, as this feature is certainly not shown in the section. Most importantly, it seems that Hawley's description of 'loose clean chalk' not far below the topsoil can be accepted, probably east of the drawn section, and this would therefore seem to be another example of deliberate chalk backfill.

There seem to have been few finds but there was a 'small fragment of human jawbone' 26in (0.66m) from the bottom in the soil below the humus, which may have been in the secondary filling of the Ditch, using the depth shown in the Newall section. The chalk fragment possibly decorated with a chevron pattern (WA obj no 499, Chapter 9, Fig 218) was also almost certainly found in the secondary fill in this segment, as it is marked 'Silt Bay 3 1926'. This piece is certainly intentionally worked whether or not the faint incisions on it are deliberate.

#### *Segment 25*

Little detail is recorded for this segment, which is identified only in the Diary. It is recorded as being similar to 'Bay 3' (ie Segment 24) 'in its earth[y] contents except that there was more chalk in them and a good deal of hard yellow chalky lumps' (1/7/1926).

#### *Segment 26*

It is difficult to identify comments relating to this segment with any certainty, but there seems to have been little of interest to Hawley in this length of Ditch.

#### *Segment 27*

The only detail assignable to this segment is that the 'silt in it contained many lumps of yellowy chalk compo', and, slightly further along westwards: 'The silt in this section contained nothing of interest' (1928, 163–4). The usual use of 'compo' is to mean redeposited chalk or at least chalk which has been wet and puddled, and here in the upper filling of the Ditch it was probably not a natural occurrence.

#### *Segment 28*

This segment was very shallow throughout, reaching a depth of only 2ft 7in (0.79m) at the eastern end and only 18in (0.46m) where it ran out of the excavated area to the west (1/7/1924). This in itself is likely to have resulted in a different filling from the normal sequence, because the likelihood of animal and other disturbance would be much greater than in the deeper segments, and there seems also to have been compaction caused by the former roadway which crossed the Ditch at this point. Hawley comments that the filling was particularly hard and compact in the length of this segment which actually underlay the line of the road (1/7/1924).

There were few finds in the upper fill although 'a few animal bones' (apparently ox) are noted (1/7/1924). The filling itself was not the normal silt, at least for part of the segment, but instead 'extremely hard, dirty, earthy chalk'; it did not, however, appear to be a result of later disturbance of the Ditch as it had 'no Stonehenge objects in it [ie bluestone, sarsen, or other objects contemporary with the stone settings]' (1928, 164).

#### *Cutting C49*

This was a small trench, 10ft by 3ft (*c* 3 by 0.91m) running along the length of the Ditch in the western part of the circuit. This longitudinal section appears to cross the dividing ridge between two segments, although this cannot be confirmed as there is no plan of this cutting and it was not large enough to have extended as far as the Ditch edges.

In the northern segment the filling appears to be a normal secondary filling of rainwash and fine rubble, but in the southern segment there is a substantial convex lens of 'coarse fill' below a layer probably representing normal secondary fill (ie 'compact rainwash and lumps'). This strongly suggests that there was deliberate chalk backfill early in the secondary filling of the Ditch even in the western part of the circuit.

A small number of finds apparently from the secondary fills include one piece of sarsen (S.56.78) indicated in the card index as having come from 'top of chalk silting' (WA 3884). Six fragments of bone and some small fragments of charcoal (S.56.79–80) are recorded from 'the chalky rainwash' (WA 3885).

**Stratigraphy**

The secondary filling of the Ditch was not an entirely natural process. This was recognised by both Lt-Col Hawley in his frequent references to 'cast-in chalk' and by Professor Atkinson, who used the occurrence of deliberate chalk backfill at the entrance to link the backfilling of the Ditch with the construction of the Avenue. Professor Atkinson's arguments have implications for phase 3 as well as for phase 2, but they may be summarised here as follows:

1 The backfilling of the Ditch at the north-eastern entrance was intended to widen the entrance to match the width of the Avenue, the width of that feature being fixed by one side of the existing entrance and a centre-line fixed by the probable astronomical alignment. As Atkinson states 'the last 25ft [7.6m] of the ditch of the circular earthwork, east of the original causeway, had been deliberately filled up, in order to bring the width of the earthwork entrance into line with the width of the Avenue' (1979, 73).

2 This backfilling extended to a depth of 3ft (0.9m), the depth at which Beaker pottery and bluestone chips first occur, and was therefore contemporary with or later than the arrival of the Bluestones. In particular Atkinson notes that in his excavation of the Ditch in 1954 a piece of unweathered bluestone was found directly on top of the dark layer above the primary chalk filling (*ibid*, 72–4).

These arguments can be refuted on two grounds. Firstly, the backfilling in the upper Ditch was not restricted to the eastern terminal of the north-eastern entrance as implied by Atkinson. It is clear from Hawley's account that both terminals were backfilled, and in fact the backfilling of the western terminal was at least as well defined and compacted as it was in the eastern terminal. This is clear from the descriptions given above (Segments 100 and 1 respectively). Reference to the plan (Plan 1) shows that the fitting of the Avenue to the entrance in the way suggested by Atkinson did not require backfilling of the western terminal. In addition, it can be argued on the basis of Hawley's descriptions that deliberate chalk backfill was more common than this, and occurred at other locations around the Ditch circuit. These occurrences are summarised in Table 13, and are reported by segment, above. This interpretation may also be applied to some of the upper Ditch filling recorded in the 1954 excavations of Atkinson *et al* (ie C41 and C42, Segments 98 and 99). Atkinson, however, did not believe that there was deliberate chalk backfill other than where he described it (Atkinson pers comm). For the Ditch sections excavated in 1954 his opinion must be accorded the respect due to the excavator; for the remainder of the circuit, however, Professor Atkinson's opinion is an interpretation of Hawley's evidence, as is the alternative interpretation offered here.

Secondly, the period at which the backfilling of at least the western terminal at the north-eastern entrance (ie Segment 100) took place does not fit Atkinson's interpretation. In this segment not only was there clear deliberate backfill pushed into the Ditch in the terminal (which, according to Atkinson's interpretation, did not need it) but this backfill entered the Ditch at a very early date and lay directly on top of the dark layer. It is also not clear on what evidence Atkinson based his assertion that Beaker pottery and bluestone chips first appeared at a depth of 3ft (0.9m), either in Segment 1 or elsewhere in the Ditch.

Throughout his description of the Ditch Hawley maintains that he did not find 'foreign stones' in it (ie bluestone fragments) and he reiterates this in his final report: 'for it [the Ditch] was silted up when the monument [ie the stone settings] was made, the chips of the stones forming the latter occurring only above the silt and never in it' (Hawley 1928, 173). This is in agreement with his year by year accounts of the Ditch, largely reproduced here under the segment descriptions. In the case of the bluestone fragment mentioned by Atkinson as lying on the dark layer, the only bluestone fragment thought to have been found deep in the Ditch, further light was shed on its stratigraphic position in 1978, when the cutting was reopened by J G Evans with Atkinson. In that excavation, described under Segment 98 above, the western edge of the western trench of 1954 was cut back (ie 1954 section Q–R). Subsequently part of the Ditch section collapsed, exposing the foot and lower leg bones of a human skeleton. Photographs show that the grave cut must have extended into the trench excavated in 1954. However, the cut was indistinct and the fill similar to the Ditch filling (Evans 1984, 13–14), which probably accounts for the fact that it was not recognised in 1954.

This burial contained Beaker-period artefacts (three barbed and tanged arrowheads and a wristguard), and has now produced five radiocarbon determinations (OxA–4886, 3960±60BP; OxA–5044, 3785±70 BP; OxA–5045, 3825±60 BP, OxA–5046, 3775±55 BP; and BM–1582, 3715±70 BP) which provide a best estimate for the date of the burial of *2400–2140 cal BC* (*see Appendix 2*). Three pieces of bluestone were recovered from the fill in 1978 (two are shown in section in the upper fill), and the discovery of the grave forced a reappraisal of the fragment of bluestone which formed such a key feature of Atkinson's phasing.

As Evans writes:

> The discovery of the Beaker-age burial requires some re-interpretation of the stratigraphy of the ditch infilling as presented in Atkinson's *Stonehenge* (1979, 73ff, but see also 215). In 1954 a fragment of rhyolite was found at a depth of 0.9m immediately above layer 8 [the dark layer]. This was taken to show that the bluestones had arrived at Stonehenge soon after the formation of the primary fill, and that the deposits above this level ... belonged to the period of Stonehenge II. This fragment can now be seen to have derived from the extreme edge of the filling of the burial pit, along with the other three pieces recovered in the current work. It is probable, therefore, that the greater part of the infilling, as visible today, had formed before the bluestones were brought to Stonehenge.
>
> (1984, 28)

As Evans notes in his reference to *Stonehenge*, Professor Atkinson accepted this reinterpretation, as he explains it in his last appendix to the 1979 edition (p 218), but he presumably felt that the implications for his phasing were too great for the necessary rephasing to be undertaken in an appendix.

The only argument which could be advanced in favour of the original interpretation, that is, that the Ditch was filled in to create an entrance causeway which matched the Avenue, would require us to postulate that although there was backfilling at various points in the Ditch's history, and certainly earlier than the construction of the Avenue, only the discrete length between the eastern terminal at the entrance and its end in C23 was intended to widen the entrance. In favour of this is the fact that in this length the backfilling seems to have been high in the Ditch, and to have been generally, but not without exception, the latest Ditch fill.

There are two reasons for rejecting this interpretation, however, even apart from the fact that it implies that this backfilling was different in nature to all the other episodes of backfilling. First, there is no positive evidence, in the form of bluestone fragments at a similar depth in undisturbed contexts within the backfilling east of the entrance, to suggest that this activity was contemporary with any of the stone settings. Two fragments mentioned as apparently coming from 'rainwash' in C42, can be seen from the 1978 section to probably lie within an area of disturbance in the upper Ditch fills. In contrast there is bluestone low in the Avenue ditches even in the relatively short lengths excavated by Hawley. Secondly, Atkinson tackled the problem of why the Bank is not noticeably lower where it crosses the line of the Avenue by explaining that:

> it must be remembered that throughout the circuit of the earthwork almost the whole of the original bank has slipped or been washed back into the ditch through natural processes of weathering. In the short stretch now in question this natural process has merely been anticipated by the deliberate throwing of part of the bank into the ditch; but the ultimate effect on the surviving height of the bank has been the same.
>
> (1979, 73)

It is irrefutable that the Bank was greatly denuded by this time but this argument ignores the fact that the Bank within the Avenue was not entirely removed, which would seem to be a basic requirement in the clearing of an entranceway, and it would also seem to be a less difficult task than filling in the Ditch as the material remaining after that operation could have been simply spread over the interior. It seems more probable that the width of the Avenue was planned, perhaps using an altered axis to the monument, but that the only part of the causeway intended to be used as a practical entrance was the central part.

The position of the Avenue ditch on the eastern side of the entrance (in this volume referred to as the southern Avenue ditch) was designed for symmetry and for effect on a grand scale. In this interpretation the filling of the Ditch on the east is earlier than and quite unconnected with the phase 3 entrance and construction of the Avenue. It can be seen simply as a further manifestation of behaviour demonstrated elsewhere around the circuit and at different times within phase 2.

This lengthy explanation of the position of both the chalk backfilling and the bluestone in the Ditch is necessary because it is important to demonstrate that the Avenue and Ditch are not conceptually related. It is in this point, more than any other, that the new phasing deviates from that presented in Atkinson's *Stonehenge*.

#### Finds

**Pottery:** Only eight sherds were found in the Ditch fill, all from the secondary fills, and all of Grooved Ware. Four of these were from a context, possibly of phase 2a, in Segment 7 of the Ditch (C28.8), These are very fragmentary; none is larger than $100mm^2$ but all probably originally belonged to a single vessel (*Chapter 9*)

## Postholes around the north-eastern causeway

A large number of postholes and probable postholes were encountered during excavation of the monument. The overall distribution is shown in Figure 66, from which it can be seen that many of these features occur in groups and may represent deliberate settings of one

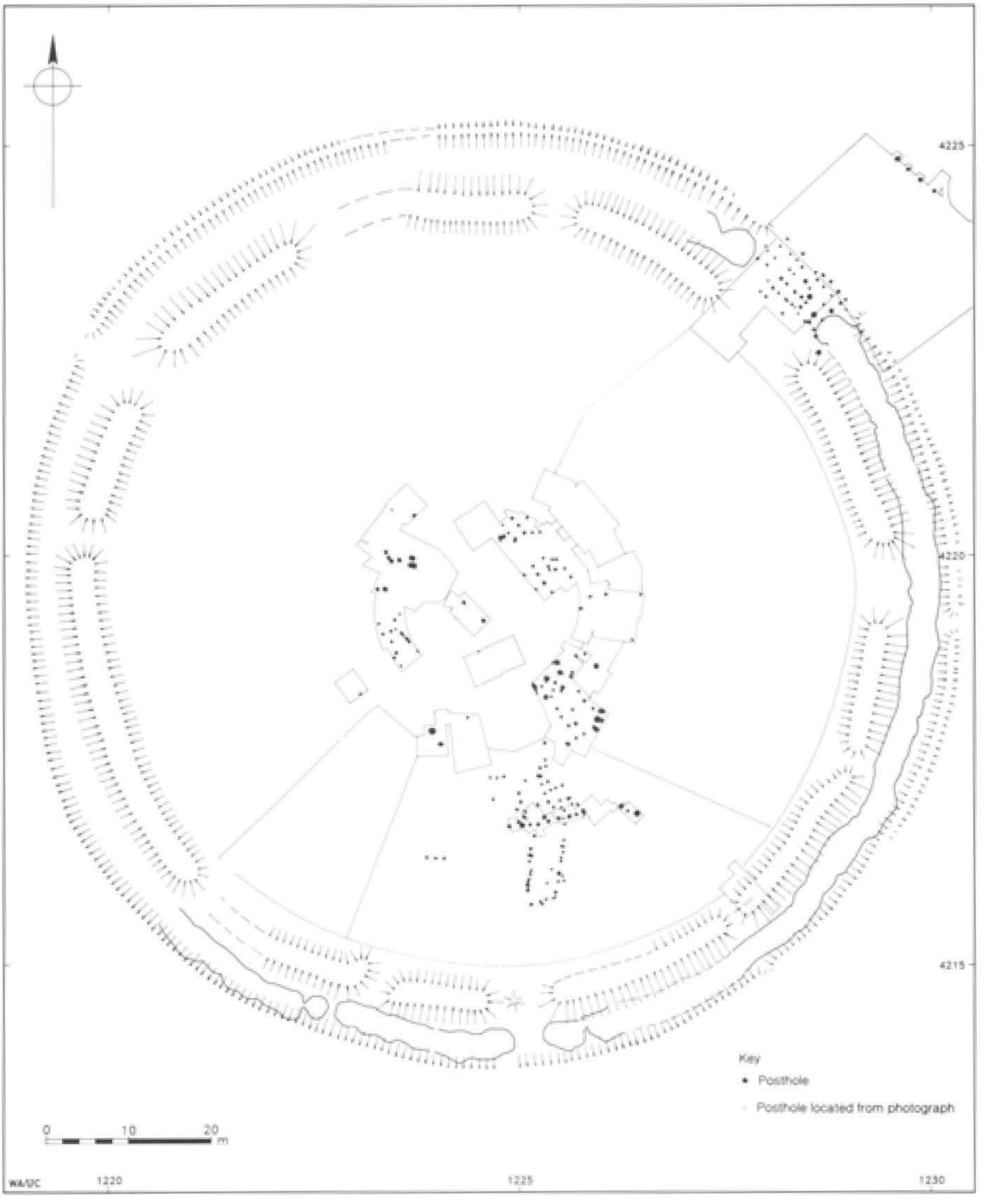



*Fig 66 Plan of all postholes with limits of excavated areas indicated*


*Fig 67 Timber settings on the main causeway with depths indicated (see Appendix 5)*

form or another. Figure 66 also shows the extent of the excavation cuttings which contained postholes; it is possible that many more exist but either lie outside the areas which have been excavated or have been removed by the later digging of stoneholes.

One group of postholes occurs on the causeway of the main north-eastern entrance. None of the postholes on or around the entrance causeway has a known relationship with any other feature, and they cannot therefore be assigned with absolute confidence to any of the

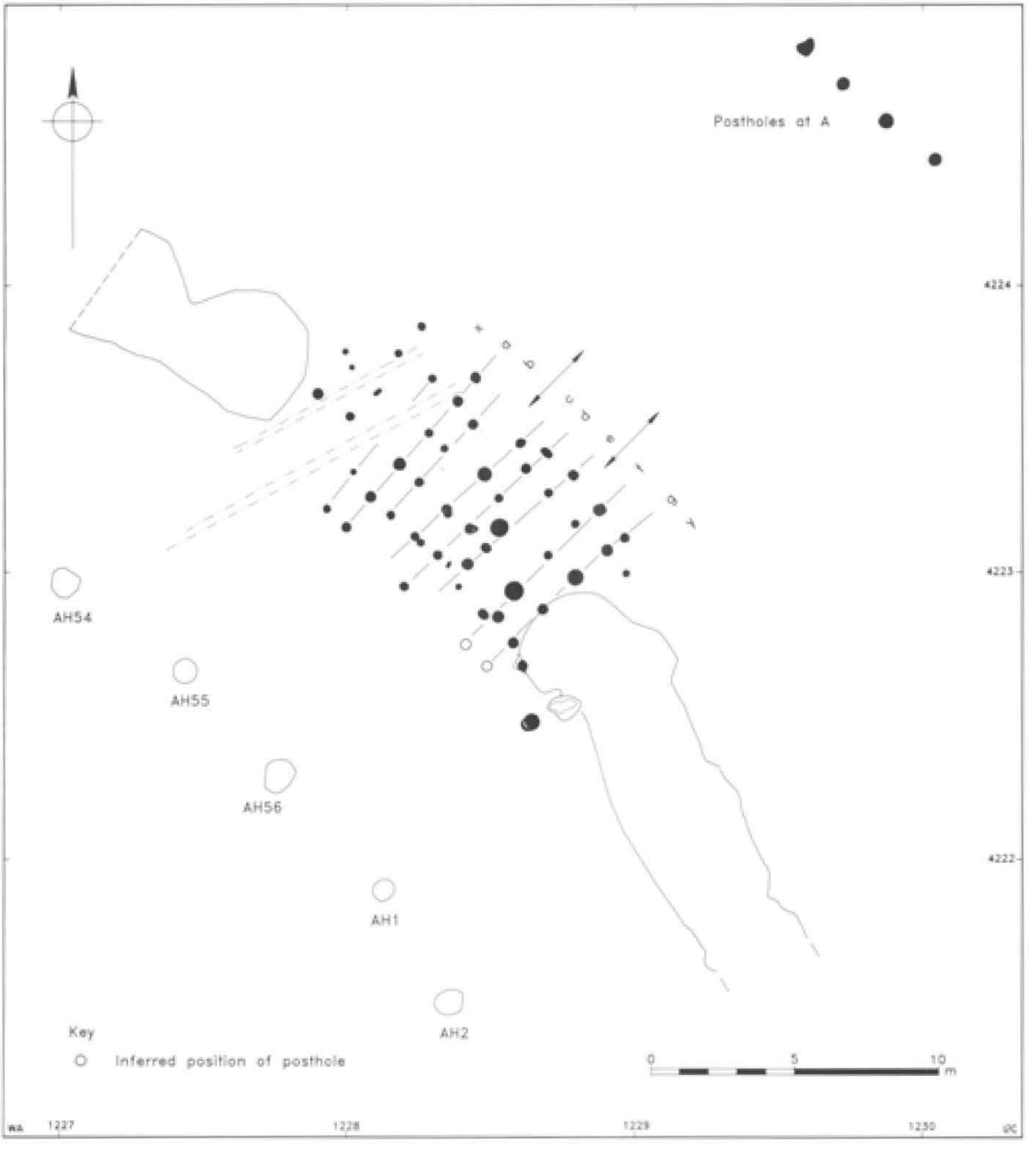



*Fig 68 Timber settings on the main causeway: possible alignments*

monument phases. There are some aspects of their layout and construction, however, which suggest that they do not belong either to the first phase of the monument, or to the last phase.

The majority of the postholes around the entrance causeway were excavated by Lt-Col Hawley in 1922 immediately following the excavation of the eastern terminal of the Ditch and concurrently with the excavation of the western terminal. This is mainly C5. With one or two exceptions the features were not described individually, but Archive drwg no 63 shows them numbered and annotated with diameters and depths (Appendix 5). This information is used in Figure 67, which shows all depths schematically together with Hawley's numbers. It is clear from both the Diary entries and the publication report (Hawley 1924) that Hawley considered some of these features to be stoneholes. At the time of excavation he referred to almost all of them as stoneholes, but in the published report this was confined to the largest. In view of the size and shape of these features the identification as stoneholes seems unlikely, and they are referred to here as postholes, except where quoting Hawley.

### Description

The few postholes which are described by Hawley, some of which can be individually identified, are as follows (using Hawley's numbering sequence).

**?46:** 'I came upon two more small stone holes [*sic*] on the edge of this [ie the semicircular edge of the terminal; the first 'stone hole' was that on the interior edge of the terminal, WA 1429] ... Found a rough implement in stone hole no. 3 [ in the order of finding them; they were obviously later renumbered]' (3/10/1922).

**Unidentifiable:** A 'fourth stone hole' is described as 'very neatly made and quite round and of even calibre to the bottom' (4/10/1922) but it is not possibly to identify which this was.

**Unidentifiable:** Several holes are described on 5/10/1922 but are not identifiable except that a hole which was last in a line of four large holes running from the first (ie the stonehole in the side of the Ditch terminal) is presumably Hawley's no 23. All the holes including this one (the fifth excavated) are described as containing nothing except fine earthy chalk.

**?33:** A large hole is described as being exactly cut by the central axis of the Avenue and measuring 2ft 4in (0.71m) in diameter and 2ft 4in deep. This could be no 33, although as this would seem to be one of the four large holes already described, it should have been excavated before the Diary entry for this hole was made. It is, however, the only large hole lying on the axis of the Avenue. There were no finds and the filling was of light grey earthy chalk, with some yellow 'compo' on the east side, extending most of the way down. It was sharply cut and diminished only slightly in diameter towards the bottom (6/10/1922).

**41:** 'One had escaped notice on the centre of edge of south Crater, and the storm of yesterday made its outline visible' (2/11/1922).

**44:** 'A rather large hole was found, diameter 27" [0.68m] x 20" [0.51m], 18" deep [0.46m], doubtless a stone hole and it is only about 2 feet [0.61m] west of the first big stone hole found in the rampart side of the ditch [ie WA 1429]. It is about the same size and depth as three others with which it forms a diagonal line across the causeway from SE to NW. In it were a few bones of a child of about 7 or 8. I afterwards dug out a similar sized hole in the causeway [possibly 42, as he does not state that it was in line with the others]' (5/11/1922). Hawley also comments that he suspected that the bones included animal bones, a comment he repeated in print (1924, 35).

**Four unidentifiable** 'Opened 5 more holes [one is identifiable as no 41]. One hole opened today was a large one and probably a stone hole. One small hole had another alongside, both ... , [illegible]. There was a decayed fragment of a large bone in one of the holes' (2/11/1922). This is not mentioned again by Hawley who, in the report, records the only finds (a few fragments of inhumed human bone) as coming from posthole 44.

General comments made by Hawley about these features include:

> They seem to be in relationship of lines or groups.
>
> (27/10/1922)

> These holes never contain anything: the top filling is reddish humus and the rest greyish white chalk with a few ordinary flints. No worked flints.
>
> (28/10/1922)

Subsequently (see entries for 'four unidentifiable' and no 44) bone was found in two of the postholes, one of which cannot now be identified. In no 44 the bone is reported as being human, but in the other Hawley does not comment on its identification.

> All the postholes vary much in depth, but those in 2 rows of 5 [possibly 12, 16, 21/22, 26, 32, and 11, 15, 19, 20, 25] are fairly regular in the diameter.
>
> (30/10/1922)

### Stratigraphy

The lack of stratigraphic relationships and finds renders these features difficult to place in the phasing of the monument and all arguments relating to their place in the history of the site must rely mainly on symmetry and comparison with other features of the monument. There are two elements to this group of features which particularly require discussion: the nature of the relationship between Hawley's posthole 41 and the Ditch, and the asymmetry visible in the plan of the postholes in relation to the entrance causeway.

Only one posthole (Hawley's no 41) seems to have had a stratigraphic relationship with the Ditch, but which was the earlier of the two features cannot now be established. Hawley seems to have come to the edge of the eastern Ditch terminal sooner than he expected when he was excavating Segment 1, and he did not record any features cutting the upper fill of the Ditch, which here was a deliberate backfilling of hard-packed chalk.

This, however, cannot be taken as proof that there were no features cutting the filling. Although the filling was of chalk at that point, and it might be supposed that a posthole would show up clearly within it, the part of the posthole cut through solid chalk on the causeway (Fig 67) was not itself recognised for some time and then only after exposure of a month and heavy rain (the area around the terminal was cleaned on 3/10/1922, but posthole 41 not recognised until 2/11/1922). This suggests that it is possible that its other half was cut through the filled-in Ditch but not recognised during the excavation, and, indeed, that the other postholes would have been missed altogether.

Conversely, it is also possible that the postholes on the causeway pre-date the Ditch. In this interpretation posthole 41 could have been cut by the Ditch, and the asymmetry of the plan could thus be due to the fact that the Ditch did not exist when the postholes were laid out. It would have to be presumed that the posts had been removed before the Ditch was dug, if the filling of posthole 41 is to be seen as having been cut by the Ditch. But even the fact of a relationship having existed between posthole 41 and the Ditch as first dug can be cast into doubt. Posthole 41 lay on the edge of the Ditch terminal where probably about half the posthole survived in solid chalk.

The upper edge of the terminal, however, is certain to have been affected by weathering, since it was left open long enough for primary filling to form, and even in the first 10 years considerable erosion is known to take place in the upper profile of chalk-cut ditches (Limbrey 1975, fig 33). The loss of as much as a metre at the top of the profile has been observed in chalk at the experimental earthwork at Overton Down, Wiltshire (Crabtree 1971). The terminal of the Stonehenge Ditch needs only to have been 0.5m east of where it is now to have cut posthole 41 during erosion rather than during the digging of the Ditch. The postholes and the Ditch, therefore, could be regarded as contemporaneous but the asymmetry of the posthole settings makes this improbable.

#### Discussion

The layout of the postholes as they survived at the time of Hawley's excavations was clearly asymmetric around the axis of the first monument (that is an axis from the central point based on the circle formed by the Bank and Ditch and a point halfway between the Ditch terminals), with the emphasis on the eastern side. Twenty of the surviving postholes lay to the west of the axis and 33 to the east, but this is undoubtedly biased by the destruction of features in the western part of the causeway by the medieval or modern trackway which was marked by visible cart-ruts running through the causeway. Hawley also noted disturbance between the Slaughter Stone and the existing postholes which he thought had removed two postholes; he considered this disturbance to be also post-medieval in date (1924, 35).

If these areas of disturbance and the possible postholes removed by them are taken into account, a figure may be suggested of 29 postholes west of the centre and 37 to the east (based on the junctions of the apparent 'grid' formed by the rows and lines, and only adding postholes within the cart-ruts or between them; Fig 68). The four added on the east are the two presumed by Hawley to have been destroyed and two between nos 45 and 46, which could have been destroyed by the Ditch or missed in excavation. It might also be argued that posthole 44 is outside the main concentration of features and may therefore not be part of the same setting, but it is in line with two other larger postholes (ie 33 and 37, and perhaps 23) and together these seem to form a diagonal element in the setting, a feature noted by Hawley (5/11/1922).

Even allowing for the bias caused by the removal of features on the western side, and bearing in mind that the edge of the western Ditch terminal would presumably have eroded at much the same rate as would the eastern, the plan would still seem to have been asymmetrical, with no postholes close to the Ditch edge on the west, and several in a similar position on the east. That the arrangement of postholes also continued to the east, regardless of the Ditch, is also suggested by the position of posthole 44, which Hawley regarded as being of the same nature of the other holes but which was probably at least 2m east of the original Ditch terminal.

The internal arrangement of the posthole setting is also open to interpretation (Fig 68). There appear to be at least three elements in the plan: rows of posts crossing the causeway from side to side (eg Hawley's posts 8, 11, 15, 19, 20, 25, 29), lines of posts running parallel to the sides of the causeway (eg 43, 42, 41, 40), and a diagonal setting of large posts running across the causeway obliquely from south-east to north-west (23, 33, 37, and 44). Hawley noted all three of these elements, including the diagonal setting of larger postholes (*see above*). As there are no stratigraphic relationships between postholes (except possibly in the case of 21 and 22 where it appears that one must have cut the other), and no dating evidence, it is impossible to be certain that all or even most of the posts were contemporaneous.

The interrelationship of the rows and lines is self-evident from the plan but the larger postholes seem to be something of an anomaly. Although their positions fit the plan of the rows and lines, because their diameters and depths are so at variance with the majority of features and cannot be accounted for by erosion or disturbance, it is possible that the large holes are replacements of smaller features in the same position.

A reasonable interpretation of this complex is that the postholes form a very restricted entrance to the monument, possibly consisting of two narrow corridors barely 1m wide flanked by at least two lines on each outer side and by three in the middle (Fig 68, rows (b) and (c) flanking the western corridor and (e) and (f) the western). A further possibility is that there were two more lines, one to the east of (g) and one to the west of (a). The westernmost line (x) is represented only by postholes 7, 8, and 9, but as one of the cart-ruts runs through this putative line it is hardly to be expected that any more would survive. Similarly, on the eastern side, the two postholes recorded by Hawley as having been disturbed by a post-medieval feature which lay between the Slaughter Stone and the second row of postholes might have formed extensions of lines (f) and (g), bringing them into line with rows (d), (a), and possibly (x).

The putative most easterly line (y) might be represented by postholes 45 and 46, with the remaining postholes cut though the hard chalk backfill of the Ditch and not recognised during excavation. As posthole 41 was not recognised until it had weathered for several weeks and the Ditch terminal was excavated over a much shorter period than that, the supposition that there may have been unrecognised postholes is reasonable. The fact that this line would lie over Ditch backfill does not render this interpretation impractical since the Ditch here is filled almost to the top of the cut with hard-packed chalk rubble. This feature was appreciated by Atkinson, as discussed above, and was suggested by him as having been intended to fill in the Ditch so that a new entrance could be created to match the width of the Avenue. Although his interpretation is not favoured here, for reasons discussed in Chapter 7 and above, the intention to fill in the entrance may have been linked to the timber settings in the entrance. Whether the backfilling was intended to widen the entrance or whether the effect of previous backfilling was simply utilised in the entrance configuration is debatable (*see below*).

A further extension of this interpretation might, on the same basis, accommodate the large posthole, 44, and the putative stonehole WA 1429 on the edge of the Ditch. Other features might well have been missed during excavation and the easterly bias of the postholes on the causeway suggests that the emphasis on that side of the entrance may have extended to these two features.

This interpretation does not adequately account for the diagonal row of large posts, and these remain unaccounted for. If they were contemporary with the other postholes, contained higher and larger posts than them, and all the posts were freestanding, then when viewed from a distance the effect caused by the irregularity of the layout would have been largely lost, and the larger posts would simply have appeared standing behind the slighter ones. The effect would have been reversed when the entrance was viewed from inside the monument. Why the irregular layout should have been chosen is not clear.

The identification of two passages or corridors through the settings raises two more questions. The western passage coincides with the axis of the first monument (based on the centre of the circles on which the Bank, Ditch, and Aubrey Holes lie and the centre of the entrance causeway), but if two entrance passageways are recognised the symmetry around this axis is destroyed. It should also be noted that Stoneholes D, E, and the presumed hole for the Slaughter Stone, which stand just on the interior side of the posthole setting, are no longer considered to be early in the sequence, on the basis of the radiocarbon dates for Stonehole E (*2480–2200 cal BC*; OxA-4838, 3885±40 BP and OxA-4837, 3995±60 BP).

The postholes on the causeway have traditionally been assigned to a period early in the monument's history, contemporary with the enclosure, as have the timber settings in the interior (eg Atkinson 1979, 170–1). The arguments of symmetry, outlined above, seem to contradict this interpretation and suggest that they do not form part of the same plan as the Bank and Ditch. Although it is possible that they pre-date the ditched enclosure this does not seem likely, and it seems reasonable to assign them to a period subsequent to the initial use of the site (Fig 66). It is possible that their construction was contemporary with that of the Avenue, but the almost complete absence of finds does not fit this interpretation, since some bluestone and sarsen fragments would be expected, as they would if the construction dated to any subsequent period. The absence of finds seems explicable only if there was little artefactual material present on the site.

## Postholes at 'A'

These (Fig 67) are described by Lt-Col Hawley in his published account of his 1923 season (Hawley 1925). The westernmost posthole was the first to be discovered.

> Towards the west of the cutting and at the line of the Avenue bank a patch of humus was seen in the surface of the solid chalk on the north edge of the cutting; this when dug into proved to be a large posthole with a depth of 43 in. [1.09m], and a diameter of from 28 in. to 20 in. [0.71m–0.51m]. On the east of it another was found 35 in. [0.89m] deep and 24 in [0.61m] in diameter, and after this came a third with a depth of 32 in. [0.81m] and a diameter of 23 in. [0.58m]. They were all in the same line, with an interval of 6ft [2m] between them. Later, in a disturbed spot, traces of another in the same line were met with. The holes were filled with fine chalky dirt containing nothing ... They resemble those on the causeway and were evidently of early date, as the Avenue bank passed over the first and partly over the second, showing existence previous to the Avenue.
>
> (Hawley 1925, 24)

It cannot be certain that this setting consisted only of these four postholes, as the area to the west has not been excavated, and to the east the point at which the next posthole would lie given a continuation of the same spacing is within the line of the Heelstone Ditch.

## Postholes in the interior

The presence of postholes within the monument, both inside and outside the area now enclosed by the Sarsen Circle, was first established by Lt-Col Hawley. The lines of postholes running towards the southern entrance were first published by Hawley in 1928, but it was more difficult from his published plans to distinguish the majority of postholes found by him within the central area (ie within the line of the Sarsen Circle). The excavations of the 1950s and 1960s also revealed postholes and almost none of these have appeared in print prior to the present volume. Despite this, and partly because Atkinson himself alluded to the probability of there having been an early timber phase, the existence of a timber precursor to the stone settings appears to have been generally accepted. To that extent, its appearance here is not new and will occasion little surprise. However, it is not possible even now to produce a definitive plan of the structure or structures which stood in the inner area because of later disturbance, including that of the construction of the stone settings, and large unexcavated areas.

### Description

The filling of postholes was not generally recorded during the excavations of the 1950s and 1960s or by Hawley. All the surviving information apart from a few comments in the Diary and publications is, therefore, in the form of plans and sections, and in most cases only the former exist. Appendix 5 gives the dimensions of all postholes and Figure 69 illustrates their diameters and depths in schematic form. Depth has been standardised as below the chalk surface in the vicinity of the feature; for most postholes, therefore, it can be assumed that there was originally at least another 0.30–0.35m of soil above this (Chapter 2). Very few descriptions or sections of postholes were recorded and survive and most of the postholes were not numbered by the excavators. In the descriptions below the WA context number is given for the cut of the posthole where it is possible to identify the feature positively.

**C13 or ?8, ?WA 2330** Hawley describes a posthole close to ('W.S.W. of') Stonehole 9 in some detail.

> It is irregularly round but the sides in solid chalk are sharp and perpendicular. It contained 6 pieces of sarsen. A piece of bone. A piece of rough red pottery, might be B.A. or older. Half of a small Quartzite hammer-stone at 34" [0.86m] B.G.L. There is a hard stratum of compressed chalk and earth between the humus and the lower filling of the hole. This stratum is probably the spoil from 8 or other stones. The hard stratum begins under 18" [0.46m] of humus and ends at 24" [0.61m] B.G.L.
> (21/8/1924)

It is difficult to estimate depths below ground surface, but if the posthole in question is WA 2330, then using the spot height for the ground (ie grass) surface near Stone 34 in 1964 (Archive drwg no 409) the overall depth of 2330 from the 1964 ground surface would be 34in (0.86m); even given that the ground surface may have changed slightly (though the 1964 spot height is not within an area of Hawley's backfill and the gravel had not yet been laid) it is clear that the hammerstone mentioned must have been close to or on the bottom of the hole. The finds must have been unequivocally within the hole for Hawley to have mentioned them. This is one of the very few cases in which finds are known to have come from a posthole, but they do not appear to have survived. The pottery has either not survived or is no longer identifiable in the assemblage. Hawley and Newall appear to have been able to recognise decorated Beaker, but plain sherds would not generally have been assigned by them to specific styles if they were thought to be early; from the description the sherd could be of plain Beaker or other Late Neolithic–Early Bronze Age style, or earlier.

**C13, ?WA 2371:** A posthole north-west of Stone 9 (probably WA 2371) resembled those of the row in which the grave occurred (C10, grave = WA 1676) and had sharp, clean, sides (25/8/1924).

**C13, WA 2380:** Very few of the postholes have even the slightest indication of a ramp but there may be one in the case of 2380, in C13. This is an exceptionally deep posthole for Stonehenge at 1.09m below chalk surface, and there is a oval feature tailing off from it to the east (WA 2382) which in turn must have had an unrecorded relationship with the putative Q Hole 12 (WA 2383). A reasonable interpretation of this 'tail' is that it is a ramp made necessary by the greater depth of this posthole, and that its relationship with Q12 was that the latter cut it. This is also one of the few postholes (the only certain example) in which there is evidence that the post decayed *in situ*, as a post 'core' 20in (0.51m) in diameter is noted in the 1964 plan (Archive drwg no 409).

**C16, WA 2421:** Hawley described this as a

> large and deep hole and is filled at the top with hard compressed earthy chalk becoming looser lower down. The lower soil has a slightly black tinge instead of the usual light brown one'
> (18/9/1924)

and when he had fully excavated the feature expanded this description to

> the upper contents were of hard rammed earthy chalk, below it was looser material of dirty soft chalky rubble of fine texture, occasionally a small portion of it was tinged with brown matter possibly decayed wood or vegetable matter. The hole contained no object of any sort not even a flint chip. The bottom was flat, the sides rather rugged and without the good definition of the usual postholes ... It was evidently an early hole judging by the absence of anything and the top layer [ie humus and rubble] passed over the top of the hard rammed earth in the top of the hole.
> (19/9/1924)

**C52, WA 3650:** Shown in section (Fig 143, Sc52.4) filled with compact chalk rubble.

### Stratigraphy

There are few stratigraphic relationships which were both recorded at the time of excavation and survive in the record, but where such relationships are recorded the posthole is almost always the earlier feature. This, and the fact that there were almost all devoid of finds, led Hawley to the conclusion that they were dug early in the history of the monument. Those relationships for which some information is available are listed here.

**C12:** When Atkinson *et al* reopened the area excavated by Hawley in 1926 it was found that the Stonehole designated 'J' by Atkinson (1956, 73) had been cut through an earlier posthole. Atkinson argues (*ibid*) that the posthole is most easily explained as being connected with the scaffolding for the erection of Sarsen Stone 60, but there is no reason why it should not be earlier than that event.

**C13:** A posthole (probably WA 2345) was cut by Stone 33f of the Bluestone Circle (Hawley 1926, 9, *see caption to Fig 133*). Posthole WA 2323 was cut by feature WA 2321, which in turn is cut by Stonehole 8; the nature of WA 2321 is not clear (21/8/1924; Plan 2). A posthole found 'under' Stone 33e, is described as an earlier posthole (Hawley 1926, 9) (WA 2345, *see caption to Fig 133*).

**C16:** When Hawley excavated around fallen Sarsen Stone 12 he noted that 'there was a large posthole [WA 2396] which had been partly cut by digging the hole for Stone 12' (4/9/1924). No depth is given for this posthole.

**C52:** Section C52.4 (Fig 143) shows a feature labelled as a posthole (WA 3650) cut by a feature filled with compact chalk rubble, which is in turn cut by a feature filled with 'earthy rubble and blues' (ie bluestone fragments). This almost certainly represents a posthole of the timber setting cut by an outlying Q/R 'dumbell' (WA 3654; *see Chapter 7*). This is in turn cut by the Bluestone Circle setting, although in this length that setting is represented by a robbing feature (WA 3381, not shown on plan because the only plan of this part of C52 is of all features after excavation, in chalk).

**Z Hole 13:** Hawley noted that at the eastern end of this Z Hole there was

> a large posthole included in the length of the stonehole. It was of previous date as it can be seen that the stonehole had cut it. It was 9" [0.23m] below the level of the stonehole and the flat floor of that hole formed a compact line above the lower contents of the posthole'.
>
> (12/9/1924)

The depth of the posthole is given as 48" [1.22m] below ground level. The chalk seems here to have been at around 15" [0.38m] below ground level, giving a depth below undisturbed chalk of 0.84m.

### Finds

Very few postholes produced any finds, and of those that did almost none of the finds survive. It is clear that on the whole these features were clean, and that artefact deposition had not occurred in their vicinity either during the erection of the posts, during the life of the standing timbers, or during their dismantling.

The few recorded finds are summarised here by cutting. Extant finds are discussed in Chapter 9.

**C8:** Posthole near Stone 8 (WA 1885) contained bone which has been identified as a human rib (*McKinley, Chapter 9*) and four fragments of animal bone.

**C17:** Sarsen and bluestone found by Atkinson.

### Discussion

There is a very strong temptation in considering the postholes in the interior to 'join the dots' to form a structure compatible with other sites of the period, that is, a circular structure probably of concentric rings of posts. But so much of the interior of the monument has been removed by features later than the timber settings, by later destruction, or remains unexcavated, that it is not possible to establish if this is the case. It seems clear, however, that if a circular structure existed it was not of the regularity and complexity of, for instance, the phase 2 timber circles at Durrington Walls (Wainwright and Longworth 1971).

Although it is not possible to discern a regular pattern or to suggest an overall ground plan for the structure which is undoubtedly represented in the interior, there are elements of the plan which can be commented on. The most noticeable feature is that there is a concentration of very large, deep postholes on the eastern side of the interior, mainly within C13 excavated by Hawley and reopened by Atkinson *et al.* These comprise WA 2355, 2351, 2343, 2380, 2332, and possibly ?2328 (Fig 69), although the latter is large in diameter only.

It can be seen that the three postholes 2351, 2343, and 2380 form a setting which could be envisaged as a double entrance, not unlike that postulated above for the north-eastern causeway. In such a plan WA 2355 could form part of a second line of an entrance, with its two partners lying in the unexcavated areas to its west. In support of this is the fact that not only are the postholes particularly large in this area, but that they lie at the point on which the feature called by Hawley 'the southern passageway' appears to be aligned.

A hint that the setting in the central part of the monument did include large posts elsewhere is provided by two postholes which Hawley noted as being unusually large examples close to Z Hole 13 (Fig 69). Hawley describes how

> when Z 13 had been emptied the end of a large previously existing posthole was found in the bottom, descending 9"

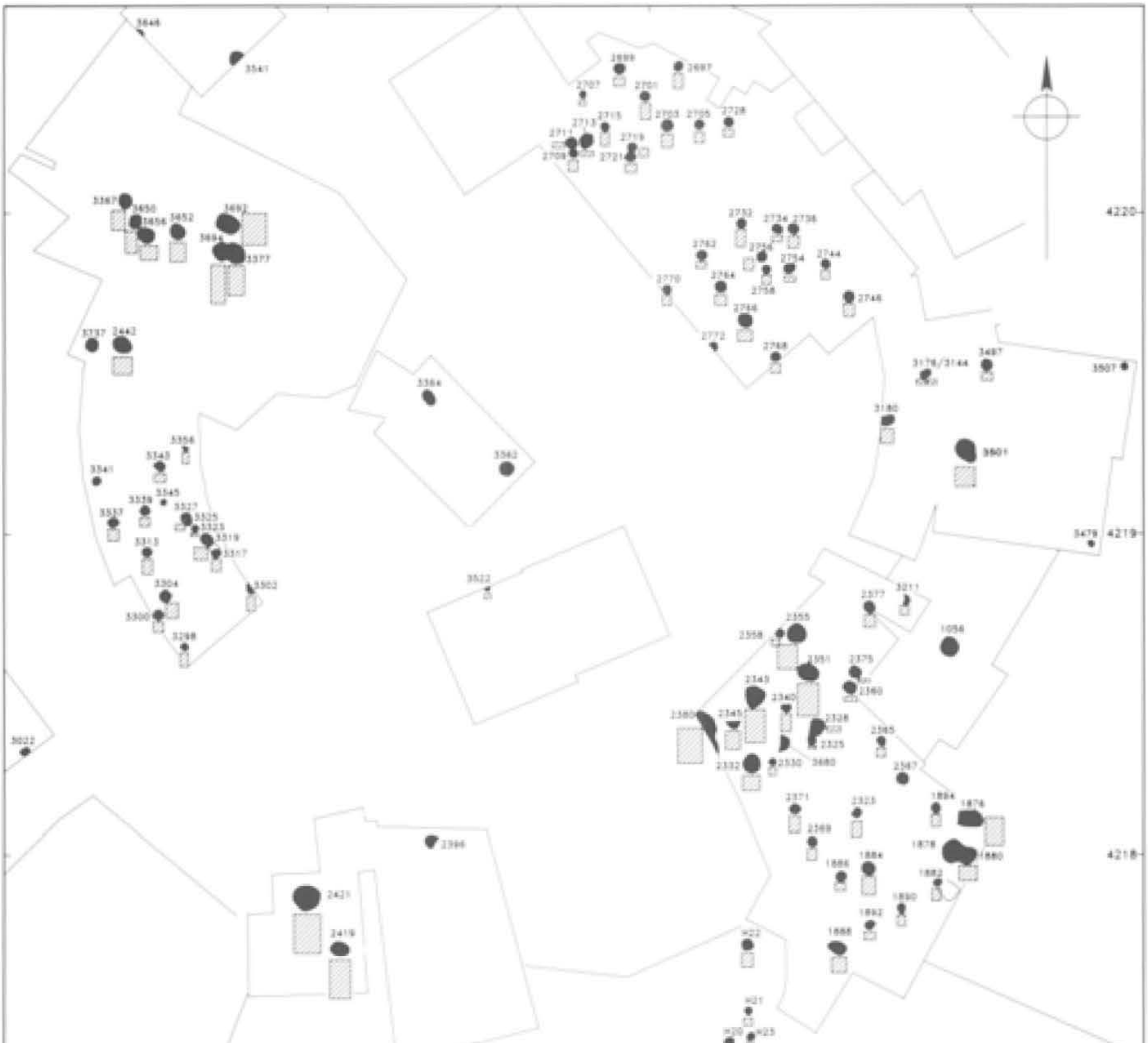



*Fig 69 Postholes in the interior with depths indicated*

> [0.23m] below it. The surviving part had apparently been emptied and filled with earthy chalk rammed hard. At 3ft [0.9m] north of the same hole ... another posthole was found with a depth of 4ft [1.2m] and a width of 32 in. [0.8m] and as similar to the part of the other found in the hole. These are the largest postholes yet found.
>
> (Hawley 1926, 15)

It could perhaps be argued that these large postholes near ZH13, together with the large postholes in C13, form part of a circular setting of large posts, but they cannot all lie on the circumference of a circle, drawn either through the postholes in C13, or from the central point of the ditched monument (Fig 70). Nor does it seem likely, given the large areas excavated and allowing for the destruction of postholes by later features, that there can have been large concentric settings laid out from the centre of the monument, as there are too many areas lacking posts in parts of the site which were excavated and which contain areas not disturbed by later features.

In the northern part of the interior, a minor entrance might be postulated as there is also a gap, between smaller posts than those in the south. This could mark an entrance from the direction of the north-eastern causeway.

## The southern 'passageway'

Hawley excavated the area of postholes in C8 and C9 in 1923, and subsequently encountered further postholes when he was 'trenching' the interior between the standing stones and the Bank in 1924 (C10). This area is not well recorded, the descriptions are difficult to follow, and it seems likely that more than one phase of construction is represented as there seem to be posts blocking the clearest line of approach. Despite this it is possible to see at least three elements among the postholes; one clear line of posts which seems to form a 'façade', a series of curving lengths of postholes, possibly forming further façade-like settings or screens, and an entrance passageway, flanked on both sides by lines of posts.

### Description

**The southern 'façade':** There is clearly a line of postholes running from east to west across the line of the southern 'passageway' (Fig 66). This line was first encountered by Hawley in 1923 when he was excavating Y Holes

> When excavating Y9 a large post-hole was found at the side of it, and it had been cut into when that hole was made. Another appeared about a foot [0.3m] from the Y10 hole. To find out if there were any more of these holes more ground was opened, and the place proved even more interesting than that at Z9. Eleven postholes were found in a line at short intervals apart.
>
> (1925, 31)

He notes that they appeared to be similar to a line previously encountered near ZH9, and that the soil conditions around them were the same.

**The northern façade or screen:** This line of posts was found by Hawley when he was excavating close to fallen Sarsen Stones 8 and 9.

> Many postholes were found here , most of them large and of the same symmetrical round form and calibre as those on the [north-east] causeway and near the Helestone [postholes at 'A']. There were chips in the soil above them but not in them, and they contained nothing but fine dirty chalk rubble, except in one instance [WA 1884] where 10 small pieces of animal bone occurred. They varied a little in width but more so in depth, which was from about 19 in. to 23 in. [0.48–0.58m]. Some were dotted about apparently without reference to anything that we could see at the time, but five formed a line with intervals of 3ft [0.9m] between them. One at the south end of the line had been cut into by digging Z9 hole, showing the posthole to have been pre-existent'.
>
> (1925, 31)

**The 'passageway':** Postholes of the 'lines' interpreted here as façades were found first by Hawley but as he continued 'trenching' he came first to a feature he describes as a 'furrow', cut into the chalk, and about 20in (0.51m) deep (Hawley 1926, 2). This depth is presumably taken from the then ground surface and the feature appears to have had only one cut side surviving . When soil was removed from the 'furrow' Hawley describes the appearance of postholes along it at irregular intervals, also that the west side of the western furrow formed a rough low wall.

> On the east of the furrow the solid chalk had been removed over the level to a depth of about a foot [0.3m], forming a wide depression with a fairly level base which was continued across to the post-hole previously found. Here another furrow [ie the eastern] similar to, but less pronounced than, the first, appeared, and had a row of holes like the others along it.
>
> (1926, 2)

Hawley dug southwards, towards the southern entrance, noting that the 'passageway' ended 45ft (13.7m) from the causeway. Towards its northern end Hawley noted

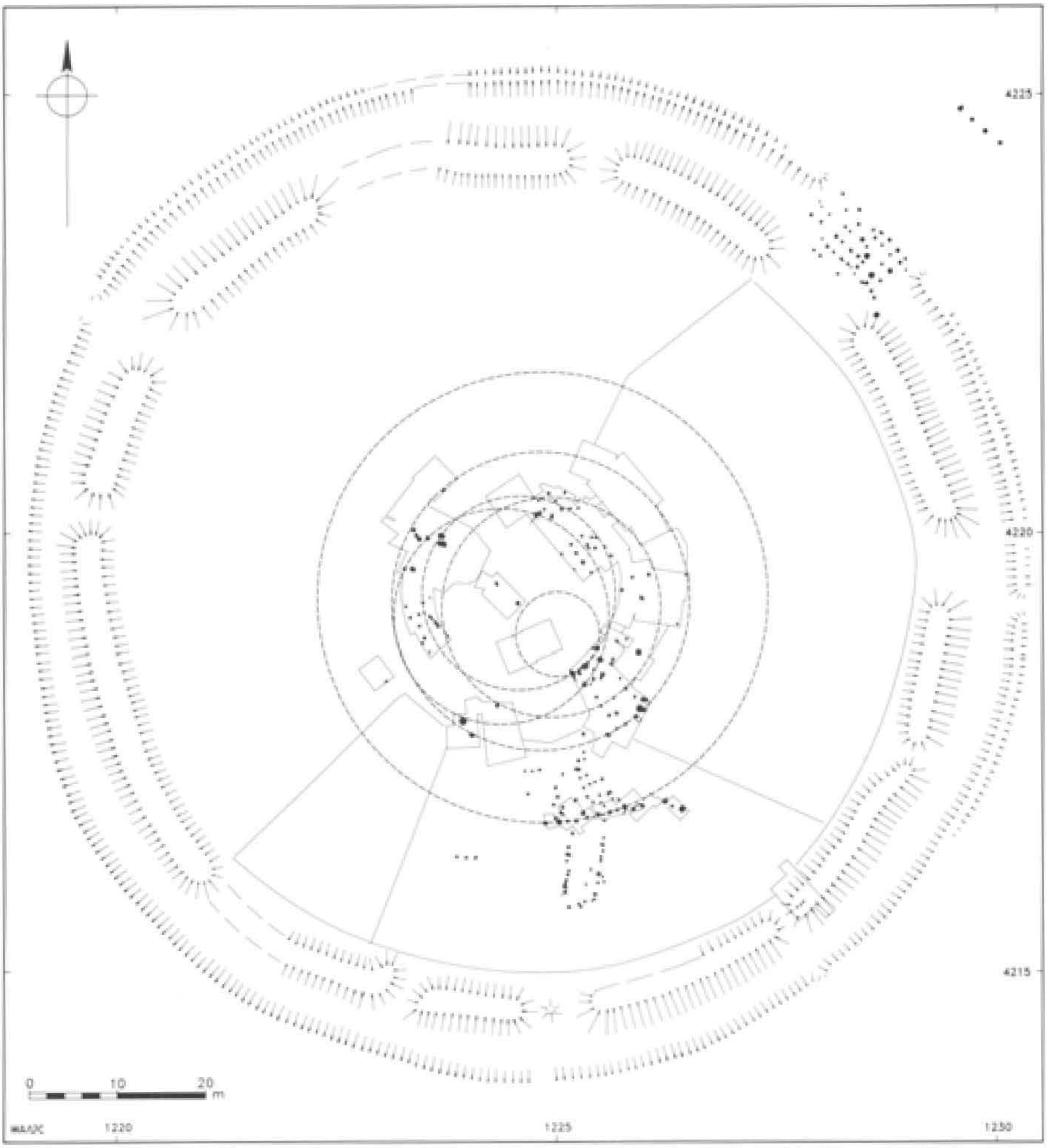



*Fig 70 A selection of circles, each generated on CAD by choosing three postholes of similar size and depth, to illustrate the difficulty of identifying concentric settings. The outlines of the principal excavation cuttings are shown for reference so that it is clear where postholes have not been recorded in excavation and where no excavation has taken place. A large number of circles were generated in this manner and no plausible circular structures have been identified*

two stratigraphic relationships: the west furrow 'was seen to have been cut through the edge of no. 8 post-hole' and that the west furrow also passed through the side of Y10 hole where 'it could be easily seen than the hole was the later, as it had cut both the chalk wall and the furrow beyond it'. (Hawley 1926, 3). The relationship with the Y Holes is to be expected, as they have been recognised as late in the history of the monument since they were discovered, but the relationship with the posthole suggests that there was more than one arrangement of timber settings within the monument and that there was a sequence to their development. It is perhaps worth noting here that the possibility of either the postholes along the passageway, or of the 'furrow' being of a very late date must be rejected on Hawley's evidence.

The line of the 'passageway' is also followed by a post-medieval track (*see Fig 11*) but this must be regarded as being largely due to the later track taking advantage of the gap in the Bank associated with the southern entrance. Hawley's comments on the age of the 'passageway' are that

> I should think it was contemporary with the causeway at the main entrance and places where similar post-holes have occurred, as they are all identical in method of making and in appearance. The top layer passed evenly over the place, and nothing of the Stonehenge period [by which he means bluestone and sarsen fragments] had penetrated to the lower levels. It was filled with fine dirty chalky matter containing nothing beyond animal bones, two worn out picks, and pieces of antlers.
> (1926, 3)

This makes quite clear that the 'passageway' is an ancient feature. The very fact that its line is coincident with a later track means that there is a strong probability of their having been a higher density of recent material in this area than in other areas of the monument and that the likelihood of datable material entering any features cut in recent centuries was therefore high. The absence of such material from all the features noted by Hawley must indicate that they are ancient features, and the absence of sarsen and bluestone fragments must, as Hawley realised, strongly suggest that they pre-date the stone settings at the site.

Hawley's interpretation of the 'passageway' was that it was exactly that, a roofed passage. His argument for this is that some of the posts were so shallow that they would have needed a superstructure to keep them standing. He notes their size as from 'small and shallow' to some which reached a depth of 28in (0.71m), and ranging in width from 15in (0.38m) to 23in (0.58m), 'the bigger being found towards the south end' (Hawley 1926, 3). Hawley's objection to the postholes being unable to stand without a superstructure would not seem to apply if the posts were only, for example, supporting hurdling which ran within the furrow, although the width of the 'passageway' (*c* 4m) would seem too great for it to have been easily roofed. If the intention was to conceal the nature of the settings in the interior from those entering, and to create a sense of mystery or anticipation about what lay ahead, then an enclosed passageway with substantial screens on either side would seem a very effective means of achieving those aims. On the other hand, if control of access was intended to be purely practical. by channelling those entering the enclosure in a particular direction, then a pathway marked by fencelines would have been sufficient.

## Secondary Use of the Aubrey Holes

*by K E Walker*

Above the chalk rubble associated with the primary cutting and use, each of the Aubrey Holes had a main fill described by Hawley as earthy chalk rubble within which was frequently deposited cremated human bone. This main fill appears from the sections to lie in 'bowl shaped or vertical sided concavities' (Pollard 1994, 150) either resulting from episodes of recutting or forming after the removal of posts. The section drawings and descriptions do not appear to indicate a natural, gradual silting up of the features (*see Figs 49–55*). Some primary chalk rubble is indicated on a number of the section drawings and the presence of chalk rubble higher up in the fills and towards the edges may best be interpreted as post-packing. After excavation of AH31 and AH32 and consideration of Hawley's results, Atkinson believed that the Aubrey Holes had been deliberately filled, 'soon' after they were first dug (1979, 27; *but see also Chapter 5*). A further possibility is that they were filled deliberately but after the posts had been removed.

The majority (24 out of 34) of the excavated Aubrey Holes contained at least one human cremation burial. Cremation burials appear to have been absent from eight holes (AH19, 25, 26, 27, 30, 31, 55, and 56). There is conflicting evidence in the Diary regarding the presence or absence of cremation burials in AH22 and 23. No cremated bone is shown on the section drawings (Fig 54), although ash is shown on the base of AH22. The evidence from AH1 is also ambiguous (only a single fragment of bone was recovered). The cremated material varied in quantity and location within the hole. Some were concentrated and possibly placed in a recut (AH4, 16, 18, and 24) but others were sparse and dispersed throughout the main fill. The amount of wood ash present, if any, was also variable. In some holes additional cremated material seems to have been deposited in a cup-shaped depression in the side or on the edge of the hole (AH3, 7, 12, 13, 14, 17, 21, 28, 29, 32). Most of the cremations no longer survive and it is clear (*see McKinley Chapter 9*) that Hawley's identifications were not very accurate, so that it is difficult to establish the number of either cremation deposits or individual cremation burials present. Summary lists of all known records of human bone and all material examined for this report are provided in Tables 57 and 58 (*Chapter 9*) with the known distribution shown on Figure 247. The cremation burials are not interpreted as the primary reason for the Aubrey Holes, and are discussed below and in Chapter 9.

There seems little doubt that with the possible exception of AH32 all the cremations were inserted some time after the holes had been dug and the primary silt formed (*but see discussion below*). Secondary cremations of this date are not unexpected, 'At other sites of this character at Dorchester cremations were regularly secondary' (Bradley and Chambers 1988, 282). Pollard has noted that a pattern can be discerned in that the frequency of cremations from the Aubrey Holes decreases towards the western sector of the monument. Aubrey Holes 22–32 produced only four cremations between them whereas, with a single exception (AH1), they were present as secondary deposits within every undisturbed hole excavated on the eastern and northern sectors of the circuit (1994, 149).

There is no clear indication of the length of time over which the burials were made but equally there is no indication that they occurred as a single event. The sections indicate that several of the pits had been recut. Some had small bowl-like depressions cut into the edge into which cremation deposits had been placed. In other cases the sections AH4, 16, 18, and 24 indicate that cremation pits had been dug into an existing fill. It has been suggested that the position of some cremations (for example that in AH3), indicates a 'dribbling down' effect caused by the void left by a rotting post (Newall 1929, 83). The majority of cremations would, however, appear to post-date the removal of the wooden posts.

A possible parallel is with the 12 rather irregular pits in an egg-shaped circle of posts lying centrally within the Dorchester-on-Thames Cursus (site 3). Well defined postpipes containing charcoal indicate that the timbers

**Table 14 Nature of cremation deposits in the Aubrey Holes**

| *Nature of cremation* | *Aubrey Hole** |
|---|---|
| *Just under turf* | 2, 3, 7, 9 |
| *Dispersed* | 4, 5, 11, 12, 20, 29 |
| *Collected in main body of hole* | 6, 8, 10, 13–18, 21, 24, 28, ?29, 32 (scoop in chalk & fill) |
| *Cup-like depression cut into chalk rubble at base* | 12 |
| *Cup-like depression on edge of hole* | 12, 17, 24, 29 |
| *Presence uncertain* | 1 (1 bone only), 22, 23 |
| *None present* | 19, 25–27, 30, 31, 55, 56 |

* *Holes may appear more than once as some contained more than one cremation deposit*

of this site were burnt *in situ*. Again, cremations were recovered from the pits. Bradley and Chambers proposed a similar sequence to that suggested for Stonehenge in which the posts had been burnt before cremations were placed in the resultant hollows (1988, 283), although Chambers and Whittle have subsequently suggested that it is 'unclear whether the cremations in the upper fills of four pits had been deliberately placed or were merely derived from surface deposits by erosion' (Whittle *et al* 1992, 174).

Wood ash was recorded in three of the holes which do not appear to have had cremations deposited in them (AH19, 30, and 55, although 19 was disturbed and 55 may have been). It was also present in varying quantities in holes AH1, 4, 6, 7, 8, 9, 10, 12, 16, 22, 28, 29, and 31. Hawley noted the possiblity of *in situ* burning in some holes (AH10 and 24) and burnt earth was noted in AH32. Whether or not this could be associated with the cremations (pyre debris having been recorded in the Ditch; *McKinley, Chapter 9*) or the *in situ* burning of posts, cannot be ascertained from the records.

**Finds**

Some cremation burials appear to have been accompanied by bone skewer pins (those in AH5, 12, 13, 24 and ?26,), and/or by antler, animal bone (AH3), occasional flint and chalk objects (AH24), and pottery fragments including the unusual ceramic object discussed by Cleal (below, Chapter 9; Fig 192 (AH29)). Unfortunately it was not possible to obtain radiocarbon dates for any of the skewer pins as insufficient collagen was present; the only existing Aubrey Hole date, from charcoal associated with a cremation in AH32, has such a wide error margin as to be completely unhelpful (3020–1520 cal BC; C-602, 3798±275). Bone skewer pins are not common but are generally associated with cremations of Late Neolithic and Bronze Age date (Atkinson *et al* 1951, 140–2). The chalk ball from AH24 is one of a number from the monument including examples from phase 1, 2a, and 2 or earlier contexts in the Ditch. Similar balls are recorded from later Neolithic contexts at henge monuments such as Durrington Walls and Woodhenge (*see Chapter 9*). There is no clear evidence that the bluestone and sarsen fragments shown on the section drawings were directly associated with the cremations and it could therefore be argued that this activity antedates the dressing of stones at the monument (*but see discussion below*).

The artefactual evidence thus indicates a period of deposition of the cremations during the Late Neolithic, here assigned to phase 2 of the monument. Comparatively speaking, Late Neolithic cremations have not often been excavated (examples include Dorchester-on-Thames (Piggott 1954) and West Stow, Suffolk (West 1990)) and it is particularly unfortunate that so few survive for examination (*see below and Chapter 9*).

## The cremation cemetery

The number of cremation burials at Stonehenge is so large, and their distribution so widespread, around the periphery of the site at least, that it is reasonable to interpret this use of the site as a cremation cemetery. A large number (52) of deposits of cremated bone are mentioned in the excavation records from the monument, although most were reburied subsequent to the excavations without examination, and it is unfortunate that we have little or no evidence regarding the composition of most of them (*McKinley, Chapter 9*). It is clear from McKinley's examination of the surviving material that Hawley's identifications were generally inaccurate, so that we cannot accept his comments on numbers and ages of individuals.

The dating of this use of the site, and particularly the date at which the activity ceased, is difficult to pinpoint. It certainly began in phase 2 and there is no incontrovertible evidence that it continued long into phase 3, in that the associations between cremations and bluestone fragments are generally not clear. The section drawings of the Aubrey Holes, in which the only such associations occur, show finds extrapolated onto each section but there are no descriptions to suggest that any of the apparent cases are actually in direct association (*see below*). Nor do any of the cremation burials come from features assignable to phase 3. Unfortunately there is also no material associated with the cremations which it was possible to date by radiocarbon (*Appendix 2*).

If a cremation burial at the bottom of the Ditch in Segment 13 (*see caption to Fig 42*) is accepted as having been cut through the primary chalk rubble then deposits of cremated bone first appear in phase 2 contexts. Other than this example it can be seen that the earliest occurrences of cremated bone are in the deliberate chalk backfill in Segments 99 and 100 of the Ditch, immediately west of the north-east entrance. The deposit in Segment 100 is described clearly as having been within clean loose chalk and was covered with more clean loose chalk; Hawley considered that there were two individuals present, possibly an adult and a child, but the bones do not survive. As it is clear that clean chalk backfill in this segment lay directly on the dark layer which is taken to mark the final stage of phase 1, it follows that this cremated bone must have entered the Ditch early in phase 2. This also applies to Segment 99, although there the cremated bone appears to have been scattered within the 'cast-in' chalk (rather than in a discrete deposit) which it is impossible to envisage as having been within a cut feature (*see above*).

The cremation burial in Segment 13, already alluded to, if not in a primary (phase 1) context, is nevertheless likely to have been deposited early in the Ditch's history. Its depth in the Ditch, and the fact that it is covered with chalk rubble only, suggest that it is likely to have been cut at the latest from the very early stages in the secondary filling. This segment also includes one of the few cremation burials to be placed within the Ditch fill during the formation of the secondary fill (*see above*).

It is important to note those occurrences which are clearly in phase 2 because the majority of the cremation burials are in contexts which do not have relationships with datable features of the monument, which at least must be very late in phase 2, or are later than phase 2. Although the cremation cemetery is regarded here as beginning in phase 2, it clearly continues into the period in which the Ditch, now full, encloses an area in which the early settings of the stone monument are constructed.

Cremated bone, both dispersed and in cremation burials, occurs in four main contexts apart from those already mentioned in the phase 2 filling of the Ditch. These are cut into the Ditch and its immediate vicinity, cut into the Bank, deposited in the interior of the monument, mainly between the Aubrey Holes and the Bank, and in secondary contexts in the Aubrey Holes.

Most of the cremation deposits from the Ditch are noted as having been cut from the top of the silt, but in no case is there an association of bluestone with the burials, and since he dated features by the presence or absence of 'foreign stones', Hawley would certainly have recorded them if they had occurred. There are several very full descriptions of cremation burials cut through the upper Ditch fills, and these are included in the segment descriptions, above.

The cremations identified in the Ditch and close to it during excavation of these areas are relatively well recorded, as are many of those in the Aubrey Holes. Unfortunately, at least 11 of the cremation deposits were found in the 'general trenching' of the interior and it has proved impossible to relocate Hawley's numbered trenches in the interior (a task also attempted, unsuccessfully, by Atkinson; Atkinson pers comm). They seem to have been found largely towards the southern end of the general trenching of 1923 (C7; Hawley 1925, 33) and in the trenching of 1924 (C10; Hawley 1926, 2).

In the Aubrey Holes cremations appear always to have been in a secondary context and it is suggested here that they entered the holes after timbers had been removed from them. Whether the removal of posts was a fairly recent occurrence when the cremations were placed in the Aubrey Holes or whether it had occurred some time previously cannot now be established. In a few instances (eg AH4 and AH7) the section drawings indicate that some secondary fill had already entered the holes before the cremated material (Figs 51 and 52). It is clear, however, that if the Aubrey Holes did hold posts (*Walker, Chapter 5*) they did not decay *in situ* and the cremations cannot be envisaged as having been placed around standing posts and trickling down into the hole as the post decayed, although this was suggested by Newall (1929) for Aubrey Hole 3. The upper fill of AH3 gives the impression of a small post having decayed, but this is a small feature on the interior side of the hole and quite out of proportion to the size of the Aubrey Hole cut (Fig 51). This was also a case where there are bluestone fragments apparently in association with cremated bone. The suggested post here, however, offers an interpretation which may account for this association without necessitating the inclusion of the cremation in phase 3. It is reasonable to postulate in this case that a cremation was placed around a marker post, or in a shallow cut containing a marker post, standing within the backfilled or naturally filled Aubrey Hole. As the post decayed and after the appearance of Bluestones at the site, both bluestone fragments and cremated bone trickled down as replacement material within the posthole.

## The Palisade Ditch

*by K E Walker and R Montague*

During the latter half of the twentieth century, three sections have been excavated through a linear feature known as the Palisade or Gate Ditch, which runs to the west and north of Stonehenge. This feature lies outside the ditched enclosure and has no direct stratigraphic link with any feature of the monument itself. In terms of the site phasing adopted in this report it is, therefore, unphased, though for a number of reasons it is considered to be contemporary with phase 2.

Although the morphology of this ditch is different in the two excavated sections for which information is available, air photographs indicate that this is the same feature. The excavations were undertaken by the Vatchers (1967), Atkinson *et al* (1953), and Evans *et al* (1978). The name 'Gate Ditch' was coined by Atkinson who traced its course in 1953 towards and through a gate in a field boundary (Evans 1984, 25). The ditch was of particular interest because of Stukeley's assertion that there was a northern extension to the Avenue from the 'elbow' (*see Chapter 7*). The location of the ditch and the three excavations comprising the Vatchers' 'Palisade/Stockade Ditch' (pedestrian underpass excavation) C81 is shown on Figure 24, above; Atkinson's 'Gate Ditch', C37, and Evans's 'Gate Ditch', C97, are shown on Plans 3 and 4.

In 1967 Faith and Lance Vatcher were commissioned by the Ministry of Public Buildings and Works to undertake an excavation ahead of the construction programme for the exit area of the pedestrian underpass to the north-west of the monument. No correspondence regarding this work had been identified in the archives apart from a mention in a letter to Reay Robertson-Mackay of the Ministry about the A303/Avenue (C86) excavations which had just been completed. The letter is dated 9 August 1967: 'Next week we are to start clearing the ground before the Stonehenge underpass work begins'.

However, after the death of Professor Atkinson in October 1994, primary archive material relating to the excavation of the pedestrian underpass was found amongst his papers, including a letter dated 10/6/1983 in which he states of the burial from the underpass (*see below*): 'I am to publish at DOE's request on behalf of the late Mrs Faith Vatcher, the original excavator'. This was to be included in the definitive volume of excavations at Stonehenge since 1919 on which Professor Atkinson was working at the time. The archive material included the finds register, plans (at 2in to 1m (*c* 1:100) with sections at 4in to 1m (*c* 1:50)), and letters, and a roughly prepared note by Lance Vatcher on the Palisade ditch under the heading *Notes of Stockade Trench SH Underpass*. This is reproduced in its entirety below.

> Trench running NE SW. Length uncovered was 10.75m. At NE limit defined by squared off terminal end [?while] SW end continued under the end of the cleared area.
>
> Ditch at chalk level on average 2.0m across.
>
> Steep sided profile about 1.38m deep taken from GL with short narrow flat bottom base 0.20 to 0.25m across.
>
> The ditch was excavated with a travelling section from [sentence not completed]
>
> The upper layers were systematically cleared down to chalk level using a JCB. Except in 4 positions where baulks had been set out to cross the stockade ditch at right angles.
>
> The stockade ditch was excavated by means of a vertical travelling section from chalk level downwards which moved forward roughly in 15cm slices. By this technique it was possible in most cases to differentiate between that material which was replacement from that which was packing by plotting on the plan and identifying actual post positions which tended in most cases to butt one up to the other. Post sizes ranged from the largest diameter of 35cm to a smaller diameter of 25cm.
>
> The baulk sections revealed two other earlier turf lines below the level of ploughsoil. The lower of these No. 3 turf line consisted of three different profiles over the trench itself and are known as 3A, 3B and 3C. 3A the upper covering the ditch straight across from one side to the other while 3C formed a curved depression leading into and out of the [?trench], conforming to profiles after replacement material had collapsed inwards filling the voids left by the decayed timber posts of the stockade.

The most significant result of the excavation was the discovery of the terminal of a V-profiled palisade trench running south-west to north-east into the excavated area and lying approximately 75m to the west of Stonehenge. A note on the front of the finds register reads 'written up Sept 1980' although it is not certain whether this refers

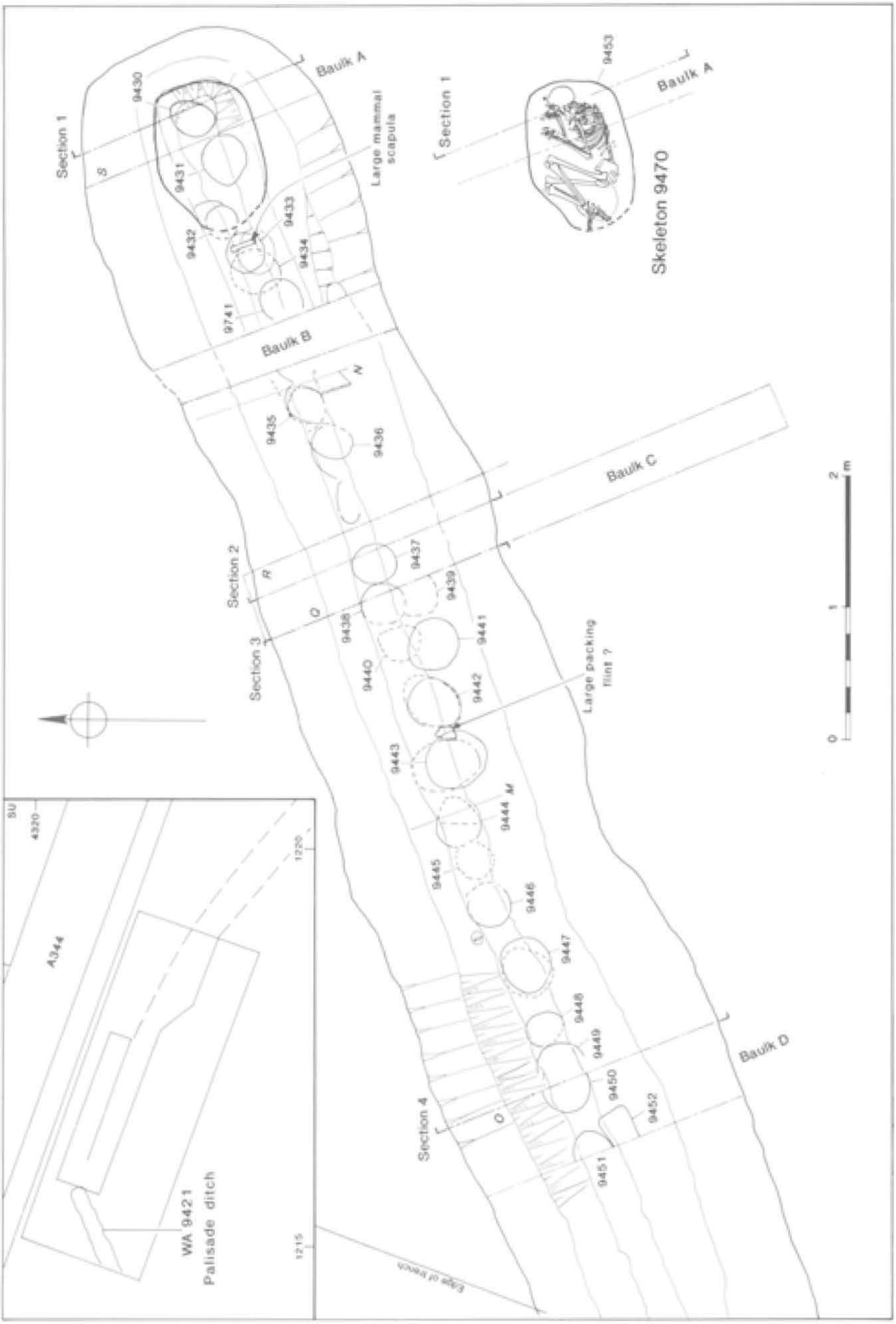



*Fig 71 Plan of the Palisade Ditch in the underpass excavation, 1967 (C81). This is taken directly from the original field plan with WA context numbers added. On the original plan the skeleton is shown superimposed on top of the ditch terminal and the underlying postpipes are shown separately. Here the skeleton has been moved and the postpipes replaced for the sake of clarity*

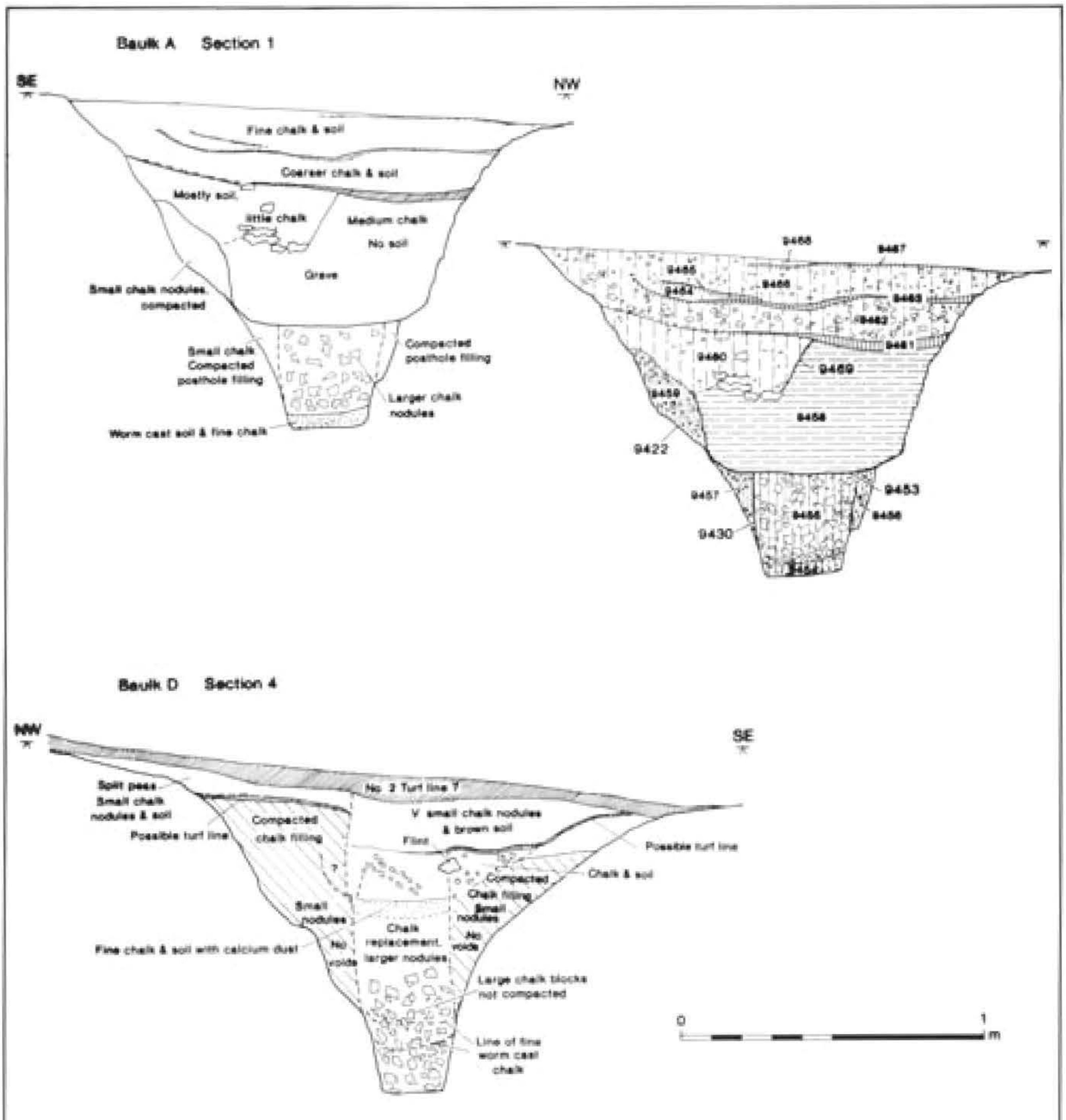



*Fig 72 Palisade Ditch, sections*

Baulk A (labelled on original as west side but appears to be east side): the postpipe and packing are both truncated by the grave cut. This is in turn cut by a later feature and sealed by the three turf lines. The turf lines must, therefore, post-date the burial, which has a radiocarbon date of 780–410 cal BC (UB–3820, 2468±27 BP).

Baulk D (east side): A possible later feature is annotated ? This section may show deliberate backfilling of the pipe after removal of the post.

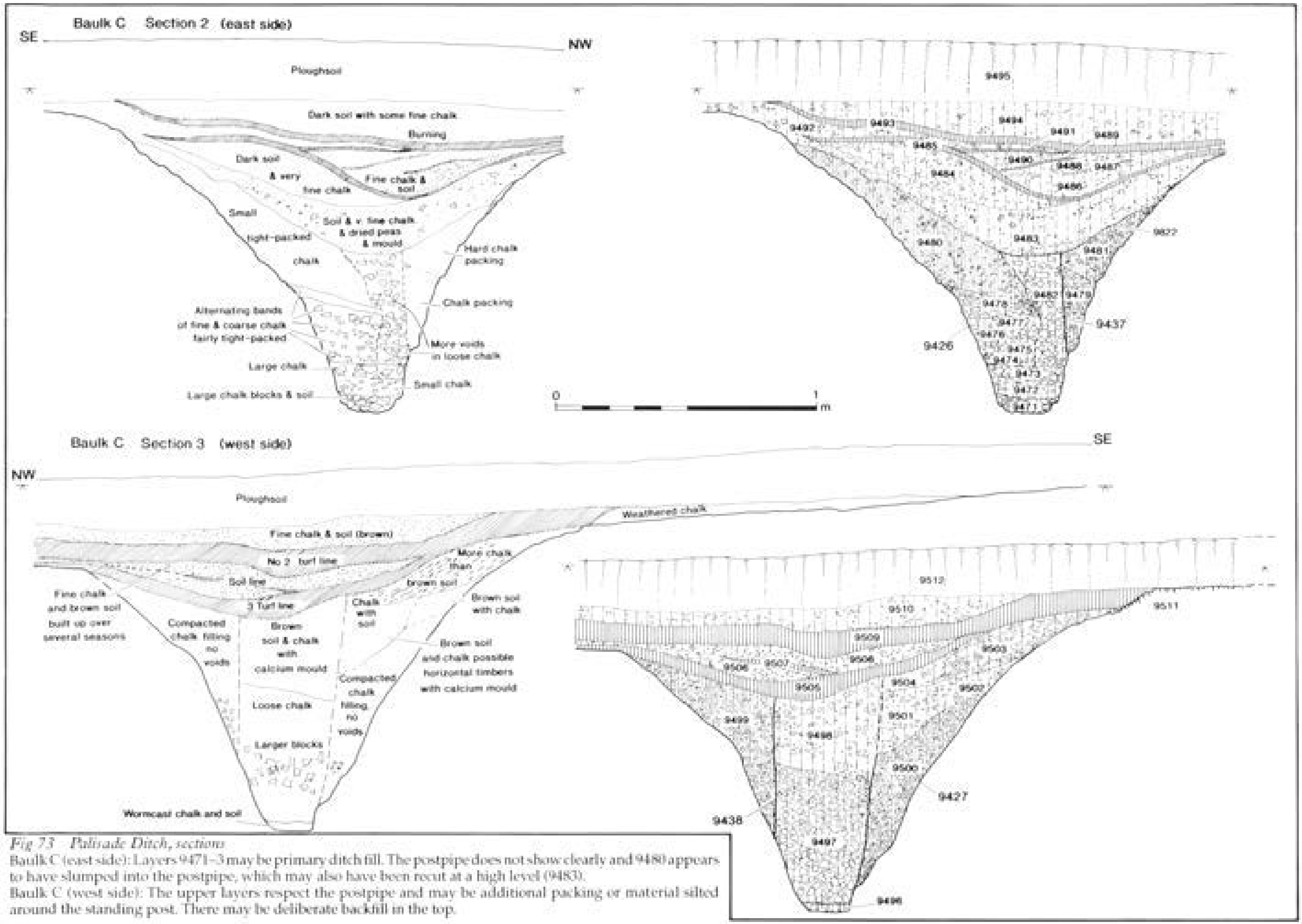



*Fig 73 Palisade Ditch, sections*
Baulk C (east side): Layers 9471–3 may be primary ditch fill. The postpipe does not show clearly and 9480 appears to have slumped into the postpipe, which may also have been recut at a high level (9483).
Baulk C (west side): The upper layers respect the postpipe and may be additional packing or material silted around the standing post. There may be deliberate backfill in the top.

*Fig 74 Palisade Ditch under excavation with baulk B remaining (Vatcher archive V8/5A)*


*Fig 75 Palisade Ditch under excavation. Section through postpipe WA 9444 in the foreground and baulk C, partially excavated, in the background (Vatcher archive V6/8A)*

to the note quoted above or to some other, as yet undiscovered, archival material. A detailed plan and four sections of the Palisade Ditch were prepared (Figs 71–3), with another plan showing the location of a posthole/pit in relation to the ditch, and a sketch plan of the limits of the excavation area. A detailed photographic archive also exists. None of these plans are provided with any levels.

The turf was removed and the soil stripped to the chalk surface. A section of ditch *c* 10.5m long including a terminal was revealed. It seems that it was almost totally excavated with four main baulks (A–D), all but one of which (B, Fig 74) were eventually removed. The ditch had a V-profile with a flat or slightly rounded base, and was *c* 1.2m wide and 1.3m deep.

The available plan (Fig 71) appears to be a composite plan of the trench at different stages of excavation, as it shows the semi-flexed inhumation at the terminal, as well as what may be either the pre-excavation soilmarks of the postpipes, or their excavated impressions in the base of the trench (*c* 0.25–0.40m in diameter). The lower portions of these pipes or 'postcores' were particularly well preserved in section (Figs 72–4 ). The ditch fills generally consisted of a small amount of 'worm cast chalky soil' on the base, and postpipe material (loose chalk rubble with voids) surrounded by tightly packed chalk. The ditch was sealed by up to three turf lines.

It seems probable from the relatively well preserved postpipes that at least some of the posts were allowed to decay *in situ* (Figs 72 and 73). Similar postpipes (0.30m in diameter) were excavated in the ditches of two later Neolithic circular palisaded enclosures at West Kennet, near Avebury, Wiltshire (Whittle 1991, 257–61). There, the oak posts, which were originally supported by backfilled soil and sarsen packing stones, are also believed to have decayed *in situ*. Unlike the West Kennet examples where posts may have been burnt (*ibid*), the Palisade Ditch sections show no evidence for burning. In the sections of the Mount Pleasant palisade enclosure, where the posts had been removed, postpipes were not visible and the filling variable (Wainwright 1979, 60).

In some areas the Palisade Ditch had clearly been cut into after the posts had decayed and the ditch had silted or been deliberately backfilled. The most obvious example of this is the grave cut into the fill of the terminal (Fig 72, *see also Fig 186*). The plan shows the postpipes preserved below the grave. A younger mature adult male (*McKinley, Chapter 9*) lay in the grave, with his head at the terminal end (ie to the east), in a semi-flexed position on his right side (Fig 186). The grave fill itself had a later feature filled mostly with soil cut into one side. A possible recut of at least part of the ditch is indicated by a section of baulk C (Fig 73) where the postpipe and packing appears to have been truncated and replaced by a soil and fine chalk with 'dried peas' and mould, before the development of the turf lines.

The suggested sequence is that the ditch was dug and wooden posts inserted into the base. They were supported by packed chalk rubble from the excavated ditch. The posts decayed and the resultant postpipes were allowed to silt up with finer secondary material. Some slumping is indicated. Various features were cut into the ditch fills at a later date (notably the grave which was inserted into the terminal). Further silting occurred during which up to three separate turflines formed.

## Finds

Most of the finds recovered during this excavation were from the turf lines and intervening upper layers of the ditch which formed well after the decay of the posts. The finds from Mount Pleasant were recovered from a similar position but here they were assumed to have accumulated while the palisade was standing (Wainwright 1979, 60). Small quantites of undiagnostic prehistoric pottery including possibly a few scraps of Beaker were recovered, apparently from the bottom of the lowest of three turflines identified in the upper ditch fills. Later pottery was also present. Plotting the positions of the pottery fragments shows a concentration of prehistoric sherds in the area around baulk C.

Other finds included pieces of volcanic ash, sarsen, and bluestone. With the exception of a single piece of sarsen from the 'base of number 2 turfline', these stone fragments were either unstratified or from undifferentiated contexts of 'ditch fill'. An unperforated chalk disc (Fig 221, WA obj no 510) came 'from the base of ditch near end'. Romano-British activity in the area is indicated by pottery and a fourth-century bronze coin (WA obj no 560). Most of these finds are from undifferentiated ditch fills although there appears to be a concentration close to baulk A, near the grave. However, this may be the result of the terminal acting as an 'artefact' trap, with artefacts accumulating into it from three sides rather than two.

## Cutting 37

In 1953 Atkinson *et al* put a section (C37) through the ditch at a point where it passes close to the elbow of the Avenue. The location of this trench is shown on Plan 3 but the only other available evidence for this excavation is a published reference to the two ditches which run parallel to the Avenue and which were considered to be part of a possible northern extension of it: 'one of these ditches is certainly and the other probably, of much later date than the Avenue' (Atkinson 1979, 67).

## Cutting 97

Evans published the results of his 1978 excavations (C97) in 1984. In this cutting (Fig 76) the ditch was asymmetrical, the north-west side being steep with a round bottom and the south-east side less steep and more irregular. The ditch was 1.20m wide and its maximum depth was *c* 0.60m, notably similar to the width recorded at the underpass (C81) excavations, but only half the depth. Primary fills (coarse chalk rubble), secondary fills (chalky loam with flint), and ploughsoil (flinty loams) were identified. Chalk rubble and coombe rock on the edge of the ditch were interpreted as being possible natural. The profile of the ditch appears to have been more symmetrical if this material is accepted as being natural, having been compacted when timbers were slid in, or acting as ramps for the timbers (Evans 1984, 25–6). Although the excavators were aware of the possibility of finding the remains of palisade timbers or

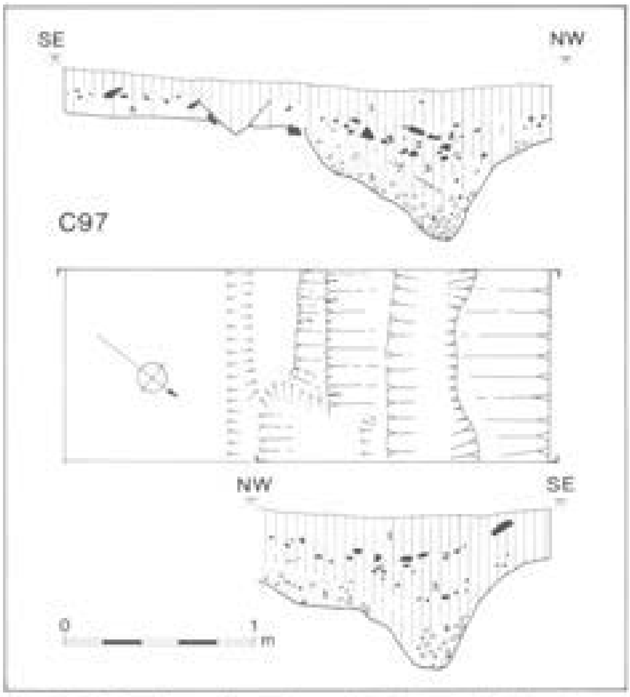



*Fig 76 C97, plan and sections of the 'Gate Ditch', the continuation of the Palisade Ditch (after Evans 1984). The location of this cutting is shown on Plan 4. A deep groove to the south-east of the ditch is interpreted by the excavator as being a plough furrow. Primary, secondary, and tertiary fills were identified. Recorded contexts consist of: 1) modern turf; 2) flinty loams (ploughsoil); 3) chalky loam with flint (secondary); 4) coarse chalk rubble (primary); 5) chalk rubble and coombe rock (?natural)*

postpipes none were visible, nor were there casts or impressions of posts on the base of the ditch. No finds are mentioned.

### Date of the Palisade Ditch

No direct date for the digging and primary use of the ditch is available as no organic material was recovered from the packing material or postpipes for radiocarbon dating. Comparisons with other palisades, however, include the radiocarbon dates for the construction of the palisaded enclosure at Mount Pleasant of 2180–1890 cal BC (BM-665, 3645±43 BP) and 2200–1820 cal BC (BM-662, 3637±63 BP) (Wainwright 1979, 50). Perhaps the closest parallel is with the West Kennet palisaded enclosure,s which it has been suggested may be seen 'as sacred precincts, defensive strongholds or stockades around prominent settlements' (Whittle 1991, 261). These have produced small amounts of Grooved Ware and radiocarbon determinations which place them in the second half of the third millennium BC (Whittle 1993 *et al* 1993, table 17, phase F).

The chalk disc recovered from the base of the ditch at the terminal is of interest as it may represent some sort of deliberate deposition. Chalk discs are a fairly common artefact type from Late Neolithic/Early Bronze Age contexts, and are a well known artefact type from henges and causewayed enclosures. They occur in primary contexts in the Ditch of Stonehenge itself (*see Chapters 5 and 9*).

A femur of the skeleton WA 9470 in the ditch terminal was submitted for radiocarbon dating in 1994 and provided, unexpectedly, an Iron Age date of 780–410 cal BC (UB-3820, 2468±27 BP). This episode provides a *terminus ante quem* for the use of the ditch as a palisaded feature in the landscape, as the grave cuts the material which is considered to have filled the postpipe after decay of the post and is itself below the lowest of the three turf lines.

The ditch runs for some distance to the south-west, visible in both geophysical survey (*Appendix I*) and as a cropmark (RCHM(E) 1979, map 1) and disappears among cropmarks of field systems visible on aerial photographs to the west on Stonehenge Down. These fields have produced surface finds of Late Bronze Age date (Richards 1990, 279) as well as a small number of sherds of Peterborough Ware and one of Grooved Ware, but there is no clear relationship with them and the Palisade runs off at a tangent from the fields. Geophysical survey evidence (obtained in a previous survey in 1990) also confirmed that the Palisade and Gate Ditches are one and the same (Fig 262).

Closer dating is not possible but on balance the digging of the ditch and construction of the palisade are most probably of Late Neolithic date. The possible relationship of this feature with Stonehenge and other features of the surrounding landcape is discussed below and in Chapters 8 and 10.

## Discussion

### Secondary silting of the Ditch

There are three main aspects of the use of the site in phase 2, the secondary filling and use of the Ditch, the timber settings at the north-east entrance, in the interior, and in the southern 'passageway', and the inception of cremation burial at the site. Phase 2 is the most difficult of the three main phases of use of the monument to justify as a coherent and unitary phenomenon. Despite the recent radiocarbon dating programme absolute dating remains uncertain for the upper fill of the Ditch, and there are no dates and no datable material of sufficient quantity or quality from the timber settings or for the cremations. In addition, it seems likely that there is change in the nature of activities through time, indicated mainly by the stratigraphy of the Ditch. There is, however, sufficient reason to see this phase as one marked by substantial differences in practice between what went before and what came after. The question of whether this 'phase' can really also constitute a coherent 'period' is discussed further in Chapter 10, and its relation to phase 3 in Chapter 7, but essentially the events and practices of phase 2 may be seen as belonging to the Late Neolithic and to have occurred mainly within the early to middle centuries of the third millennium BC, at a time when Grooved Ware and its associated artefacts dominated the world of material goods.

In this phase the Ditch of the monument seems still to have provided a focus for some activities, as it did in phase 1, but these activities may not have been undertaken continuously throughout the phase. The refilling of the Ditch with clean chalk was certainly a major feature, but it is not clear whether this activity occurred as a single event or series of related events. On the contrary, it seems that it varied in both date and nature, with the backfilling to the west of the north-eastern entrance taking place at the beginning of phase 2 and occupying much of the upper Ditch, but on the eastern side of the same entrance it took place after some secondary fill had formed. In other locations there are lenses of chalk, generally in the upper part of the secondary filling, which may or may not represent deliberate backfill.

Because of the way in which the Ditch was recorded and in particular the lack of section drawings for most of the excavated length, it is difficult to assess how frequent were the disturbances within the Ditch secondary filling, compared with those certainly cut from above. It is clear from the 1954 Ditch sections (C41/42) at least that there were almost certainly episodes of activity during the formation of the secondary filling, including cutting into the partly filled Ditch, and probably also the deposition of artefacts and other material. The most certain occurrence of Grooved Ware in the Ditch is from an area of disturbance, either cut from above or during the filling, in cutting C26 (Segment 17) close to the southern entrance. The same is true of the bone object (WA obj no 23) dated to 3100–2700 cal BC (OxA–4883, 4300±70 BP) from the same segment. It is unfortunate that the only other occurrence of Grooved Ware from the Ditch filling was of such small fragments and in such a position that although they appeared to lie within primary chalk rubble Hawley felt that it was likely that they had been deposited higher up (*above and Chapter 9*).

## Implications of the radiocarbon dating

The radiocarbon dating of the Ditch is discussed in detail in Appendix 2. It was recognised from the outset that it would be difficult to obtain a definitive dating for the upper fill given the likelihood of there being redeposited material. The selection of material was aimed at reducing this risk to the minimum by selecting fresh, unweathered material and fragments from Atkinson's excavations which could be securely located. Unfortunately, and as explained in Chapter 10 and Appendix 2, primary evidence, principally finds recording details from the 1954 excavation, became available only after the samples had been submitted for dating.

This threw some doubt on the security of some of the contexts from which samples had been taken. In addition, some of the events of deposition which it would have been desirable to date, both for themselves and to establish a *terminus ante quem* for the filling of the Ditch, could not be dated because of the unsuitablility of the available bone (mainly skull fragments and vertebrae). As a result, the upper filling of the Ditch and the episodes of activity within it have not individually been securely dated (*see Chapter 10 for full discussion*), but mathematical modelling of the dates indicates that the secondary fills took between *400 and 730 years* between *3020–2910 and 2570–2260 cal BC (see Appendix 2)*.

The date of the inception of the secondary filling, however, is constrained by the event of digging the Ditch (*3020–2910 cal BC*), plus the duration of the primary filling and stabilisation process, and the secondary filling seems to have ceased to form by the time that the Beaker-period grave was dug during phase 3. Bluestone fragments do not occur anywhere in the Ditch except in the very topmost disturbed fill in C42, with the exception of those in the Beaker-period grave, and this fact provides a convincing argument for the upper filling of the Ditch pre-dating the introduction of the Bluestones and being at least broadly contemporary with the timber settings in the interior.

The overlap of the radiocarbon-defined phases, however, indicates that phases 2 and 3 overlap at around the middle of the third millennium BC. It would be stretching the bounds of credibility to suggest that human activity at the site conveniently changed its nature at the point in time marked by the completion of the filling of the Ditch, and so it must be accepted that the changes which occur are not coincident with that occurrence. It must therefore also be accepted, on the grounds of the radiocarbon dating, that phase 3 activity began while the topmost part of the Ditch fill was still forming and that the absence of bluestone fragments is therefore not due to their absence on site but to the fact that they were not widely spread around the periphery of the site at that time. It is not possible, however, to reconcile the timber settings of phase 2 with this overlap period as it seems impossible that they should have stood at the same time as the early stone settings in the interior. It is unlikely, for instance, that the timbers could have stood with the Q/R setting on the basis of plan alone and ignoring the posthole cut by R37 and the probable Q/R 'dumbell' in C52 (WA 3654), and they certainly could not have stood with the Sarsen Circle. The timber settings must therefore be seen as having been constructed before the uppermost parts of the Ditch filled up.

This is only problematic in relation to the postholes at the north-eastern entrance. It has been postulated that posts on the east of the entrance had originally cut the filled-in Ditch, the relationships having been missed by Hawley. If the Ditch fill here had been composed entirely of natural secondary filling this would directly contradict the sequence proposed here and would place the timber settings at the entrance at least in phase 3. Although these could be seen as separate from the developments in the interior this seems to be a case of special pleading given their similarity to those in the interior in terms of form and lack of finds. Quite apart from the difficulties of envisaging the timber and early stone settings standing together, the lack of bluestone fragments from features in the interior is particularly difficult to explain in the central area, where the dressed Bluestone structure (of perhaps 3ii or 3iii) would possibly have been prepared by this time. These difficulties, however, do not arise if it is accepted that the upper fill of Segment 1 at the north-east entrance is backfill which entered the Ditch well before the beginning of phase 3, ie probably not later than about 2550 cal BC. This is not an unreasonable date given that the formation of ditch fills slows down considerably towards the top of cuts and also given the fact that the cutting of the Beaker-period grave took place after an unknown length of time (ie that there is no firm end-date for the filling of the Ditch, only for the period at which it was certainly full and was cut by the grave).

The most serious implications of the dating for the original phasing are in the dating of the cremation burials. It was originally postulated that phase 2 activity was still taking place after the natural secondary filling of the Ditch had formed, and that for a short period before the inception of the stone monuments cremation burials took place around the Ditch and Bank in a continuation of use of the site as a funerary monument, a use which had begun during the formation of the Ditch fills and after the removal of the posts in the Aubrey Holes. The late dating of phase 2 fills of the Ditch refutes this and suggests that the cremation burials were contemporary with the earlier of the stone settings in the interior at least. It is also possible that some of the burials in the Aubrey Holes date to phase 3 though there are very few instances where much secondary fill seems to have accumulated before cremated material was inserted (*see above*).

The identification of the early start this type of activity does not seem to be in doubt, and the paucity of bluestone fragments with cremation burials seems to point to this activity not continuing long into phase 3. It also seems more likely to belong to the third millennium BC than the second and as such cannot be envisaged as long surviving the end of phase 2 and the appearance of Beakers.

## Possible period of 'abandonment'

The molluscan sequence from the Stonehenge Ditch in the 1978 cutting (Evans 1984, 13) has been used to provide evidence for an 'abandonment' phase, both at Stonehenge and elsewhere in its local area, contemporary with the lower part of the secondary filling of the Stonehenge Ditch at least. In the light of the evidence from the Hawley excavations some doubt can be cast on the scale of this, at least for Stonehenge itself. The evidence of the backfilling episodes in the Ditch at various times from the beginning of phase 2 (ie directly following the formation of the dark layer) to some time after the development of secondary filling and the evidence for disturbances and deposition in the Ditch, all cast doubt on the nature and duration of the 'abandonment' phase. If it is accepted that part of the secondary filling in Segment 98 is backfill then it is possible that the snails incorporated in it were derived from an area of unkempt grass nearby, possibly on the Bank, which was then dumped into the Ditch.

In the Stonehenge sequence the molluscan analysis indicates that some change occurred towards the top of the secondary filling in layer 6 of the 1978 section (Evans 184, 13, fig 9), where open country species increase, but this layer is not recognisable in any of the earlier section drawings, including those of 1954, and so cannot be correlated with finds or features anywhere else in the excavated part of the Ditch. It may be suggested that this may correlate with the beginning of phase 3 and the change in nature of the site associated perhaps with the dismantling of the timber settings and the beginnings of the stone monument.

Given the archaeological evidence it is difficult to see the phase of scrub or woodland in or around the Ditch as a phase of complete abandonment and neglect of the monument, and certainly not as a phase of 'dereliction' lasting possibly 400–600 years as suggested by Richards (1990, 269). This interpretation resulted partly from the evidence of other monuments in the Stonehenge area, particularly the henge at Coneybury. There are, however, considerable difficulties in attempting to correlate the period with shade-loving molluscan species, which lasts throughout the secondary fill at Coneybury, with the Stonehenge sequence, since the Coneybury sequence is poorly dated by comparison with Stonehenge. Although the ditch at Coneybury is likely to have been dug slightly later than that at Stonehenge, as it has Grooved Ware in a primary position, it has only one radiocarbon date (OxA–1408, 4200±110 BP, 3080–2490 cal BC). In addition, Beaker pottery is recorded as coming from the top of the primary filling (*ibid*, 129), suggesting that the sequence is later than that at Stonehenge. If the appearances of Beaker at Stonehenge and Coneybury are taken as being approximately contemporaneous this would suggest Coneybury's 'abandonment' phase as taking place during Stonehenge phase 3. This must be regarded as uncertain, however, in the light of the radiocarbon date and the fact that most of the Beaker sherds appear to have come from higher in the filling (Ellison 1990, 146–8), raising the possibility that the apparently early Beaker was intrusive.

## Date of the cremation cemetery

The date range over which the cremations were deposited cannot be established, but it seems that this activity, although beginning in phase 2, also continued into the early part of phase 3, and indeed most of the cremation burials may date to the later phase. There is no artefactual evidence to suggest that it continued later than this and the sparse evidence for the association of bluestone fragments with cremations indicates that they were not buried when bluestone was widely spread around the periphery of the site (ie as it is by phase 3; *see occurrences with Beaker sherds around periphery in phase 3, Chapter 7*). Essentially the use of Stonehenge for cremation burials can be seen as a phenomenon of the early to middle third millennium BC.

Cremation cemeteries such as those at Dorchester-on-Thames, used along with the Stonehenge examples by Piggott to define 'the Dorchester Culture' (Piggott 1954, 351–63), appear to be loosely connected with Grooved Ware. Piggott, although defining a 'culture' separate from that associated with Grooved Ware, acknowledged that the two 'cultures' shared bone pin types (*ibid*, 352), and it has long been clear that although Grooved Ware generally does not have direct associations with cremation cemeteries, their use lies within the framework which encompassed Grooved Ware. Dorchester-on-Thames site 2, a penannular ditch, produced a date of 2930–2620 cal BC (BM–4225N; 4230±50 BP; Whittle *et al* 1992, table 12, 155) from its primary fill with some cremations cut into its upper fill and others in the immediately surrounding area. At site 3 in the same complex, dates on charcoal associated with cremations which lay above the burnt posts of a post setting, produced dates of 2920–2280 cal BC (BM–2163R, 4070±130 BP), 2910–2140 cal BC (BM–2166R, 4030±130 BP), and 2280–1530 cal BC (BM–2165R, 3550±130 BP). Dates with such large ranges do not help to refine the chronology but suggest that the practice was essentially one current during the third millennium, although possibly continuing into the second.

The only local evidence for the date of a cremation other than artefacts associated with Early Bronze Age cremations is the radiocarbon date obtained for an inhumation associated with a cremation under the barrow Durrington G7. Unfortunately this date has a large calibrated range (2460–1780 cal BC; 3700±100 BP; OxA–1398; Richards 1990, 175, 260). There were no artefacts with the burial which are datable on typological grounds, but the date suggests that this is more likely to belong to the Early Bronze Age than to the Late Neolithic. However, it lies towards the earlier end of the range and could be seen as forming a link between the Late Neolithic use of cremation and the Early Bronze Age tradition.

## Timber structures

Phase 2 Stonehenge is difficult to class as a henge because neither the Bank nor the Ditch are of the diagnostic form for henges and they are not part of the same plan as the timber settings. However, because of the timber settings, it is justifiable to suggest that in phase 2 the monument is close to the tradition of henge monuments. Direct comparisons with sites in the local area are difficult to establish either because the differences of scale are too great (Durrington Walls at one end, perhaps Fargo Plantation at the other; *see Chapter 10*), or because the difference in date is likewise too large (Woodhenge), but the existence of a large, apparently complex timber setting in the central area is clearly paralleled by the structures within henge monuments generally. The control over access implied by the narrow corridors at the north-eastern entrance and the southern passageway and perhaps by the Palisade outside the monument seems very much in the tradition of Late Neolithic timber settings, although the deposition of material goods at some sites in and around such settings is not reflected here.

In terms of absolute dating and on the basis of the little evidence available for this, it might perhaps be suggested that the timber settings were constructed around the middle of the first half of the third millennium BC, and this is not in conflict with what is now known of timber circle development. In Gibson's recent wide-ranging review (1994) the Stonehenge timber settings can be seen to belong to his class of multiple circular settings, which belong to the 'large and complex' monument phase of development. This is both followed and preceded by a phase of smaller and simpler circles. The dating is still so poorly defined that it is impossible for Gibson to suggest a firm chronology but he points out, using the evidence of available radiocarbon dates and associations, that there appears to be an increase in complexity of circles between *c* 3000 and 2500 cal BC, with a *floruit* during the second half of the third millennium and a return to smaller circles after *c* 2000 cal BC (1994, 205–6). As an obviously complex setting, but not of the formality and regularity of for instance, Durrington Walls phase 2, a date for the Stonehenge settings before the *floruit* but some time after the beginning of the tradition seems perfectly acceptable and in accord with Gibson's interpretation. This is despite the fact that Gibson has, in the absence of other published information, followed Burl's (1987) rendering of the Hawley excavation evidence. This includes features which must belong either to the Bluestone Circle or to the robbing of it in a postulated double circle (compare Burl's figure 6 and Figs 129 and 130 in this volume). Full analysis of the excavation archives has revealed a more complex situation than a double circle, and a suggests a monument of less regular form than that postulated by Burl.

Other features of the timber circle tradition pointed out by Gibson and relevant to Stonehenge include the replacement in stone of a minority of circles, mainly in Scotland (1994, 205), the subsequent use of timber circle sites for cremation cemeteries, and elaborate control over access to the interior (*ibid*). In all these aspects Stonehenge is clearly part of the tradition and the control of access is particularly striking. Gibson does not refer to the timber settings at Stonehenge in his discussion of the evidence for processional ways, drawing attention instead to the Avenue and to the fact that it approaches the monument directly only in its last stretch, comparing this to the change in direction of the West Kennet Avenue at Avebury. Another example of such indirect approach is clear in the southern passageway of the timber phase, in which the route followed is not the shortest distance between the entrance and the interior settings. In addition there were other features, façades, fence lines, or screens, dividing off the central area from the outside. The complexity of these outlying features cannot now be disentangled but it seems likely that there was more than one phase of arrangements. There is also a similarity in alignment between the southern passageway with the 'avenue' of the phase 2 Northern Circle at Durrington Walls, and a frequent emphasis on the south in timber circles and their associated settings, noted by Gibson (1994, 200, 207).

In terms of the deposition of artefacts and animal bone, the timber settings at Stonehenge do not readily afford comparisons with the nearest timber circles, ie those at Durrington Walls and Woodhenge, but this may be because the construction and use of the Stonehenge settings was earlier. The dating of both Durrington Walls and Woodhenge is imprecise on the available radiocarbon evidence, but there is enough evidence to indicate that they date to around 2500 cal BC rather than any earlier (see Gibson 1994, Figs 38 and 39), ie towards the end of Stonehenge phase 2. The difficulty of separating the lower ditch fills from the upper and the fact that a proportion of the animal bone has been discarded mean that it is difficult for conclusions to be drawn about changes in assemblage composition between phases 1 and 2. Gibson points out a clear association between pig and timber circles and although it is not possible to conclude from the Stonehenge evidence that pig was more important as a species in phase 2 than phase 1, it was certainly present in phase 2, in which context Serjeantson comments on the unusually high proportion of wild as opposed to domestic pig (Chapter 9). However, it would seem to be stretching the evidence to suggest that this is analogous to the evidence for large-scale deposition of animal bone and artefacts at Durrington Walls.

## Conclusion

In summary, the change of emphasis in phase 2 is from a monument which is perceptibly part of an ancient tradition to one in which a concern with human remains is exhibited and which participates in the development of the new, timber circle, tradition. The Ditch, although undoubtedly not the focus of attention, is certainly not neglected entirely, although individual lengths appear to have been allowed to become overgrown at some periods. Activity in the Ditch comprises both deliberate backfilling and disturbance almost certainly involved in some places with the deposition of material. This may have increased with time although it is impossible to determine this from the Hawley archive. Most of the deposition of chalk objects is likely to have occurred during this phase, but it is also possible and perhaps likely that it continued after it. This could, for example, explain the poor recording of the many chalk objects from the southern part of the Ditch circuit, in C29, as Hawley might have accorded them less detailed recording if he found them above the Ditch silts, even if only immediately above, and it is possible to envisage this activity as being contemporary with many of the cremations.

It is not clear how long the timber structures survived or whether they survived beyond the point at which the Ditch had become filled to the top of the cut. If, as seems likely from the radiocarbon dates, the Sarsen Circle at least is constructed before this time, then they almost certainly did not. If in phase 2 Stonehenge approaches most nearly the classic henge monument, deviating only in that an earlier enclosure was utilised rather than one being constructed for the purpose, by the end of this phase its use it has shifted again; in the period of the stone monuments which follows it takes on another complexion.

*Fig 77 Elevated shot over the Sarsen Circle in 1956 with Bluestones 46–9 and 31 in front. Beyond the Sarsen Circle are the Slaughter Stone and Heelstone with the Avenue running into the background. In the foreground, C12 has been returfed (P50012)*

# 7 The stone monument, phase 3

*by Rosamund M J Cleal*

## Summary

### The period

This period of the monument's history falls within the Late Neolithic to Early Bronze Age. These periods are not well defined in any part of the country and there is no clear point at which the Late Neolithic can be said to 'become' the Early Bronze Age. Over time, however, we can see the introduction of metal, and the development of new styles of pottery and new burial practices. The appearance of Beaker pottery and the goods which came with it are particularly important. By the end of this phase at the monument the tradition of single burial in barrows had been common practice for generations, and metal weapons were common grave goods, presumably in widespread use.

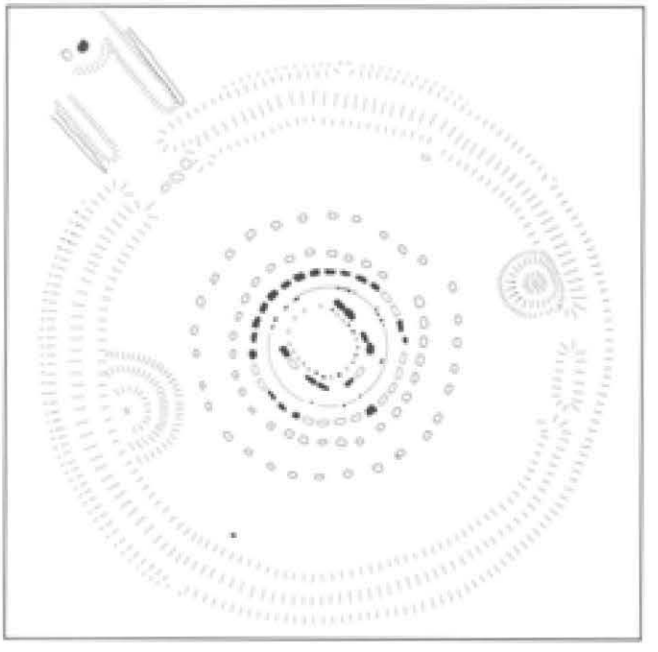
### Outside the monument

The landscape around Stonehenge is open grassland, probably used for grazing animals. Some areas are set aside for burial and groups of round barrows are built within sight of the monument to the north, south, east, and west. Settlements in the area seem to be small and may be short-lived as people move around the landscape.

### Inside the monument

This phase sees the development of the stone settings, which echo the earlier timber monument, executed in stones which were brought long distances to the site. The design of the stone settings changes through time, with one plan superseding another, but in overall plan and probably in function the monument appears to remain the same. A complicated but poorly defined sequence of erection of individual and paired stones occurs at the periphery of the monument in this phase, and the Avenue, linking Stonehenge to the river Avon, is constructed.

**Dating**
*c 2550 to 1600 BC*



### Sequence in the interior

- Bluestones in Q and R Holes (sub-phase 3i)

*dismantled*

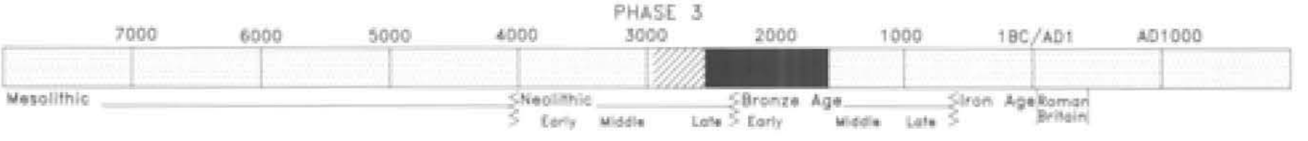
- Sarsen Circle and Trilithons (3ii), possibly standing with Bluestone setting including trilithons (3iii)

*Bluestones dismantled*

- Bluestone Circle and Bluestone Oval with Sarsen Circle and Trilithons (3iv)

*arc of stones removed to form*

- Bluestone Horseshoe with Bluestone Circle (3v)
- Y and Z Holes dug for stones but not filled (3vi)



## Summary: landscape and monument

The major change of use of the monument which is taken as marking the beginning of this new phase is the decision to render the central settings in stone rather than wood, and to do so using stone not local to the area (Fig 77). The appearance of 'bluestone' is taken as a diagnostic marker for the phase, the justification for this being discussed in detail in Chapter 10.

On a wider front it seems that this change at the monument is also a reflection of change on a grander scale. Beaker pottery was in use at least by the time that the first stone setting in the interior of the monument was dismantled, and small amounts of Beaker pottery occur within it.

The principle which has been followed throughout the analysis of the monument is to postulate a division between 'phases' only where there is evidence for a major change in the whole nature of the monument. After the move to the use of stone which is taken as the beginning of phase 3, no such major point of change is discernible until the monument passes out of use, towards the end of the Early Bronze Age. It is now no longer necessary to suggest a late extension of the Avenue, as considered by Atkinson (1979, Appendix 2), as the new series of radiocarbon dates demonstrates that the Avenue in its entirety dates to phase 3 (*see below and Appendix 2*). Nor is it necessary to include the Y and Z Holes in a Middle Bronze Age use of the monument (Atkinson 1979, Appendix 1) and the Middle to later Bronze Age pottery can be seen as the result of no more than small-scale and occasional use of the site for purposes probably not of the same nature as in phases 1–3.

## Archaeology and environment

*by Michael J Allen*

When the start of the major construction phase and stone settings was implemented, the landscape around Stonehenge not only looked significantly different from that seen when the first monument was constructed, but the use of the landscape and natural resources had also changed. It can be seen to be continually changing throughout the 1000 years of the construction programme of phase 3. The landscape discussion here

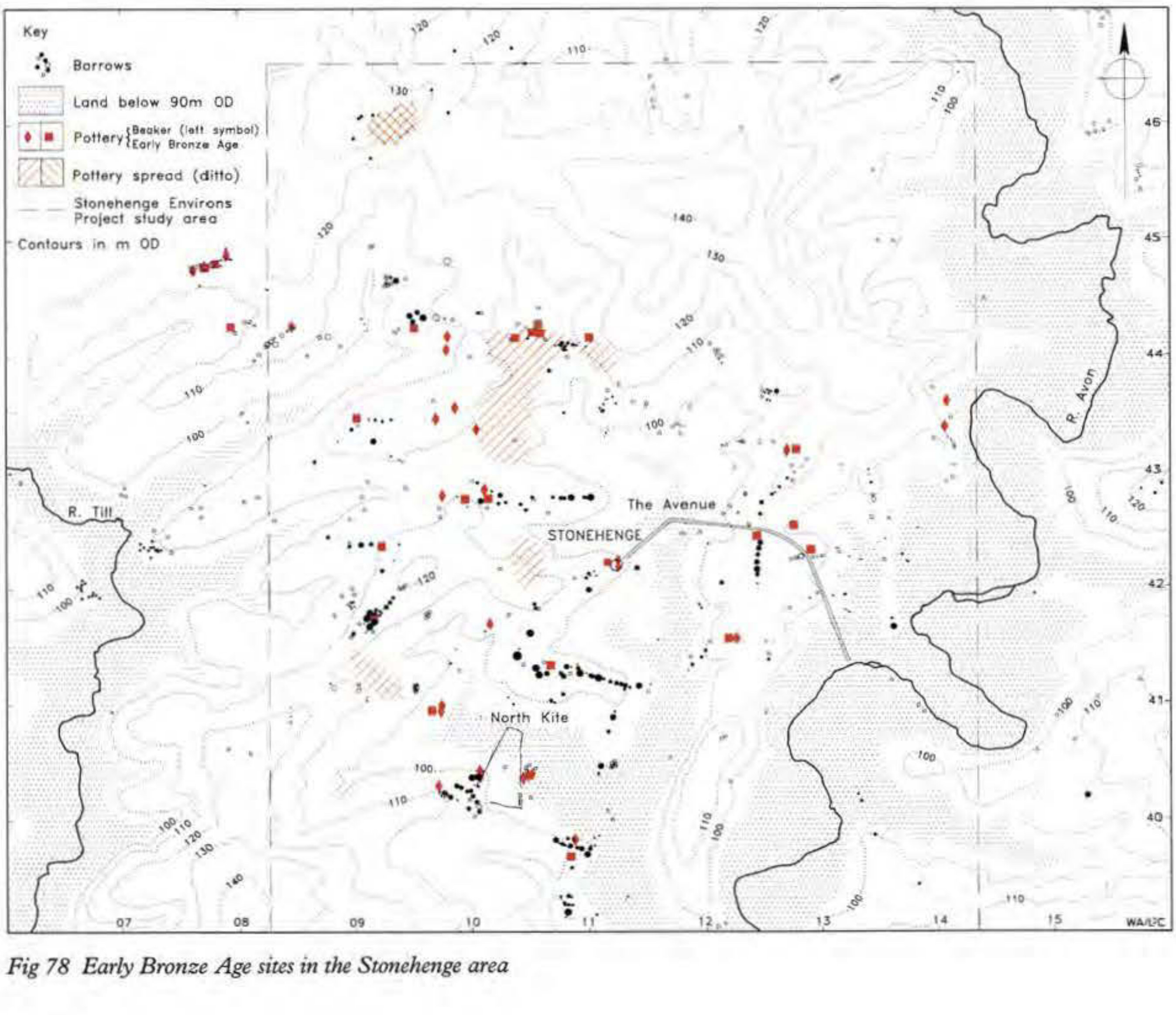



*Fig 78 Early Bronze Age sites in the Stonehenge area*

therefore covers a millennium (*2550–1600* cal BC) during which we might expect to see considerable change. To a certain extent that change is not as clear, or as chronologically defined, as one might expect, largely as a result of the paucity of environmental sequences or assemblages with associated and related radiometric dates. However, as the sequence of construction progressed significant changes are apparent. The pasture landscape with open woods and scrub seen at the beginning of phase 3 gave way to a managed, defined, and more intensively farmed, landscape.

Bronze Age barrows were constructed in long-standing short grazed grassland on the ridges of King Barrow (Allen and Wyles 1994) and Amesbury (Kerney in Christie 1964; 1967). It also seem likely that Vespasian's Camp was cleared of trees when the barrows were constructed there (Allen unpublished). Elsewhere there is evidence of the establishment of formal field systems and larger land division, particularly around the dry valleys such as at North Kite (Fig 78). Some of the undated enclosures apparently associated with field systems in the area may also originate in the Early Bronze Age (*see Chapter 8 for examples*). These 'enclosures' were superseded in the later Bronze Age by larger integrated systems of land division typified by those from Wilsford Down to Rox Hill, but testify to the beginnings of formal land allotment at an earlier date than these major field systems. Some such as North Kite were established in grassland (Allen in Richards, 1990, 191–2), but may have existed in a mixed pastoral and arable landscape, as indicated by ploughwash accumulation in the ditch (Entwistle pers comm; Allen pers obs). This more rigid and rigorous management of this farmed landscape is similar to the intensity of arable cultivation suggested elsewhere on the southern chalklands (Allen 1988; 1994) and in Wessex particularly (Allen 1992).

It could be argued, therefore, that phase 3 sees a primary shift from a landscape dominated by downland grazing to one of mixed arable and pasture. The greater emphasis on cereals (and thus presumably increasing sedentism) certainly leads to the establishment of more permanent settlements and farmsteads. Cereal cultivation on an increased scale requires not only planning and investment of labour with delayed returns, but also labour intensive episodes of ground preparation, sowing, and harvesting. This economy enables labour to be deployed in other activities at other times of the year. Physical wealth, as reflected also in the contents of some of the contemporaneous barrows in the area, together with the availability of labour at specific seasons, may be seen as contributing factors in, and might be formally displayed by, the construction of the monument itself.

## Component parts of the monument: introduction

As a monument made up largely of well-spaced concentric settings, phase 3 Stonehenge offers little in the way of relationships between the elements, and the stratigraphy is minimal. This difficulty is particularly acute when it comes to attempting to equate events around the periphery of the monument with those in the central area, and in trying to tie in isolated features wherever they occur. This problem has been dealt with by dividing the monument into two main areas: interior and periphery. It is possible to identify some sequence to the events in each area but it is impossible to link the two sequences with absolute confidence. Even within each of these areas it is difficult to place some of the elements within the sequence for that area. This is particularly true of isolated features, such as Stonehole F, or even the Station Stones (*see below*). In Appendix 8 the confidence with which individual elements have been assigned to phase is indicated. Some of the isolated elements simply cannot be placed within any particular sub-phase of phase 3 and are treated as phase 3 only on the assumption that stoneholes are more likely to belong to a phase in which stone settings were favoured than to a phase in which timber settings predominated. The argument is not particularly strong, but on present evidence there appears to be little alternative.

## The sequence in the interior

The 'interior' is taken to include all features in the central part of the monument. This comprises mainly the area enclosed by the Sarsen Circle, but is also taken to include the Y and Z Holes. This area is complex, and although a considerable proportion has been excavated this has been carried out over many years and by many separate excavators. The approach to the area which has been adopted here is to discuss the development of the monument in six sub-phases which, it is hoped, enable its development to be chronicled in a way which accords with the evidence available. The monument is discussed chronologically, therefore, but to assist the reader in dealing with the complexity of the excavated evidence the site plans are divided into four sectors – north, south, east and west – most of which contain a number of cuttings. Each sub-phase is illustrated with plans of those sectors which contain features which have been assigned to that sub-phase. The entire interior is also illustrated in Fig 14 and Plan 2, where all excavated features are shown. The change in the monument's axis between phases 2 and 3 is shown in Figure 79.

### Phase 3i: Q and R holes and related features

The Q and R Holes were first identified and described by Atkinson (Atkinson 1956, 46–50) as a result of the excavations in 1954 when a series of irregular holes filled with 'tightly rammed dirty chalk rubble' were observed between the Bluestone Circle and the Sarsen Circle in the eastern part of the monument (C45). These were named the 'Q' Holes, Atkinson explaining that this was because he was reminded of John Aubrey's frequent comment, as marginal notes in the manuscript of *Monu-*

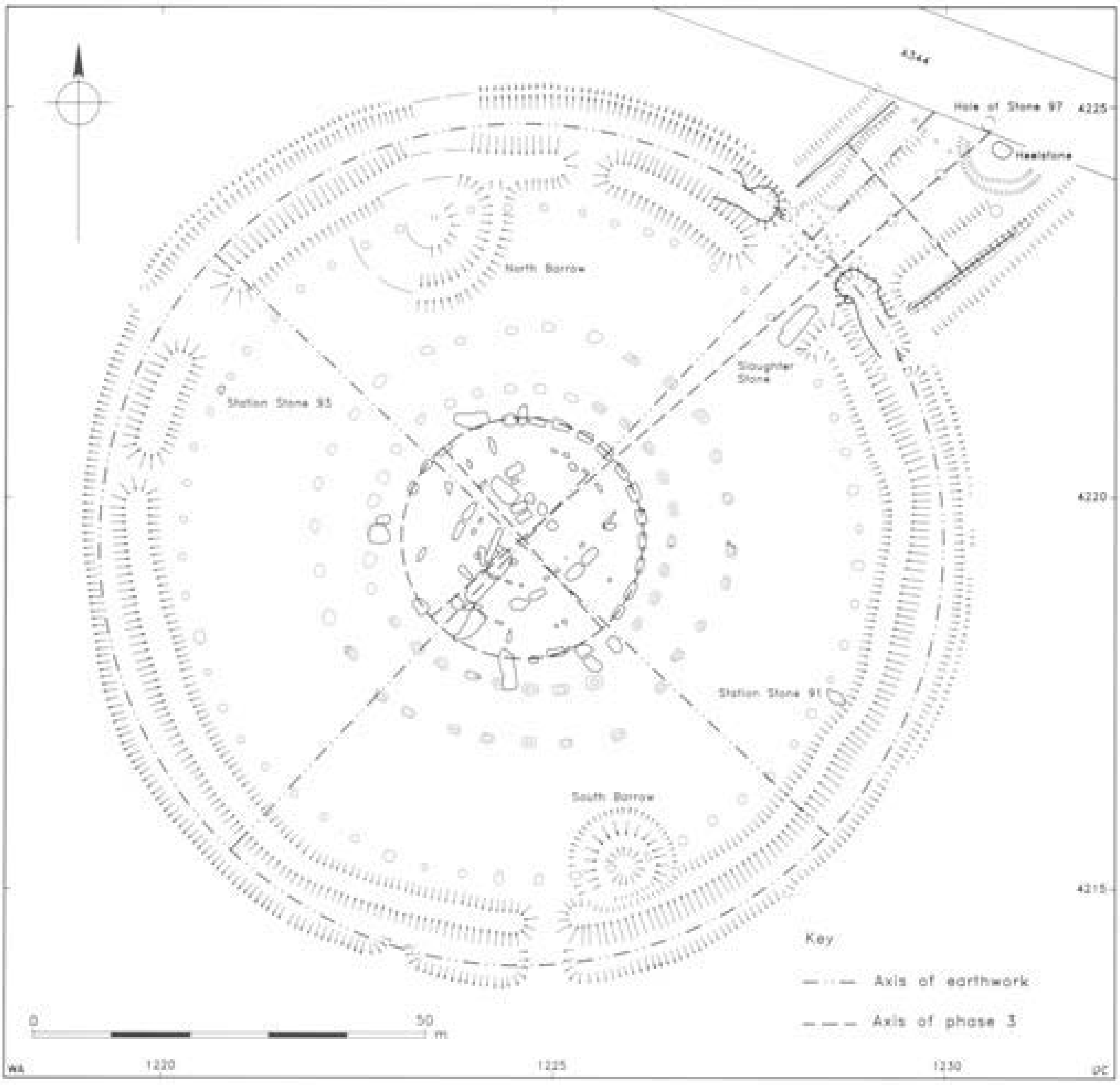



*Fig 79 The change of axis. The axis of the phase 1 and 2 monument was established by first plotting on CAD a circle representing the medial line of the enclosure Ditch. This was generated from three random points around the Ditch circuit. This operation was repeated five or six times and the centre projected from each circle drawn. The centre point of the monument for phases 1 and 2 was established as the best fit from all the generated centre points and the axis projected from this centre point through the main north-eastern entrance coincident with the centre line of the causeway as defined by the terminals of the Ditch. The phase 3 axis was established in a similar manner but with circles generated for the Sarsen Circle from the standing stones. The axis line was projected through the gap between Stones 30 and 1 and out through the main entrance, coincident with the centre line of the Avenue at its terminal*

*menta Britannica*, of *quaere quot:* 'enquire how many' (1956, 48, n1). The enquiry in this case could not be answered by Atkinson and remains unanswered, as the holes apparently cease within the western sector (Figs 80 and 81) although there is one isolated example in that sector (WA 3654).

The R Holes were features of similar shape and identical filling to the Q Holes, found just inside the present Bluestone Circle, each pair connected by a trench, resulting in a 'dumb-bell' shaped feature. The centre part of each 'dumb-bell' was filled with very tightly packed clean chalk rubble (*ibid*, 48) which was interpreted as the remaining primary fill of the original 'dumb-bell', the expanded ends having been backfilled with dirtier chalk after the removal of stones. Stone impressions were visible on the bottom of each end of

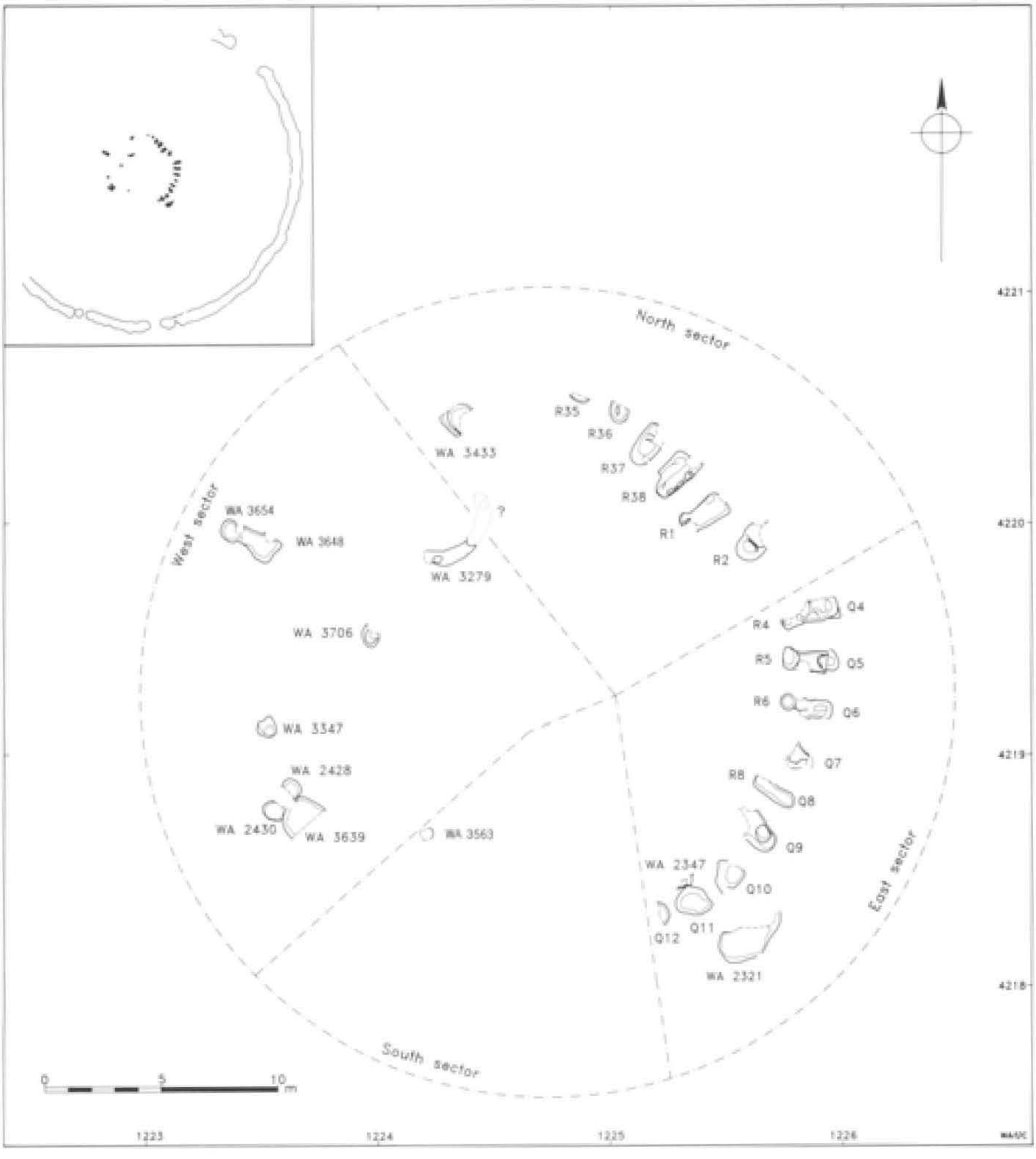



*Fig 80 Phase 3i: plan of the Q and R Holes and related features with the sectors indicated (note that the same sectors are used for all subsequent phase 3 sub-phase plans)*

the 'dumb-bell' in most cases, that is, within each Q and R Hole. An important feature of these impressions was that 'the occurrence of minute chips of dolerite embedded in some of these impressions showed conclusively that the Q and R holes had once been the sockets for bluestones' (*ibid*, 58).

Subsequent to the recognition of this series of apparently related features, it became clear that Lt-Col Hawley had also excavated features of this type. In 1956 Atkinson *et al* re-excavated an area inside the Bluestone Circle which had already been largely excavated by Hawley (C12), and were able to confirm that Q and R

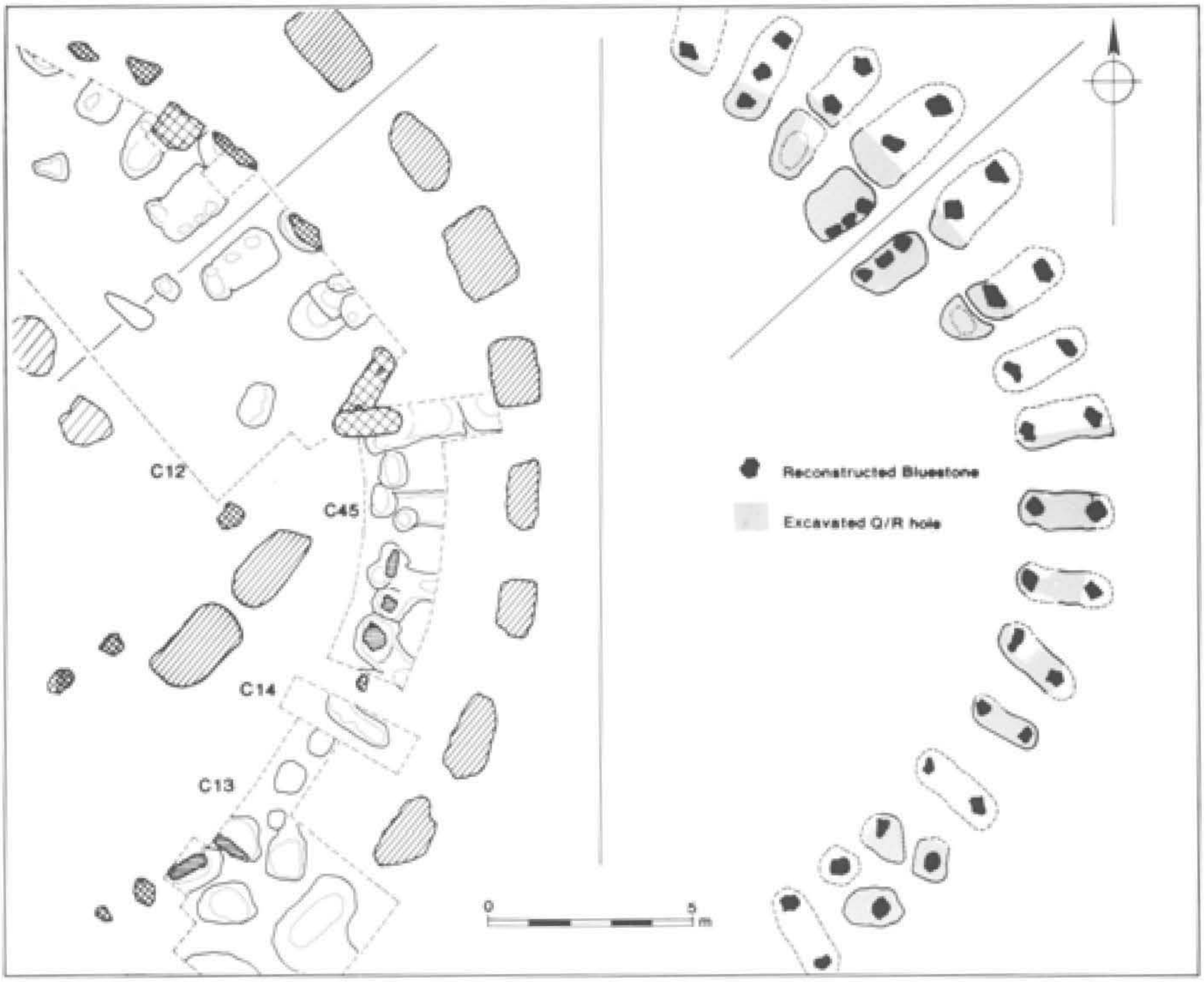



*Fig 81 Reconstruction of the Q and R setting, taken from an unpublished plan prepared by Atkinson*

Holes did exist in that area. Subsequently they excavated other areas in the interior of the monument which proved to have features which could belong to this series, some of which had already been excavated by Hawley. These are discussed in detail below.

### Description

When initially identified in 1954 these features were apparently easily defined because of their distinctive shape and packed chalk fill. In subsequent seasons identification seems to have been more difficult and there are several features over which it is possible to speculate, including some about which Atkinson himself appears to have had doubts. In particular, the dumb-bell shape was not always present or easily recognisable. Because the nature of the fill is therefore such a diagnostic feature, all the Q and R Holes, and features which are only tentatively identified as such, are tabulated (*Table 16, below*). Detailed descriptions of the features are given below. Numbering is by Wessex Archaeology context number, with the Q and R number also given; features are described clockwise from the north (ie from the western extremity of C12, *and see Fig 80*). Also listed are absent pairs to excavated features, and the likely reason for their absence (eg outside excavated area, disturbance, etc). It is clear that there was a revision of the numbering between the recognition of the features in 1954 and the publication of *Stonehenge* in 1956. In the field drawings the northernmost Q Hole in the 1954 cutting (C45) is labelled as Q3, but in the publication figure it is Q4, with Q3 proposed as lying in the area of fallen Bluestones 150 and 32. This is presumably because the spacing, if regular, would call for a hole in that position. The numbering as given in the publication is followed here, on the grounds that the existence of a setting of paired Q and R Holes remains largely conjectural, with many holes difficult or impossible to identify and, that being so, it is deemed acceptable to retain in the numbering a pair based wholly on conjecture. Numbers in parenthesis are context numbers of the filling.

**Q/R Hole 35, WA 2695 (2694), C12:** R35 was excavated by Atkinson *et al* in 1956 (Fig 82). It contained a single fill of 'compact chalk rubble' (Fig 132, Sc12.4) 1ft 4in (0.40m) below datum, which is here the level of chalk bedrock (Archive drwg no 253). If the pair to it, Q35 exists, it lies in an unexcavated area.

**Q/R Hole 36, WA 298 (2692), C12:** R36 was excavated by Hawley 1926, as part of his section 5 (ie trench or area 5) and was then emptied in 1956 (Fig 82). Hawley describes it as an 'incline', interpreting it in the same way as he does the features in front of Bluestones 31 and 49, that is, as ramps used in setting up the stones. In the published account he gives its depth as 27in (0.68m), and notes that it was not directly opposite Stone 47 so might therefore have been used as the ramp for both 47 and 48 (although he must mean 46 not 48, as he has previously described the 'incline' for 48; 1928, 171). It is not, however, mentioned in the Diary, although a 'shapeless' hole 0.58m (23in) deep described as being in the north-east corner of the first section, which abuts section 5, may be this feature. This was opened in the one day of excavation spent in this area in 1925 (8/9/1925). In the Office of Works plan of March 1927 (Archive drwg no 75) this is marked as a stonehole 2ft 1in (0.63m) deep but this appears to be the only occasion on which it was described by that term. The 1956 profile shows a feature 23in (0.58m) deep with a filling of 'earthy chalk rubble' (Archive drwg no 253, Fig 132, Sc 12.5). The pair to this, Q36, if it exists, lies just outside the excavated area.

**Q/R Hole 37, WA 299 (2687), C12:** R37 was excavated by Hawley in August 1926 (Fig 82). It lies within his section (ie trench or area) 3. It was interpreted by Hawley as the ramp for the fallen Bluestone 48. The posthole to the east (ie WA 2705) was cut by it:' There was a posthole on the east edge of the incline which had been cut into when the incline was made and there was another 2 feet [0.61m] from the south edge' ('section 3' in Diary for August 1926, following 13 August entry but apparently not entered as a daily record). In the published account (1928, 170) it is described as having 'a rather large hole on the south-west corner of it, not so big as those in the other inclines, but large enough to hold a small stone', the other inclines being R Holes 38 and 1, and the stoneholes in them, WA 2726 and 2749. The implication is that the 'stonehole' was not an integral part of the 'incline'; a slight bulge is visible on the south-western side in Hawley 1928, figure 4, marked L (but this seems to be the result of a poor perspective drawing) and, in the same report, figure 3, from the opposite direction, shows 'L' to be the posthole which was cut by the feature.

On the MoW plan there is a very slight enlargement on the south-western side but given the ambiguity of the description and illustration of this feature it cannot be assumed that there was a separate stonehole either as part of it or in relationship to it. The feature as planned in 1956 shows no irregularity, but has a slight ridge running across it, with a moderately well-defined depression to the north, and a less well-defined one to the south (Fig 275). Atkinson, however, states in *Stonehenge* that there was no stone impression visible in this feature, and that it therefore was an unused R Hole (1979, 205). It is shown as such in a previously unpublished drawing (Fig 81) probably prepared by Professor Atkinson for publication with the altered account of the Q and R Holes. The fill is described in the 1956 section drawing as earthy chalk rubble (Archive drwg no 253), and in a sketch plan of 1 September 1926 (Salisbury & South Wiltshire Museum) as yellow rubble. Q37, if it exists, lies beyond the excavated area.

**Q/R Hole 38, WA 300 (2689), C12:** R38 was excavated by Hawley in 1926 as part of his section (ie area) 2 and by Atkinson in 1956 (Figs 82–4). It was interpreted by Hawley as the ramp for the *in situ* Bluestone 49. It was noted as similar to the incline to Stone 31 (*ie* R1) but deeper, at 1.22m (4ft) from the surface, the overlying layers being given in different sketch plans as 34in and 19in (0.98m and 0.48m) deep. The MoW plan (Archive drwg no 75), which may give depths from the chalk surface (no datum is given), gives the depth of this feature as 1ft 5in (0.43m), but this cannot have been its deepest point as Hawley describes it as having a perpendicular cut on its east side of 29in (0.73m) in solid chalk (1928, 170). Hawley also noted a large hole on the western side 'which could have held an upright stone' (*ibid*). No relationship was noted between this hole and the 'incline' (Fig 84). In the phasing adopted here this stonehole (WA 2726) is envisaged as forming part of sub-phase 3iv, in which the present Bluestone Horseshoe stood as part of an oval setting, this stone comprising part of the now missing length of the oval. In a sketch plan (made with a *camera lucida)* on 1/9/1926 (Salisbury & South Wiltshire Museum) the fill of the 'incline' is shown as yellow chalk rubble. In the 1956 excavations a surviving portion of the fill of the R Hole was noted as containing 'compact rubble' (Fig 132, Sc 12.2; Archive drwg no 254); this section also shows the important stratigraphic relationship between the stonehole of Bluestone 49 and the R Hole, with the cut of the Bluestone hole clearly cutting the compact rubble fill of the R Hole. In his published account Atkinson describes this feature as having three clearly defined stone impressions on its base (1979, 205) and so it is shown in an unpublished drawing obviously intended to illustrate this description (Fig 82)

The existence of Q38 was postulated by Atkinson on the basis of a section and descriptions by Hawley (1979, 60; Hawley 1922). The section through Stone 30 of the Sarsen Circle and its stonehole show a much greater depth of archaeological deposit on the interior side of the hole than on the exterior. On the exterior there is only 2ft (0.6m) of deposit above solid chalk, including turf and topsoil below ground level, whereas on the interior the equivalent depth is 4ft (1.22m). Even with an allowance made for the greater build-up of deposits within the Circle, there remains a difference of probably 2ft (0.6m), with the depth below the Stonehenge Layer apparently *c* 1ft (0.3m) outside the Circle and 3ft (0.9m) inside (measurements taken from Hawley 1922, fig 22). Atkinson used this as evidence for the existence of a Q Hole in this area, postulating that the outer end of it had been excavated but not mentioned by Hawley (1979, 60). Although Atkinson only mentions the published section there is additional evidence in the archive for the existence of at least two features between Stone 30 of the Sarsen Circle and Stone 49 of the Bluestone Circle. There, in the grid area UX.pt (Fig 275), a 'large bowl-shaped hole with loose earth containing nothing' was noted (7/7/1920), and east of it there 'is a ridge of chalk rock and E again of the ridge a deeper depression was seen. ... This is in RW.pt.' (*ibid*). It was not investigated because it was felt to be too close to the stones of the Bluestone Circle (*ibid*) but subsequently the excavated area was extended as far as Stones 31 and 49 (12/10/1920). No other features were noted, however, and it appears that at least Stone 31 was in a hole cut into solid chalk, not into an earlier feature: 'in hole in solid chalk under the above' (ie below earthy chalk rubble) 'and in yellowish chalk rubble to datum [here at

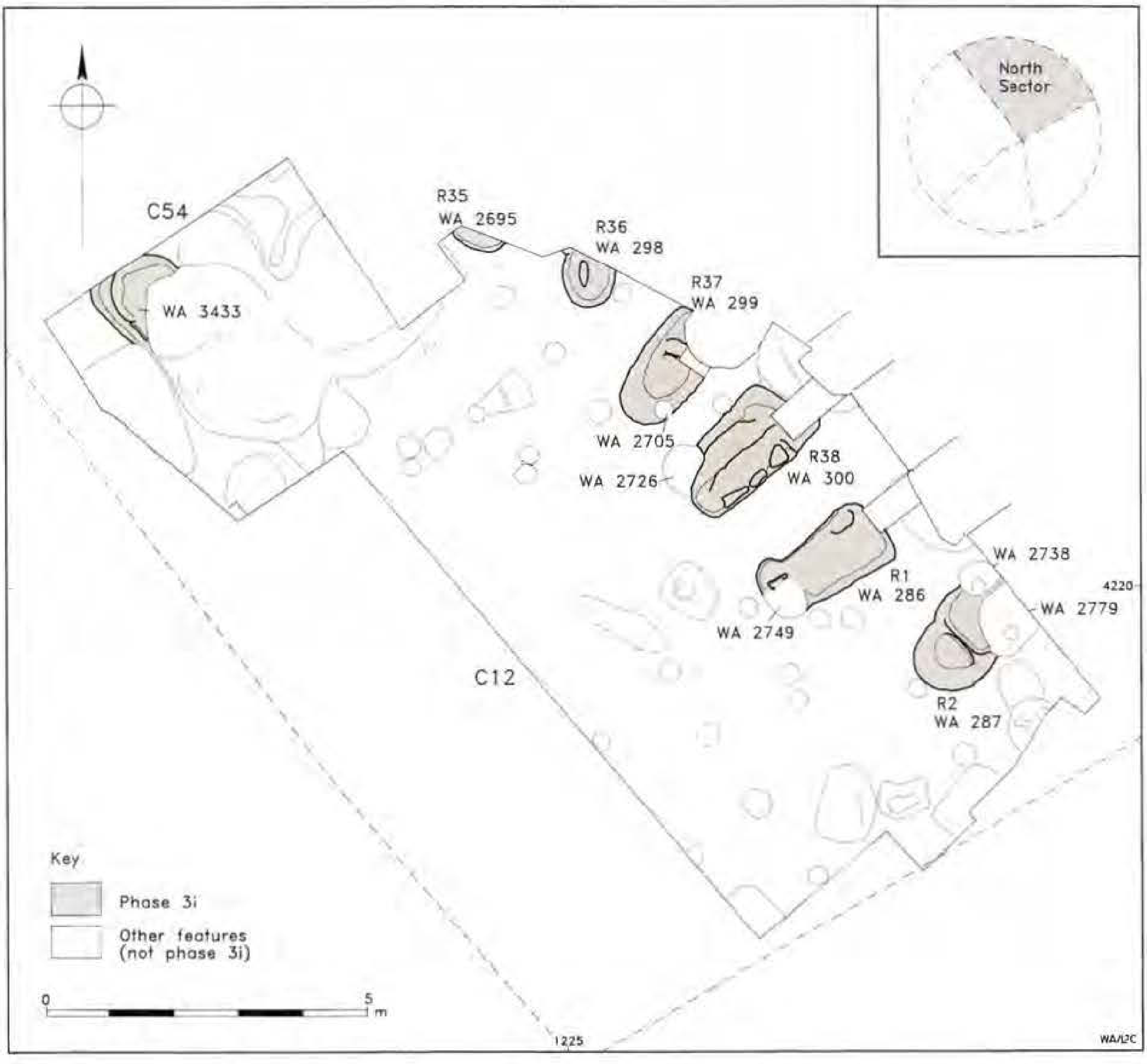



*Fig 82 Phase 3i: Q and R Hole settings, north sector plan*

ground level] 46″ [1.17m]' (11/10/1920), the yellowish chalk rubble presumably being the filling of the stonehole; Stone 49 is noted in the published report as standing in 'a shallow hole in the solid chalk with a little yellowish marl around it' (1922, 43). In addition, an archive plan of the grid used for finds recording shows the edge of Stonehole 30 as broken, where it must have cut or been cut by another feature.

There is evidence, therefore, for a feature of some sort lying between the Bluestone Circle and the Sarsen Circle, but only between Stone 30 and Stone 49; the area excavated between Stone 1 and Stone 31 is similar, but there are no comments suggesting the presence of features.

**Q/R Hole 1, WA 286 (2690), C12:** R1 was excavated by Hawley in 1926, as part of his first trench in this area and was reopened in 1956 (Figs 82 and 83). It was first seen as 'a large hole ... a little south of where the cut began. It looks like a stonehole and may be a continuation of the horseshoe. From the north lip of this hole the solid chalk was sloped down in the direction of Stone 31' and Hawley therefore interpreted it as likely to be the ramp for Stone 31 (13/8/1926). The fill was of loose chalk rubble, a filling he noted in all the features in that section, and he appears also to be referring to this large feature when he remarks that 'the place was very irregular and there was an extension to the right [east] which cannot be accounted for' (*ibid*). In the published account Hawley describes 'a large deep hole contiguous to the incline on the south with the appearance of having been made to hold a stone about the size of those of the horseshoe and descending 4 ft [1.22m] from the surface' (1928, 169). The relationship between this hole (WA 2749) and R1 cannot be established with any confidence, and it must be regarded as possible that Hawley failed to recognise a relationship between the filling of R1 and that of the stonehole; in the phasing adopted here this stonehole is regarded as belonging to sub-phase 3iv, in which the present Bluestone Horseshoe formed part of an oval setting,

*Fig 83 The R Holes in C12, from left to right R37, 38, 1, and 2 (P50811)*

*Fig 84 R Hole 38 (P50809)*

the oval including a stone standing in this hole (*see below*). Hawley records R1 as having a vertical side on the west, 0.46m (18in) high 3½ft (1.06m) from the surface, and with a curved eastern side; the hole at the eastern end was 4ft (1.22m) deep from the surface, and therefore about 0.15m deeper than the base of R1 (1928, 168). In the 1956 plans and profiles the depth of R1 where crossed by the profile Y–Z is around 0.56m (1ft 10in) (Fig 276), the datum being at the level of the chalk surface, and the depth as shown on plan for the hole at the southern end is 0.68m (2ft 3in), with a ?stone impression a further 0.07m (3in) deeper. The plan (Fig 276) and photographs of this area show only one clear impression in the base of R1, that is at its northern end, although the feature was deeper on the western side than on the eastern. The small amount of remaining filling of R1 does not appear to have been recorded in 1956, and the section (Fig 132, Sc 12.3) indicates that this may have been because it did not prove possible to distinguish the filling of R1 from that of the stonehole for Bluestone 31.

It is difficult to reconcile the existence of Q1 with the descriptions of the excavations in 1920 which appear to have covered the area in which this feature should have lain. It must be concluded that its existence is unlikely.

**Q/R Hole 2, WA 287 (2685), C12:** R2 was excavated by Hawley in 1926 (Fig 82) but is mentioned only briefly in the published report and Diary. 'At the north end of the cut the incline to the missing stone next to no. 31 could be seen, but both it and the neighbourhood had been disturbed' (1928, 172). In a sketch plan in the archive dated 1/9/1926 this is shown as filled with yellow rubble. In the MoW plan of March 1927 it features as a stonehole 27in (0.68m) deep and in the profile drawn in 1956 as 1ft 1in (0.33m) deep below the chalk surface. In the 1956 field drawings of this cutting it is not possible to fully reconcile the plan and section (Fig 275 and Fig 131, Sc 12.1); in particular the relationships of WA 2738 and WA 2779 with the R Hole are not clear. From the section it appears that they may simply be irregularities in the base of it, but in plan it appears much more likely that they are the stoneholes, or rather the robbed stoneholes, of the Bluestone Circle in this area. If so it would seem that the section cannot lie along the cutting edge, as it appears to show only an undisturbed part of R2. This is discussed further under subphase 3iv, below If it is R2 which is shown in the section the fill is of compact chalk rubble. Professor Atkinson postulated a stone standing at the inner end of this feature in the 1956 edition of *Stonehenge* (fig 3) but on re-excavating it he found no evidence that it had held a stone, and modified his interpretation accordingly (1979, 205). Q2, if present, would lie outside the excavated area

**Q/R Hole 3:** Not identified by excavation. At the eastern end of the section, however, a feature is shown on section which is not identifiable on the plan of that area (Fig 131, Section Sc 12.1, WA 2686; Fig 275). This feature is also visible on photograph (Fig 119). The fill is described as 'grey rubble fill' on section, and although this is not typical of the Q/R filling, it is not impossible that this is a feature of the same setting. It is not clear why it is omitted from the plan of features in bedrock, as in the section it is shown cutting chalk.

**R Hole 4, WA 288 (3195):** The relevant area was excavated in 1954 but the site of any R Hole lay within an area excavated by Hawley around the fallen Bluestone 32 (Fig 85). The features mentioned by Hawley in this area seem to be to the west of the two fallen stones (*ie* within C12), but he describes the excavation as 'a small area ... around the fallen Foreign Stone no. 32 and the diabase lintel which it partly covers' and a recently discovered sketch plan (PRO 31/2102) shows that he also excavated on the eastern side, but without noting any features. He also remarks on a small modern disturbance in the area, containing broken crockery (1926, 13), which might also have removed relationships between features in this area. A feature is marked on plan in an appropriate position in 1954 (Archive drwg no 211, Fig 278), but the relationship between it and the stonehole for fallen

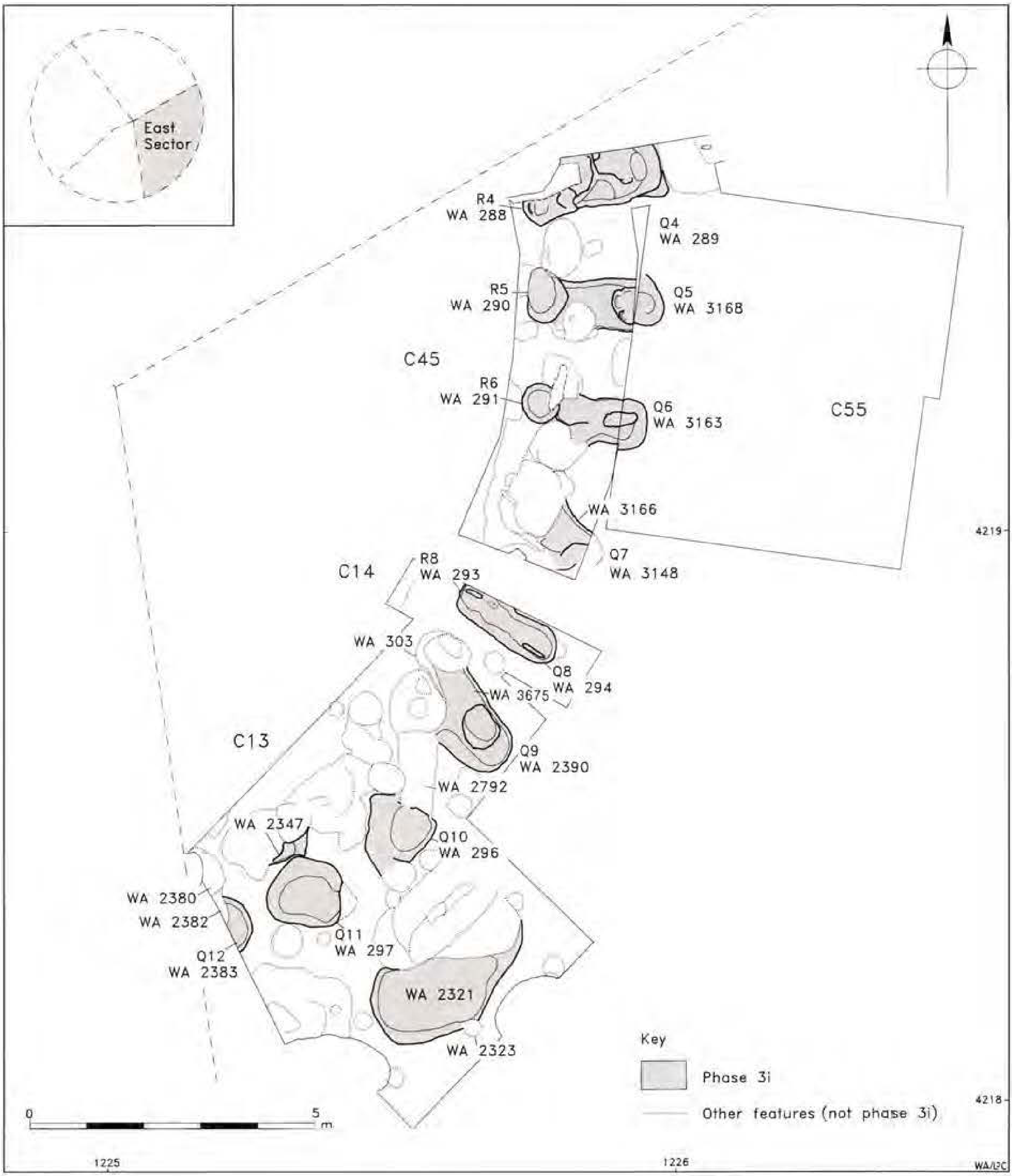



*Fig 85 Phase 3i: east sector plan*

Bluestone 32 does not show in the section along the northern edge of this cutting (Fig 140, Sc 45.1) because of the modern disturbance.

**Q Hole 4, WA 289 (3170, 3641), C45:** This feature is not labelled on the 1954 plan. The next Q Hole (clockwise) is marked Q4 but it is clear from the published plan (Atkinson 1979, fig 3) that after the field drawings had been made WA 289 was recognised as the fourth Q Hole, with a putative third in the area of the two fallen Bluestones (Fig 85). No depths are given for this feature, but it shows in section at a maximum depth of 27in (0.68m) below the Stonehenge Layer (Fig 140, Sc 45.2). In the longitudinal section (Fig 140, Sc 45.1) the fill is described only as 'Q filling/mixed, no runs', this may be taken as an indication that the filling was of the type standard among Q Holes (ie packed chalk rubble, with no separate lenses of fill) but the desciption of it as 'mixed' seems unusual, implying that it was not a homogeneous filling of chalk rubble. In the cross-section (Fig 140, Sc 45.2), however, it is described as 'chalky and earth fill, rather larger at the bottom'.

**R Hole 5, WA 290 (3188), C45:** Excavated in 1954 (Fig 85) this feature is labelled in the field drawing as R4 but on the published plan appears as R5. It does not appear in section. The depth given on the field plan is 2ft 10in (0.86m) and although the position of the datum for this plan is not clear comparison with features which appear on both plans and sections suggests that this is a measurement from about present ground level. Allowing for a depth of about 0.3m for turf and the Stonehenge Layer, this gives a probable depth of 0.56m. There is no detail of the filling.

**Q Hole 5, WA 3168 (3167, 3541), C45:** Excavated in 1954 this feature is labelled on the field drawing as Q4, but is Q5 according to the published plan (Atkinson 1979, fig 3; Fig 85). Two Beaker sherds were found in the 'chalk and earth fill' (Fig 140, Sc 45.2). The feature was 1ft 9in (0.53m) deep below the Stonehenge Layer.The eastern end of this feature was excavated in 1959 (C55) but it does not appear on section and the filling is not described in that year.

**R Hole 6, WA 291 (3191), C45:** Excavated in 1954 (Fig 85); not labelled on the field plan, where its depth is given as 3ft 1in (0.94m). The depth seems to have been taken from about the ground surface and the likely depth of the cut is therefore *c* 0.64m. It is not shown in section and there are, therefore, no details of the filling.

**Q Hole 6, WA 3163 (3162, 3640), C45:** Excavated in 1954, this feature is labelled Q5 on the field plan but appears as Q6 in the published plan (Atkinson 1979, fig 3; Fig 85). It is 2ft (0.63m) deep below the Stonehenge Layer in section (Fig 140, Sc 45.2) and filled with earth and chalk. The relationship between this pair of Q and R Holes and Bluestone 32c does not appear on section. The eastern end of this feature was excavated in 1959 and is shown on section as filled with 'fine Q fill' (Fig 146, Sc 55.4; Archive drwg no 356).

**R Hole 7, WA 292, C45:** The site of this feature must lie beneath the *in situ* Stone 32e of the Bluestone Circle. None of its filling is shown in the section excavated in 1954 (Fig 85).

**Q Hole 7, WA 3148 (3149), C45:** This was excavated in 1954 (Fig 85). The section shows this feature to have a maximum depth of 25in (0.63m) below a modern disturbance (Fig 141, Sc 45.6). It is also shown as cut by the stonehole for Stone 33 of the Bluestone Circle (Fig 120). The eastern section (Fig 140, Sc 45.2) shows a feature marked as the Q Hole (Q6 *sic*; ie Q7 in the final numbering) filled with chalk and earth, cutting another feature filled with 'hard chalk packing' (WA 3166). This would appear to represent a feature not referred to by Atkinson in print; however, when the likely extent of this earlier feature is seen in plan, it seems that a more plausible interpretation of this is that the 'hard chalk packing' is the original fill of the Q/R 'dumb-bell', and the Q Hole fill the disturbed fill of the stonehole itself.

**R Hole 8, WA 293, C14:** This feature was excavated first in 1954, partly under the concrete raft laid by the Office of Works around Stones 6 and 7 of the Sarsen Circle (Fig 85). The area was partially reopened in 1964 as part of the larger excavation around fallen Stones 8 and 9 of the Sarsen Circle. The section along the northern side of the cutting (cutting J, Archive drwg no 206, Fig 135, Sc 14.2) shows the 'compact Q/R fill' (WA 3206) cut by the stonehole for Stone 33a of the Bluestone Circle (WA 3205). The empty profile drawn through this cutting shows a surviving 'groove' for the R 'stone' (Fig 135, Sc 14.1), which also appears on the plan.

**Q Hole 8, WA 294 (3209), C14, with WA 3208 (3207) trench joining Q8:** Q8 lay wholly under the concrete raft laid around Stones 6 and 7 in 1919/20 although the feature was not identified as such in that excavation (Fig 85). The fill was noted as 'compact Q/R fill' in 1954 (Fig 135, Sc 14.2; Archive drwg no 206) and there was a 'stone groove 1"–1½" deep (0.025–0.04m) in the base (Fig 135, Sc 14.1; Archive drwg no 210).

**R Hole 9, WA 2389, C13:** When postulated by Atkinson in 1956 Q9 and R9 were proposed solely on the basis of spacing as only a small part of the area in which they would be expected to lie had been excavated (in 1924), and it seemed likely that at least R9 could have been totally removed. The area excavated by Hawley in 1924 was reopened and extended in 1964. There is no clearly defined feature in the expected position for R9, only the feature found by Hawley (WA303) which appears to be the stonehole for missing Stone 33b of the Bluestone Circle. The only aspect to suggest that there was an R Hole in this position is the existence of a trench (WA 3675) linking this area to a recognisable Q Hole, Q9. If an R hole was removed by WA 303 the Q/R pair must have been angled obliquely to the usual orientation of the Q/R 'dumb-bells'.

**Q Hole 9, WA 2390 (2391), C13:** Excavated in 1964, this feature does not appear on section and there are no details of the filling. The depth below the surface of the chalk was *c* 0.79m (calculated from nearest spot height given on chalk surface; Archive drwg no 410).

**R Hole 10:** There are a number of interpretations possible of the section through the Bluestone Circle at this point which include the identification of an R10 beneath the Bluestone holes (Fig 134). The identifications are tentative at best, and it seems likely that if an R Hole existed in this area it would have been destroyed either by the construction of the Bluestone Circle or by its destruction.

**Q Hole 10, WA 296 (2336), C13:** This was found in 1926 (Fig 85) in excavating Stonehole 8, when

> the west side of the hole showed soft moved soil passing to that direction ... [this] is shaping a roughly rounded hole of considerable size and approaches near to the circle of the foreign stones. No chips in the filling.
>
> (19/8/1926)

The following day's entry seems to be a continuing description of this complex of features:

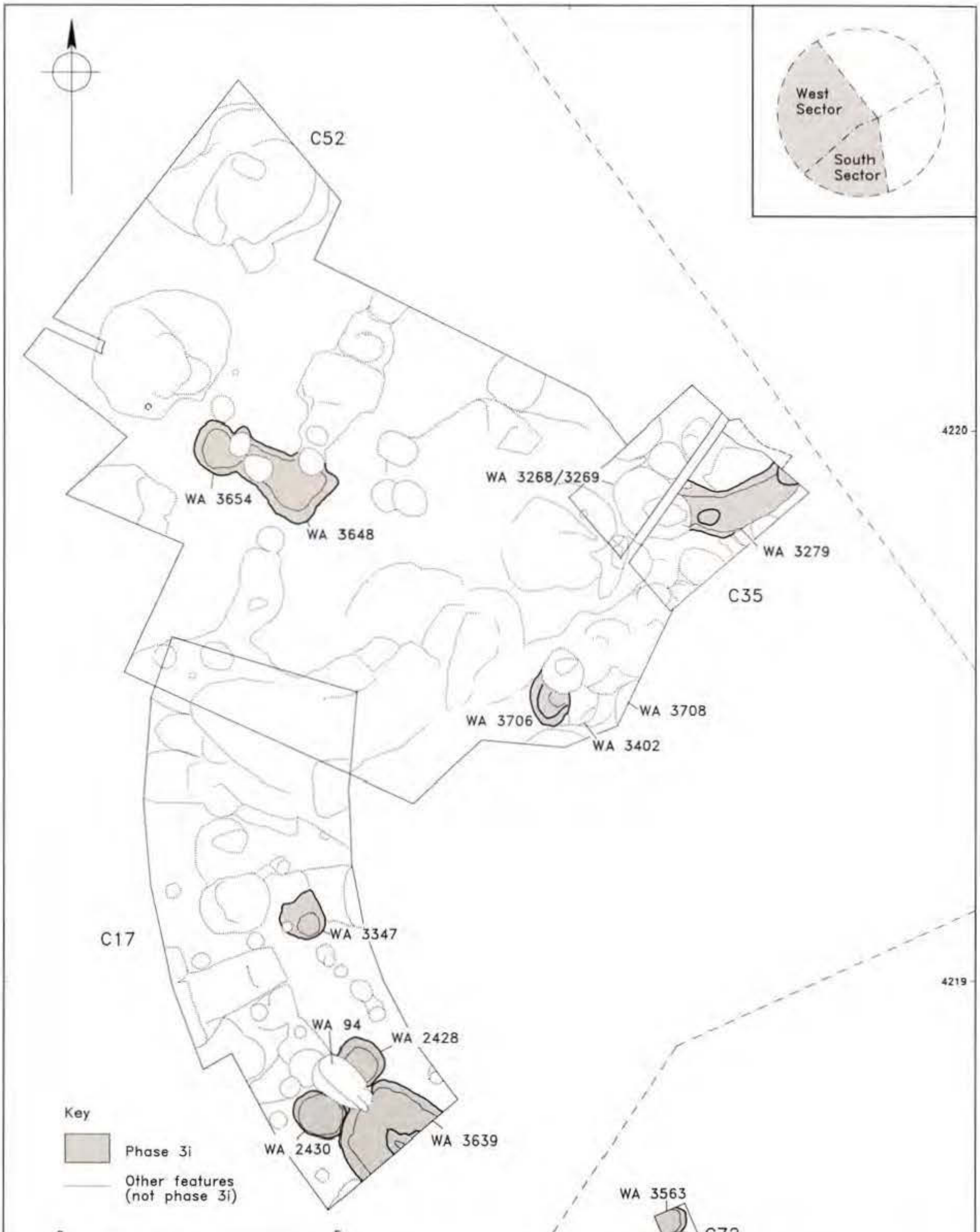



*Fig 86 Phase 3i: west and south sector plan*

> began by digging at the north end of the small hole. Soft soil passes from it apparently to another cavity beyond. The first hole appears to be older than the one which follows it northwards and seems to have been cut close to the North side of it and destroyed the crater shape. This destruction seems also to have been done by the digging of No. 8 stone hole or by the upward movement of its base when it fell. The first small hole might have been made for a stone but it is impossible yet to say what the continuation beyond was, it was probably later and one piece of rhyolite was found in the upper part of it.
>
> (20/8/1926)

The description is difficult to match exactly to features excavated, particularly in the apparent contradiction between the initial roughly rounded hole 'of considerable size' and the small hole mentioned next day, and it cannot be certain that Hawley is writing of the same feature, but from the directions given they would seem to be the same. The interpretation is therefore that the earlier hole, probably damaged by Stonehole 8, and which may have held a stone, is 296, and probably a Q Hole, while 2792 is a possibly late feature.The feature identified here as probably Q10 was approximately 19in (0.48m) deep from chalk surface.

**R Hole 11, WA 2347 (2348), C13:** This feature was excavated in 1924 and 1964. Hawley did not recognise it as a separate feature. The depth from chalk surface was *c* 20in (0.51m). Atkinson has suggested (notes in archive) that it could be R11, an interpretation suggested by its position and depth. No details are given of the filling or of relationships with other features. It may be shown on Hawley's section line A–A, B–B (Fig 134, Sc 13.a) but neither its fill nor its stratigraphic relationships are shown.

**Q Hole 11, WA 297 (2349), C13:** This may be the feature described as 'a large cavity in solid chalk ... it is probably a foreign stone hole and one or two large fragments of that stone can be seen in the soil which fills it' (21/8/1924) (Fig 85). This description does not fit particularly closely that of a Q Hole, but would seem likely from the directions given in Hawley's Diary, to refer either to this hole or to Q10. The feature which appears on plan in this position is that identified by Atkinson as Q11 in the published plan of the Q and R Holes (1979, fig 3). In section (Hawley 1926, fig 3; Fig 134, Sc 13.5) it is quite convincing as a Q Hole; the fill is shown as earthy chalk rubble, a type of filling occurring in other Q Holes. It was *c* 23in (0.58m) deep from the chalk surface.

**Q Hole 12, WA 2383 (2384), C13:** This was partially excavated in both 1924 and 1964 (C13; Fig 277) though the only information available is that given on the plans for each excavation. The depth below the chalk surface was 20in (0.51m). The relationship between this and WA 2382 is not known, but WA 2382 could be a ramp for WA 2380, a posthole 1.09m deep below the chalk surface. The hachuring, which gives the impression that WA 2382 cuts WA 2383, could be seen as belonging to the basal remnant of the earlier, and deeper feature (WA 2382) through the fill of which WA 2383 was cut.

As there is no description of the filling, the designation of this as Q12 is on its size, shape and position only.

**WA 3563, C72:** A partly excavated feature, in the southern sector (Fig 86), which is annotated on the field plan as a 'Q Hole' . It lies approximately on the line of the Q Holes but there is no other indication of why it was considered to be of that setting.

**WA 2430 and WA 2428, C17:** WA 2430 is described on the section as a Q Hole (Fig 136, Sc 17.2) with 'very compact rubble (Q filling)' but is shown as cutting what appears to be the filling of the stonehole for Bluestone 40c of the Bluestone Circle. The relationship is not certain as the filling of the Bluestone hole (context 2427) seems to extend outside the hole (WA 94). Atkinson explicitly includes this feature as a Q Hole in his published account, where it and WA 2428 are described as the last complete pair of Q and R Holes of the circuit (ie counting clockwise) (Atkinson 1979, 205). It is not clear whether either of these had a stone impression on its base, but both appear to have been considered as Q and R Holes during or soon after excavation, as finds are recorded as from both a 'Q hole' and an 'R hole' in this part of the cutting (ie section A). In an archive note Atkinson is noted as stating that the section is incorrect. The 'R Hole' part of the pair, WA 2428, is shown on section as completely emptied by a modern disturbance which may be Lt-Col. Hawley's excavation. In this area Hawley seems to have limited his excavations to identifying the positions of stumps of the Bluestone Circle, but this area had already been badly disturbed when he found it. He points out that the Bluestones must have been missing when the fragment of Sarsen Circle Stone 15 fell over WA 3639/2425, which he seems to have felt may all have been part of one robbing operation in post-medieval times, the date being suggested by a 'seventeenth century glass flagon' (Hawley 1926, 11) apparently within the disturbed fill above [WA 3639; ie within the later cut WA 2425].

*Fig 87 Fragments of Stone 40c in situ in C17. To the left is the fill of the possible Q Hole (P50721)*

Photographs of this section (Fig 87) cannot be used to settle conclusively the question of the relationship between the Bluestone hole and WA 2430, but they do suggest that the relationship may have been difficult to interpret in the field, and interpretation of the section drawing is therefore open to some doubt.

### Uncertain Q/R holes

There are two features on the line of the Q/R setting which are of uncertain status in regard to that setting. One was identified as an unfinished R Hole by Professor Atkinson while the other, not identified as part of the setting by Atkinson, shows considerable similarity to the accepted Q/R 'dumb-bells'.

**WA 3347 (3346), C17:** Excavated in 1956 (Fig 86), this feature in the western sector is shown only in plan and there is no record of its fill. It is irregular in plan, with a maximum width of *c* 1.17m and a depth of probably around 0.5m (from undisturbed chalk level elsewhere in the cutting. It is described in an appendix to the 1979 edition of *Stonehenge* as

> Beyond this [the last complete pair, here WA 2430 & 2428] in a clockwise direction there was only a single hole, on the line of the remainder of the R holes, and this was clearly unfinished. It was filled with clean chalk rubble, tightly rammed; and on the bottom was the discarded antler pick which had been used in its excavation. It looks very much as if the construction of Stonehenge II was abandoned while this hole was actually being dug.
>
> (Atkinson 1979, 205–6)

The antler pick produce a radiocarbon determination (I–2384) which has now been rejected on technical grounds (*see Appendix 2*). Figure 88 shows the antler *in situ*.

**WA 3654 (3655), 3648, C52:** A dumb-bell shaped feature, in the western sector (Fig 86), excavated in 1958 and shown on plan and section (Figs 143, Sc 52.4 and Fig 285). Its maximum length was 8ft 6in (2.6m) and its maximum breadth 4ft (1.2 m); the maximum depth shown in section is *c* 1in 6in (0.5m). The fill was of compact chalk rubble and the feature is shown cutting a posthole. Another feature (WA 3652) cuts the compact chalk filling, and does not therefore

*Fig 88 Antler in situ in the base of WA 3347 (P51137)*

figure on the plan of the cutting, which is of features in bedrock. WA 3652 is almost certainly a disturbed stonehole of the Bluestone Circle, as it is on the line of the Circle, and most of the Bluestone holes in this length of the circuit seem to have been shallow in depth, at least below the present chalk surface, and to have been disturbed. There are no stoneholes shown within this feature.

### Other features

There are six features which are clearly not Q or R Holes, but which may be of similar date. In no case can the attribution to this sub-phase be considered secure, but all six must be regarded as early in the history of the Monument, and probably stoneholes; it is likely therefore, that they belong to early in phase 3 rather than in phase 1 or 2, and they are considered here.

**WA 2321, C13:** This feature, in the eastern sector (Fig 85), was first excavated by Hawley, and later re-opened by Atkinson *et al.* Hawley notes

> A large crater-shaped place which when it was made cut the posthole [WA 2323] ... It is a large, crater-shaped hole with a flat bottom, which might have held a large stone it was cut by the making of stone hole 8.
>
> (21/8/1924)

It was *c* 0.44m deep (measurement taken from the 1964 plan spot heights, adjusted to below level of chalk surface). The feature is shown as excavated by Hawley (Fig 277), but the 1964 plan seems to show an extension, towards Stone 7, which is of similar depth (0.48m).

**WA 3639, C17:** Only the lowest part of this feature, in the western sector (Fig 86), survives as there is a substantial recent feature (WA 2425) cutting through it which was encountered by both Hawley and Atkinson *et al.* The lower fill was of earthy chalk rubble and contained a stone axe fragment of Group 1 (WA obj no 489, Fig 216). The extent of the remnant feature is not shown in plan, but from the north–south extent of the remnant fill (shown in section) it seems that it may have filled most of the floor area of the recent feature. This is also suggested by the post-excavation plan showing the axe *in situ* (Fig 89).

**WA 3279 (3278), C35, the Crescentic Feature:** This feature, in the western sector (Figs 86 and 90), is shown in field plans and sections; a reconstructed section prepared by Professor Atkinson was also published by Lawson (1992, fig 3). In the field drawings it is a curving feature with one end truncated by later stoneholes (WA 3268 and 3269) and the other surviving but hidden beneath fallen Sarsen 59. Its width averaged 0.75m, and its maximum depth was probably about 1.2m below the level of undisturbed chalk surface (Fig 283). The sides were almost vertical and there were two depressions marked in the base. The filling is described as 'medium grey rubble' in the section (Fig 139, Sc 35.1) but is not illustrated in detail. In the reconstructed section the fill is shown as being of more or less horizontal layers. As there appear to be no photographs showing this detail Professor Atkinson was presumably drawing on memory or a source not now available. In either case, the fact that the layers were horizonal suggests that the filling may have been deliberate backfill.

**WA 3706, C52:** This feature, in the western sector (Figs 86 and 91), was close to Stone 69 and WA 3402. No relationship is recorded between these features either as an annotation on the field drawing (Archive drwg no 315) or on section, as the section appears to pass through only WA 3402. It seems impossible, however, for the volcanic ash stump within WA 3402, which is shown both on plan and on section, to have remained in place if WA 3706 was dug after it. As WA 3402 is earlier than the stonehole of Stone 69 (of the Bluestone Horseshoe/Oval) and has therefore been assigned to sub-phase 3iii, WA 3706 must be of an earlier sub-phase and possibly

*Fig 89 Group 1 stone axe in situ in WA 3639, looking north (P51089)*

*Fig 90 C35 with the Crescentic Feature at bottom left of the trench (P50728)*

*Fig 91 C52: WA 3402 (left) with Stone 69 to the right (P51151)*

therefore phase 3ii or 3i. There is no relationship recorded between this feature and the stonehole for Stone 57 of the Sarsen Trilithons.

**WA 3708, C52:** A feature shown only on plan and section, in the western sector, and lying largely outside the excavated area. It is noted on the plan as '?II hole', that is, that it was considered to belong possibly to Atkinson's phase II, the phase of which the Q and R Holes are the main element. As the feature lies within the line of the Q and R Holes by several metres it was obviously not considered to be part of that setting so the reason for the attribution to Atkinson's phase II may have been that it was cut by a feature attributable to Atkinson's phase III (and as it is some distance from the Sarsen Trilithons of IIIC it would have to have been a feature of IIIB at the earliest). The section along the cutting edge (Fig 144, Sc 52.7) shows a feature which is probably WA 3708 cut by the ramp for Stonehole 69 of the Bluestone Horseshoe, and it is annotated as only 'pre-IIIC'. It may be that the fill was similar to that of the Q and R Holes, or suggested in some other way that it was likely to be earlier than this, as the annotation on plan can otherwise not be accounted for.

**WA 3433, C54:** Excavated in 1959, this feature, in the northern sector (Fig 82), appears to have been quite extensive with a maximum surviving width of *c* 4ft (1.2m). In the south-east the feature had been removed by the stonehole for Trilithon Stone 60 and it extended out of the cutting to the north-west. Although the feature is shown in section (Fig 145, Sc 54.2) the section only just clipped the feature and its maximum surviving depth was clearly much deeper than that shown in section. It is not possible to establish the height of the undisturbed chalk surface in this cutting because there had been extensive disturbance, and the depth of features cannot therefore be related to the chalk surface, but from the section it is clear that the feature was not as deep as the stonehole for Stone 60. The nearest spot height to WA 3433 within the stonehole is deeper by 14in (0.46m) than that within it, but this still suggests a substantial feature. The fill is of earth (Fig 145, Sc 54.2), and the plan is also annotated with 'crushed area'. This is not described further and could be interpreted as damage caused by the raising of Stone 60 if it were not that the section suggests such a distinctly different fill from the stonehole, and a fill of a type not normally found within the erection ramps at the site. If it is not, therefore, an erection ramp, it must be a pre-Sarsen Circle hole, and the crushed appearance due to the resting of a heavy weight on the area, although it should be noted that it is not annotated or suggested by Atkinson as a stone impression.

### Stratigraphic relationships

The main stratigraphic relationships of the features assigned to this sub-phase were identified by Atkinson in his 1956 publication and were not altered substantially

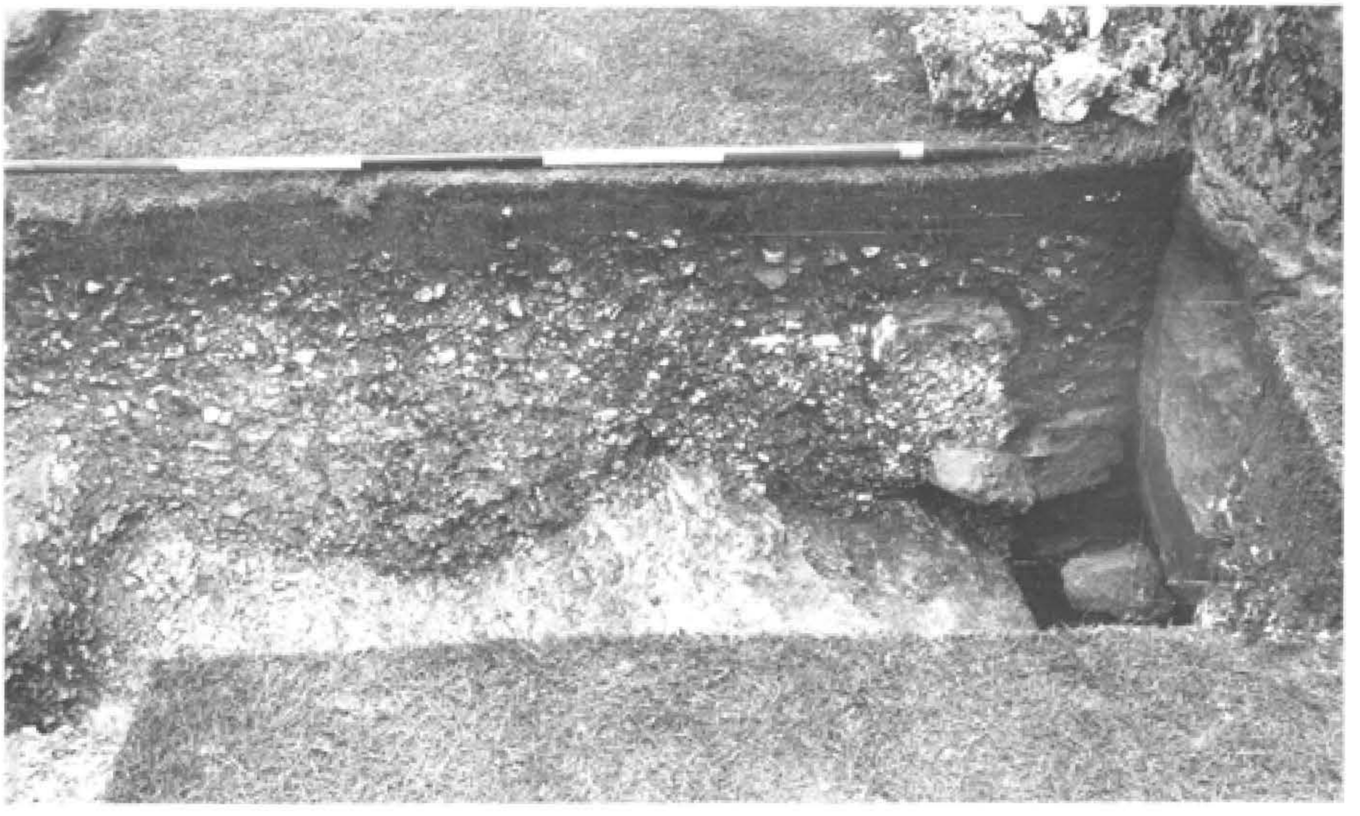


*Fig 92 Q Hole 4 (left) and the stonehole for Stone 3 of the Sarsen Circle (right) (P51674)*

by his later excavations. He noted that in several instances the Q and R Holes were cut by stones of the Bluestone Circle and that one, Q4, was cut by the stonehole for Stone 3 of the Sarsen Circle (Fig 92). There is no stratigraphic relationship between the Sarsen Circle and the Bluestone Circle but it seems likely that the Sarsen Circle was earlier on the grounds that the Bluestone Circle lies on a rather ragged circle, such as might be constructed if the expedient of a peg and string could not be used because of structures standing in the interior of the circle.

The radiocarbon dating also suggests that the Sarsen Circle was the earlier element. Stratigraphic relationships between elements of the monument are so rare that all those relating to the Q and R Holes are listed here, from the north-western end of the excavated features clockwise:

R37 cut a posthole (WA 2705), probably of Phase 2.

R38 was cut by the stonehole for Stone 49 of the Bluestone Circle.

Q4 was cut by the stonehole for Stone 3 of the Sarsen Circle.

The stonehole for Stone 31 of the Bluestone Circle almost certainly cuts the fill of R1, but the relationship does not appear to have been as clear cut as is the case with R38 and Stone 49, and it is marked on the section by a dotted line.

Q7 and R8/Q8 were cut by the stonehole for Stone 33 of the Bluestone Circle.

The probable Q/R pair WA 3654/2648 cut at least one post-hole (Fig 143 Sc 54.4) probably of phase 2, and is cut by the Bluestone Circle (un-numbered stonehole).

It is clear from this that the Bluestone Circle is certainly later than the Q and R settings, but it is unfortunate that only a single stratigraphic relationship indicates the relationship between the Q and R Holes and the Sarsen Circle. Although obviously later than the erection of a stone in the Q Hole it is possible, for example, that the Sarsen stonehole could have cut the packing of the Q Hole rather than the backfill and therefore have been standing at the same time as the Q stone. This does, however, seem unlikely given the extent of the Sarsen Circle stonehole cut across Q4, and it is accepted here that the erection of the Sarsen Circle is most likely to have been later than the dismantling of the Q and R setting.

The stratigraphic relationships listed above do not include those with individual features which cannot be assigned to phases and which are detailed in the individual Q and R Hole descriptions, above. Nor does it include the problematic relationship with the hole for Bluestone 40c, which has also been discussed above.

**Table 15 Finds from the Q and R Holes**

| *WA context* | *Cutting* | *Bluestone* | *Sarsen* | *Other* | *Atkinson cat no* | *Details of context* | *Q/R no (where sequence clear)* |
|---|---|---|---|---|---|---|---|
| ?298 | C12 | – | 1 | | S.56.25 | From stone impression in R Hole between Stones 46 and 47 | ?R36 |
| 289 | C45 | – | 1 (small) | | S.54.1314 | Middle filling | Q4 |
| 289 | C45 | 2 | – | | S.54.1315 | | Q4 |
| 289 | C45 | 2 | – | | S.54.1374 | 'East side upper filling' | Q4 |
| 289 | C45 | – | 2 | | S.54.1375 | 'East side upper filling' | Q4 |
| 289 | C45 | 4 | – | | S.54.1376 | 'East side lower filling' | Q4 |
| 290 | C45 | 2 | – | | S.54.1325 | | R5 |
| 290 | C45 | – | 3 | | S.54.1326 | | R5 |
| 3168 | C45 | – | – | 2 sherds Beaker | S.54.1329 | Depth below turf 1ft 9in (0.56m) | Q5 |
| 3163 | C45 | – | – | 2 frags antler | S.54.1343 | South side | Q6 |
| 3163 | C45 | 7 | – | | S.54.1344 | South side | Q6 |
| 3163 | C45 | – | 1 | | S.54.1345 | North side 3in (0.08m) above bottom | Q6 |
| 3163 | C45 | 5 | – | | S.54.1346 | 2in (0.05m) from bottom | Q6 |
| 3148 | C45 | 2 | – | | S.54.1359/1 | | Q7 |
| 3149 | C45 | – | – | 1 'Greensand chert' | S.54.1359/2 | | Q7 |
| 3149 | C45 | – | 5 | | S.54.1360 | | Q7 |
| 293 | C14 | – | 1 | | S.54.1363 | 'Extreme bottom of in [*sic*] stone impression' | R8 |
| 2430 | C17 | 1 (small) | – | | S.56.36 | Q Hole in 'trench IIA' (C17) | |
| 2428 | C17 | | 1 maul frag | | S.35.57 | 'Cutting IIA R hole' * | |
| 3346 | C17 | – | – | 1 antler | S56.47.2 | 'Cutting IID, bottom of R hole' | |
| ? | C17 | – | – | 1 flint | S.56.47.1 | 'Cutting IID, bottom of R hole' | |

* *In section this is shown as having been completely emptied in recent times (ie by Hawley) but the finds location suggests that some fill might have remained and been removed in 1956*

**Finds**

The features of this sub-phase have produced very few finds but these do include material which has substantially influenced the site phasing both in the past and here. Atkinson noted that the stone impressions visible in some of the Q and R Holes sometimes contained bluestone fragments: 'the occurrence of minute chips of dolerite embedded in some of these impressions showed conclusively that the Q and R holes had once been the sockets for bluestones' (1979, 58). This was written when the Q and R Holes had only just been identified and before the reopening of C12, the 1926 Hawley cutting, and the excavation of C13 and C17, also previously excavated by Hawley. As Hawley did not specifically identify or describe the Q and R Holes in C13 and C17, nor mentioned bluestone chips in the features identifiable as R Holes in C12, it is reasonable to assume that when Atkinson made this statement he was referring to finds made during the 1954 excavation of C45. There is now no stone (with the exception of one flint flake) from this cutting in the archive (and therefore it does not figure in the stone report, *Montague, Chapter 9, below*), but the finds can be reconstructed from the finds index. This clearly demonstrates that both bluestone and sarsen were recovered from the Q and R Holes although the size of the pieces cannot be established (Table 15).

It is clear, then, that at least the Q and R Holes excavated in 1954 (C45) contained a considerable number of bluestone fragments. The Q and R Holes in C12 had been largely emptied by Hawley in 1926; any finds made then cannot now be identified and the same applies to the excavation by Hawley of C17. The occurrence of sarsen in the holes, including a piece of sarsen maul, may relate to rough shaping of the bluestones and need not imply the presence of any large sarsen stones. It is quite possible that sarsen occurred locally or was brought into the area in small quantities and pieces also occur in the Ditch early in the history of the monument.

### Radiocarbon dates

Two radiocarbon determinations have been obtained from material ascribed to the Q and R Holes by Professor Atkinson, one during the 1994 dating programme (OxA–4901) and one obtained by Atkinson (ie I–2384). Both have now been rejected on technical grounds (*see Appendix 2*). The 1994 determination was obtained because there are very few finds from the Q and R Holes and almost no material suitable for radiocarbon dating. In view of this and because it was felt to be important to obtain a date for this sub-phase, the earliest of the Bluestone settings, bone was submitted from a feature which was identified in the finds index as a Q Hole even though the specific feature could not be identified on plan (because features were not numbered during the excavations and identification relies on the feature being described, or related to another identifiable feature). It was felt that as the Q and R Holes had been identified by Atkinson *et al*, and that Atkinson had presumably identified the feature from which the sample came as a Q Hole, then the attribution was a reliable one. In the event, the determination (3800±45 BP) is inconsistent with the stratigraphy and it was concluded that the bone had either come from a feature which was not a Q/R Hole or was from a disturbed context (*see Appendix 2 for a full discussion*).

### Discussion

There are several problems in intepreting this early part of phase 3 of which the most serious is the nature and integrity of the Q and R setting. The main questions must be: was there ever a coherent setting of stones along the lines of that proposed by Atkinson and, if so, was it ever completed and with what was it contemporary?

As much of the evidence was not recorded at the time of excavation it is impossible now to establish whether the Q and R Holes were more similar to each other in form and filling than they were to other features. Certainly they are described as being of similar form and filling by Atkinson, who clearly believed in the integrity of the Q and R setting. It was he, after all, who saw many of them and defined them in the first place. It should be remembered, however, that several had been emptied or partially emptied by Lt-Col Hawley before they were seen by Atkinson. Table 16 summarises the descriptions of the fillings, both those of the later excavations and those given by Hawley. Any judgement of the degree of similarity or dissimilarity between the features is complicated by at least two factors: that the same observer may use different descriptive terms on different occasions and that different observers may well describe the same phenomenon in different terms. This last is illustrated in the case of the R Holes in C12 which were completely emptied by Hawley and were subsequently re-excavated in 1956. In R38, for example, the remnant filling of 'compact rubble' described by Atkinson *et al* must be the 'yellow chalk rubble' described by Hawley (or more likely Newall in this case). Given this, it seems reasonable to accept that the features were alike in filling, although it should also be noted that there are many other features, other than Q and R Holes, for which similar descriptions are given, so that the question of whether they were particularly distinctive in their filling cannot be considered as established.

**Table 16 Q and R Hole fillings**

| *No* | *Description* | *Excavator* |
|---|---|---|
| R35 | Compact chalk rubble | Atkinson *et al* |
| R36 | Earthy chalk rubble | Atkinson *et al* |
| R37 | Earthy chalk rubble<br>Yellow chalk rubble | Atkinson *et al*<br>Hawley/Newall |
| R38 | Compact rubble<br>Yellow chalk rubble | Atkinson *et al*<br>Hawley/Newall |
| R1 | Loose chalk rubble | Hawley |
| R2 | Compact chalk rubble | Atkinson *et al* |
| Q4 | Q filling, mixed, no runs; Chalky and earth fill, rather larger towards the bottom | Atkinson *et al* |
| Q5 | Chalk and earth fill | Atkinson *et al* |
| Q6 | Earth and chalk [1954]; fine Q fill [1959] | Atkinson *et al* |
| Q7 | Chalk and earth (Q Hole); hard chalk packing [possibly the linking trench of the 'dumb-bell', ie in WA 3166] | Atkinson *et al* |
| R8/Q8 | Compact Q/R fill | Atkinson *et al* |
| Q11 | Earthy chalk rubble | Hawley |
| WA 2430* | Very compact rubble [Q filling] | Atkinson *et al* |

**ie Atkinson's last pair*

One distinctive feature of the fillings of the Q and R Holes, which is emphasised in the published description given by Atkinson, but is more difficult to identify from the primary record, is the difference between the original packing of each feature and the disturbed fill where the stones had supposedly been removed. The former is described as 'very tightly packed clean chalk rubble' and the latter as 'tightly rammed dirty chalk rubble' (Atkinson 1979, 58) but these terms are not used in the field sections, which are the only records available. The only case in which this seems readily identifiable is in the case of Q7, in which the fill marked in section as Q7 is 'chalk and earth', which it seems reasonable to assume could be interpreted as dirty. This lies within a feature which cuts another (WA 3166) which was filled with 'hard chalk packing' (Fig 140, Sc 45.2). Read in conjunction with the plan (Fig 278) this suggests that WA 3166 is the remnant of the undisturbed middle of the 'dumb-bell', and the feature marked Q7 the disturbed Q stonehole. The fact that this one clear example of the features occurs in cutting C45, excavated in 1954, highlights a major problem with the Q/R setting.

It seems beyond reasonable doubt that the features encountered during the excavation of C45 in 1954 did form a coherent arrangement and were correctly interpreted as a single setting. The interpretation of the filling of each 'dumb-bell' as including a central undisturbed part and disturbed ends, combined with the impressions on the bases of the features and the occurrence of bluestone chips all seem entirely acceptable as the below-ground remains of a dismantled setting of uprights, probably Bluestones. From here onwards, however, there seems to have been increasingly doubtful identifications of features as although Atkinson was careful not to refer to the setting as a circle in print it is clear that the temptation to regard the setting as a circle might well have been overwhelming, and not unreasonable, given that the monument includes a number of circular settings. So, in the re-excavation of C12 more Q and R Holes were identified and here too the identification seems not unreasonable, although the fillings of the features in most cases did not survive to be examined.

The excavation in C12, however, which took place in 1956 after the text of Professor Atkinson's *Stonehenge* had been written, proved some of the interpretation of the setting to be incorrect. This is reported in an Appendix to the post-1956 editions of *Stonehenge*, but the description is difficult to follow without a plan to accompany it and the 1956 description and plan of the Q/R setting in the main text remains the most familiar version of this setting (Atkinson 1979, 58, fig 3). The Q and R Holes are illustrated as holding one stone at each end, with the exception of holes Q/R 37 and 2, which hold three each, and holes Q/R 38 and 1, which hold five. The reopening of C12 proved that R37, R38, R1, and R2 were not dumb-bell shaped, but comprised at least two features each separated by undisturbed chalk. In addition, as described by Professor Atkinson in Appendix I to the later editions of *Stonehenge*, and as illustrated in Figure 81 (taken from an illustration clearly prepared under Professor Atkinson's direction for publication but not included in *Stonehenge*) the interpretation of the stone settings had to be modified.

> On either side of the axis separate in-lying holes had been dug, each of which had held three bluestones in line. The impressions on the bases of these stones could still be seen in the chalk. To the right and left of these holes, at R2 and R37, there was again a separate additional hole inside the main circle of the 'dumb-bell' trenches; but in this case neither hole had been finished, and no stone had ever stood in them.
>
> The reconstruction of the entrance area of the double bluestone circle [illustrated in Atkinson 1979, fig 3 centre] thus requires alteration. On either side of the axis there should be *five* stones in line, the inner three in a separate hole; and outside these, at R2 and R37, there should be two stones of the main circle and an unfinished hole inside them.
>
> (Atkinson 1979, 205)

Lt-Col Hawley does not describe the presence of stone impressions on the base of R1 and R38, only commenting on the larger holes on the inner edge of the features, which almost certainly were not part of them (and are discussed in sub-phase 3iv, *below*). The impressions both in plan and in the photographs, appear to be small in comparison with other presumed stone impressions. There would seem to be two possible interpretations: that they were not stone impressions, or that they were impressions of narrower than usual stones, or even timber uprights. The very soft nature of the chalk in some areas of the monument is commented on by Hawley and the possibility must be considered that heavy timbers could leave impressions. One other factor worth noting is that it is not clear whether the impressions were recognised as such during excavation. The discussion of these features is important because the impressions suggest that R1 and R38 are unusual and mark what can be suggested as an entrance which coincides with an axis based on the centre of the later Sarsen Circle and the centre line of the Avenue. In Atkinson's interpretation the Q and R setting, initially assumed to be a circle not unlike that of the later Sarsen Circle, is contemporary with the construction of the Avenue. In the present interpretation the Avenue is not assumed to be present at this early date, the widened entrance is not connected with the planning of the stone settings in the interior, and the Q and R setting is not a circle. If R Holes 1 and 38 did flank an entrance which is coincident with the later axis, then that axis, in so much as it varies from the first axis, would have had to be based on some other features than the Avenue and the later circle. In the discussion of the periphery, below, it is suggested that the Q/R setting may have been contemporary with the erection of a pair of stones, Stone 97 and the Heelstone, in the area beyond the north-eastern causeway.

As can be seen from Figures 82, 85, and 86 the remaining form of the setting is uncertain. The northern and eastern lengths, exposed in C45 and C12 are convincing as a setting of stones belonging to one plan although there must be doubt as to the existence of an entrance and the number of stones or other uprights placed in some of the features, as outlined above. But beyond this it is difficult to be certain that features assigned to this setting either by Atkinson or by the present authors are really part of a distinct setting, or are so assigned because they happen to be features which lie more or less along the line of the supposed Q and R setting and do not clearly belong to any other setting. This applies, for instance, to feature WA 3347 in C17, the feature from which an antler on the bottom was used to produce a radiocarbon determination (*see above*). This feature did not have a stone impression and was considered by Atkinson to be unfinished. It is described as being

> on the line of the remainder of the R holes, and this was clearly unfinished. It was filled with clean chalk rubble, tightly rammed; and on the bottom was the discarded antler pick which had been used in its excavation. It looks very much as if the construction of Stonehenge II was abandoned while this hole was actually being dug.
>
> (Atkinson 1979, 205–6)

In conversation between the present writer and Professor Atkinson, shortly before his death, when asked how similar this feature was to the other R Holes and why it was thought to be one, Professor Atkinson stressed that it was on the same line as the others. This is indeed the case although it is separated from the nearest pair of holes by a distance greater than the distance between pairs in the more certain lengths of the setting (Fig 81). It is difficult to avoid the conclusion that the fact that this feature was on the same line as the other R Holes may have been the overriding consideration in assigning it to this setting given that it lacked one of the other diagnostic features, a stone impression. It is difficult to judge from the descriptions the extent to which its filling differed from the fillings of other non-Q/R features and, as very many of the features in the interior of the monument are filled with chalk rubble, the distinction between 'ordinary' chalk rubble fill and the compact chalk rubble fill typical of Q/R holes may always have been a matter open to some interpretation. Lt-Col Hawley, for instance, does not describe the fillings of the R Holes excavated by him in C12 as distinct from other features on the grounds of compaction.

The difficulty of identifying Q and R Holes from description alone is also highlighted by the case of feature WA 3654/3648 (Fig 81). This feature was excavated in 1958, after the raising of the fallen stones of the fourth Trilithon. It lies on the line of the Q and R Holes though separated from the nearest pair by about 10m. Its fill is recorded as of compact chalk rubble, it cuts a posthole, and is cut by what is almost certainly the hole for a stone of the Bluestone Circle (Fig 143, Sc 52.4). Its depth below undisturbed chalk surface is similar to that of the undoubted features of this setting in C45. All these features strongly suggest that it is a Q and R 'dumb-bell' and it is closer to the 'dumb-bell' shape of the features first identified as Q/R Holes than, for instance, the separate Q and R features in C12 or C13. It is, however, not mentioned as a Q/R Hole in *Stonehenge* although, Appendix I of the volume must have been written after that area had been completed as it refers to the 1958 season (Atkinson 1979, 203). The omission of WA 3654/3648 must therefore have been because Atkinson considered it not to be a Q/R Hole. The evidence provided here shows that his rejection of the feature as a Q/R Hole must have been on the grounds that he considered his interpretation of the setting as having been abandoned at feature WA 3347 to be correct, and that WA 3654 could not therefore be a Q/R Hole because of its position. Its omission cannot have been on the grounds that there were no stone impressions within it as lack of an impression did not exclude WA 3347 from being assigned to the setting. Overall, it is very tempting to accept WA 3654 as belonging to the same setting as the Q and R Holes, perhaps not used in the final setting, although even its lack of stone impressions is not certain.

There are six more features which may be considered with the Q and R setting. None of these can be certainly assigned to this sub-phase but there are strong indications that each belongs to an early period of stone settings. Two of these, the Crescentic Feature and the feature close to Stone 69 (respectively WA 3279 and 3706) lie at the base of stratigraphic sequences of which the topmost feature is a Bluestone of the Bluestone Oval/Horseshoe. In each case the feature is a stonehole and another stonehole intervenes in the sequence between it and the Bluestone Oval/Horseshoe. It is possible that neither is as early as the Q/R setting but neither confirmation nor refutation of this is possible on present evidence. Given that the Q/R setting appears not to have extended continuously around the full circle and that these features coincide with the area of the interior which mainly lacks Q/R Holes, it is not unreasonable to presume that something filled the space. This is as far as it is possible to go. The excavated length of the Crescentic Feature certainly held two stones and one could have been destroyed by the later stonehole at its south-western end. The length remaining beneath fallen sarsen Stone 59 could hold another one or two stones.

The other four features possibly assignable to this early period are WA 2321, 3433, 3639 and 3708. WA 2321, excavated in 1924, is recorded as cutting a posthole and being cut by the stonehole for Sarsen Circle Stone 8 (Hawley 1926, 8). It seems likely therefore to have been contemporary with the Q/R setting. Hawley notes it as a 'large crater-shaped hole with flat bottom, which might have held a large stone' (*ibid*). It is shallow for holding a stone but no shallower than some of the shallow Sarsen Circle and Trilithon holes. The possibility of a stone here cannot be dismissed in view of the fact that it lies close to an area which was clearly important in the timber phase (ie probably an entrance, *see Chapter* 6) and faces across the interior the perhaps three-stone setting in the Crescentic Feature.

Feature WA 3433 is in a similar stratigraphic position in that it is cut by a Sarsen Circle stonehole although in this case there is no relationship with a posthole to confirm that it is not earlier than sub-phase 3i. Its exact nature is uncertain as, although shallow, it is not impossible to envisage it as a stonehole and the comment on plan that it was crushed slightly strengthens this interpretation.

Of the two remaining features possibly of this sub-phase, WA 3639, unlike the other two, does not lie within a stratigraphic sequence and has been largely destroyed by post-medieval disturbance. This appears to have been a large feature as evidenced by the fill remaining at the base of the disturbed portion and its importance is highlighted by what must be regarded as the deliberate deposition of a fragment of a Group I axe on its base (*Chapter 9*). It is certainly deep enough to have served as a stonehole and it is tempting to see it as such because it lies on the stone settings axis through the monument. The likelihood of a stone standing in this position is strongly suggested by the unusual direction of the erection ramp of Sarsen Stone 56 of the Great (third) Trilithon. The ramp for this stone approaches the standing stone 56 on its short, north-western, side. To have erected this very large stone from the side and probably, judging from the ramp extending in front of it, to have had to manipulate it from the interior, seems such a complicated undertaking that only the presence of something standing close behind it seems likely to have made such a course of action necessary.

This, then, strongly suggests the existence of a stone standing in WA 3639 at an early date and presumably retained there at least until some time during or after the use of the Sarsen Trilithons. As the stone is likely to have stood within the Q and R setting it may well have been a Bluestone, but a larger one than those standing in the Q and R Holes, to judge from the greater size of its hole. There is, of course, a Bluestone (type) stone of a larger size and of a more unusual stone (Cosheston Beds Sandstone) than the others still remaining at Stonehenge, namely the Altar Stone, and it seems reasonable to postulate that it once stood here.

The final feature possibly belonging to this sub-phase is WA 3708, and this is certainly the weakest attribution to the phase of all six features considered here. It is shown in section as sealed by the filling of the ramp for stone 69 of the Bluestone Oval/Horseshoe, but that of course only assigns it to a phase earlier than sub-phase 3iv. On plan, however, it is annotated as '?II Hole', indicating that on excavation it was thought to have been earlier. This may have been on the grounds of its appearance, but this is not now resolvable. Because of this uncertainty it is also considered in sub-phase 3iii.

In summary, the Q and R Holes must, on the evidence available, be taken as a real setting in at least the northern and eastern part of the monument. It is more difficult to accept them as a continuous feature to the south-east, south, and south-west, and it seems justifiable to feel that Professor Atkinson became over-zealous in identifying Q and R Holes in these areas because of his conviction that they had been intended as a continuous and near-circular setting. Because the setting extends out of the excavated area to the north-west, and could extend for some distance in that direction, it is impossible to be certain of its original form. It may loosely have been a semi-circle, or even a three-sided, open rectangular form with rather rounded sides. In either case the Altar Stone, if it stood in WA 3639, could have formed a focal point, more or less facing the 'entrance'. Other features may have stood within this area and played a part in whatever activities were carried out within it. There is no need to see this setting as unfinished, or it may be that there were modifications begun but not finished. Whatever the details it is clear that this sub-phase is more complicated than the simple 'dumb-bell' setting first proposed by Atkinson.

## Phase 3ii: Sarsen Circle and Trilithons

The most dominant features of the surviving stone settings are the outer circle of Sarsen Stones and the five Sarsen Trilithons (Figs 93–5). Stoneholes of the Sarsen Circle were the first features to be excavated this century, with the stonehole of Stone 56 excavated by Gowland in 1901, and it was with Stoneholes 6 and 7 of the Sarsen Circle that Hawley began in 1919. Sarsen stoneholes also featured prominently in the excavations of Atkinson *et al*, and stoneholes of both the Sarsen Circle and Trilithons formed a large part of the last major season of excavation at the monument, in 1964. The fills of these features are similar and are only described here in a summarised form. In both the Gowland and Hawley excavations the fills were excavated in spits. Gowland published sections showing stratigraphy (some of which are shown here (Fig 150), and this is also the case with some of the Hawley excavations. For the excavations in the 1950s and 1960s there are extant sections and plans. Finds were recorded in the early years with the aid of a grid (the 'registering plate' or frame first used by Gowland and later by Hawley) and in the 1950s and 1960s by individual finds number.

### Description

The stones and stoneholes of the Sarsen Circle and Trilithons are described clockwise, from Stone 27 in the northern sector. Lintel stones are discussed only where still visible at the monument. (By tradition lintels are assigned a number one hundred greater than the second stone on which they rest, or once rested. An exception to this is Stone 150 which is a fallen Bluestone lintel, its original supporting stones being unknown.) In the descriptions which follow the context number cited is that of the stonehole cut only. The recent history and current position of each stone is described. On the phase illustrations (96, 97, 99, and 100) only the Stone number is given.

**Sarsen Circle Stone 27, WA 55, C58:** Excavated by Atkinson in 1964 (Figs 95 and 96). The north–south section shows a fill of chalk rubble with packing stones with weathered soil against the face of stone. The east–west section shows chalk rubble packing with weathered chalk rubble above (Fig 148). The Stonehenge Layer is not present on the sections relating to the south-east quadrant of the cutting and may therefore have been removed at some time prior to 1964. No spot height is give on the plan but the hole appears to have

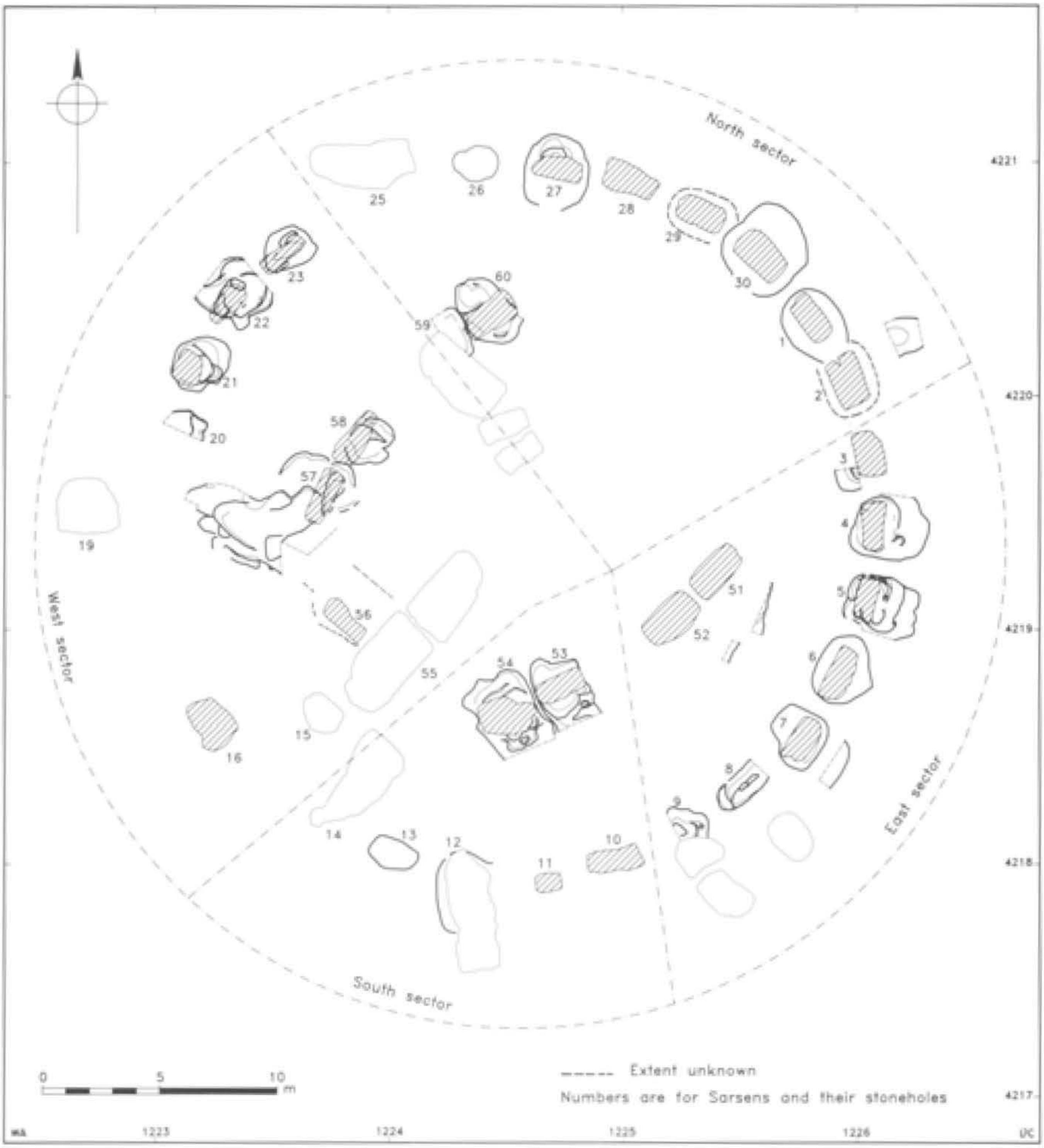



*Fig 93 Phase 3ii: the Sarsen Circle and Trilithons, all features plan*

been at least 5ft (1.52m) deep below the chalk surface (Fig 148, Sc 58.1). There does not appear to have been a ramp for this feature, although the stonehole extends slightly further on the interior (Fig 96). Maximum dimensions taken from the plan indicate a large feature *c* 9ft by 10ft (*c* 2.75 by 3.0m). Finds from the fill of the stonehole noted in the finds index included deer antler from 'amongst the packing stones' in the north-west quadrant (WA 3547; S.64.41); as one of the few extant examples of antler from the Sarsen Circle this was noted as a high priority for radiocarbon dating. On examination by Serjeantson, however, the finds proved to be animal bone, but they were nevertheless submitted for dating on the grounds that although the association between antler and the construction of the feature was likely to have been stronger than that with discarded animal bone fragments there was no positive evidence that the animal bone fragments were redeposited. The resulting date, however (OxA-4902, 5350±80 BP; 4360–3990 cal BC), indicates that this material must be residual, and

*Fig 94 The Sarsen Circle from the outside, Stones 29–2 (Wessex Archaeology)*

*Fig 95 Sarsen Circle Stones 27–5 from inside the monument with stones of the Bluestone Circle in front (Wessex Archaeology)*

is indeed earlier than even the ditched enclosure of phase 1. A feature (WA 3557) is shown on the southern edge of this cutting but there are no details of it in the archive.
**State of stone:** Standing; staightened in 1964.

**Sarsen Circle Stone 28, WA 57:** This is marked on an archive plan (MoW plan, Archive drwng no 424) as straightened in 1964, but there is no indication that any excavation was undertaken in connection with it (Figs 95 and 96).
**State of stone:** Standing; straightened in 1964.

**Sarsen Circle, Stone 29, WA 59, C2:** This was excavated in 1920 (Figs 94–6) and reported in Hawley 1922 but with no plan or section illustrated. The level of undisturbed chalk surface was here 20–24in (0.51–0.61m) below the ground surface, and the bottom of the stone was 55in (1.40m) below the ground surface, giving a depth of stonehole as only in the region of 0.80–0.90m. There was no erection ramp for this stone, and there were 47 packing stones, listed by Hawley as 2 large flints, 19 sarsen, and the rest of 'Chilcot and Hurdcot ragstone'. They occurred throughout the filling of the stonehole, were visible almost as soon as the turf had been taken off, and extended to the base of the stone. There were more on the north and north-east than elsewhere, and here several of them were cemented together in a hard mass about 4ft (1.2m) wide. Hawley had this analysed by government chemists in the belief that it might be a deliberate concrete but this was not proved and it seems to have been a natural occurrence (PRO Work 14/2463, Memo 8/3/21). The remainder of the filling was of 'earthy chalk rubble', with about a 'foot [0.3m] of white chalk rubble' at the bottom. The stone had a 'bluntly-pointed base with the under sides sloping inwards and meeting about the vertical axis'. There were seven postholes in the base of the stonehole, along the southern edge of the hole in a length of about 2½ft (0.76m); they varied in diameter from 4–8in (0.10–0.20m) and 20 packing stones also lay along this side of the stone (Hawley 1922, 43–5; 5/10/1920–18/10/1920).
**State of stone:** Standing (lifted and reset in concrete by Lt-Col Hawley; *see Figs 188 and 189*).

**Sarsen Circle Lintel 130:** In place.

**Sarsen Circle Stone 30, WA 62, C2:** This stone was excavated in 1920 (Figs 94–6) and was described and illustrated by Hawley in 1922. The base of the hole lay at about 2½ft (0.46m) below the level of undisturbed chalk surface and here the stonehole seems to either have cut through an earlier feature (*see also discussion of Q Hole 38, above*) on the interior side, or been cut by a later one (Hawley 1922, fig 2), the relationship not being clear in Hawley's section. The filling of the stonehole was of earthy chalk rubble. Two rows of post holes were found within the stonehole possibly holding posts intended to support a cracked part of the stone while the backfilling took place. There was no erection ramp for this stone. Fifty-eight packing stones were found in the stonehole identified by Hawley as being mainly of glauconite and Chilmark ragstone with only a few of sarsen. An antler pick was found 'at a high level in front of Stone '30' at 36in (0.91m) below datum, but it is not clear whether this lay within the undisturbed fill of the stonehole or not (Hawley 1922, 38, 40–42; 8/6/1920–16/7/1920).
**State of stone:** Standing (lifted and reset in concrete by Hawley; *see Figs 188 and 189*).

**Sarsen Circle Lintel 100:** In place.

**Sarsen Circle Stone 1, WA 17, C2:** This was excavated in 1920 (Figs 94–6) and described and illustrated by Hawley in 1922. The base of the stone was at approximately 4ft (1.2m) below the level of undisturbed chalk surface and there was no erection ramp. Hawley particularly comments on how closely the stone fitted into the hole, the stone generally being within 23–25in (0.580.63m) of the sides (13/7/1920). Forty-eight packing blocks were found in the stonehole, mainly around the north-east face and north corner. Hawley identifies them as 'mostly of sarsen, but about one-third were of glauconite and Chilmark ragstone'. A single posthole was found, on the south side of the base. An antler pick was found close to the bottom of the stonehole (Hawley 1922, 38; 28/6/1920–13/7/1920).
**State of stone:** Standing (lifted and reset in concrete by Hawley; *see Figs 188 and 189*).

**Sarsen Circle Lintel 102:** In place.

**Sarsen Circle Stone 2, WA 20, C2:** There is no detailed plan or section drawing of this stonehole, which was excavated in 1920 (Figs 94–6) and described by Hawley in 1922. The stone is recorded as 84½in (2.15m) below datum; as the datum is *c* 2½ft (0.76m) above the undisturbed chalk surface at the neighbouring stone, 1, this suggests a depth below undisturbed chalk level of about 4½ft (1.4m) for the bottom of Stone 2. Hawley records the presence of an erection ramp for this stone, unlike 1, 29, and 30, which was probably

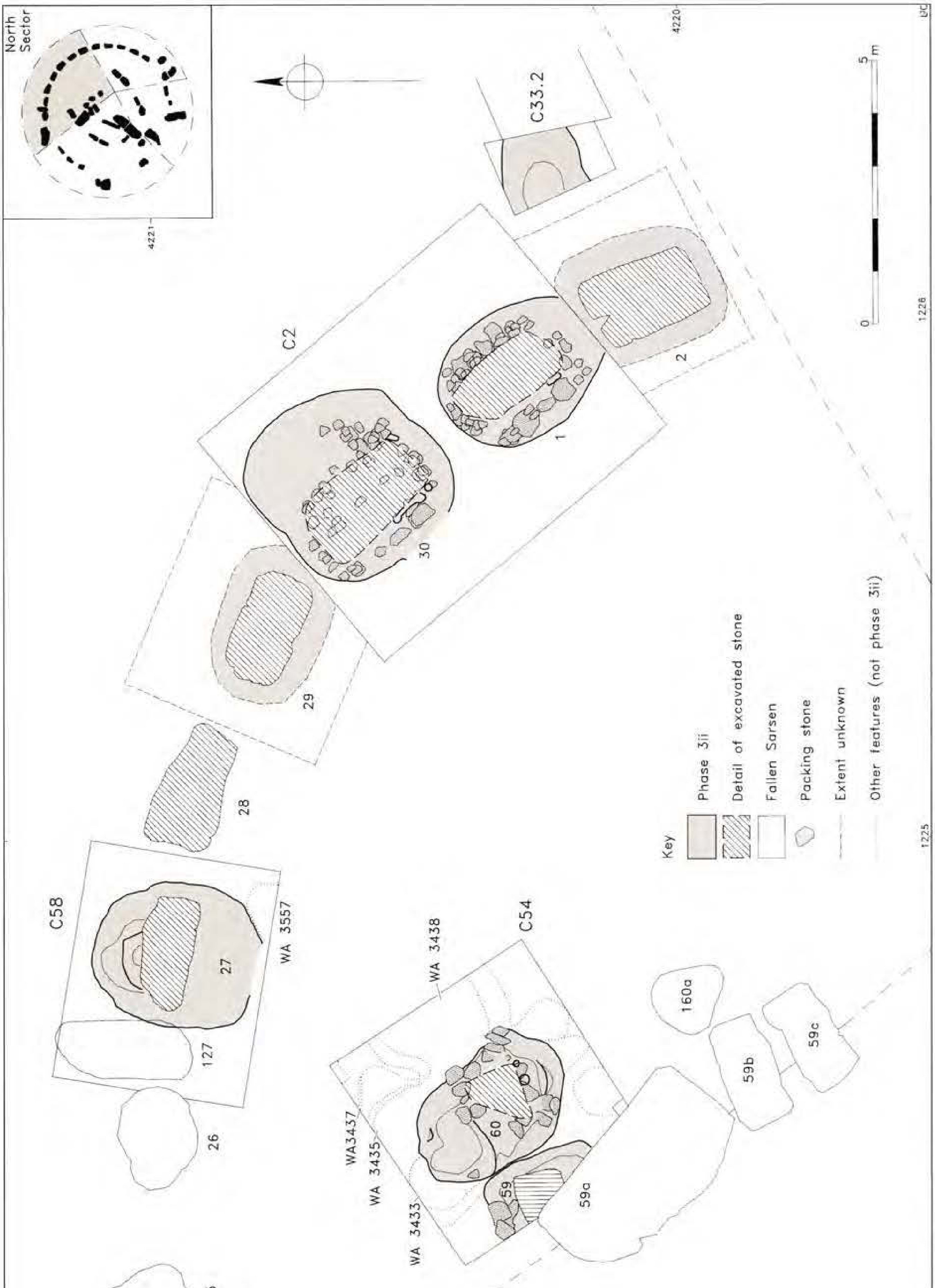



Fig 96 Phase 3ii: north sector plan

required because of the depth of hole necessary to make the stone the same above-ground height as its neighbours. (The erection ramp for this stone was probably also encountered in the 1923 excavations. Hawley describes spoil from Z Hole 2 overlying the fill of the ramp for Stone 29. Stone 29, however, is not the stone directly in front of ZH2, and was described as not having an erection ramp when excavated in 1920. It seems that the ramp described as for Stone 29 must be that for Stone 2; Hawley 1925, 29). The filling of the stonehole was mainly of earthy chalk rubble, with white chalk rubble towards the base. Only ten small sarsen packing blocks were found, Hawley commenting that the great depth of the stone below ground probably rendered them unecessary. An antler pick is listed as coming from the bottom of this stonehole (10/11/1920). It also seems to have had Romano-British pottery at a considerable depth in brown earth near the stone which illustrates how later material could trickle down beside the stones in the gaps created by the stone's movement over time (Hawley 1922; 9/11/1920–4/12/1920).

**State of stone:** Standing (set in concrete, but not lifted, by Hawley; *see Figs 188 and 189*).

**Sarsen Circle Stone 3, WA 22, C45:** Only part (on the inner face) of this hole was excavated by Atkinson in 1954 (an extension to C45; Figs 95 and 97). From the section it appears that the hole was not excavated to its base but it appears to have been at least 1.37m deep (from the top of the turf). The section drawing (Fig 140) shows 'brown sandy soil' surrounding large packing blocks which seems to be part of the primary fill. A substance called 'cardboard' is noted low down in this fill. Also present is 'concrete' defined in a note as puddled chalk (elsewhere referred to as 'morganite'; *see Chapter 1*) and another layer described as 'stonehole filling with runs'. Finds were limited to the 'upper, and middle layers' and include later pottery. The section through this stonehole demonstrates the relationship between the Sarsen Circle and at least one of the Q Holes, as the stonehole clearly cuts Q Hole 4 (Fig 140, Sc 45.1). A single Beaker sherd was recovered from the fill (FN decorated fabric Bkr/G1).

**State of stone:** Standing, no details of any adjustments are given on the MoW plan.

**Sarsen Circle Stone 4, WA 24, C55:** This was excavated in 1959 (Fig 97) and was *c* 3ft (0.90m) deep below the level of undisturbed chalk surface (Fig 146). There was a short erection ramp (*c* 4ft (1.2m) long) on the exterior side. Within the stonehole were six small postholes along the side nearest the interior of the monument; none of these are shown in section. The filling of the stonehole was mixed and comprised deposits of earthy chalk rubble, 'morganite', and chalk rubble.

**State of stone:** Standing; MoW plan shows it as straightened in 1959 (*see Fig 188*).

**Sarsen Circle Lintel 105:** In place.

**Sarsen Circle Stone 5, WA 27, C55:** This stonehole was excavated in 1959 (Fig 97). It was *c* 3ft (0.90m) deep below the level of undisturbed chalk surface. There was a short (*c* 4ft (1.2m) long) erection ramp for the stone on the exterior side. The filling of the stonehole was mixed and comprised earthy layers and earthy chalk rubble (Fig 146, Sc 55.4; Fig 287). There were no post or stakeholes clearly within the stonehole but there were four small postholes or stakeholes just outside on the interior side.

**State of stone:** Standing. MoW plan says straightened in 1959 (*see Fig 188*).

**Sarsen Circle Stone 6, WA 29, C1:** Excavated in 1920 (Fig 97) it was *c* 3ft (0.90m) below the level of undisturbed chalk on the exterior side (Hawley 1921, fig. 4) and extending 'along nearly the entire front [ragstone slabs were] ... set in a mass of extremely hard earthy chalk, like concrete, extending down nearly to the base of the [Stone], around which was a mass of burnt wood ashes in fine earth (fig 4)' (Hawley 1921). The only finds recorded from the fill of the stonehole are packing stones, mainly of sarsen and flint, with the ragstone slabs already mentioned. (Hawley 1921, 25–8; 21/1/1920–5/2/1920).

**State of stone:** Standing, lifted, and reset in concrete 1919–20 (*see Fig 188*).

**Sarsen Circle Lintel 107:** In place.

**Sarsen Circle Stone 7, WA 31, C1:** Excavated in 1919–1920 (Fig 97) it was *c* 4ft (1.2m) below the level of undisturbed chalk. Hawley notes that on the south (exterior) side there appeared to be an incline cut down towards the stone. (This was later encountered again in 1923, where it was seen to be clearly cut by Z Hole 7 (Archive drwg no 59; Hawley 1925, 29). Five postholes were found within the stonehole along the exterior side between the stone and the edge of the hole; packing stones in this area and the side of the stone itself showed signs of being burnt *in situ*. The postholes are not shown in section, but are described as only penetrating the chalk rock to a depth of 3–4in (0.08–0.10m). Hawley notes that nine large sarsen packing blocks in the stonehole filling at this point covered the postholes and that the posts must, therefore, have been burnt before the packing was placed in the hole (17/12/1919). The filling of the stonehole was mixed, comprising clayey rubble, some mixed with wood ash, chalk rubble, and earthy chalk rubble. There appear to have been no finds other than packing stones from the undisturbed stonehole filling, with the exception of a small piece of antler, probably broken from a pick (9/1/1920). (Hawley 1921, 20–5; 3/12/1919–26/1/1920).

**State of stone:** Standing, lifted and reset in concrete 1919–20 (*see Fig 188*).

**Sarsen Circle Stone 8, WA 2314, C13:** Excavated in 1924 and 1964 (Fig 97) as an oblong hole, *c* 4ft (1.2m) wide according to both the description in Hawley (1926, 6) and 1964 plans (Archive drwg nos 70 and 409) and between 6 and 8ft (1.8–2.4m) long (Archive drwg nos 70 and 409; Hawley 1926, 6). A groove 6in (0.15m) deep was noted crossing the hole and was interpreted by Hawley as having been intended to hold a thin end of the stone in position. Within this there was a 'deep hole, intended no doubt for big wooden wedges to give additional security and accuracy of position to the [Stone] when being erected' (1926, 6). The depth within the groove was 15in (0.38m), and within the 'deep hole' 34in (0.98m) below the level of the nearest spot heights on the chalk surface. The depth of the deep hole suggests either that Hawley was correct in supposing that it was connected with the erection of the stone or that it was a pre-existing feature cut by the stonehole.

The side of the hole towards the interior of the monument was badly disturbed by rabbits and the exact limits of the feature are difficult to establish, the 1924 and 1964 excavations having produced slightly different plans; the shallow feature

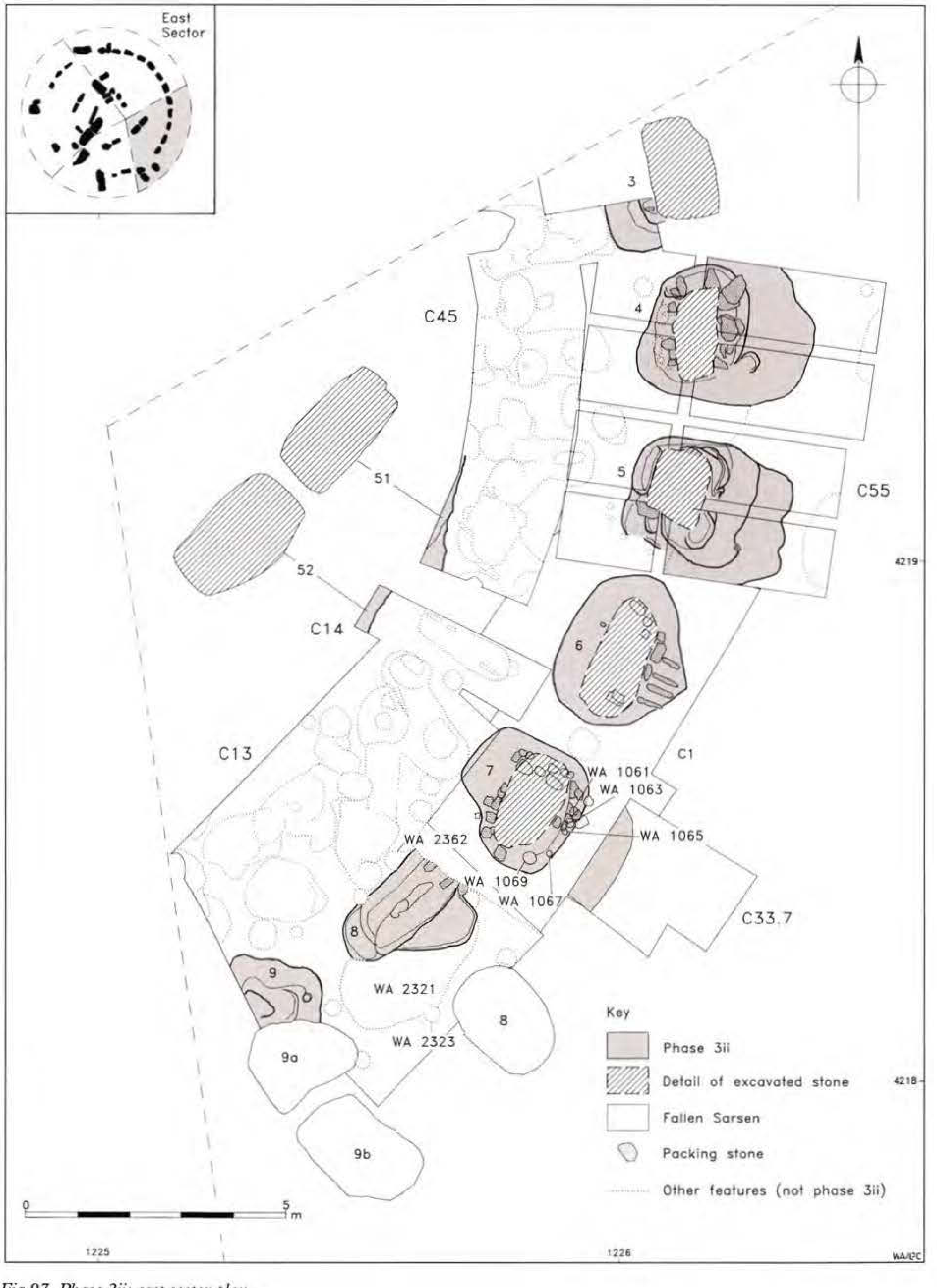



*Fig 97 Phase 3ii: east sector plan*

WA 2362 (only *c* 0.1m deep below the chalk surface) may be part of the hole or recent disturbance.

The hole was filled mainly with 'humus', reaching to the bottom of the feature, but with chalk rubble and some packing blocks still *in situ* at the sides (*see Fig 274*) . There were 43 packing blocks mostly identified by Hawley as sarsen but with 'one or two of Oolite' (1926, 6). Hawley also noted the absence of any finds other than stone chips from the humus in the stonehole, and suggested that it might have fallen early on in the history of the monument (*ibid*). In the Diary this is clearer, with no 'foreign' Stone 'chips below 24"–26" (0.61–0.6m) BGL' (20/8/1924). The bone object submitted for radiocarbon dating (WA obj no 24) appears to have been recovered from below the level at which bluestone chips were observed (Hawley 1926, fig 1; Fig 134), but it has produced a later Bronze Age date (1260–840 cal BC; OxA–4885, 2840±60 BP; *see below*). Hawley noted that the hole was a shallow one 'shorter than any we have seen opened [ie between 1919 and 1924]: no. 29 being the next lowest' (20/8/1924).

**State of stone:** Fallen, date of fall unknown, but pre-1740 (date of John Wood's Survey).

**Sarsen Circle Stone 9, WA 2334:, C13** This was partially excavated in 1924 (Fig 97) and further excavated in 1964; complete excavation was not possible because of the proximity of standing Sarsen Stone 10. Dimensions and depth are both uncertain. No spot heights are given within it in the 1964 plan and the feature does not appear on section. A single posthole-like feature lay within the hole; this could be either a posthole cut by or cutting the stonehole or, more likely, a feature contemporary with it and related to the erection of the stone. The tip of an antler tine was found embedded in the chalk of Stonehole 9 (S.64.7; context 2335; Fig 98).

**State of stone:** Fallen and broken in two parts. Date of fall unknown but pre-1740 (date of John Wood's survey).

**Sarsen Circle Stone 10, WA 37:** Unexcavated (Fig 99).
**State of stone:** Standing

**Sarsen Circle Stone 11, WA 39:** Unexcavated (Fig 99).
**State of stone:** Standing, but possibly broken in antiquity, as it is considerably shorter than the other stones of the Circle.

**Sarsen Circle, Stone 12, WA 2394, C16:** Excavated in 1924 (Fig 99), Stone 12 lies partly over its hole and excavation of the stonehole could not be completed. Hawley noted it as 4ft 6in (1.37m) deep below the surface which, as the solid

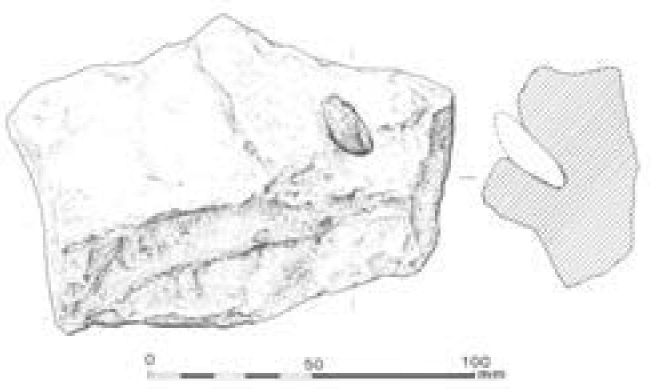



*Fig 98 Lump of chalk from Stonehole 9 with tip of antler tine embedded*

chalk surface is noted as 14in (0.36m) below ground surface, gives a depth of 1.01m for the stonehole below the undisturbed chalk surface. There was a 'short steep incline from the south [exterior] ending in a straight fall of 9" [0.23m] to the base of the pit (Hawley 1926, 10). The filling where the original packing survived was of hard rammed chalk at 'the front [exterior side], but that was the weak spot and it had fallen in that direction' (*ibid*). The stone seemed to have fitted its hole closely on the other three sides. There were few packing stones in the fill and those present were near the top; Hawley notes that it was more usual to find that the ramp ended with a sharp drop into the hole proper with packing stones tightly packed into the space between the stone and the edge of the hole, almost forming a wall. Here there was apparently virtually no room for packing stones in this position. Also present in the hole was 'a little hardened soil of the nature of concrete, similar to that at No 6 Stone, formed naturally' (4/9/1924). Hawley also notes that 'In the pit the soil consisted of dirt and rubble, and contained no objects, so probably the Stone had fallen at an early date. A large posthole had also been cut by the Stonehole.' (3–4/9/1924).

**State of stone:** Fallen. Date of fall not known but possibly early, certainly pre 1740 (date of John Wood's Survey).

**Sarsen Circle Stone 13, WA 2400, C16:** Excavated in 1924 (Fig 99), this hole had already been extensively disturbed. The base of the hole was *c* 47in (1.19m) below the surface and therefore probably *c* 33in (0.84m) below the undisturbed chalk surface (the depth to solid chalk surface is not specified but was 14in (0.36m) at neighbouring Stone 12). The stone had not, however, rested on the bottom, but on top of a layer of 'large flints mixed with chalk which had been rammed hard to form a solid mass about a foot [0.3m] thick' (Hawley 1926). Below this there was a row of small holes similar to those encountered within other stoneholes. Hawley concluded that the hole had either been dug for a longer stone which had not been used, that the depth of hole had been incorrectly calculated for the stone used, necessitating the adjustment, or that the stone had broken.

> Had the base of the stone been soft it might have been broken when tipped into the hole and the shortened piece used afterwards, and the broken pieces used for packing blocks. There were 34 packing blocks altogether and some small fragments.
>
> (10/9/1924)

This at least implies that the lintel arrangement was intended to continue around the circuit and was presumably carried out, as a difference of a foot or so would not otherwise have been so important. The filling of the hole was of 'rubbly soil containing much humus, which extended to the bottom and contained all the varieties of stone chips down to that depth' (Hawley 1926, 10–11; 10/9/1924).

**State of stone:** Fallen and removed; Hawley noted that the stone had

> entirely disappeared, and from the irregular state of the top of the pit it may have been intentionally taken out and broken up, as large broken angular pieces of Sarsen were found around the place.
>
> (1926, 10)

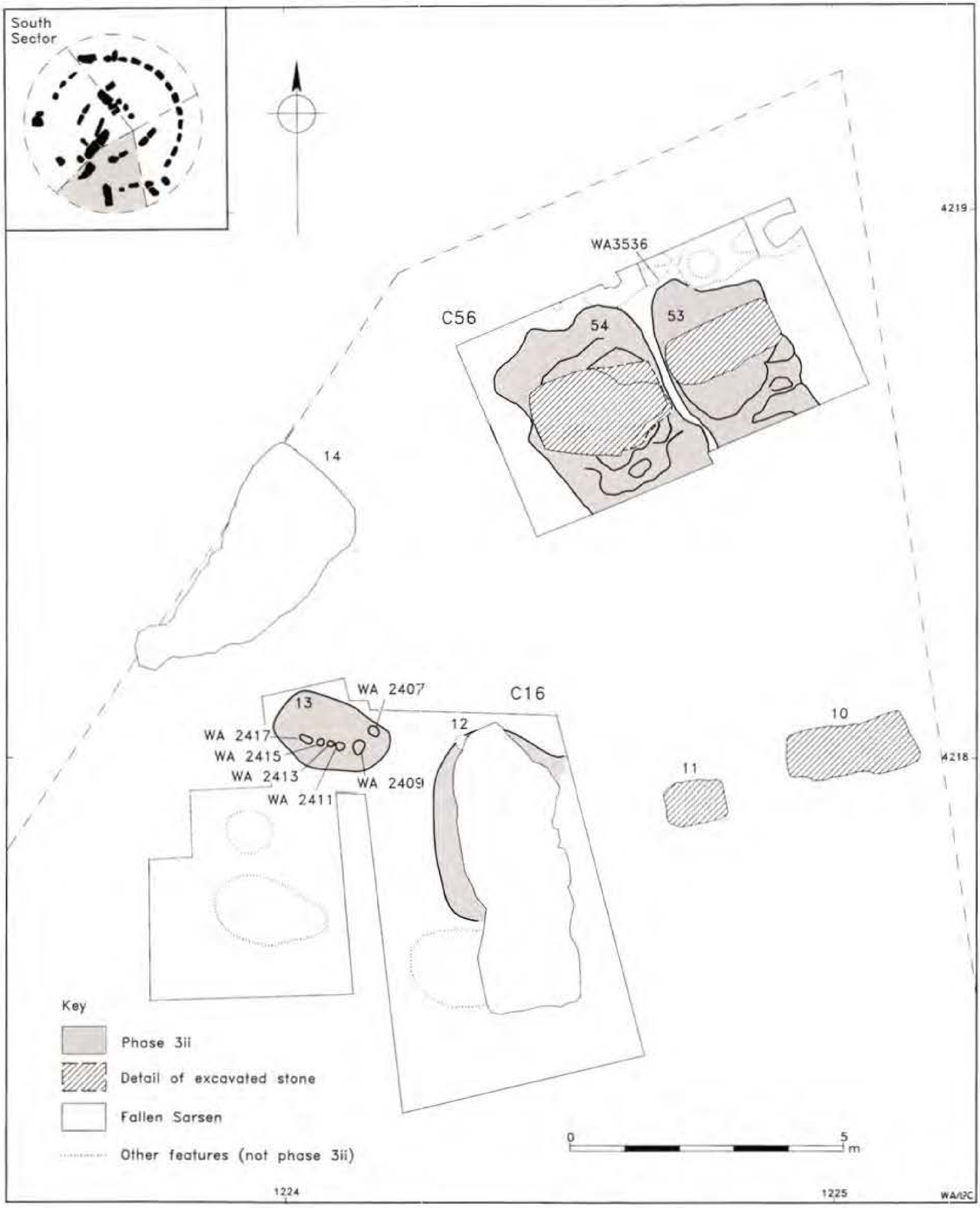



*Fig 99 Phase 3ii: south sector plan*

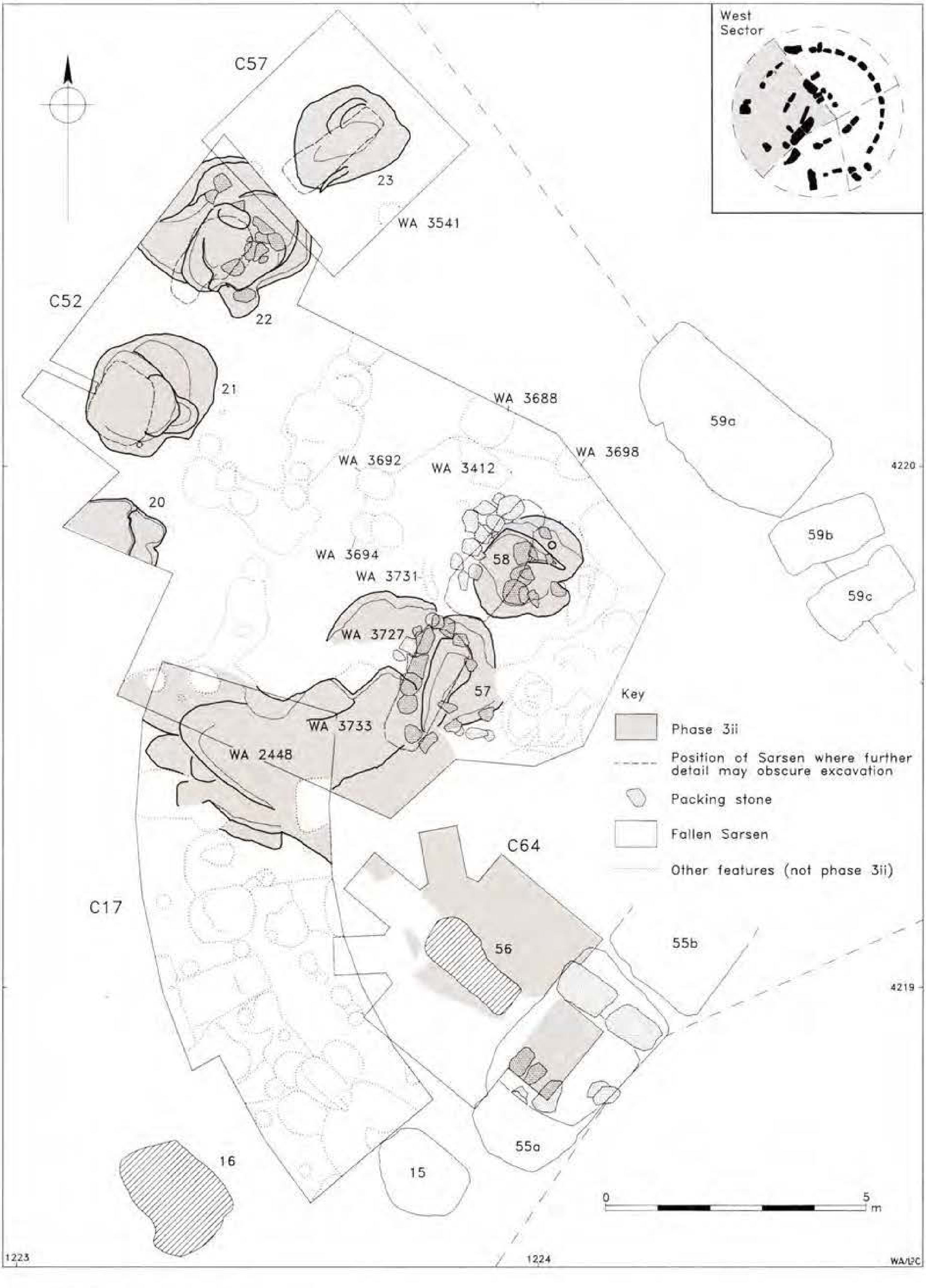



*Fig 100 Phase 3ii: west sector plan*

**Sarsen Circle Stone 14:** Unexcavated (Fig 99).
**State of stone:** Fallen. Date of fall unknown. Does not lie horizontal but has been supported by Stones 38 and 39 since at least the end of the seventeenth century (Chippindale 1990, fig 5).

**Sarsen Circle Stone 15:** Unexcavated (Fig 100)
**State of stone:** Fallen. Date of fall unknown.

**Sarsen Circle Stone 16, WA 44:** Unexcavated (Fig 100).
**State of stone:** Standing.

**Sarsen Circle Stone 17:** Unexcavated.
**State of stone:** Stone absent.

**Sarsen Circle Stone 18:** Unexcavated.
**State of stone:** Stone absent.

**Sarsen Circle Stone 19:** ?Unexcavated, there is no evidence of how much disturbance occurred to the subsoil when the stone was moved in 1958.
**State of stone:** Fallen. Date of fall unknown; removed and replaced 1958 (*see Fig 188*).

**Sarsen Circle Lintel 120:** Unexcavated.
**State of stone:** Fallen and broken. Date of fall unknown.

**Sarsen Circle Stone 20, WA 3714, C32:** This was excavated in 1958 (Fig 100) but is not shown in the section and no spot height is given on the plan.
**State of stone:** Stone absent. Date of fall and/or removal unknown but must have preceded the fall of the fourth Trilithon as the Trilithon's lintel overlay the stonehole.

**Sarsen Circle Stone 21, WA 48, C52:** This was excavated in 1958 (Fig 100). Although the stone lay on a section line the section shows only the stone *in situ* in an unexcavated block (Fig 143, Sc 52.2); there is no later version showing the stone removed and it is not clear whether this was done, as there is a line on the plan which could be the outline of the stone still in place (Fig 285). There is no spot height shown on the plan. Unusually, the erection ramp for this stone was on the inner rather than the outer side. Atkinson commented that this is the only one of the excavated stones to be so treated (Atkinson 1979, 207), although Stonehole 27 also appears larger on the interior side than on the exterior.
**State of stone:** Standing; lifted and reset. MoW plan says straightened (*see Fig 188*).

**Sarsen Circle Lintel 122:** 'When the broken lintel belonging to these two stones (122) was being repaired, two sets of mortices were found on its under surface' (Atkinson 1979, 208).
**State of stone:** Lintel now in place, fell on 31/12/1900 and was replaced in 1958.

**Sarsen Circle Stone 22, WA 3406, C52:** Excavated in 1958 (Fig 100). Although shown as being on a section line the stonehole is not shown in section nor is there a spot height on the plan (Fig 285). Atkinson noted that there was 'clear evidence that the Stone had been erected from the outside' (1979 207). A possible posthole between Stones 22 and 23 is shown in the edge of C57 (*see below*) but lies partly below the concrete now surrounding the stone.
**State of stone:** Standing. Fell on 31/12/1900 and was re-erected 1958 and set in concrete (*see Fig 188*).

**Sarsen Circle Stone 23, WA 50, C57:** Excavated 1964 (Fig 100), the plan of this feature (Fig 288) implies maximum dimensions of *c* 90in by 72in (2.28m by 1.83m) although this may include an erection ramp on the outside of the hole as the north-profile shows a sloping side on the exterior (Archive drwg no 406). No spot height is given on the plan but the maximum depth in profile is *c* 1.06m (although it is unclear if this is from the undisturbed chalk surface). No finds are recorded from the stonehole.
**State of stone:** Standing. Fell in March 1963, re-erected in 1964 (*see Fig 188*).

**Sarsen Circle Stone 24:** Unexcavated
**State of stone:** Stone absent.

**Sarsen Circle Stone 25, C114:** A small excavation was undertaken by Atkinson in 1964 at the western end of this stone. Evidence is from a MoW plan only (Archive drwg no 425). No other details are available.
**State of stone:** Fallen. Date of fall unknown.

**Sarsen Circle Stone 26 :** Unexcavated, although the eastern edge of the stone lies within C58 (Fig 96). The section (Fig 148, Sc 58.2) shows 'fine soil' beneath the stone, and this is likely to be disturbance or recent fill rather than the fill of its stonehole.
**State of stone:** Fallen; date of fall unknown.

**Sarsen Circle Lintel 127:** Unexcavated.
**State of stone:** Fallen. date of fall unknown but pre-1740 (date of John Wood's Survey).

**Sarsen Circle Stone 28:** Unexcavated (Fig 96); although C58, around Stone 27, approaches this stone, there is no indication in either plan or sections that the stonehole for this stone was excavated or even encountered.
**State of stone:** Standing.

***Trilithon 1***
**Trilithon Stone 51, WA 110:** Unexcavated, apart from the eastern end of its erection ramp, encountered in the south-western end of C45 (Figs 97 and 101). When parchmarks were recorded in 1994, however, rectangular parched areas showed against the exterior faces of both Stone 51 and 52. These were similar in appearance to the parchmarks caused by the backfill in several of the excavated areas, but there is no indication in the archive that these stones have been excavated. Augering in 1994 (Wessex Archaeology 1994b; auger hole 6; *see Fig 290*) within 2m of the stones recovered clinker at a depth in excess of 0.15m. Clinker was used to backfill many of the excavation trenches (see Chapter 8) and it is therefore possible that an unrecorded excavation took place here.

**Trilithon Lintel 152:** Lintel in place (Plate 7.3).

**Trilithon Stone 52, WA 112:** Unexcavated; although the eastern end of its erection ramp was excavated in the western end of C14 (Fig 97).

*Fig 101 Trilithon 51/52 (Wessex Archaeology)*

*Fig 102 Stone 56 (Wessex Archaeology)*

**State of Trilithon:** Standing with Lintel in place.

***Trilithon II***

**Trilithon Stone 53, WA 115 (C56):** Excavated in 1964 (Fig 99; Plate 4.3), the Stonehole was shown by excavation to have been disturbed on the inner face by the digging of a large hole (WA 3536; Figs 147 and 288) which must have been relatively modern as it cut through the Stonehenge Layer. The exterior part of the feature was filled with packing stones in a matrix which is not described. No spot depth is given on the plan but the feature would appear to be at least 54in (1.37m) deep. Maximum dimensions from the plan are *c* 7ft 2in by 9ft (2.23 by 2.74m), although the erection ramp runs out of the cutting to the south-east. Finds may include a fragment of antler tine from 'chalk rubble at very bottom of hole' (S.64.21, WA 3516), which must be either from this stonehole or from that of Stone 54. This has been radiocarbon dated (OxA-4840, 3985±45 BP; 2850–2400 cal BC).

**Trilithon Lintel 154:** Lintel in place.

**Trilithon Stone 54, WA 118, C56:** Excavated in 1964 (Fig 99), the southern end of the erection ramp lay outside the cutting to the south-east but the plan (Fig 288) indicates maximum dimensions of at least 11ft 6in by 9ft (3.5 by 2.74m). A spot height is not given but the hole appears to have been at least 6ft 6in (1.98m) deep (probably from the top of the undisturbed chalk). The sections of this feature show several large packing stones in an matrix which is not described (Fig 147). One small Beaker sherd was recovered from the fill of the stonehole (fingernail decorated, fabric Bkr/G1).

**State of Trilithon:** Standing with lintel in place; straightened in 1964.

***Trilithon III, the 'Great Trilithon'***

**Trilithon Stone 55, WA 4143:** Gowland excavated beneath one part of this stone (55a) which is fallen and broken into two parts (excavation Q, Gowland 1902, 52–4, figs 7 and 12) (Plate 5.3). He did not find a clear well-cut hole but only a 'shallow cavity' and he postulated that the stone had stood in the cavity, propped and wedged by sarsen stones which he found lying under the fallen stone. The 'cavity' as it shows in section is barely 2ft (0.61m) deep (*op cit*, fig 12) and it seems unlikely that such a large stone could have stood in it. Without full excavation of the area under 55a, however, Gowland's observations and interpretation cannot be tested. The section which shows the 'cavity' (ie Gowland 1902, fig 12) also shows a much clearer and deeper cut which looks similar to the stonehole for Stone 56. This, however, if it was the hole for 55, would place that stone too far into the interior to line up with Stone 56. Gowland does not explicitly describe this cut but he may be referring to it when he describes how two of the blocks of sarsen which he considered to have been supports for Stone 55 when it was standing 'had the ground entirely cut away from above and almost completely from around them. Any attempt to raise or dislodge these blocks would certainly have caused the fall of the monolith' (*op cit*, 56; *see also op cit*, 96–8). This description could be interpreted as an indication of a cut from a high level, and therefore recent in date, but the description is so unclear that the section cannot be interpreted with confidence.

**Trilithon Lintel 156:** Fallen, date of fall unknown. This lintel appears to have two unfinished mortice holes on its 'upper' side (Atkinson 1979, 43) (Plate 5.2).

**Trilithon Stone 56, WA 123, C64):** Excavated mainly by Gowland as a result of his work to stabilise the remaining stone of the Trilithon (Fig 102; Plate 5.1). Gowland's excavations revealed a substantial stonehole, 5ft (1.52m) deep from the surface of the chalk bedrock and 7ft (2.13m) from the ground surface (Figs 86 and 100). The extent of this stonehole is difficult to establish in plan but it is clear that it did not extend far to the south-west (ie from the external flat side of the stone) where Gowland found a clear, vertical edge to the hole less than a foot (0.3m) from its base (Gowland 1902, 49, fig 9). Gowland's figure 8 (*ibid*, 48) appears also to show the very edge of a probably weathered cut immediately to the south-west of the stone and indicates that the hole cannot have extended more than half a metre in that direction (*ibid*, 48, fig 8; the letters on this section are in reverse order, as they do not match the order given on the plan, fig 7; Fig 150). The same is indicated on the south-eastern side with a sharp, vertical cut directly to the south of the stone and the hole not extending to the south-east even as far as the section at the edge of the cutting, 2ft (0.61m) from the stone (*ibid*, figs 7 and 10). To the north-east and particularly to the north-west the picture is not so clear and has important implications for features in cuttings C17 and C52.

The area to the north-east (*ie* the flat interior side) of Stone 56, in Gowland's trench V (Fig 149), was

> of an entirely different character from that on the opposite side ... The chalk rock was found to have been entirely dug away and removed for a distance of at least 6 feet [1.83m] from the base of the Stone, and to a depth of 7ft [2.13m] at the west corner of the excavation and of 11 feet (3.35m) at the south-east end.
>
> (Gowland 1902, 54, fig 13)

The lowest point of the stone was at 8ft 3in (2.5m) below the datum line which in this cutting was *c* 1ft (0.30m) above ground level. The fill was of chalk rubble. Stone 68 of the Bluestone Horseshoe occurs in this area and from the section (*ibid*, fig 13; Fig 150, Sc 64.3) it is clear that it must be contemporary with or later than the filling of the stonehole for Stone 56. No cut-line is visible in the fill of the sarsen stonehole, but it is uncertain whether, had the hole for Stone 68 cut the fill of Stonehole 56, it would have been noticed (the line which appears to be a cut for Stone 56 in this figure shows the position occupied by Stone 56 when it was leaning).

To the north, that is, beyond the northern angle of the stone and immediately to the north-west of its short western side, the picture is very unclear. The most problematic of the cuttings is Gowland's cutting VI (*ibid*, fig 29, 102–3; Fig 149). The two sections of this cutting along its south-western (Fig 149, Sc 64.1) and north-western (Fig 149, Sc 64.2) sides show the cut of the stonehole at the end nearest Stone 56 extending to a depth of 7ft (2.1m) below the datum (which here is approximately at ground level). A vertical cut at the end of the trench furthest from the stone is shown extending to *c* 6ft (1.8m) below ground surface (Fig 149, Sc 64.2). The relationship between these two cuts is not described by Gowland. As this relationship is important the description of this section needs to be given in full.

> At the bottom of layer 5 the chalk rock was reached in divisions F R M [Sc 64.2]. It was then found that the this rock extended only to about 1 foot six inches [0.46m] from the south-west side of the excavation, the other 1 foot six inches [0.46m] being chalk mixed with more or less earth ... the chalk rock was found to have been cut away to form an almost perpendicular face in a line with the middle of the long axis of the base of monolith No. 56.
>
> (Gowland 1902, 102)

The (longitudinal) half of the excavation which was not chalk rock (ie the north-eastern half) consisted of earthy chalk rubble down to its lowest point and this was disturbed by rabbit burrows down to 6ft 6in (2m), that is, almost to the bottom.

The same feature may also have been excavated in C17 and C52 both by Hawley and by Atkinson *et al*, but there may have been more than one deep feature in this area. The evidence is open to differing interpretations. The observations are discussed in more detail below, by excavation.

**State of Trilithon:** Stone 55 is fallen and broken. The date of its fall is unknown; it appears to have already fallen by 1573–75 when the monument was drawn by Lucas de Heere (Chippindale 1983, 33–4). Stone 56, the largest stone of the monument, is standing, having been straightened in 1901 (Fig 188).

### *Trilithon IV*

**Trilithon Stone 57, WA 125, C52:** The Stonehole was excavated in 1958 (Fig 100) and re-erected in the same year (Fig 103). The area around this Trilithon was disturbed. A number of stones had fallen (57, 58, 22, 158, and 122) and the disturbances included relatively recent intusions. The spot height on the plan indicates that the base of the hole was only 3ft (0.91m) deep below the undisturbed chalk level. Atkinson (1979) mentions that the hole was very shallow and notes that this 'doubtless accounts for the absence of any well defined ramp ...' (*ibid*, 207). The section (Fig 143, Sc 52.2) shows that much of the fill was disturbed although some packing stones (Fig 104), 'compressed chalk' and 'chalk packing' remained *in situ*. Atkinson notes that '... on the inner side, were traces of decayed anti-friction stakes which served to protect the back of the hole from being crushed by the toe of the Stone, as it was being raised' (1979, 207).

At least two large features, for which there is no other information, appear on the plan immediately adjacent to the Stonehole (WA 3727 and 3733). Relationships with these features (if any), are unclear, but 3727 could be an ill-defined ramp and 3733 possibly part of the ramp for stone 56 (see below). The relationship between the hole for Stone 57 and the complex feature which may be the ramp for 56 is unclear, but there would appear to have been a stratigraphic relationship, although presumably only reflecting the sequence of construction rather than a difference in date.

*Fig 103 Trilithon 57/58 with Bluestones 69 and 70 in front (Wessex Archaeology)*

The only finds from the Stonehole are a Romano-British pottery sherd (S58.14) from 'top of stone impression in earthy filling' and a flint scraper from disturbed soil below the turf (S58.15). A chalk phallus (Atkinson cat no S58.16, Fig 224) was recovered from disturbed rubble outside the stonehole.

**Trilithon Lintel 158:** Lintel replaced in position in 1958.

**Trilithon Stone 58, WA 128:** The Stonehole was exavated in 1958 (C52; Figs 100 and 103). The area had been subject to much disturbance including a feature annotated as the 'Gypsey howk' (*see Chapter 8*). Atkinson mentions that the hole was very shallow and suggests that this 'doubtless accounts for the absence of any well defined ramp ...' (1979, 207). The spot heights on the plan indicate that the base of hole was between 3ft and 4ft (0.91–1.22m) below the undisturbed chalk level. The section (Fig 143, Sc 52.3) shows that although most of the upper portion of the hole was filled with modern earthy rubble some packed and coarse chalk rubble remained. A number of packing stones were also present. A stakehole (WA 3384) was identified within the packed chalk rubble. As for Stone 57, Atkinson noted that '... on the inner side, were traces of decayed anti-friction stakes which served to protect the back of the hole from being crushed by the toe of the Stone, as it was being raised' (1979, 207). The section

*Fig 104 Stoneholes for Stones 58 and 57 under excavation in 1958, showing packing stones, looking east (P50080)*

also demonstrates the large amount of disturbance caused by both humans and animals.

The recorded finds from this feature include glass and clay pipe recovered from disturbed upper contexts, and animal bone and clay pipe recovered by workmen. Some samples of 'concrete' from within the hole were retained. This was probably similar to the substance found by Hawley in other stoneholes.

**State of Trilithon:** Standing. Stones 57 and 58 (and presumably 158) fell on 3/1/1797, as noted by Chippindale (1983, 113):

> The Trilithon had long been leaning. The immediate cause of its collapse was a sudden and very rapid thaw after very deep snow. Gypsies were in the habit of camping at Stonehenge before the Wiltshire fairs and it was said they dug a hole in 1796 the better to shelter beside the Trilithon. Water gathering in the scoop had done the rest.

The Trilithon was re-erected in 1958 (Figs 103 and 188).

### *Trilithon V*

**Trilithon Stone 59, WA 3425:** In the course of examining fallen Stone 72, Hawley removed 'a little of the turf from the edges up to fallen Stone of the 5th Trilithon No 59a' (2/9/1924).

In 1959 Atkinson *et al* partially excavated the northern edge of the stonehole which is largely covered by the fallen Stone 59a. On the plan (Fig 287) a stump of Stone 59 (Fig 100) is shown within the feature as are several packing stones. One section shows rammed rubble around this stump. Other sections show the ground around the stone to be disturbed, the upper fills of the stonehole being filled with disturbed earthy rubble (Fig 145, Sc 1–3). No finds are listed for the 1959 excavations.

**Trilithon Lintel 160:** Unexcavated.

**Trilithon Stone 60, WA 133, C54:** This feature was excavated by Atkinson *et al* in 1959 (Fig 100). The plan (Fig 287) gives spot heights of up to 3′10″ (1.17m) below datum, but there are no spot heights for the surface of undisturbed chalk, as there is very little present in the cutting and the depth relative to the chalk cannot therefore be calculated. The plan shows a crushed area on the outer edge of the hole (possibly a ramp but filled with earth, WA 3433), and this is considered in phase 3i, above. Packing stones, probable stakeholes, and traces of wood are shown in place around the stone (Fig 287). The sections (Fig 145, Sc 2 and 3) show that although the upper layer of the stonehole was filled with disturbed earthy rubble possibly undisturbed compact coarse rubble and chalky rubble were present at lower levels. No finds are recorded for the 1959 excavations.

**State of Trilithon:** Stone 59 fell and broke into three pieces at an unknown date before 1740 (date of John Wood's Survey). It lies on top of Stone 71. The Lintel also fell, presumably at the same time, and broke into three pieces. Stone 60 is standing, having been straightened in 1959 (*see Fig 188*).

### Excavation beside the Great Trilithon

**1924, Lt-Col Hawley (C17):** This area was first excavated by Lt-Col Hawley in 1924 when he was investigating the Bluestone Circle. This excavation was partial, and the area was later reopened by Atkinson *et al*, who found considerable *in situ* deposits remaining. Hawley encountered a large feature near the fallen third Trilithon which he considered to be the ramp for Stone 57 (of Trilithon IV), then still recumbent. He recorded how they

> came upon the incline in chalk rock for introducing the big Stone [by which he probably means Stone 57, as he has already referred to the 'big stone' as being fallen, so it is clearly not stone 56] to its place. It began 30″ [0.76m] below the surface and the slope was followed down to a depth of 5½ ft (1.7m) where it ended on level rock. Had we been able to advance we should have been near the chalk wall of the pit it stood in [ie at the edge of the Stonehole proper]. It was filled with fine earthy chalk, hard rammed on the top, getting looser lower down and ending in large pieces of clean quarried chalk. It contained only a horn pick and pieces of horn, but amongst the pieces of clean chalk at the bottom there was one which had been roughly cut to the form of an axe.
>
> (1926, 12)

The diary provides some further detail about the nature of the feature and also indicates that the cuts for the Bluestone Circle stoneholes 'probably' cut the large feature, although this cannot be regarded as a certain stratigraphic relationship.

> Found depressions which no doubt held foreign Stones [ie Bluestones of the Bluestone Circle] as they came into the line of the Foreign Stone circle. Below these the soil was loose composite of earthy chalk matter in fine division. When this was partly removed a very smooth sloping side was come upon. Removing soil about it showed that it was extensive and might have been a large crater. A fine stag horn pick was found upon the bottom of the descending side on the west ... A little burnt matter occurred about half way down.
>
> (1/10/1924)

The general lack of finds is noted, and the following day Hawley recorded that it

> was filled with loose earthy chalk which was hardly compressed at the top, but becoming gradually looser as we descended. The lower soil had a good many large pieces of quarried chalk in it ... A very decided dirt line of humus followed the extent of the excavation down the side and upon the bottom. There were no chips of any sort filling the cavity.
>
> (2/10/1924)

Depth is given as 5ft 6in (1.7m) at the bottom of the 'incline' (below ground level) and 30in (0.76m) at the top. Amongst the 'large pieces' of chalk was a possible skeuomorphic chalk axe (context 2449, WA obj no 508, *see Montague, Chapter 9*).

**1956, Atkinson *et al* (C17):** This trench was excavated in sections separated by baulks with the most northerly section ending at the fallen Trilithon Stone 57. The large feature partly excavated by Hawley was re-excavated and it appears that some of the unexcavated parts of it were also excavated. It is described in Appendix I to *Stonehenge*, in which the results of this year and the trench of 1958 are combined (Atkinson 1979, 207–8). The feature was sectioned along both the northern (Fig 137, Sc 17.7) and eastern (Fig 137, Sc 17.8) edges of the cutting, the eastern section lying only 3m from Stone 56 at its closest point (Fig 129 and 105) and shows a filling mainly of chalk rubble of varying compaction. There is noted, however, at both northern and southern ends of the section an earthier fill which, on the northern side at least, appears to be the filling of an earlier feature which had been cut by the ramp for Stone 56. These deposits are recorded as 'earthy' and 'earth, black' on the section. There is an archive note by a previous researcher (P Berridge) that Professor Atkinson agreed that this constituted evidence for an earlier feature. Although, however, the earthy fill on either side of the section must pre-date the chalky fill of the main cut, the

*Fig 105 Antler in situ in Sc 17.8, in C17, looking east (P50354)*

interpretation of the earthier filling as representing an earlier and separate feature may be questioned on the basis of the 1956 section and photographs alone without the additional radiocarbon evidence or the 1958 sections, although these too do not support it. The 'earth, black' on the right side of the section may be interpreted as the initial trample and soil filling, a recognised occasional primary fill of cut features on the site, preceding chalk rubble natural primary filling where it occurs or, as in this case, backfilling of the feature. The 'earthy' filling on the left of section 2, however, is not of the same composition and, as can be seen from the photographs, is a chalky layer or layers; it is not pure chalk rubble like the majority of the filling but nor is it an entirely earthy fill.

The other section across this feature (Fig 137, Sc 17.7) shows the cutting edge at the northern end of C17 where it lay along the side of the fallen Stone 57. This shows that the earthier filling of WA 2451 lay within a cut which began *c* 4ft (1.2m) from the eastern section. As the section Sc 17.7 shows that it ran out of the cutting, it might be expected to have shown in Gowlands trench VI, but either it did not extend that far, or had been removed by the stonehole, or merged into the stonehole. On section its filling is shown as loose rubble (Sc 17.7). It should be noted that the broken line shown in this area in plan is a much later feature WA 2446, which cut only the fill of the large feature.

If the fill of the ramp can be regarded as a natural filling then the earthier material in the lower of the two cuts would have to be seen as a feature belonging to an earlier phase of activity. Clearly the evidence of the sections indicates that there was a deeper cut in the base of the ramp and that its fill was of a different composition to that of the main ramp, but there is no clear evidence that the two events were separated by any great length of time, and some to suggest that they belong simply to one sequence of related events; the sequence which saw the erection of the large Trilithon Stone 56.

This interpretation is strengthened by the results of the 1958 excavation which opened up the area of the ramp to the north, that is, the area adjoining the'earthy' fill seen in section (Fig 137, Sc 17.8). Here it is difficult to distinguish between the large ramp and the stonehole for Stone 57, the latter being very shallow and definable mainly by the lines of sarsen blocks used as packing (*see Fig 106*). Even if a stratigraphic relationship between this feature and WA 2448 and WA 2451 was identifiable, which it is not, this could not prove or disprove the existence of a feature belonging to an earlier phase, only that some elements were earlier than others in the sequence of events.

A suggested sequence of events might therefore be that the ramp for 56 was dug with a step, the step showing as the cut WA 2451, but for some reason was partially backfilled, perhaps to make the drop less abrupt for the stone, with a fill of earthy chalk (WA 2452/2813). Subsequently it was cut into (showing in Fig 137, Sc 17.8), perhaps when the ramp was used, and the ramp then backfilled with the chalky fill WA 2449. The alternative is that a feature at least 1m deep (Sc 17.8) was dug in this area before the ramp for stone 56 was dug, for an unknown purpose. The radiocarbon dates which have now been obtained for antler from the chalky fill and from the 'earthy' fill suggest that if this is the case the two events were very close in time, and it is not possible to envisage WA 2451 as an early feature.

**1958, Atkinson** *et al* **(C52/C17):** In this year Trilithon Stones 57 and 58 were lifted and a cutting (C52) excavated under and around the positions they had occupied when recumbent. Part of C17 was also reopened. Professor Atkinson described the results of both the 1956 and 1958 excavations in the following terms:

> To the west of the fallen trilithon, and partly buried beneath the fallen Stone 57, we found an immense sloping ramp, cut in the chalk and filled with tightly-packed rubble, running inwards and downwards directly towards the base of Stone 56, the surviving upright of the central trilithon. There can be no doubt that this ramp was used in the erection of Stone 56, and for this purpose a ramp would indeed be very necessary, since the bottom of the Stonehole lies about 8ft [2.4m] below the present ground surface, far deeper than in the case of the other sarsen Stones of which we have details.
>
> (1979, 207)

Atkinson took this to indicate that the stone must have been erected from the side, either standing initially on

*Fig 106 1958 excavation of C17 (P51133)*

its narrow western face or turned once upright. Although this seems a difficult method of erecting the stone the evidence for it seems compelling.

The plan and photographs of the 1958 excavation of the remainder of the ramp neither refute nor confirm the existence of an earlier feature. A continuation of cut WA 2451 is not identifiable in the 1958 excavation suggesting perhaps that it was not a discrete feature so much as a step in the ramp floor, perhaps intended to facilitate the movement of the stone, as suggested above. The 1958 photographs illustrate that the main fill of the ramp consisted of tiplines of rubble of varying composition (Fig 106) in which the backfilled cutting, C17 lies immediately to the right). They also show how in plan at least it must have been difficult to distinguish Stonehole 57 from the ramp for Stone 56. As these may have been constructed at more or less the same time this is understandable.

The only method of resolving the question of the existence of a much earlier feature would be positive dating evidence and the evidence now available does not seem to support the argument for a long period of time having passed between the deposition of the fill of WA 2451 and the filling of the remainder of the ramp (*see below, radiocarbon dates*).

**Stratigraphic relationships**

There are few stratigraphic relationships between the Sarsen Circle and Trilithons and other major elements of the monument and only three of those elements are represented: the Q Holes, the Bluestone Oval/Horseshoe, and the Z Holes. The stonehole of Stone 3 of the Sarsen Circle is certainly later than the filling of Q Hole 4 (*see Fig 92*). Bluestone 68 of the Bluestone Oval/Horseshoe stands in the filling of the stonehole for Stone 56 of the Great Trilithon but the relationship is ambiguous as the section by Gowland shows no cut for Stone 68 and it could therefore have been placed within the filling when the stonehole was filled, or be cut into it. As it seems quite likely that Gowland may not have recognised a feature filled with chalk rubble cut into another filled with chalk rubble, there seems a strong possibility that the erection of Stone 68 was later than that of Stone 56. The ramp for Sarsen Circle Stone 7 was cut by Z Hole 7, as described by Hawley in the clearest of terms.

> The incline [ie erection ramp] at no. 7 was more instructive, as the part distant from the stone had not been disturbed. It was examined by opening the Z hole and the incline at the same time, and getting a

> vertical section across them both, with the dividing ridge of solid chalk appearing in the middle. The overlap in the digging of Z hole could now be clearly seen passing over the ridge and above the contents of the incline, proving conclusively that the Z hole was made after the incline.
>
> (Hawley 1925, 29)

Other relationships include the clear sequence identified by Hawley in which Sarsen Stone 8 cut feature WA 2321 which in turn cut a posthole (*see sub-phase 3i, above*). There must also have been others, as for example in C54 where it seems that there must have been a relationship between the stonehole of Stone 60 of the fifth Trilithon and feature WA 3444 which seems likely to have been a stonehole of the Bluestone Oval/Horseshoe (Fig 118) but no relationship is recorded (Fig 287).

There are also strong indications that there were stratigraphic relationships between stoneholes of the Bluestone Circle and the large ramp for Stone 56 of the Great Trilithon in C17. This is a difficult area to interpret as the excavation by Hawley of this part of the Bluestone Circle seems to have been less meticulous than that of some other areas and is certainly less well recorded. In the main he confined his excavations to identifying stones or stoneholes by digging down to where he supposed they might be rather than by excavating larger areas. In his published account the description of this area states only that 'When searching for the Foreign Stone holes between [sarsen] no. 14 and the stone of the Trilithon we came upon the incline in chalk rock for introducing the big stone to its place' (Hawley 1926, 12), but in the Diary account he noted that the foreign stone circle may have cut the large hole for the stone of the Trilithon, as also referred to above.

> Found depressions which no doubt held foreign stones as they came into the line of the Foreign Stone Circle. Below these the soil was loose composite of earthy chalk matter in fine division. When this was partly removed a very smooth sloping side was come upon. Removing soil about it showed that it was extensive and might have been a large crater.
>
> (1.10.1924)

Some support for this may be derived from the section through the ramp for 56 provided by the northern end of C17 (Fig 137, Sc 17.7). The cut filled with WA 2445 (which does not show in plan as the plan is mainly of features in bedrock) is either the emptied trench in which Bluestones of the Circle stood or a robbing trench for the Circle stones, and is an extension of WA 3718 (Fig 122); in either case it indicates that the Bluestone Circle must have been cut into the ramp for Trilithon Stone 56, this ramp also probably cutting a posthole (WA 2442). Although the posthole is projected onto the section it seems unlikely that this would have been done if the relationship then shown in section was misleading (Fig 137, Sc 17.7).

There are interesting possible relationships between the sarsens and other features in one or two other parts of the site but none is conclusive. In C45, for instance (Fig 141, Sc 45.3, bottom right) it is tempting to interpret the stonehole for Bluestone 33 of the Bluestone Circle as cut through the tail end of the ramp for Stone 51 of Trilithon I, with the disturbance more or less following the line of the original cut for Stone 33. This would not be at odds with the other evidence from the site for the Bluestone Circle and Oval/Horseshoe being probably later than the sarsen settings but it must be admitted that this section cannot be held to tip the balance either way, as the crucial point at which the relationship would have been made clear has been destroyed by the disturbance.

**Finds**

With the exception of the many packing stones of various rock types, many of which do not survive in the archive, there were few finds from the holes of the Sarsen Circle and Sarsen Trilithon. In two cases there are pieces of bluestone from the Sarsen Circle: one of calcareous ash from Stonehole 30, and a piece of rhyolite from Stonehole 22. As the presence of bluestone on the site is attested by its occurrence in the Q/R Holes this does no more than confirm that bluestone pieces were already scattered around the site by early in phase 3.

Hawley recovered a piece of worked chalk from the ramp for Stone 56 which he recognised as a skeuomorphic axe, and a chalk phallus was also found in a disturbed context close to the neighbouring stone, 57 (*Montague, Chapter 9*). In both cases it is possible that the objects date to an earlier use and are redeposited in the stoneholes.

Four antler picks are known from stoneholes of this phase: one from the Sarsen Circle and three from those of the Trilithons (*Serjeantson, Chapter 9*). Three of these are radiocarbon dated. It is reasonable to assume that these were used to dig the stoneholes in which they were found or others of the same settings.

**Radiocarbon dates**

There are four radiocarbon dates for this sub-phase: one from the Sarsen Circle and three from the Sarsen Trilithons, one of which is a British Museum date (BM–46; 3670±150 BP). One other date was obtained, from animal bone fragments in the stonehole for Stone 27 of the Sarsen Circle (OxA–4902, 5350±80 BP), but this clearly pre-dates the monument, as it calibrates to 4360–3990 cal BC and must, therefore, be redeposited.

The dates are:

UB–3821, 4023±21 BP, 2655–2485 cal BC. Sarsen Circle stonehole for Stone 1 (Hawley cat no 236A).

OxA–4840, 3985±45 BP, 2850–2400 cal BC. Sarsen Trilithon stonehole for Stones 53 or 54; chalk rubble at bottom (Atkinson cat no S.64.21).

OxA–4839, 3860±40 BP, 2470–2200 cal BC. Erection ramp for Stone 56 of the third Trilithon (Atkinson cat no S.56.52).

BM–46, 3670±150 BP, 2480–1680 cal BC. Erection ramp for Stone 56 of the third Trilithon (no cat number).

The two dates from the erection ramp of 56, one of which (OxA–4839), almost certainly comes from an antler in the lowest, earthy fill (WA 2452) and therefore from the putative early feature (it was collected in 1956 and is probably the piece illustrated in section (Fig 137, Sc 17.8, but it is not possible to be absolutely certain). This, taken with the evidence of the plans, sections, and photographs (discussed above) seems to render unlikely the existence of a deep pre-ramp feature. BM–46 is recorded (in *Radiocarbon* 2, 27) as being from 'clean chalk filling of the ramp leading to Stonehole 56', and was collected in 1958 (and therefore is from C52), according to the entry in *Radiocarbon* (vol 2, 1960, 27).

The dates for the Trilithon setting and Circle do not form a coherent and obviously contemporary group, and reasons for this are discussed in Chapter 10 and Appendix 2, below. It is clear, however, that the erection of the Circle was early in the sequence, and the practical difficulty of erecting the Trilithons, once the Circle was in place (and assuming that it was a complete circuit), suggests that it is unlikely that the Trilithons are later.

**Discussion**

The construction of the Circle and the Trilithons is described in detail by Atkinson and the above-ground details will not be reiterated here (Atkinson 1979, 36–47, 122–41). Atkinson argued, and the argument seems reasonable, that it is unnecessarily complicated to see the construction of the Circle and Trilithons as separate operations as although there is no positive evidence that they are contemporaneous the similarity of construction suggests strongly that they are (*ibid*, 78). This argument seems reasonable, as does the reasoning that points out the difficulties of erecting the Trilithons once the Sarsen Circle was in place (*ibid*, 77–8). Although the new radiocarbon dates cast doubt on the contemporaneity of the Trilithons and Circle, because the radiocarbon sequence appears to contradict the commonsense arguments for the sequence of the erection (*see Appendix 2 and Table 65*), the dates are so few in number that there do not yet seem to be sufficient grounds for accepting that the Trilithons post-date the construction of the Circle.

In any discussion of the complexities of construction the question of whether the Circle was complete must be considered. That it may not have been is suggested by the smallness and unsuitability of Stone 11 as a Stone for the Circle. This stone is smaller in all dimensions than the other surviving sarsens, at only *c* 1.2m wide, 0.6m thick and 2.4m above-ground height, compared with an average width of 2.1m, a range of thickness of 0.9–1.2m, and an average above-ground height of approximately 4.1m (Atkinson 1979, 37–8). Atkinson does not, however, reject it as a standing element of the Circle, pointing out that its present lack of height is presumably due to its having broken in the past, although it must always have been undersized in width and depth. Even if this stone did not ever function as a support, and there is no positive evidence that it did not, it would not imply that the Circle was 'unfinished' in the sense that the plan was abandoned. It is equally possible that the makers and users of the monument, although unable to technically complete the structure, did for their purposes regard the monument as finished. As long as it fulfilled their needs it must have been regarded as 'complete', and as it did function as a monument for many generations it presumably was that to its users. It might also be noted here that it is possible that even if the full Circle was achieved it may not have survived in a complete form for long, as stones may have fallen during the use of the monument.

Some of the stoneholes are very shallow and may have led to instability of the structure early on in its history and while it is difficult to envisage the monument being used with the fallen stones of the Great Trilithon lying where they are now, it is more likely in the case of Sarsen Circle stones, particularly if they fell outwards. If Z Hole 8 does not lie under Stone 8 of the Sarsen Circle this would confirm this interpretation, and there is only the inconclusive evidence of probing to suggest that it is present (Atkinson, who was confident that it did exist, pers comm). It is also perhaps worth noting that the fact that there are many more sarsens missing from the southen part of the Circle than the rest is perhaps an indication that there was some feature of that length of the circuit which encouraged wrecking, such as the fact that the Circle was already incomplete in that area.

A practical point worth noting in addition to Atkinson's description of the likeliest method of raising the stones into position (*ibid*, 131–3), is that Hawley commented on the occurrence of burning in some of the stoneholes. This appeared to have taken place *in situ*, and he accounted for it by postulating that the stakes and posts used to help guide the stones into position and protect the edge of the stonehole would have been burnt once the stone was in position and before the packing material was put into the hole, as decaying posts remaining in the holes could have caused voids and therefore instability once the stone had been in position for some time (Hawley 1921, 22). This is a plausible explanation but the posts do not always seem to have been burnt so it may not have been an invariable practice.

If the Sarsen Circle and Trilithons are accepted as being broadly contemporaneous and were standing early


*Fig 107 Phase 3iii: all features plan*

in the history of phase 3 of the monument, it is necessary to consider what, if anything, they were standing with, and here, as explained elsewhere (*Chapter 10*), this sub-phase must be considered in conjunction with phase 3iii, below. It seems quite possible that the Q/R Bluestone setting was dismantled to create another Bluestone setting, perhaps incorporating trilithons, which may have stood with the sarsen setting.

## Phase 3iii: pre-Bluestone Circle/Horseshoe features

It is impossible to assign all features within the monument to phase and sub-phase and, indeed, to attempt this would be a mistake. There are several features which it is impossible to assign to phase or sub-phase with any confidence (these are discussed in the 'Unphased' sec-

*Fig 108 Bluestone lintel 36 of the apparent pre-Bluestone Oval/Circle setting raised on planks having been lifted from C47 in 1954. The mortises and finely tooled shaping are very clear. The stone was replaced in its pre-excavation position and these features are now only partly visible (P50799)*

tion, below), but there are also a small number which occur within sequences which end with Bluestones of the Oval/Horsehoe. These are assumed not to be early in the history of the monument, as they directly stratigraphically precede a fairly late feature (ie the Bluestone settings) and in some cases succeed earlier features, and are therefore considered as part of the stone monument of phase 3. To enable them to be discussed as a whole they have been assigned to sub-phase 3iii, although this is a term of convenience rather than assumed to be a real, coherent, and separate stage in the development of the monument. That there was a 'missing' element in the development of the monument is, however, suggested by the features of the Bluestones themselves which led Atkinson to propose a 'dressed bluestone setting' (ie his phase IIIB).

Consideration must be given in any interpretation of the monument to the observations by Lt-Col Hawley, Professor Atkinson, and others, that the present Bluestone settings include stones which have been more elaborately dressed to shape than the simple dressing of the majority of the stones of the Bluestone Horseshoe. These elaborately dressed stones include two lintels (Stones 36 and 150) and at least two uprights with tenons (Stones 67 and 70, and possibly also 69), and the tongue and groove pair (Stones 66 and 68; Atkinson 1979, 55; Fig 116). The identification by Professor Atkinson of wear close to the mortises on the underside of the lintel Stone 36 indicates that this lintel had stood *in situ* for some time before it was dismantled (*ibid*, 52–3, plate 18b; Fig 108); this implies, therefore, a setting either at Stonehenge or elsewhere in which there were at least two trilithons and a tongue and groove pair.

A simple equation of the pre-Bluestone Oval/Horseshoe features with the dressed Bluestone structure is not possible, but the insertion of sub-phase 3iii in the sequence is intended to indicate the likelihood that there was a period of construction which we are unable to identify or accurately place chronologically.

### Description

All features described lie within cuttings of the west sector (Figs 107 and 109). WA cut numbers are followed, where appropriate, by context numbers in parenthesis.

**WA 3268 (3267), C35:** An approximately circular feature, its upper part recut by 3269 (Bluestone Oval/Horseshoe stonehole) and its original dimensions therefore not certain. It cut the Crescentic Feature 3279, and would have removed any stone impression present at the end of that feature (Fig 110). It was 3ft 6in (1.1m) deep below the level of undisturbed chalk and was filled with 'loose grey rubble' (Figs 139, 283, 284). The feature is described as a stonehole in *Stonehenge* (Atkinson 1979, 211).

**WA 3270, C35:** A roughly oval feature, with a maximum diameter of at least 2ft 3in (0.68m). It was only clipped by section (Fig 139, Sc 35.2) and its full profile and depth cannot be established. At its edge, in the section, it was filled by the compacted chalk layer WA 3266 which appears to have been the packing for Stone 70b of the Bluestone Oval and Horseshoe (ie phases iv and v) but as this is so near its edge it may not be its real fill and it seems more likely that this is a feature either backfilled or sealed with compact chalk, and therefore pre-dating the Oval/Horseshoe setting. As the compact chalk seems to be associated with the construction of the Oval/Horsehoe setting, the use of WA 3270 may have only been in the preceding period rather than in a much earlier one. There are no spot heights to the top of the chalk surface in C35 so that the depth from the chalk surface cannot be calculated. Photographs suggest that this was not a substantial feature (Fig 110).

**WA 3284 (3683), C35:** Excavated mainly in 1956 (C35) but it lay within the area reopened as part of C52 (1958). It appears to have been contiguous with WA 3286 and, like it, sealed by a compacted chalk layer elsewhere referred to as 'morganite' (WA 3282). It had a maximum depth of approximately 3ft (0.9m) below undisturbed chalk surface and it was filled with 'rubble' or 'loose grey rubble' (Fig 139, Sc 35.3 and 35.4), which appeared not to be distinguishable from the fill of WA 3286.

**WA 3285 (fill of recent material), C35:** Excavated in 1956 (C35). It had a maximum depth of *c* 2ft (0.6m) below the undisturbed chalk surface and its filling is recorded as entirely disturbed. Although shallower than the neighbouring feature WA 3286 and only partially excavated, it appears likely to be of a regular, oval shape and it is possible that it was a disturbed feature contemporary with 3286 and 3284, with which it forms a line.

**WA 3286 (3283), C35:** Excavated in 1956 (C35). It had a maximum depth of *c* 3ft (0.90m) below the level of the

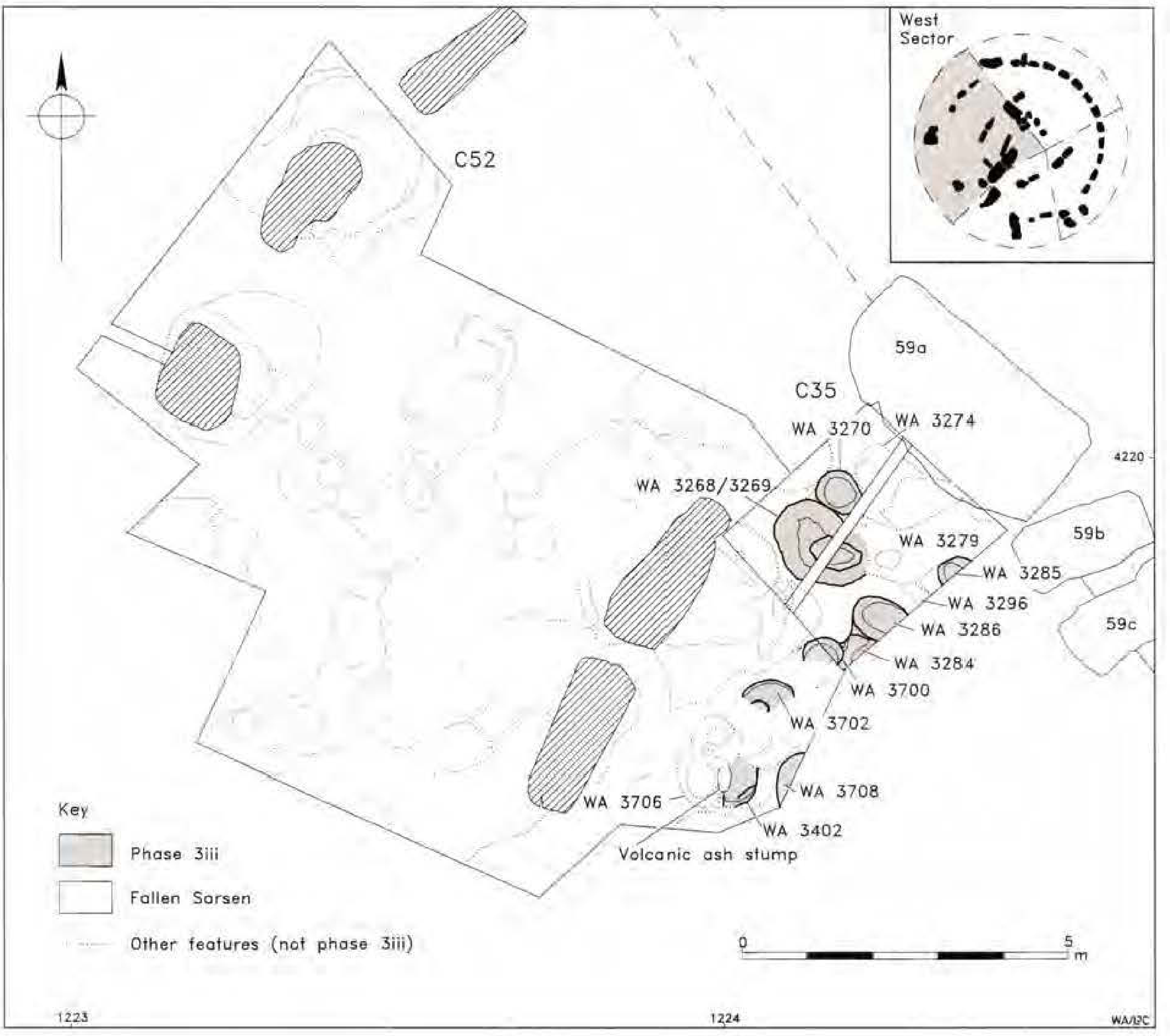



*Fig 109 Phase 3iii: west sector plan*

undisturbed chalk surface and is contiguous with WA 3284 (Sc 35.3). In a note in archive, in which P Berridge records Professor Atkinson's comments, this feature is noted as belonging to an inner setting of Atkinson's phase IIIB. As the feature was not cut by a feature of the Bluestone Horseshoe the attribution to this phase must be solely on the grounds that it was sealed by a layer of 'morganite' (described in the same archive note as a hard puddled chalk, giving a concrete-like finish, and used to seal stoneholes). This material was used to seal the backfilled feature WA 3268 and to pack the stonehole for the Bluestone Oval/Horseshoe above it (Fig 139; Sc 35.1). It is impossible to ascertain whether the same layer (WA 3266) sealed this feature (ie 3286) but even so the similarity in the material and the use made of it was presumably such as to suggest contemporaneity. It is not clear from the archive notes, plan, and sections whether there was a clear stone impression on the base of the feature although the fact that Atkinson ascribed it to an inner setting suggests that there was.

**WA 3402, C52:** This feature is shown in section (Fig 144, Sc 52.6) to be clearly cut by the stonehole for Stone 69 of the Bluestone Horseshoe. It is also shown in plan (Fig 285) where it is annotated as 'IIIB' stonehole', that is, it was thought to belong to the setting of dressed Bluestones that must have preceded the present settings. It was *c* 0.40–0.70m in diameter, and 0.70m deep below the undisturbed chalk surface. In section the remains of a volcanic ash stump are shown as a thin lens almost on its base (Fig 144, Sc 52.6) and this is also shown in plan as an area 0.37m by 0.24m. The plan is difficult to interpret, however, as the lens of volcanic ash is shown as lying across the junction between two features: the feature marked as a 'IIIB stonehole' on the plan (WA 3402) and feature WA 3706, which is not annotated and is not on the section. The photographs (Fig 91) suggest that the section ran just east of the eastern limit of 3706. In a single archive drawing (no 807) this complex of features is shown as having held three stones in different phases: Stone 69 in its hole (WA 153) and one each

*Fig 110 General view of phase 3iii features in C35; WA 3268 to the right of the baulk; Crescentic Feature of 3i to bottom left; WA 3286 and 3284 to top left. Looking south-west (P50725)*

*Fig 111 C52 with Stone 69 in front of fallen Trilithon Stones 57 and 58, showing position of sections. See Fig 91 for a close up of the section at bottom left of Stone 69 (P50358)*

in features WA 3706 and WA 3402. It is not clear when this plan was drawn up, and it is the only indication that there may have been some evidence visible in the field for a stone having stood in 3706. The interpretation favoured here, therefore, is that WA 3706 was a stonehole very early in the history of the stone setting (and has been discussed in sub-phase 3i), and that WA 3402 held a stone of volcanic ash in a pre-Bluestone Oval/Horseshoe phase, and so is included here.

**WA 3700, C52/35:** This feature was partially excavated in 1956 (C35) as part of WA 3284. Subsequently, in 1958, it was reopened and fully excavated as part of C52. This revealed it as well-defined and almost circular; it is recorded on the field plan as '?stonehole of pre-IIIC'. It is not shown in section but was presumably cut by the ramp for Stone 69 or by the stonehole for Stone 70, both of the Bluestone Oval/Horseshoe. It appears to form a line with the features which are sealed by 'morganite' (ie WA 3284 and 3286) and the disturbed feature WA 3285.

**WA 3702, C52:** Excavated in 1958 (C52). On plan it is noted as '?stonehole of pre-IIIc', presumably because it was cut by the ramp for the stonehole of Stone 69 of the Bluestone Oval/Horseshoe (Fig 117). There appears to be part of a stone impression surviving, but there are no details of filling or depth.

**WA 3708, C52:** Recorded on plan as a '?II hole' (ie belonging to Atkinson's phase II), the reason for this feature being assigned to phase II, rather than IIIB is not clear, and it is possible that it belongs to a later period than Atkinson's II. As it is noted as possibly of that early date, however, it has also been considered in phase 3i. *For description see sub-phase 3i, above.* In section it is shown as sealed by the fill of the ramp for stonehole 69 of the Bluestone and Oval/Horseshoe and annotated as 'pre-IIIC hole'. (Fig 144, Sc 52.7).

**Stratigraphic relationships**

The identification of features as belonging to this phase is largely on the basis of stratigraphy and at least two of them (WA 3402, and 3268) occur in stratigraphic sequences in which they are clearly the stratigraphic element preceding the erection of a stone of the Bluestone Oval/Horseshoe. Four features are sealed or filled by 'morganite'; in two cases (WA 3268 and 3270) that layer (WA 3266) was certainly the same as that which packed the stonehole of a stone of the Bluestone Oval/Horseshoe (Fig 139, Sc 35.2) and in the two other cases (WA 3284 and 3286) it may also have been the same layer, but this is not recorded.

The other features are more tentatively ascribed to this sub-phase: WA 3708 because in section it is shown sealed by the filling of the ramp for Stone 69, although it is annotated as being possibly of an earlier phase (Atkinson's phase II, *ie* present sub-phase 3i), and 3702 and 3700 because they appear to have been cut by the ramp for Stone 69. WA 3285 is certainly the feature of which the attribution to this sub-phase must be regarded as the weakest, being only on the grounds of its similarity in shape to other stoneholes and the fact that it forms an alignment with other features assigned to this sub-phase. Also in support of this attribution is the fact that the 'morganite' layer which seals the other features could easily have extended over this feature as well, judging by its position at the point at which it is cut by recent disturbance. It is also likely that recent disturbance, for whatever purpose, may have followed the relatively loose fill of an ancient feature in preference to solid chalk, as clearly happened in the case of WA 3639 (*sub-phase 3i, above*).

**Dating evidence**

There are no finds identifiable as from features of this sub-phase and no radiocarbon dates were obtainable.

**Discussion**

As described above, this sub-phase cannot be considered to be a unitary phenomenon as can, for instance, the Sarsen Circle and Trilithons. The assigning of individual features to the sub-phase is uncertain and it is impossible to equate these features firmly with any other elements of the monument. It is incontrovertible, however, that there were features holding stones which preceded the present Bluestone settings and that the present settings include stones which were used in a previous form. Given this it is justifiable to consider the other pre-Bluestone elements from the point of view of the likelihood of any of the 3iii features, or the elaborately dressed Bluestones, forming part of a setting with other major elements of the monument. It should be noted, however, that although all the present Horseshoe Bluestones are dressed, only the elaborately dressed examples, which are clearly reused in their present positions, need have stood in a previous setting.

On superficial examination of the evidence it would seem that the elaborately dressed Bluestones can best be proposed as having stood in the Q and R settings and indeed this is not impossible. These holes do seem to have held standing Bluestones and there were many of them, so that they could have accommodated all the presently dressed Bluestones and not just the elaborately dressed ones. It is also possible that the features of 3iii stood with the Q and R setting although if this were the case it would imply that the Crescentic Feature pre-dated the other stone settings at the monument, as indeed it might as that feature shows no relationship with any earlier feature and could therefore date to phase 2 or even to phase 1. The interpretation favoured here is to place the Crescentic Feature no earlier than the other stone settings at the monument, that is, with the Q and R Holes and this necessitates a post-Q/R dating for the sub-phase 3iii feature WA 3268 which cuts it and the other features which, like it, are sealed by 'morganite' (ie WA 3270, 3286 and 3284).

A more likely combination perhaps is of the 3iii features with the Sarsen Circle and Trilithons; there are no stratigraphic relationships which render this impossible and it has at least two commonsense advantages as an interpretation. In Atkinson's phasing the Bluestones play no part in the plan of the monument for the duration of his phase IIIa which consists only of the Sarsen Circle and Trilithons. This necessitates supposing that the Bluestones were removed to some other place away from the monument and it has sometimes been suggested that it was in this other place that the dressed Bluestones, including the presumed trilithons, stood. This seems unnecessarily complicated and the hypothesis that the dressed Bluestone structure may have been contemporary with the Sarsen Circle and Trilithons (that is, standing in the features termed here 3iii) has the added advantage of placing at the same point in the sequence the two episodes in which the most elaborate dressing of stone took place and the most technically complicated stone structures, both including trilithons.

Whether this setting was erected at the same time as the Sarsen Circle and Trilithons or not it is impossible to suggest a plan for the setting, although it is clear from the arrangement of the identifiable features that it could have stood with the Sarsens. Atkinsons's interpretation of some of the 3iii features, which he equated with the elaborately dressed Bluestone setting and placed in his phase IIIB, is that they formed an oval which in part followed the line of the present Horseshoe and was in part made up of features in C12 which are here considered to be part of sub-phase 3iv. When Atkinson first proposed this theory in the first edition of *Stonehenge* (1956), he suggested that the stoneholes which he calls 'J', 'K', and 'L' (which, confusingly, do not equate with the lettering of features by Hawley in this cutting) were part of this setting (Fig 275, WA 2717, 2730, and 2760 respectively). These are separated by greater distances than the usual gap between stones of the Bluestone Horseshoe and this was the principal argument proposed by Atkinson for suggesting that they were part of a different setting (1979, 82). These features, and two others in C12 (WA 2726 and 2749), considered by Atkinson to be part of the dressed Bluestone setting of his phase IIIB are discussed as part of sub-phase 3iv (*below*).

Subsequently, the reopening of C12 (which had first been excavated by Hawley) and the excavation of C35 and C52, led Atkinson to propose two more features for the setting, both of which have been described above (WA 3268 in C35 and WA 3402 in C52). Both fitted the proposed spacing of the setting which Atkinson suggested was *c* 11ft (3.35m) centre to centre, on the basis of the spacing between the stoneholes in C12 (excluding the stonehole 'K' (WA 2730) which he removed from the setting after he had re-excavated the area and identified two more stoneholes (*ie* WA 2726 and 2749)). This gives a total of six holes identified as being part of this setting (Atkinson 1979, 210; ie WA 3402, 3268, 2717, 2726, 2749, and 2760) which 'were evidently set in an oval, following and completing the circuit of the present bluestone horseshoe, with an interval of about 11ft [3.35m] between one stone and the next. The hole K [ie WA 2730] on the same axis probably belongs to the same setting' (*ibid*), although not to the oval itself, and he also suggests that there may have been a pair of stones opposite K, the only excavated stonehole of which is WA 3359 in C53. This stonehole, for which there is no extant section, was considered too small to have held the Altar Stone but might have held the pair to it (Atkinson 1979, 212). An interesting coda to this is that at the end of the interview held between Professor Atkinson and two of the authors of this volume a few months before his death, his parting words were that he had often thought that the reason for creating the tongue and groove pair could have been to form a large single block which would have more nearly matched the size of the Altar Stone than any other single Bluestone, and that the two joined stones could have stood in the hole WA 3359, with the Altar Stone in a hole in the unexcavated area on the other side of the axis. This possibility is not dismissed here, although without excavation the existence of a pair cannot be confirmed. Even with excavation it is unlikely that such isolated features could be assigned to one particular setting. It does seem probable, however, that the Altar Stone was standing in a hole somewhere within the line of the Sarsen Trilithons when it fell, judging by its present position, although this does not preclude an earlier site for it, as suggested in sub-phase 3i, within the first Bluestone setting.

Overall, however, the interpretation offered by Professor Atkinson for the dressed Bluestone setting is rejected here and it seems from archive notes that Atkinson himself recognised the situation as more complex and unresolved than is suggested in *Stonehenge*. In particular, the archive notes suggest that the possibility of an inner setting of stones within the area enclosed by the present Horeshoe was recognised and was presumably considered to be contemporary with it (notes on C35, referring to WA 3286). This possibility seems reasonable and such a setting could comprise, in addition to WA 3286, features WA 3285, 3284, 3700, 3702, and possibly 3708, although this last may belong to an earlier setting, as discussed above. It is not suggested that any of these holes held the Bluestone trilithons; although it is possible in some cases (perhaps WA 3284 and 3286 for example) since without knowing the exact position of stones within these features they cannot be confirmed or rejected as having held the trilithon uprights. (It is worth noting that the holes for the uprights would have to have been very close together, perhaps touching, or dug as a single feature; the distance of the mortise holes on Bluestone 150, for example, is *c* 0.9m, and with stones of *c* 0.5m width this gives a distance between nearest stone edges of only 0.4m.)

It is tempting to enter into calculationsof the number of Bluestones but this has led previous authors astray, and is probably best resisted. Professor Atkinson's original interpretation, written in 1955, was as follows:

> we know that the number of bluestones available from the dismantled double circle of period II [ie the Q and R Holes] was eighty-two. If sixty [which he has previously explained is the number of the known X and Y Holes plus the hole possibly hidden beneath fallen Sarsen 8] are subtracted from these, twenty-two remain, which is precisely the apparent number of the stones in the dressed bluestone setting (nineteen in the present horseshoe, the two lintels in the circle and the Altar Stone). This correspondence cannot be dismissed as a chance coincidence; and it may accordingly be accepted (as a working hypothesis which covers the observed facts in the simplest way) that the dressed bluestone setting and the Y and Z holes are associated with each other, and form parts of one and the same phase of construction.
>
> (Atkinson 1956, 68)

This is a very clear statement of the situation as perceived early in the history of the excavations by Atkinson *et al*, but unfortunately Professor Atkinson does not appear to have felt that it was possible to present a re-examination of the the hypothesis in the light of the evidence which was obtained after *Stonehenge* was written. Even in the second of the two appendices to the volume, the last published in 1979, the Y and Z Holes are still presented as belonging to phase IIIB although it is suggested that they were dug at the end of that phase (Atkinson 1979, 216). As the radiocarbon date obtained by Professor Atkinson from the Y and Z Holes was a late one (I–2445, 3190±105 BP, which he calibrated to *c* 1540±120 BC (calibration curve unspecified); the date has now been rejected on technical grounds, *see Appendix 2*) the fact that the Y and Z Holes were still seen as firmly tied to phase IIIB had the effect of dating the subsequent phase, IIIC, to the second half of the second millennium BC.

In addition, even by the time the first appendix was written it had become clear that the setting of Q and R Holes did not form the circuit that Atkinson had first presumed, with the clear implication that the assumed total of 82 stones could not be taken as correct. As can be seen from the discussion of the Q and R Holes (*above*) it is impossible to make any sort of guess as to the total number of stones in the setting as there are far too many unknown factors. The initial premise on which the hypothesis formulated by Atkinson had been based, therefore, could no longer be supported. In the current interpretation the evidence of the new radiocarbon dates, which are still moderately late in the second millennium, are taken as an indication only that the Y and Z Holes are late, and the only other implication of this, on stratigraphic grounds, is that the Sarsen Circle, the erection ramps for some of the stones being cut by Z Holes, is earlier than this. As the Y and Z holes do seem to have been intended as stoneholes (*see below*) part of the Atkinson interpretation may be retained, in that it is quite likely that the intention was to move some of the Bluestones, but it is beyond the realms of archaeology to establish whether these were to be derived from one of the settings or from an outside source.

It is salutary also to consider the other assumption inherent in the interpretion of Professor Atkinson, presented above, which is that given that the initial number of stones was 82 (and assuming for a moment that it was), then the number of stones in the dressed stone setting matches the difference between the number of Y and Z Holes (60, assuming the missing Z8) and 82, that is, it is the 19 stones which seem reasonably likely to be the number standing in the present Horseshoe, plus the two lintels. Even if the assumptions regarding ZH8 and the original 82 stones are ignored there is also one other assumption made in this: that all 19 stones of the present dressed setting (ie the Horseshoe) had stood in the previous dressed setting. In fact, only the elaborately dressed stones 36, 66, 68, 70, 150, and possibly 67, need have stood in the earlier setting, as they are the only stones to show signs of having been dressed for a position they now no longer fill. The remaining dressed stones of the present Horseshoe could have been dressed only to stand in the positions they now occupy and now that it seems clear that the total number of stones standing in the Q and R Holes was not as large as 82, it is no longer so difficult to envisage how all of them might have been used in a phase pre-dating the existing settings. The present total of all Bluestones now at the site need only have been reached by bringing in Bluestones for those settings, that is, late in the sequence.

It is not possible even on the evidence now available to do more than Atkinson did, that is to present a hypothesis. The premise that there was a setting of elaborately dressed Bluestones standing within the monument is accepted and it is suggested here that it may have been constructed close in time to the Sarsen Circle and Trilithons, so that, essentially, sub-phases 3ii and 3iii may represent a more or less single episode of use of the monument. The recognition of some depth of stratigraphy in C35, below a stonehole which appears to belong to the Bluestone Oval/Horseshoe, suggests, though it cannot prove, the presence of some features which may belong to this setting. It is not accepted, however, that this setting took the form of an oval on the line of the present Horseshoe but rather that it consisted of a number of features which cannot, on present evidence, be seen to form a recognisable geometric form. Only two seem to have lain close to the line of the present Bluestone Horseshoe: WA 3268 and WA 3402, and possibly also WA 3270, the remainder appearing to form an alignment within the present line of the Horsehoe. This also does not include other possibly contemporaneous features in other parts of the site which cannot be certainly assigned to this sub-phase and which are described as unphased (*below*), since they cannot be seen to have even likely relationships with any other single sub-phase. There is a particular problem in dealing with this phase in that the corresponding area on the eastern side of the interior has not been excavated and there may well be features of a complementary setting on that side. The occurrence of features in the small holes dug for concrete pads around the second Trilithon (Stones 53 and 54) (*see below, unphased features*) suggest that this may well be the case and the possibility also of a setting of at least two stones around the axis has already been discussed.

One last point worthy of note is that Atkinson could identify no stonehole(s) which are likely to have held either the Bluestone trilithons or the tongue and groove pair and none are suggested here. One possibility which has not been considered hitherto is that at least one of the trilithons was supported by the tongue and groove pair, as it may be incorrect to assume that the tongue and groove stones were actually intended to fit together. It is possible to suggest a connection without them being physically joined, that is, that the join was symbolic rather than actual. The upper part of the tongued Stone 66 is missing and the top of Stone 68 does not show any positive evidence for having had a tenon, but tenons had been removed effectively from Stones 67 and 70, and possibly also from Stone 69. If the tongue and groove pair did support a lintel then either Stone 67 or Stone 69 must be considered as having been misidentified as trilithon supports, as there would be otherwise one too many trilithon uprights, but this is entirely speculative as it is difficult to envisage a manner in which it could be proved or refuted. There seems no question of the lintels belonging to a continuous setting rather than separate trilithons, as the mortise holes are too far from the ends of the stones for that to be possible.

## Phase 3iv: the Bluestone Circle and Oval

As this proposed sub-phase of phase 3 is made up of a number of discrete features arranged in two concentric elements separated by some 5–6m it would not be reasonable to expect to be able to demonstrate stratigraphically either that all the features belong to the phase or that the two major concentric elements – the Circle and the Oval – were erected as part of the same plan. The two main elements presented here, and the features of which they appear to be composed, are the result of a necessarily subjective evaluation of the likelihood of particular features standing together and of the contemporaneity of the larger stone settings to which they apparently belong.

This sub-phase comprises a major reorganisation of the stone settings within the interior. There are three main elements – a northern arc, a circle, and a horseshoe – which probably belong to two major settings, the Bluestone Circle (Figs 112 and 113) and the Bluestone Oval (Figs 114 and 115). The internal association between the stones of each of these three elements seems, on a common sense basis, to be stronger than the association between the different elements; it is easier, for instance, to accept that the stones of the Bluestone Circle were placed there as part of one plan than that the Horseshoe of Bluestones was erected at the same time, but there are no relationships which demonstrate contemporaneity of features either within the settings or between them.

It should be stressed, therefore, that the elements are placed here largely on an interpretation of their plans.

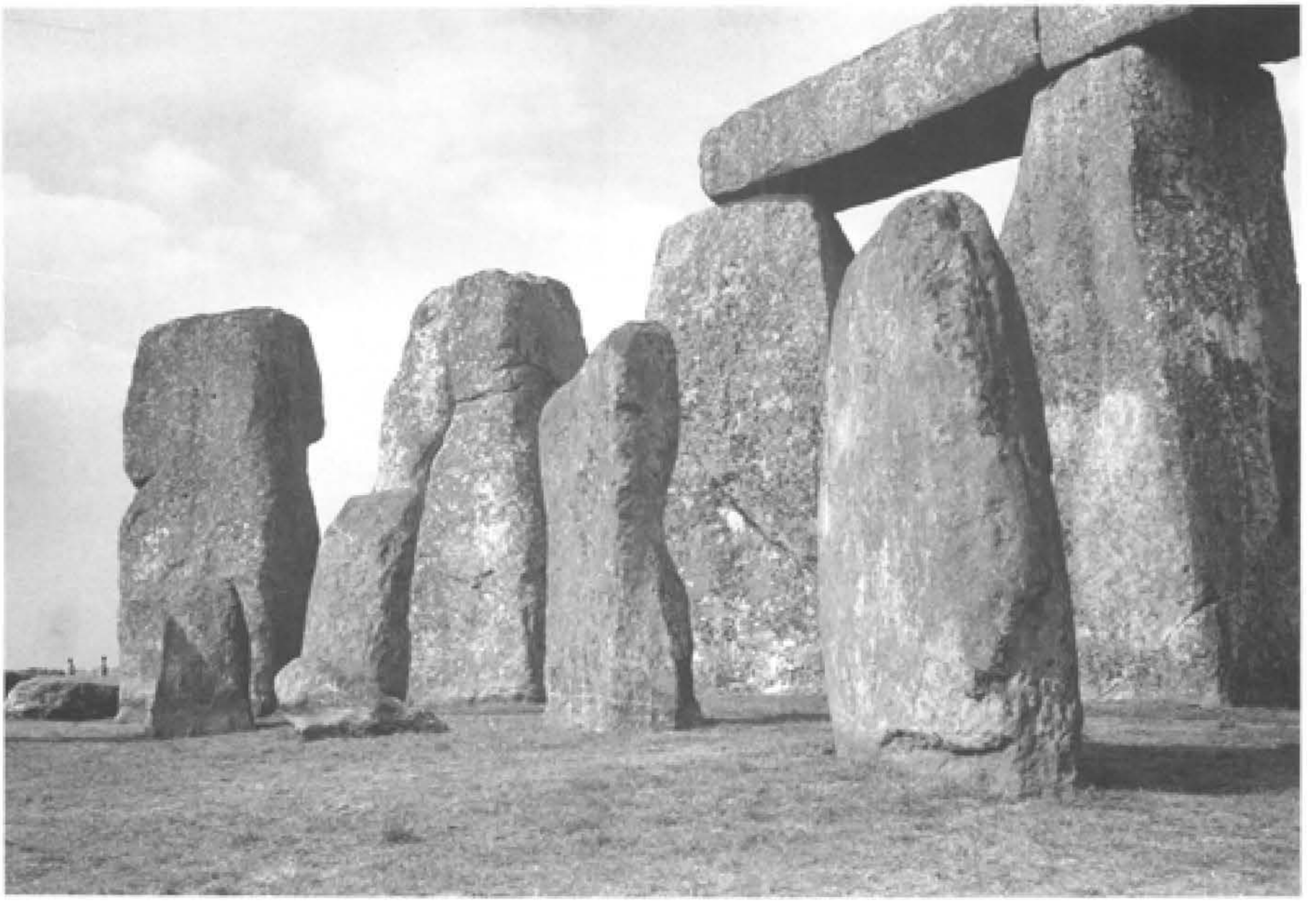


*Fig 112 Bluestone Circle: Stones 46–9 and 31 (north sector) inside the Sarsen Circle, c 1959 (P52348)*

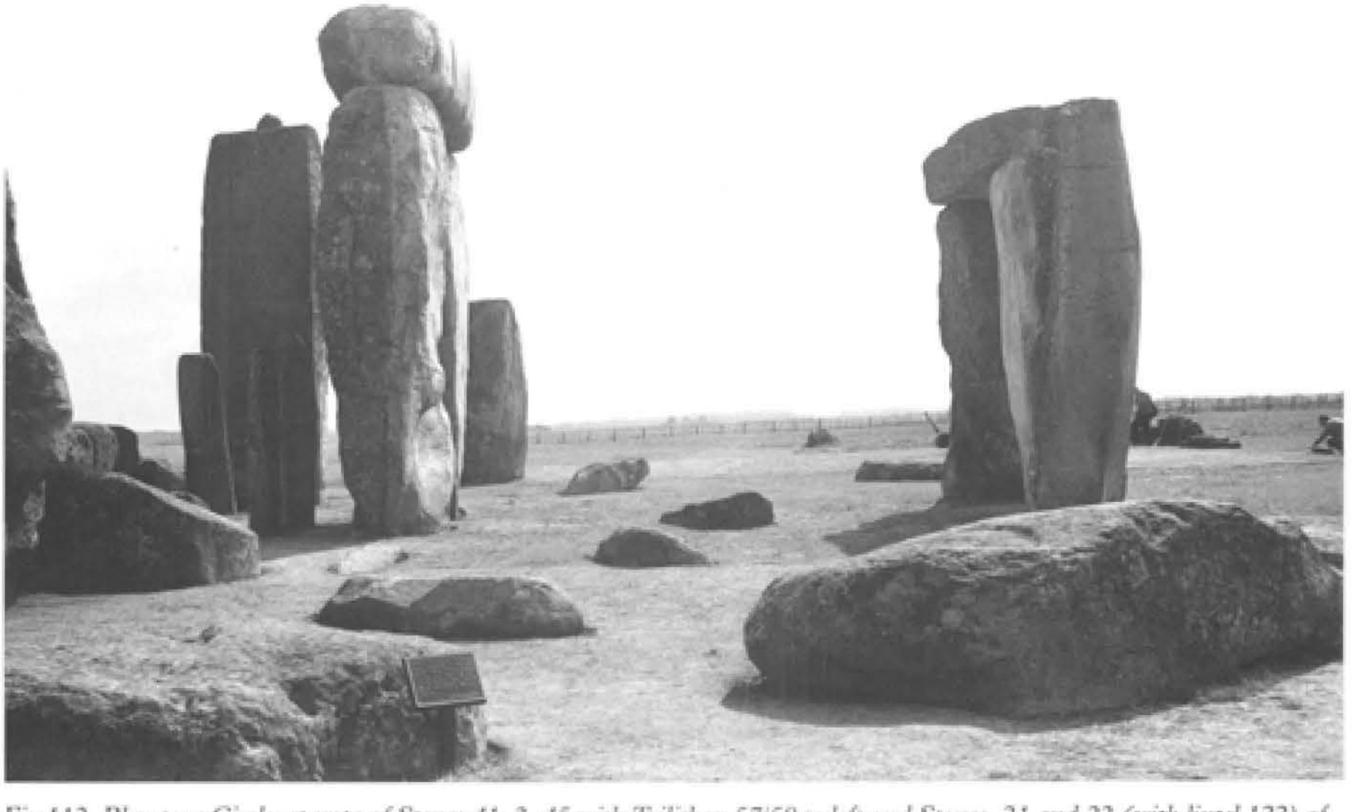


*Fig 113 Bluestone Circle: stumps of Stones 41–3, 45 with Trilithon 57/58 to left and Stones 21 and 22 (with lintel 122) of the Sarsen Circle (right) c 1959 (P52344)*

*Fig 114 Bluestone Horseshoe: Stones 63 and 62 in 1994 (Wessex Archaeology)*

*Fig 115 Bluestone Horseshoe: Stones 70, 69, and 68 in 1994 (Wessex Archaeology)*

**The Bluestone Oval, the northern arc:** The area in which these features lie was first excavated by Hawley, briefly, in 1925 but was not investigated on a large-scale until 1926. Subsequently the area was reopened and enlarged in 1956 (all three stages designated here C12; Figs 116—8). The 1956 season took place after Atkinson had written *Stonehenge* and the results were only published in the appendices to later editions of that work. The reinvestigation led Atkinson to modify the interpretation of the area offered in *Stonehenge*, particularly in regard to the Q and R setting (1979, 58–61, 205, fig 3).

**The Bluestone Oval, the surviving 'horseshoe':** The Bluestones of the inner setting, now standing as a horseshoe (Fig 117), are postulated here as originally belonging to an oval setting of which the arc at the northern end was subsequently removed.

**The Bluestone Circle:** It is regarded here as likely that the construction of the Bluestone Oval and Circle were more or less contemporaneous events and that the Circle remained standing and apparently unmodified during sub-phase 3v when the northern arc of the Bluestone Oval was removed to create the Bluestone Horseshoe (Fig 117).

### The Bluestone Oval, the northern arc

The stoneholes which are identifiable around the northern sector of the proposed oval were designated by letter by Atkinson. This area was first excavated by Hawley in 1925 and 1926 and his descriptions and numbering are also given.

**(WA 2717), (Atkinson J; Hawley 4), C12:** Listed by Hawley as a probable stonehole 38 x 21in and 14in deep (0.96 x 0.53 x 0.36m). It is difficult to identify this feature in Hawley's Diary and published record apart from the listing (Hawley 1928, 168) but it may be the 'bowl-shaped hole to the south of the incline which seemed to have been enlarged from a post-hole and held two large lumps of clean white sarsen, four pieces of quartzite, and a quartzite hammer' (*ibid*, 171) (Figs 116 and 118). Atkinson stated that on reopening this cutting this hole 'could also be seen to have been cut through a filled-up post-hole' (1979, 209).

**(WA 2726) (Hawley 3), C12:** This feature was listed by Hawley as a stonehole 51 x 20in and 15in and 28in deep (1.29 x 0.51m, and 0.38m and 0.71m deep) (the base of the feature presumably being stepped, although the plan is not sufficiently

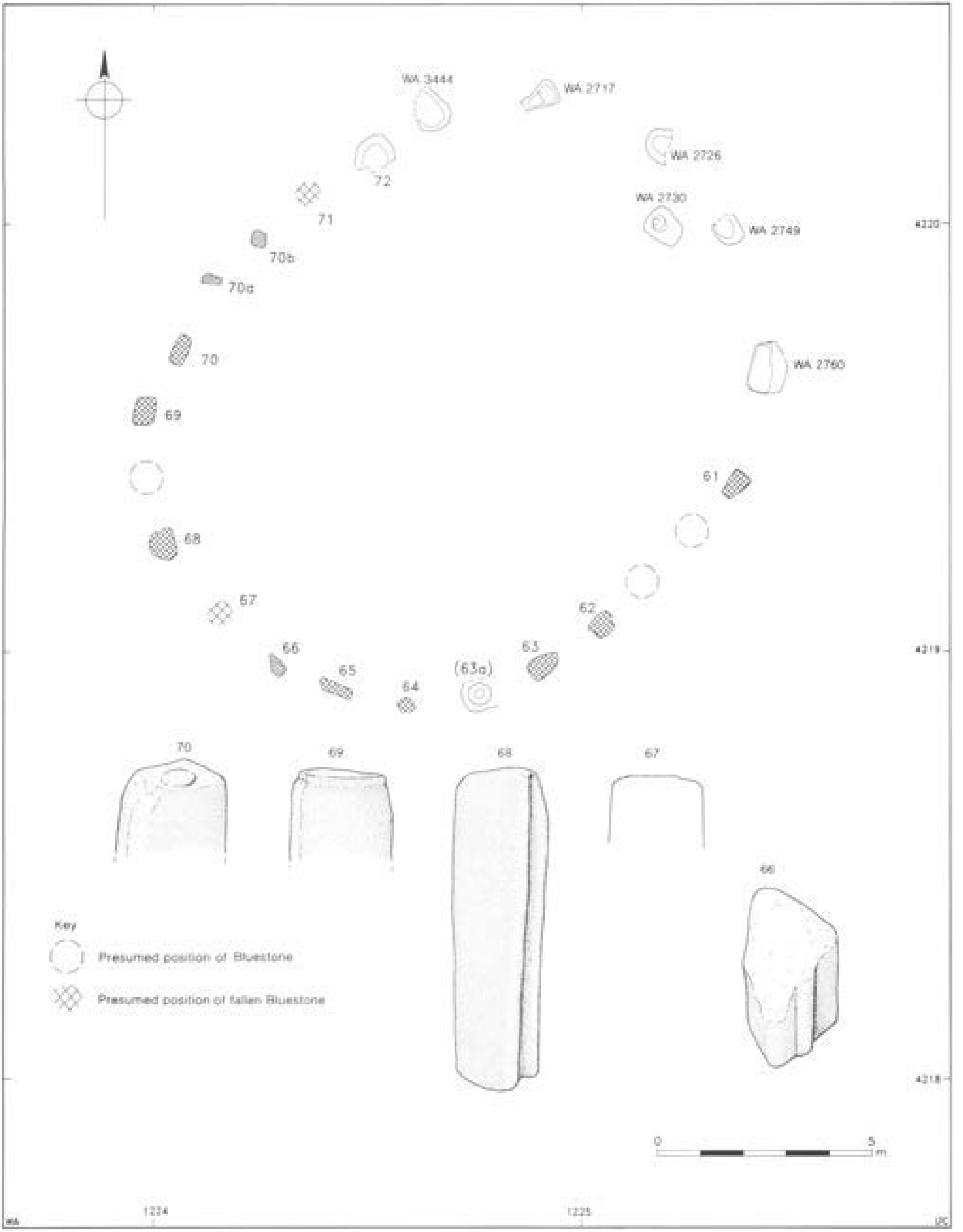



*Fig 116 Phase 3iv: Bluestone Oval plan and profiles of reused elaborately dressed stones. Open circles indicate probable positions of missing stones*


*Fig 117 Phase 3iv: Bluestone Oval and Circle, all features plan*

detailed to show this). In the Diary it is noted as 'a deep round hole on the left side near where an incline begins towards the stone opposite to it' (13/8/1926, Section 2) (Figs 116 and 118), and in the published account he notes it as 'a large hole on the west of the incline, as in the last (ie in front of Stone 31), which could have held an upright stone' (1928, 170).

**(WA 2749), (Hawley 2), C12:** This was listed by Hawley as being a probable stonehole 37 x 27in and 20in deep from chalk floor to bottom (0.94 x 0.69 x 0.51m). It is difficult to distinguish this feature from the stonehole of the inner end of the R Hole 1 from the archive drawing (no 821). In the published account Hawley described this as 'a large deep hole contiguous to the incline on the south with the appearance of having been made to hold a stone about the size of those of the horseshoe and descending 4ft [1.2m]' (1928, 169). In the Diary he describes how 'a large hole was found ... It looks like a stone hole and may be a continuation of the horseshoe. From

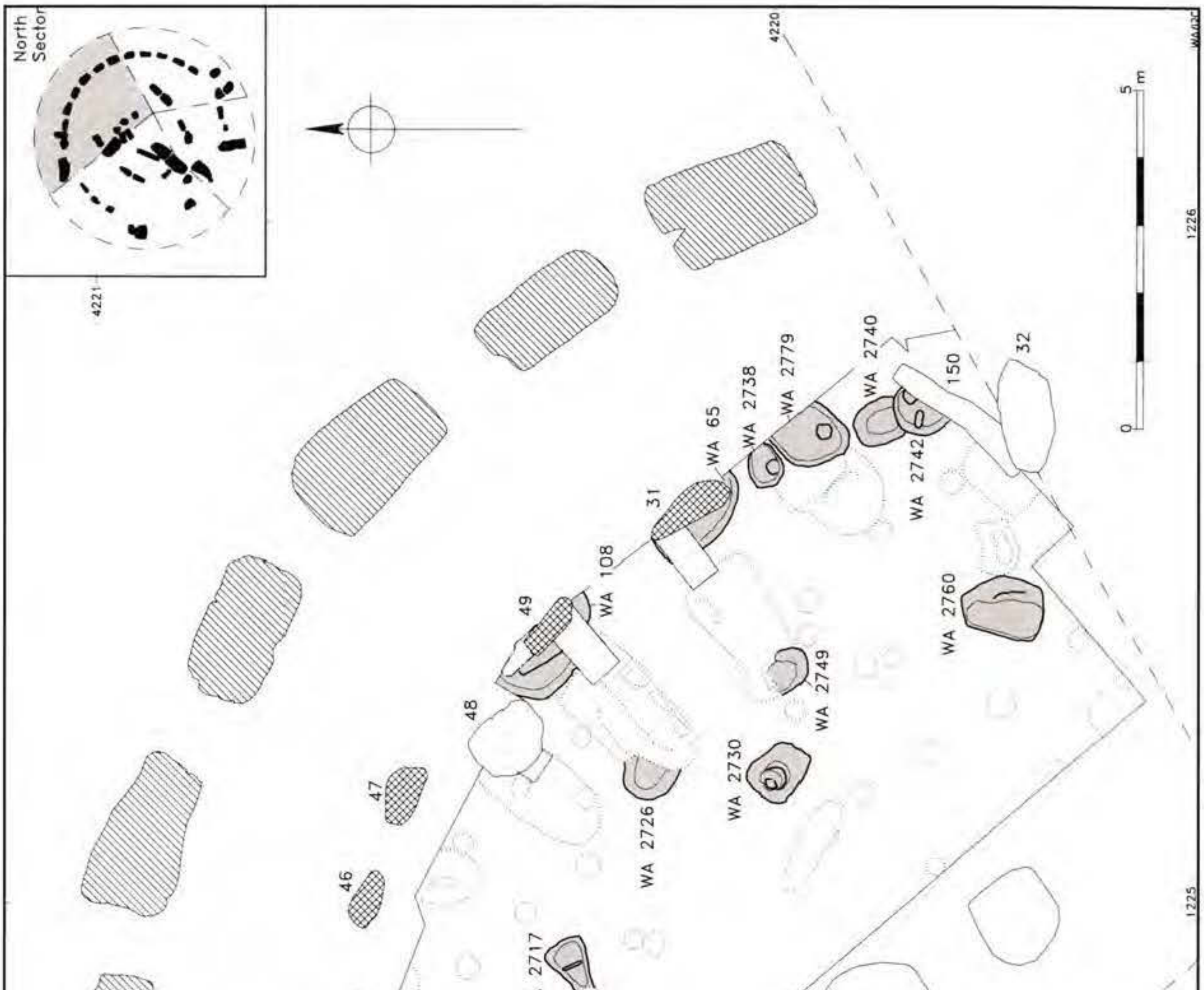



*Fig 118 Phase 3iv: north sector plan*

the north lip of this hole the solid chalk was sloped down in the direction of Stone 31'. It was filled with loose chalk rubble, as were 'the other cavities' (13/8/1926, Section 1) (Figs 116 and 118).

**(WA 2760), (Atkinson L; Hawley 1), C12:** Again listed by Hawley as a probable stonehole 49 x 27in and 20in deep (1.24 x 0.69 x 0.51m deep) from 'chalk floor to bottom' (presumably from the chalk surface to the base of the feature; Hawley 1928, 168) this feature was first encountered by Hawley in his first section (ie trench) of this cutting but excavated completely in his fifth section, when he described it as 'a large stone hole 4ft deep [1.2m] but of oval shape apparently made to hold a rather flat stone, the thickness of it would perhaps be about 15 to 18 inches [0.38–0.46m]' (13/9/1926, Section 5) (Figs 116 and 118).

In addition there was a single hole within the arc which Atkinson has suggested may also belong to this setting.

**(WA 2730), (Atkinson K; Hawley F), C12:** Noted by Hawley only as a shallow posthole (1928, 168) this seems also to be the feature referred to when he describes 'a large cavity or depression north of the grave, which had two postholes observable in the bottom portion of it' (1928, 171) (Figs 116 and 118). Atkinson states that when this area was re-excavated it was clear that this feature had held a single stone, and not two posts, as supposed by Hawley (1979, 209).

**Stratigraphy:** It is not possible to establish the stratigraphical relationships of those features of the northern arc which clearly must have had them (ie WA 2726 and 2749). As noted in the description above, Lt-Col Hawley describes the relationship between WA 2749 (his stonehole 2) as 'contiguous' with the incline (ramp)

*Fig 119 View of C12 with stoneholes of the northern arc of the Oval forming a curving line in the foreground, R Holes beyond. WA 2760 to the right with Stone 150 lying behind (P30506)*

to Bluestone 31 (shown by Atkinson to be a separate feature, his hole R1). In the case of WA 2726 Hawley simply commented that 'There was a large hole on the west of the incline [ie R38], as in the last, which could have held an upright stone' (Hawley 1928, 170). Professor Atkinson, however, states that 'Moreover, within stones 31 and 49, at the inner ends of the two in-lying stones of period II [ie the Q/R setting], and *cutting into their filling* [present author's emphasis], were two more stone-holes. These, together with holes J and L, formed the end of an oval setting of which the remainder lay on the line of the present bluestone horseshoe' (1979, 209–10). This was Atkinson's position after his re-excavation of Hawley's cutting, but if the two are compared, it seems very unlikely that there was enough, if anything, of the fills of the R Holes and the two stoneholes remaining to establish the relationship (Fig 119). Indeed, if there had been, it seems likely that Atkinson would have said so. It is not intended here, however, to question the sequence as proposed by Atkinson; it seems unlikely that the stoneholes were cut by the R Holes as there is no evidence from elsewhere for an early setting but the distinction between supposed relationships and demonstrable ones should be made, particularly as they tend, once cited, to enter the literature as established fact (eg Pitts 1982, fig 31, which refers to this passage of Atkinson's).

In the case of hole J (WA 2717) Hawley describes it as appearing to have been enlarged from a posthole (*see above*), but Atkinson recorded that on reopening it could be seen to have cut a posthole. The description by Atkinson here implies that a relationship was observed in the field and it must be supposed that there was sufficient of both fills surviving to indicate the relationship. Atkinson further comments, however, that the posthole 'was almost certainly connected with the raising of the sarsens of period IIIa. The date of this hole [hole J] was thus fixed as later than period IIIa' (1979, 209). As the interior of the monument contains numerous postholes, many of which cannot be easily linked to the erection of the sarsens and very few of which even contained sarsen fragments, this statement is impossible to substantiate. Hole J could, on the basis of this evidence alone, only be assigned to a period later than the majority of the postholes (here, phase 2), although it is considered likely that it is contemporary with the Bluestone Horseshoe and is later than the sarsen settings.

**Finds:** Hawley's Diary entry for this excavation (13/8/–5/9/1926) lists numerous topsoil finds but assigns nothing to the Stoneholes themselves.

### The Bluestones of the surviving 'Horseshoe'

The components of this setting are described clockwise from Stone 61 (Figs 116, 120–22). Where stone numbers are given in parenthesis this indicates that no actual stone was present.

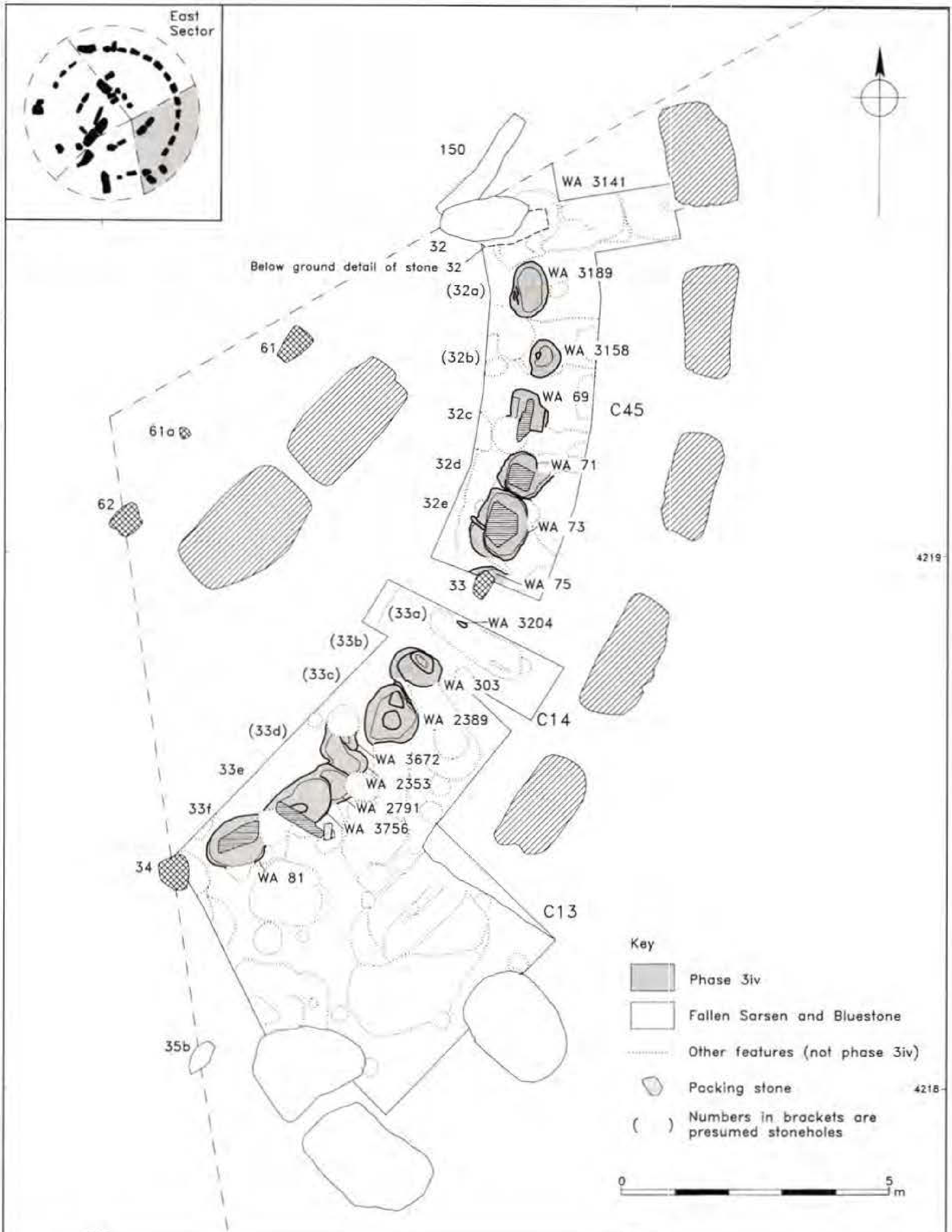



*Fig 120 Phase 3iv: east sector plan*

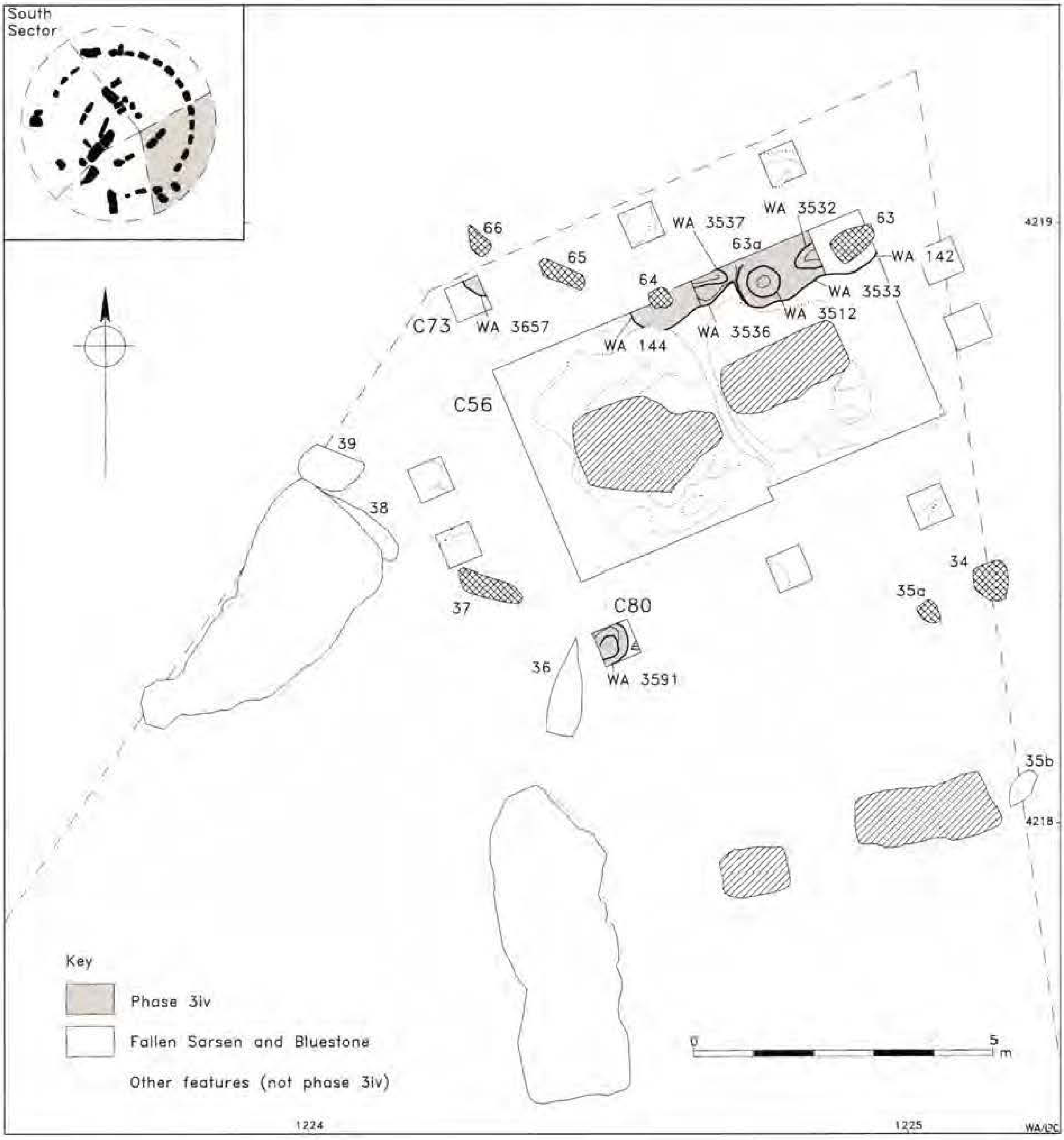



*Fig 121 Phase 3iv: south sector plan*

**Stone 61, WA 138:** Standing, unexcavated (Figs 116 and 120).

**Stone 61a:** This stone is represented by a fragment, probably not *in situ*, which should, if the spacing of the rest of the Horseshoe continues have stood between Stone 61 and a further stone, 61b (Figs 116 and 120).

**Stone 62, WA 140:** Standing, unexcavated (Figs 114, 116, 120, 121).

**(Stone 61b):** Assumed on spacing only (Fig 116).

**Stone 63, WA 142 and 3532, C56:** Although the stone lay within C56 excavation did not take place immediately around the stone; feature WA 3532 may be part of the stonehole or ramp for the stone, but this is not certain. Its depth below chalk surface cannot be calculated, but it is clear from the spot heights that it was of similar depth to WA 3512 (Figs 114, 116 and 121).

**(Stone 63a), WA 3512, C56:** Circular feature with a diameter of 2ft (0.6m) and a depth below surface of *c* 3ft 8in (1.12m) (it is not possible to calculate depth the below the

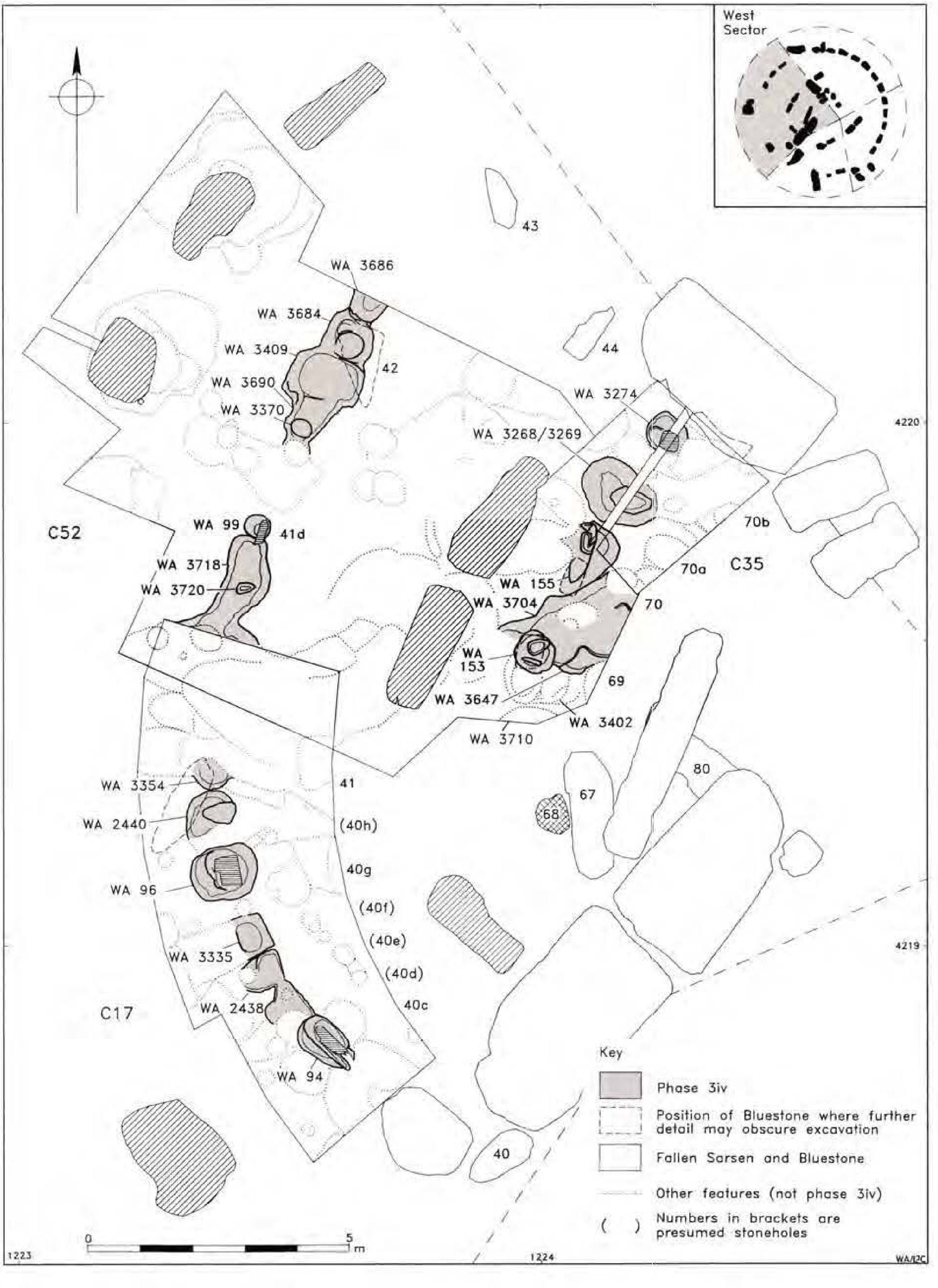



*Fig 122 Phase 3iv: west sector plan*

chalk surface for this feature but it is unlikely to have been much greater than 2ft 6in (0.8m)). The plan (Figs 116 and 121) seems to indicate that in this length of the setting the Bluestones stood in a trench, in which there were individual stoneholes only in the base, WA 3533 being the trench and WA 3512 and perhaps WA 3532 the holes within it. This is similar to some lengths of the Bluestone Circle, where the stones may have been set in a continuous feature (most obviously in C52). WA 3536 appears to be an extension of this towards Stone 64 (Fig 121) but there is also modern disturbance in this area, however, which shows in section (Fig 147, Sc 56.2) but is not clearly identifiable on plan, and this may be creating a false impression. The stone is missing.

**Stone 64, WA 144, C56:** The depth and nature of this stonehole are not certain; it may not have been completely excavated. The feature does not show on section and there is no spot height. The plan (Figs 116 and 121) shows the feature truncated by a sharp line which suggests that there may have been a change in the nature of the excavation at that point with only the top edge of the feature being uncovered. The stone is *in situ*.

**Stone 65, WA 146:** The probably *in situ* broken stone is unexcavated (Figs 116 and 121).

**Stone 66, WA 148, C112:** Examined only in 1950, by R S Newall, in a small excavation which did not go as far as the base of the stone (C112) (Figs 116 and 121). There are no plans or photographs of this in the archive, but it is published in *Stonehenge* (Atkinson 1979, plate 19B) and in a note by Newall (1952). The stump lies below the southern corner of fallen Stone 55b (Fig 123) and Atkinson suggests that it had been broken before the fall of Stone 55 (*ibid*, 54). It is a dressed Bluestone and has a tongue or ridge of stone projecting down one side (the eastern side as it is now placed). The stonehole for this stone may just have been clipped by the small cutting C73, excavated in 1964 as one of the bases for concrete pads around Stones 53 and 54 (Figs 121 and 288). In that cutting, feature WA 3657 is shown only on plan and was only 6in (0.15m) deeper than the surrounding chalk surface but it could be part of a shallow ramp leading to the stonehole.

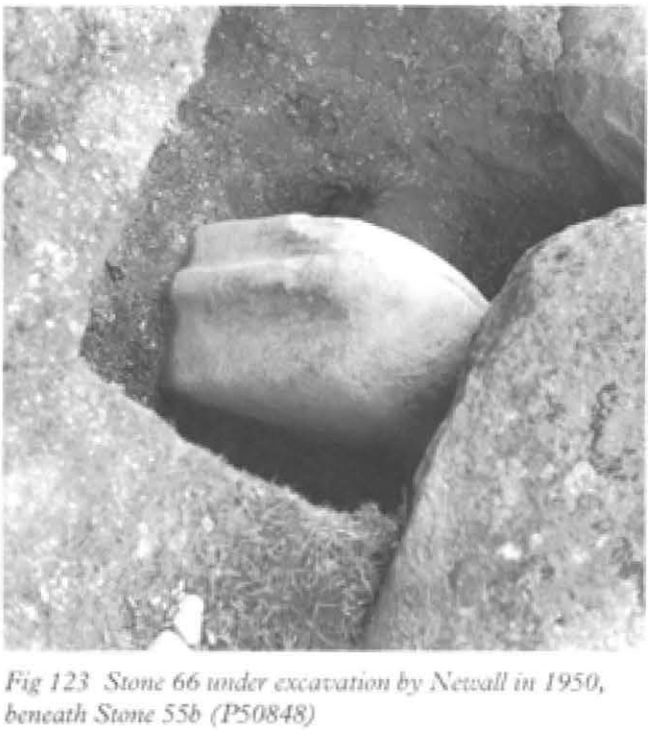


*Fig 123 Stone 66 under excavation by Newall in 1950, beneath Stone 55b (P50848)*

**Stone 67:** The stonehole for this fallen stone probably lies just outside the area excavated by Gowland (Fig 149). It is possible that it was within Gowland's trench IV but there is nothing identifiable as such a feature. If, however, the stonehole was cut into the filling of the hole and ramp for Stone 56 it is possible that it would not have been recognised as different from the fill of that feature (Figs 116 and 122).

**Stone 68, WA 151:** This stone (Figs 115, 116, and 122), one of the elaborately dressed Bluestones (Fig 124) presumed to have formed part of the pre-Bluestone Horseshoe setting described above (phase 3iii) has not been lifted and appears to lie outside the area excavated by Gowland as shown in his plans (Fig 149). It does figure, however, in a section illustrated by him showing Stone 56 and the fill of its stonehole (Gowland 1901, fig 13; Fig 150), suggesting that the trench must have extended slightly further than shown. No cut within the filling of the stonehole for Stone 56 is shown for Stone 68 but it is likely that such a cut would not have been recognised. As the section stands, however, the stratigraphy must be interpreted

*Fig 124 Stone 68 in 1964 (P50947)*

as showing only that the erection of Stone 68 was contemporary with or later than that of Stone 56.

**(Stone 68a):** The position of a stone is proposed on the grounds of spacing (Fig 116). The area has not been excavated but WA 3710, which extends out of C52 towards this area, is marked on the field drawing (Archive drwg no 315) as a modern hole and could therefore have been dug during the removal of a stone.

**Stone 69, WA 153, C52:** Excavation of this stone in 1958 included the removal and replacement of the stone in its position (Figs 115, 116, and 122). The cut for the stone was approximately circular with a diameter of *c* 2ft 6in (0.76m) and a depth of 4ft 3in (1.29m) below the undisturbed chalk surface but there appears also to have been a ramp on the north-eastern side (context 3647, Fig 122; Fig 144, Sc 52.5).

**Stone 70, WA 3277/155, C35/52:** This stone was partly excavated in 1956 (C35; WA 3277) and partly in 1958 (C52; WA 155) when the stone was removed and replaced in position (Figs 115, 116, and 122). The nature and extent of this feature is unclear from the 1958 plan as is its relationship with the stonehole for Sarsen Trilithon Stone 58, although it must be presumed to have cut the filling of that feature. Section Sc 52.1 (Fig 142), along the north-eastern side of the fallen Stone 58 while it was still on the ground shows 'ancient filling' around Stone 70 and the stonehole for 58 but does not show a cut; there may have been none to see, and the two features therefore contemporary, but the use of stipple is unlike any other section in the archive and strongly suggests that it is a convention rather than a realistic rendering of the stratigraphy and appearance of the deposits. Stone 70 – which was removed and replaced in 1958 – does not now seem to lie centrally within the hole but there is no indication in the archive as to why this is. The only spot height within the feature is only 15½in (0.39m) (a note on one of the sections (Archive drwg no 308) states that the spot heights for this cutting are from 336.35ft OD (102.51m), which is noted as the height of undisturbed chalk surface). This shallowness seems to be confirmed by the section (Fig 139, Sc 35.1, WA 3277) in C35, which shows a depth of only about 0.4m below chalk surface for the part of the hole which lay within that cutting. The plan of C52, however, seems to show a deeper cut below the stone for which there is no spot height given. This suggests that the stone may have stood within a deeper slot (Fig 285). To one side of the stone there is also a deep rectangular cut 2ft 8in (0.81m) below the chalk surface. In C35 some disturbance was noted around the base of the stone and photographs also suggest that the deepest part of the original stonehole lay west of the section (Fig 125).

**Stone 70a, WA 3269, C35:** This stone survives as an *in situ* stump (Figs 116 and 122). It was excavated as a feature cut into the filling of an earlier stonehole (WA 3268). The stratigraphical relationships of this feature are illustrated and discussed in Figure 138. The dimensions of the feature are not certain but it appears to have been of similar depth to WA 3274, the hole for Stone 70b. The remaining stump of the stone was found standing on a 'plinth' of bluestone, which was interpreted by the excavators as the broken end of the stone, perhaps having become detached during the finishing or even the erection of the stone and used to make up the required height (Figs 125, 138; Atkinson 1979, 211). Height is important in this setting as above ground height of the Bluestones

*Fig 125 C35, Bluestone stump 70a in Stonehole WA 3269 (P51279)*

increases towards the Great Trilithon. The stump of 70a, which is rectangular, also appears to have been placed with its long side at 90° to the line of the rest of the setting.

**Stone 70b, WA 3274, C35:** Excavated as a disturbed feature in 1956. A remnant of the original filling appears to have survived (WA 3265, Sc 35.1). A fragment of stone occurred in the disturbed filling of the feature. The stratigraphic relationships of this feature are discussed in the caption to Figure 139. The original dimensions are uncertain but the diameter at the base was *c* 2ft (0.6m) and the depth below the chalk surface is unlikely to have been more than *c* 2ft (0.6m).

**Stone 71:** The end of this fallen stone is visible, lying beneath, and probably felled by, the fallen Sarsen Stone 59 (Figs 116 and 118). On the apparent spacing of the Bluestone Horseshoe a hole may be presumed beneath Stone 59.

**Stone 72, WA 3446, C54:** This fallen stone was excavated in 1959 (Figs 116 and 118). It consisted of an oval feature with a maximum diameter of at least 3ft (0.9m). The depth from the chalk surface cannot be calculated as there are no spot heights for the chalk surface in this part of the trench and it does not occur on section. The spot height given within the feature is 1ft 9in (0.5m) suggesting that it was probably in the region of 2–3ft (0.6–0.9m) below the present day turf surface, using the spot height on turf at the other end of the trench as a guide (the datum height also does not survive for this trench).

**Stone ?72a, WA 3444, C54:** Excavated in 1959 this probably oval feature (Figs 116 and 118), in which no stone survives, had a maximum diameter of at least 3ft (0.9m). There are no spot heights for the chalk surface in this cutting nor does the feature show on section. It seems from the spot height given within the feature of 1ft (0.30m) that it was probably only about 2ft (0.6m) deep below the present day turf surface. (The datum height also does not survive for this

**Table 17 Finds from the Bluestone Oval**

| *WA context* | *Cutting* | *Bluestone* | *Sarsen* | *Other* | *Atkinson cat no* | *Details of context* |
|---|---|---|---|---|---|---|
| 3511 | C56 | 26 | 1 | 1 frag antler | S.64.29–31 | 'Fill of stonehole 63a' (WA 3512) |
| 3861 | C52 | – | – | 1 sherd R-B, clay pipe frags, modern pin, | S.58.18–21 | 'Stone 69, SE quadrant, small hole' |
| ? | C35 | – | – | clay pipe frags, gin trap, glass | | 'Cutting IIIrd extension' |

trench). The stratigraphical relationship with the stonehole of Sarsen Stone 60 does not show on any of the sections but presumably WA 3444 was partly cut through the filling of that feature. There is no evidence that it was a Bluestone hole, but it is similar in shape and depth to WA 3446 and the two lie on the projected line of the Horseshoe. There is a note in archive that Professor Atkinson confirmed that he believed this feature to be Bluestone hole 72a in the sequence (notes for cutting C54).

**Stratigraphy:** It is frustrating that in two cases in which there are sections showing both Bluestones of the Horseshoe and Sarsens of the Trilithon setting (ie Fig 142, Sc 52.1 and Fig 150) there is no stratigraphic relationship recorded. This could perhaps be regarded as evidence for there really being no stratigraphic relationship visible, because the two elements were erected together, but in neither case can this be asserted with any confidence. The relationships with earlier features have been discussed above, largely in sub-phase 3iii.

**Finds:** Only two of the above features have recorded finds; these are listed in Table 17. No details of any of the finds from any of the 1959 excavations have been preserved and no finds from that season have been identified amongst the collections.

**Dating:** A single radiocarbon date has been obtained, from Stonehole 63a: OxA–4877, 3695±55 BP, 2280–1940 cal BC (*see Appendix 2*).

This does not refute the interpretation favoured here that the Bluestone Circle and stones of the present Horseshoe were erected at the same time and with the dates from the Circle (*below*) it lends firmer support to the hypothesis that both are later in the sequence than the Sarsen Circle and Trilithons.

### The Bluestone Circle

Only the excavated parts of the Circle are described, clockwise from C12, the northernmost part. There is an additional difficulty in describing the Circle which does not arise with the Oval/Horseshoe in that the setting seems, for part of its circuit at least, to have comprised stones set in a virtually continuous trench in which it would have been difficult to identify discrete stoneholes even if the stones were still standing. Because of the extensive destruction and removal of the stones it is now quite impossible to be certain how many stones originally stood in the setting. In the excavations of Atkinson *et al* an attempt was made to number the buried and identifiable stoneholes according to the numbering of the stones visible above ground, by extensions (eg 33a, b, c, etc between standing Stones 33 and 34). This system is not easily applicable to the more completely destroyed lengths, such as that in C52, and even in more complete lengths there are still areas in which it is impossible to be certain whether features belong to the Circle or not. These doubtful features lead to problems with the numbering and clearly did so even at the time of excavation as there appears to have been some alteration of the numbering during or soon after excavation. Because of these problems there is no attempt made here to assign all features to a number in the alpha-numeric sequence used by Atkinson *et al*, although these numbers are referred to where they are clearly assigned. Missing stones are numbered in parenthesis.

**Stone 49, WA 108, C12:** The stonehole for this stone, in the northern sector, was first encountered by Lt-Col Hawley in 1920, when he was excavating around stones 1 and 30 of the Sarsen Circle and felt that because of disturbance in the area the Bluestones 49 and 31 needed a concrete support 'about their bases on the north side' (Figs 112, 117, and 118). His published account of this stonehole is that it was 46 in (1.17m) below the ground surface, and the total height of the stone 9ft 10 in (*c* 3m). The stone

> appears to have been a naturally very flat slab and retains the original brown crust on the face. The west side has been chopped away to make it narrower, or perhaps straight. There is a broken fragment 19 in [0.48m] long at the base, still fitting against the stone, showing the original width there to have been 47 in [1.19m]. This fragment not having moved from its position seems to indicate that the stone may have been dressed after being set upright: there were, however, but few chips present, although many were found nearby in the excavated area [ie C2].
>
> (Hawley 1922, 43)

In the 'earthy chalk rubble about stone 49' were sarsen, quartzite, and bluestone fragments and two worked flints, but this seems to have been above the cut, as Hawley notes that 'below the earthy rubble the stone stood in a shallow hole in the solid chalk with a little yellowish marl around it' ; there were no packing stones (*ibid*).

The area on the interior side of the hole was partially excavated in 1956 by Atkinson *et al*; section drawings (Figs 131, Sc 12.1 and 132, 12. 2) show the main fill to have been of chalky rubble with brown earth against the face of the stone. The sections also support Hawley's description of the hole as shallow, as they show it to be only about 0.7–0.8m below the chalk surface and as having a broken fragment still in place next to the stone (Sc 12.1). The stonehole is shown to cut R Hole 38 (Sc 12.2). No finds are recorded from this feature. The stone is still standing.

**Stone 31, WA 65, C12:** This stonehole, in the northern sector, was first encountered by Hawley, at the same time and for the same reasons as his excavation around Stone 49, above (Figs 112, 117, and 118). The published account describes the stone as having 'a curved or convex face on the north side down to the base and the edges of the sides are rounded off' (Hawley 1922, 43). The depth below ground surface of the hole was 46 in (1.17m) and the total height of the stone 9ft 4in (2.84m). The nature of the filling of the stonehole is not described in detail, but appears to have been similar to that of Stone 49 (*ibid*).

Partially excavated in 1956 by Atkinson, section drawings (Figs 131, Sc 12.1 and 132, 12.3) show a white (chalk) rubble fill with earthy rubble above and earth against the side of the stone. Sc 12.1 shows the hole to be similar in depth to that for Stone 49, at only 0.7–0.8m below the chalk surface. The relationship with R1 is unclear as the field drawing shows a dotted line and question mark at the likely cut line (Sc 12.3). There are no finds recorded from this feature. The stone is still standing.

**(WA 2738), C12:** The stone is missing but a feature excavated here is possibly a stonehole of the Circle (Figs 117 and 118). It is difficult to match the section to the plan in this area (Figs 131, Sc 12.1 and 275) The south-eastern half of Sc 12.1 appears to run along the cutting edge and archive photographs confirm this and seem to show an undisturbed fill of WA 2685 and that WA 2686 lay to the north of the fallen Bluestone 150 (Fig 119); but neither the photograph nor the section show the cuts of WA 2738 and WA 2779 either as the remnant bases of features which were cut by the probable R2 (WA 287), or as features cutting the fill of that R Hole. Nor does the plan show a feature in the south-eastern corner of the cutting, as suggested by the position of WA 2686 on the section. The interpretation favoured here is that WA 2738 and WA 2779 are emptied stoneholes of the Bluestone Circle, and cut the fill of R Hole 2, the field plan showing, unusually, features which did not cut bedrock. There is some support for this in the photograph (Fig 119), in which the distinct step in R2 is visible but no other cuts in its base; in an earlier poor quality photograph (archive P51147) which shows a section through R2 further to the south than the cutting edge in which a possible cut can be discerned on the eastern side (ie in the position of WA 2779) and the surface of the fill of R2 beyond this shows two shallow scoops which give the impression that excavation has been started on features in the top of R2. Although it would be unusual for two features which did not cut bedrock to be included, in some field plans features not cut into bedrock are shown with bedrock-cut features (particularly in C17 and C52). Finally, the location and spacing of WA 2738 and WA 2779 is quite in accord with that of the Bluestone Circle once away from the entrance.

**(WA 2779), C12:** This feature is again possibly a stonehole of the Circle (Figs 117 and 118). It is difficult to match the section with the plan in this area (*see above*).

**(WA 2740), C12:** This feature is again possibly a stonehole of the Circle (Figs 117 and 118). It is difficult to match the section to the plan in this area. It appears that there must have been a relationship between this feature and WA 2742 but the possibility remains that they were both of the Circle as they only just overlap. It is possible that one cut the other as part of a sequence of construction rather than as a later event (ie only the packing of the stonehole need have been cut while the stone was *in situ*) or that the apparent relationship has been produced by the extraction of the stones during the dismantling or wrecking of the monument.

**(WA 2742), C12:** This is another possible stonehole of the Bluestone Circle (Figs 117 and 118). Its relationship with WA 2740 is unknown but it would appear to have had one as the two features overlap. It does not seem possible to reconcile the plan and section here and this feature does not seem to be shown on the section.

**Stone 32, C45:** The stonehole for this fallen stone is not clearly identifiable although Hawley thought that he had found it in 1924 (1926, 13) (Figs 117 and 120). Subsequently, when C45 was excavated by Atkinson *et al* in 1954, this area was found to be disturbed. It seems likely that Hawley' s excavation, which is probably represented by WA 3141 (Fig 140, Sc 45.1), had removed all trace of the hole. This disturbed area is also shown in transverse section (Fig 141, Sc 45.3) in which there is also what appears to be the lower end of the stone, in cross-section.

**(Stone 32a), WA 3189, C45:** Excavated in 1954, this feature only appears on plan and no stone is shown *in situ* or survives (Figs 117 and 120). Finds listed from the feature are 14 pieces of bluestone (S54.1304) from 'close to bottom of stonehole' and one sarsen piece (S54.1305) from 'bottom'.

**(Stone 32b), WA 3158, C45:** Excavated in 1964, this feature appears in plan, section (Figs 141 and 278) and in profile (Fig 143, Sc 45.3). There clearly must have been a relationship with the central part of the Q/R pair 5. It was largely on the evidence from this cutting that Atkinson based his description of the QR setting as formed of 'dumb-bells' with stones at each end of a linking trench, and this appears to be such a feature. The simplest interpretation of these features is as shown in the phased plan (Plan 2), in which the base of the stonehole is phased as 3iv/v and the area around it as the Q/R linking trench. The section (Fig 143, Sc 45.3) suggests that this is correct but it is not made explicit in the section. The lower part of the section shows the well-defined cut of the Bluestone hole (WA 3158) apparently retaining part of the original packing (WA 3157) but not the stone, with WA 3156 perhaps representing original packing or packing which fell in to the void when the stone was removed. WA 3155 must be replacement material subsequent to the removal of the stone.

On the northern side of the feature the cut line is not vertical and is shown as if it was not clear or had been partially removed. It is on this side that there would seem necessarily to have been a relationship with the Q/R trench. This is shown in section by suggesting that the packing on that side is part of the Q/R pair (the hard packing within WA 3168). This implies that the section drawing has omitted a line between fills but that this was sometimes done is suggested by the section through the Q Holes (Fig 140) which shows no difference between Q5 and Q6 with chalk and earth fills and the neighbouring (unphased) feature (WA 3160) with a chalky silt fill; nor with the layer shown above them which it would seem more likely was the layer which sealed them rather than the same material..

**Stone 32c, WA 69, C45:** A probably *in situ* stump, excavated by Atkinson *et al* in 1954 (Figs 117 and 120). It is shown only in profile, so that it is not clear whether it was standing within original filling or not (Fig 141, Sc 45.3).

**Stone 32d, WA 71, C45:** *In situ* stump, excavated by Atkinson *et al* in 1954 (Figs 117 and 120; Fig 141, Sc 45.3c).

**Stone 32e, WA 73, C45:** *In situ* stump, excavated by Atkinson *et al* in 1954 (Figs 117 and 120; Fig 141, Sc 45.3d).

**Stone 33, WA 75, C45:** Standing stone, excavated by Atkinson *et al* in 1954 (Figs 117 and 120). It is shown as cutting a 'Q' filling, of Q hole 7 (Fig 141, Sc 45.3).

**(Stone 33a), WA 3204, C14:** Excavated by Atkinson *et al* (Figs 117 and 120). A stonehole and stone impression, with original filling still *in situ*. It clearly cut the fill of R Hole 8 (Fig 135, Sc 14.1 and 14.2).

**(Stone 33b), WA 303 (filling disturbed), C13/14:** Excavated in 1924 and reopened in 1964 (Figs 117 and 120) this was identified by Hawley as a stonehole for a stone of the Bluestone Circle on the grounds of its spacing in relationship to stoneholes with Bluestones *in situ*. It was not recorded in section but shows a depth of 0.61m below the chalk surface when reopened in 1964 (Archive drwg no 410). Hawley described the excavation of this area in the following terms

> Opened a strip of ground west of Stone 7 to find out if there were any more Foreign stones but found none. The craters from which they were extracted could be seen spaced at the same intervals as we found the 2 stumps SW of stone 7 [ie 33e and 33f] (and north of 8). Traces of fire were seen in one of the craters directly below No. 7 and there were two chips of dolerite and one of sarsen burnt, so perhaps the fire was made by those who took the stone and it was probably dolerite.
>
> (28/8/1924)

The description of burning and the presence of dolerite could relate to this stonehole or to the next stonehole clockwise (WA 2389) which also does not have a stone *in situ* and is in front of Stone 7.

**(Stone 33c), WA 2389, C13:** This stonehole was excavated in 1924 and reopened in 1964 (*see Stone 33b for a description of this area by Lt-Col Hawley*). When excavated by Hawley this was identified as a stonehole for a missing stone of the Bluestone Circle on the basis of its spacing (Figs 117 and 120). In Hawley's plan it appears as a regular, circular hole, although it only appears on a small-scale plan of the monument and may therefore be stylised. In the plan of 1964 two shallow depressions (the deepest only 0.10m deeper than the base of the stonehole), probably stone impressions, are shown in the base (Figs 126, 277; Achive drwg no 410). Either of these may be the stone impression for Stone 33C, but Peter Berridge has suggested (notes in the archive) that one is the stonehole for R Hole 10, which implies that one of the two impressions must have been at the base of a feature which cut the other. This suggestion is not considered to be correct by Atkinson (archive notes) but neither interpretation can be proved or disproved on the surviving evidence as no section was recorded by Hawley. That at least one of the impressions and probably the cut of the feature as it now appears is the Bluestone Circle stonehole seems a reasonable argument.

**(Stone 33d), WA ?2353, C13:** Excavated first by Lt-Col Hawley (Figs 117 and 120), the area was subsequently reopened by Atkinson *et al* in 1964 (C13). The recording of the obviously complex stratigraphy in this area by Hawley is difficult to interpret and is discussed in detail in the caption to Figure 134.

**Stone 33e, WA 79, C13:** As for Stone 33d (*see Fig 133*).

**Stone 33f, WA 81, C13:** As for Stone 33d (*see Fig 133*)

**Stone 34, WA 83, C13:** Standing stone on the edge of an excavated area (C13) opened by both Atkinson *et al* and Hawley (Figs 117 and 120). Hawley's excavation did not extend as far as this stone, and in Atkinson's excavation only the very edge of the stonehole was encountered, less than 0.2m from the stone, and the feature visible close to the stone on plan (WA 2380) is a posthole, and is clearly marked as having held a post (Fig 277).

**Stone 35a, WA :** Unexcavated stump (Figs 117 and 121).

**(WA 3591 (3592)), C80:** This feature was recorded only in one of the small trenches (C80) excavated to take concrete pads around Trilithon Sarsens 53 and 54 (Figs 117 and 121). It lies close to the fallen Bluestone Lintel 36. It did not fully lie within the trench so the overall dimensions could not be recorded but its maximum dimension appears to be *c* 2ft (0.6m) and its depth from what is probably the undisturbed chalk surface is 2ft 10in (0.86m). It is not recorded as a Bluestone hole, and it seems to lie very close to a rhyolite stump which may be *in situ*. It is, however, of the shape and dimensions of Bluestone Circle holes, and is on the line of the Circle. The stones of the Circle are closely spaced, particularly in some lengths and it is in any case not certain that the Bluestone stump is *in situ* as this is not clear from the plan. On balance this seems likely to be a Bluestone Circle stonehehole, although it is not possible to number either this or the neighbouring stump in the sequence.

*Fig 126 General view of C13 in 1964 looking north-east (P 51295)*

**Stone 40c, WA 94, C17:** *In situ* stump, in a feature which had been disturbed either by Lt-Col Hawley, or in an earlier episode of disturbance. The section (Fig 136, Sc 17.2) shows the debatable relationship with a feature identified as a Q Hole (WA 2430), discussed above (sub-phase 3i).

**(Stone 40d), WA 2438, C17:** The spacing of the stones in this length of the circuit seems closer than normal, and the identification of features cannot be certain in all cases, because of the robbing of stones, but this feature may be a Bluestone hole (Figs 117 and 122). There are no details for it, other than the plan (Fig 122).

**(Stone 40e), WA 2438, C17:** Stonehole excavated by Atkinson *et al* in 1956 (Figs 117 and 122). The southern edge of the feature seems to have been clipped by the section Sc 17.3 (Fig 136), which shows some original filling surviving *in situ*.

**(Stone 40f), WA 3335, C17:** A disturbed stonehole, excavated by Atkinson *et al* in 1956 (Figs 117 and 122). No original filling appears to have survived (Fig 136, Sc 17.4).

**Stone 40g, WA 96, C17:** An *in situ* stone, excavated by Atkinson *et al* in 1956 (Figs 117, 122, and 136, Sc 17.5).

**(Stone 40h), WA 2440, C17:** A stonehole excavated by Atkinson *et al* in 1956 (Figs 117 and 122); not shown in section.

**(Stone 41), WA 3354, C17:** This fallen stone may have stood in hole WA 3354, a feature possibly encountered by Hawley (Figs 117 and 122). It was excavated by Atkinson *et al* in 1956.

**(WA 2445), C17:** This feature shows only in section (Fig 136, Sc 17.7), as it did not cut the chalk. It is recorded only in C17, where it lay beneath the fallen Sarsen Trilithon Stone 57. It cut the filling of the ramp for Stone 56, and thus is the only example of a Bluestone Circle feature cutting a feature of the Sarsen settings. It is unfortunate, however, that its identification as a Bluestone hole, or robbing trench, is not absolutely certain because features not cut into chalk were not recorded in plan. It seems reasonably certain from the plan, however, that this is a continuation of feature WA 3718 or is a stonehole within it (Fig 122). From the location of the projected posthole on the section (WA 2442) it would seem that the cut containing WA 2445 lay slightly to the east of it, and that fits well with the line of the Circle here. It is likely that there was at least one other Bluestone hole cutting the ramp for Stone 56, to the south of WA 2445, given the usual spacing, and some confir-

*Fig 127 General view of C17 in 1956 with the fallen stone 57 to the left (P51127)*

mation for this is given by Hawley's Diary description of the area south of the stone of the fallen Trilithon IV (ie Stone 57).

> Found depressions which no doubt held Foreign stones as they came into the line of the Foreign Stone Circle. Below these the soil was loose composite of earthy chalk matter in fine division. When this was partly removed a very smooth sloping side was come upon. Removing soil about it showed that it was extensive and might have been a large crater.
>
> (1/10/1924)

and the next day he was able to identify this as the incline for, as he thought, Stone 57.

**(WA 3718 and 3720), C52:** WA 3720 is marked as a stone impression on plan (Fig 285). There are no spot heights given for undisturbed chalk in the area, but the spot heights in the trench (3718) and in the impression (3720) are within 1–2in (*c* 0.03m) of the spot height for WA 99, suggesting that, like all the other Bluestone features in this cutting, it was *c* 0.4–0.5m in depth below chalk (Figs 117 and 122). The nature of the filling is unknown.

**Stone 41d, WA 99, C52:** This stone survives as a stump *in situ* (Figs 117, 122, and Fig 143, Sc 52.2), with a filling of very compact chalk rubble. It also is a shallow feature, only *c* 0.4m below the chalk surface. The cut, WA 99, is shown on the field plan as a posthole, with the stone across it, but the section suggests no reason for this and this feature has not been interpreted here as a posthole.

**(WA 3652), C52:** This feature shows only on section (Fig 143, Sc 52.4) as it was entirely cut through the fill of the suggested R Hole WA 3648, and lies to the south of posthole WA 3652. It is 0.4m deep below the chalk surface, and is filled with a clearly completely disturbed filling of rubble and fragments of Bluestone.

**(WA 3370, 3409, 3686, and 3684) around fallen stone 42, (C52):** It is difficult to identify individual stoneholes in this length of the circuit, as the removal of stones appears to have been particularly thorough here (Figs 117 and 122). It is also not clear whether the trench-like appearance to this part of the Circle is due to the process of stone-robbing, or whether the stones originally stood in a trench rather than in individual holes. Whether in holes or a trench the stones were clearly not deeply buried, as WA 3409, which had some original filling still in place, was only *c* 0.4m deep below the chalk surface (Fig 142, Sc 52.1a). In the length represented by these features there would seem to have been at least four stones, each represented by features cutting chalk (ie one each in WA 3686, 3684, 3409, and 3370, Fig 122). There are no neighbouring spot heights for undisturbed chalk with which to compare the

**Table 18 Finds from the Bluestone Circle**

| *WA context* | *Cutting* | *Bluestone* | *Sarsen* | *Other* | *Atkinson cat no* | *Details of context* | *Stonehole no* |
|---|---|---|---|---|---|---|---|
| 2342 | C13 | – | – | 1 plain body sherd (LNEBA/G6) | S.64.5 | 'Clean chalk packing on inner side of stone | 33f |
| 2427 | C17 | 6 | – | 1 piece bone, antler tine | S.56.36/35/39 | 'Bluestone hole filling' 'Original stonehole' | 40c |
| 3203 | C14 | 5 | – | – | S.54.1362 | 'Extreme bottom' | 33a |
| 3145 | C45 | 3 | – | – | S.54.1350 | 'Stonehole 33' | 33 |
| 3192 | C45 | – | – | 1 flint | S.54.1331 | 'Filling near base' | 32c |
| 3909 | C45 | – | 4 | 1 small antler or bone frag | S54.1332–3 | 'Extreme bottom' | 32 |

spot heights for 3684 and 3370, but both are within an inch of the spot height for the south-eastern end of 3648 which is known from the section (Fig 143, Sc. 52.4) as 0.4-0.5m deep below the chalk surface, and this is consistent with the known depth of WA 3409. WA 3370 is also shown on section as having some fill remaining *in situ* (Sc 52.3) and with a depth of 0.4m below chalk surface.

**Stratigraphy:** The main problem in dealing with the relationships of the Circle is that many of the stones have been removed and it is often not possible to establish whether the feature remaining is the emptied-out hole or an enlarged hole. It is obviously safer to err on the side of caution and assume the latter. It is clear, however, that the Circle did cut a number of earlier features which appear to have formed a setting of some regularity, that is, the Q and R Holes. There is in addition some evidence to suggest that the Circle also cut the fill of the erection ramp for Stone 56 of the Sarsen Trilithons (see Fig 137, Sc 17.7). This would be entirely in accordance with the established interpretation that the Circle and Horseshoe are both later than the Sarsen settings, since Stone 68 also almost certainly cuts the ramp for Stone 56 (*discussed above*).

In general, the stratigraphy of the Circle is either clear-cut or has been destroyed or inadequately recorded, the most problematic area being in C13,. This area is discussed in detail in the caption to Fig 134. The identification of a feature in C52 as being almost certainly a Q/R 'dumb-bell' (*see phase 3i, above*) provides a short but useful sequence in this area for the monument of posthole of the interior timber settings (Fig 143, Sc52.4, WA 3650) – Q/R dumb-bell (WA 3654/3648) – Bluestone Circle (WA 3652).

**Finds:** Finds are recorded from the stoneholes of the Bluestone Circle but in some cases these appear not to be extant in the collection. The record of finds taken from the Atkinson *et al* archives is summarised in Table 18. Only those finds which are probably derived from the original packing of holes or are from holes with stones *in situ* are included but in many cases this is difficult to establish with certainty.

**Radiocarbon dates:** Two radiocarbon dates were obtained, both from Stonehole 40c in C17:

OxA–4878, 3740±40 BP, 2290–2030 cal BC
OxA–4900, 3865±50 BP, 2480–2140 cal BC

The radiocarbon dates, when compared with that from the Bluestone Oval/Horseshoe Stonehole 63a do not contradict the interpretation of the Circle and Horseshoe as having been constructed as part of the same plan, nor that they are both later than the Sarsen Circle and Trilithons (*see Appendix 2*).

### Discussion

The interpretation proposed here is that the present settings of Bluestone Circle and Horseshoe were erected at the same time and that there was, in addition, a northern arc of stones which formed part of the same plan as the present Horseshoe. This northern arc was later removed (*see sub-phase v, below*). There are two major problems in accepting this interpretation: first, establishing that the stones of the northern arc formed part of the same setting as the Horseshoe stones and, secondly, establishing the contemporaneity of the Oval with the Circle.

Professor Atkinson was not the first to suggest that there were features in the northern part of the interior which could have formed part of an ovoid setting. Lt-Col Hawley suggested this in 1928.

> Regarding the extension of the ends of the horseshoe, there are certainly three stones on the north-east which show a definite prolongation of the figure, namely, the large one in the last section excavated [ie stonehole L, WA 2760], one in the first section [WA 2749], and one in the second, as before mentioned [WA 2726]. There is a long oval hole in the solid chalk [hole J, WA 2717], about 3½ft [1.1m] wide, that would take a rather wide stone. It is about 7ft (2.1m) from the incline to stones 46

> and 47. This hole is on the same curve as a large hole [WA 3444] about 5ft [1.5m] from the north-east corner of the standing stone of the fifth trilithon, which was too near that stone to allow of it being excavated with safety. From these indications I believe that the stones of the horseshoe were continued in a curve forming an ovoid figure and not one of a horseshoe shape. After passing the trilithons the figure was prolonged with stones standing at least twice as wide apart as those immediately in front of them, on account of the scarcity of stone, and they were probably the last erected.
>
> (1928, 172–3)

Atkinson did not disagree with Hawley's interpretation that this area had held a number of stones standing as part of a coherent setting although it seems that he may have misread Hawley's descriptions (which are certainly difficult to follow). Atkinson described Hawley's putative setting as consisting of three standing stones designated (by Atkinson) J, K, and L, but it seems reasonably certain from the passage quoted above that Hawley was writing of four features: (from the west) WA 2717 (J), 2726, 2749, and 2760 (L). These are also the features then suggested by Atkinson as forming *his* putative setting:

> within stone 31 and 49, at the inner ends of the two in-lying stoneholes of period II ..., and cutting into their filling were two more stone-holes [2726 and 2749]. These, together with holes J and L, formed the end of an oval setting of which the remainder lay on the line of the present bluestone horseshoe.
>
> (1979, 209–10)

The difference between the two interpretions then is only this: that Hawley believed that the rest of the Oval setting comprised the stones of the Horseshoe still in place today, while Atkinson believed that the Oval, although on exactly the same line as the present Horseshoe, was composed of fewer stones set at a greater distance apart than those of the present Horseshoe. Subsequently these were removed and replaced in new stoneholes on the same line, but closer together and without any stones at the northern end, thus creating the present Horseshoe.

The main argument used by Atkinson to support the hypothesis of an earlier, oval setting, was that the spacing of the four stoneholes at the northern end is wider than that between the stones of the present Horseshoe. The spacing of the northern stones:

> averages 11ft [3.3m] centre to centre, or just twice the spacing of the stones in the present horseshoe. It was estimated that if this spacing was continued round the oval, another hole in the same series should lie some 5ft [1.5m] north-east of stone 70, between it and stone 59a. A small cutting was made here to test this hypothesis in 1956 [C35] and the hole was duly discovered exactly where it was expected with an impression of the stone on the soft chalk of the bottom [WA 3268 (Figs 122 and 139, Sc 35.1), as Atkinson makes clear on the following page, 1979, 211]. Further confirmation came during the restoration in 1958, when yet another hole in the same series was found close below the southern side of stone 69 [ie WA 3402, Plan 2 and Fig 144, Sc 52.6].
>
> (*ibid*, 210)

It is incontrovertible that there is a difference in spacing between the present Horseshoe and the four holes of the northern arc although averaging the spacing as Atkinson does obscures the fact that the spacing is not regular within the arc. The distance between the central holes, WA 2726 and 2749, is less than the other four gaps (Fig 116). The reasons for this difference in spacing both within the arc and between the arc and the present Horseshoe cannot be accepted as necessarily indicating that the elements were not part of one plan. As it is clear that the Trilithons were already in place it is perhaps to be expected that any setting within the central area might reflect the existence of the Trilithon 'horseshoe'. Atkinson's suggestion of an earlier oval is harder to refute but it is does not appear a strong argument on present evidence. If a spacing of *c* 3.3m (ie 11ft) is assumed, as suggested by Atkinson, this suggests stones at the sites of: the northern end of the fifth Trilithon; beneath Stone 59; on the site of Stone 70a; at Stone 69; at Stone 68; close to Stones 66, 64, and 63, and between Stones 62 and 61. Atkinson only cites two of these in *Stonehenge*: the hole beneath Stone 70a (WA 3268) and that close beside and cut by Stone 69 (WA 3402). There is a hole close to the corner of Sarsen Stone 60 (WA 3444), but that also fits the spacing of the Horseshoe and is best seen as the opposite number to Stone 61 of that setting.

Stone 68 was apparently excavated by Gowland, and it is possible that a hole without a standing stone in it would not have been recognised, particularly as it would have probably have been cut through the fill of the stonehole for Stone 56. Although a small excavation was made to uncover Stone 66 it was too small to estabish whether there was also an earlier feature.

Only in C56, on the eastern side of the Horseshoe, are there any features which could possibly be cited as belonging to this setting and these were not cited by Atkinson in support of his hypothesis although he subsequently did add to the text of *Stonehenge* (ie in 1979, Appendix 2) and could therefore have added new evidence if he had felt it strengthened the argument. The spacing suggests a stone to the east of Stone 64 and there is a possible hole in that position (WA 3537) but the feature is not convincing. It is unfortunate that there is no section drawing for the north-eastern side of the cutting as this side runs along the line of the Horseshoe and without this there is no evidence that WA 3537 was demonstrably earlier than the Bluestone Horseshoe holes. In fact there is some evidence to suggest that the area was badly disturbed by later digging and the possibility cannot be dismissed that it is a later feature.

Finally, it seems odd that if any features in this area had been demonstrably early, or even likely to be so, that Professor Atkinson would not have used them in the published appendix as further proof that his hypothesis was correct. On balance it seems unlikely that any features were demonstrably earlier than the Bluestone Horseshoe features and it is possible that WA 3537 is part of the stonehole or ramp for Stone 64.

In summary, this sub-phase can be seen as a considerable elaboration of the monument, perhaps involving the introduction of a large number of new Bluestones to supplement those already on the site. The stones already present seem to have included the elaborately dressed Bluestones of the Bluestone Trilithon setting, which may have stood with the Sarsens, ie in sub-phase 3ii; it must be presumed that these had already stood in the Q and R Holes, in either a dressed or natural state.

The Horseshoe of Bluestones was intended as a coherent setting within the Oval, reflecting the larger, Sarsen version and it is is clear from the remaining stones that they were intended to increase in height from the ends towards the centre of the setting. This suggests that the stones of the northern arc may have been small, as they lie near the shorter ends of the Horseshoe. The setting around the entrance is quite likely to have also included the stonehole WA 2730, and may even have included a burial in WA 2724 (*see unphased features, below*).

It also seems possible that it was in this sub-phase, with its major remodelling of the monument, that the Altar Stone was placed in a position somewhere inside the line of the Oval/Horseshoe. Atkinson *et al* recorded its pointed base lying under fallen Stone 55b, but considered it unlikely to have stood in the nearby hole WA 3359, which may have belonged to an earlier setting or have held a pair to the Altar Stone. This has also been discussed with regard to the dressed Bluestone setting (*phase 3iii, above*), and there are no grounds for preferring one of these interpretations over the other.

It also seems reasonable, though it cannot be proved, that the Circle and Oval were constructed as part of a single plan. As pointed out by Atkinson (1979, 80) they both include elements of the elaborately dressed Bluestone setting, which strengthens the impression that they were part of a single remodelling of the monument. As most of the Circle stones are not shaped (*ibid*, 51) it could be suggested that they constitute a new selection of stones, brought in to supplement those of the earlier setting. It would be an interesting exercise for the future to establish by microscopic or chemical examination whether the Bluestones of the Oval and Circle derive from separate, distinguishable, sources.

Finally, the two cases of stones being placed in unusual positions is intriguing, but little can be offered by way of explanation. It would also be of interest to examine the complementary areas of the Horseshoe and Circle in the eastern half of the monument. The 'propping up' of Stone 70a, in the recut of a hole of a previous setting (Figs 125 and 138) may have been necessitated by the requirement that stones of the Horseshoe part of the Oval were graduated in height. The orientation of Stone 33e, at 90° to the usual orientation, is more difficult to explain, and is also commented on under phase 3v, below (and in the caption to Fig 134). This unusual placement of the stone is reminiscent of the emphasis on this area in phase 2, and it may not be too fanciful to suggest that this apparently non-functional 'entrance' indicates a memory and recognition of this area as having functioned as a real entrance for previous generations of users of the monument.

## Phase 3v: The Bluestone Horseshoe and Circle

It is impossible to establish that the Bluestone Circle and Oval formed parts of a single plan, although the arguments for it are considerable, but the same reservations do not need to be felt in the case of the Bluestone Circle and Horseshoe. The present arrangement of Horseshoe and Circle (Fig 128) must have been the product of an intentional remodelling of the monument. This could have involved either, as argued here, the removal of the northern arc, the resetting of the stones from a previous, separate oval setting (ie Atkinson's interpretation), or been part of a single act, using stones from some other source.

Whatever the case, it is clear that at some stage the Horseshoe and Circle were intended to be the major Bluestone setting of the interior, and it is that arrangement which has remained 'frozen' (apart from the considerable 'wrecking' which is likely to be post-monument in date) down to the present. The radiocarbon dates from both Circle and Oval/Horseshoe features suggest that the stones were put in place in the late third millennium BC. If, as is suggested here, the final remodelling did not take place until some time later, with the removal of the northern 'arc', this would place this sub-phase probably in the early second millennium BC.

The only hint at any activity around the Horseshoe or Circle later than this is on the eastern side of the Circle, in C13, where it is possible that Stone 33e, which lies at 90° to the rest of the Circle, was turned from a more 'normal' position at a late point in the monument's history. The stratigraphy in this section, however, was recorded by Hawley and is difficult to interpret (Fig 134). It is equally possible that Stone 33e is in its original

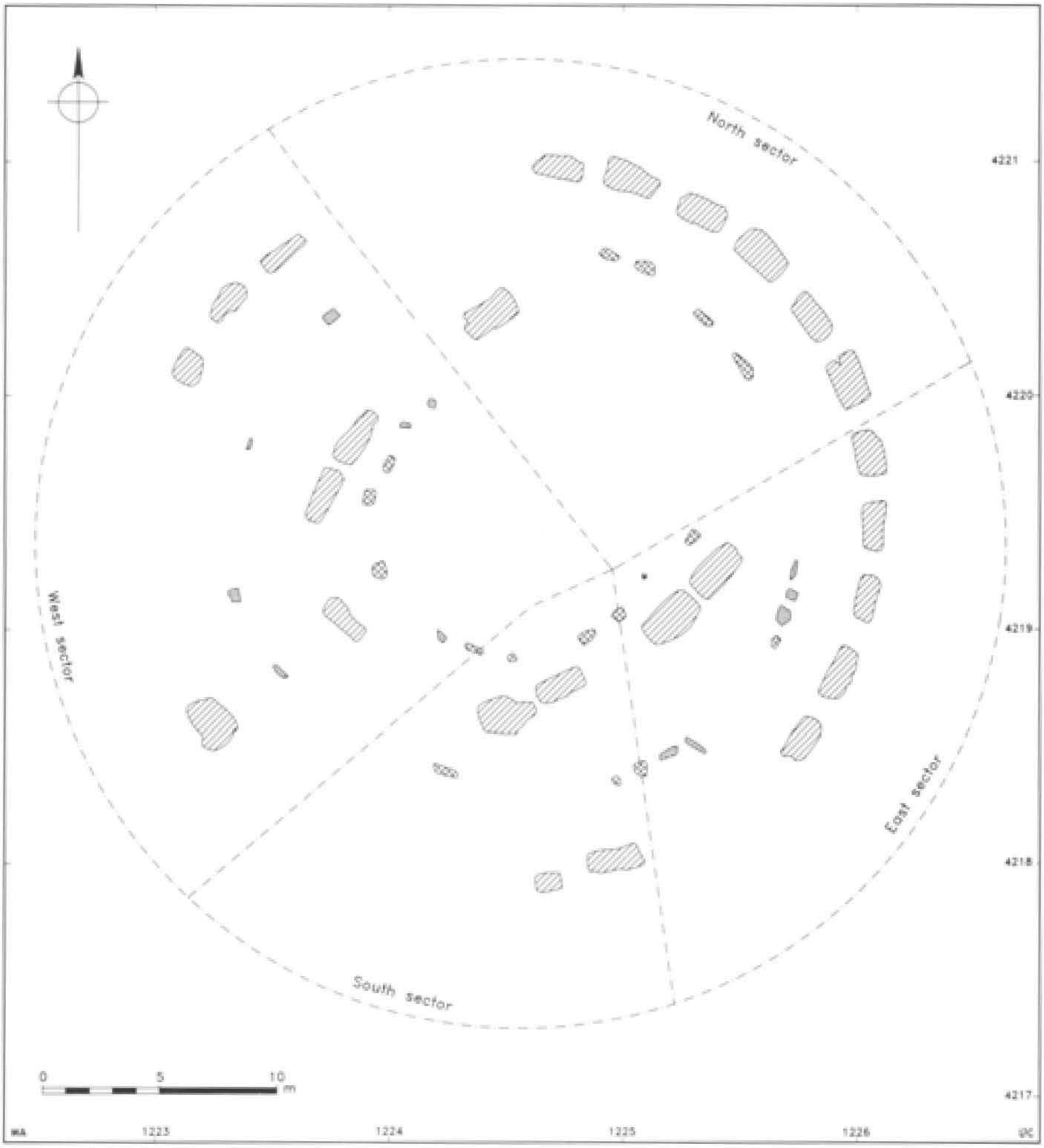



*Fig 128 Phase 3v: The surviving elements of the Bluestone Horseshoe and Circle standing with the Sarsen Circle and Trilithons*

position and was intended to lie at a different angle to the other stones of the Circle.

The stone settings of this sub-phase may well represent the last 'working' arrangement of the monument as the subsequent remodelling (ie sub-phase 3vi) appears not to have been completed. Whether the monument had by then already begun to suffer from deterioration is a point not yet answered, although at some future date the early fall of Stone 8 could be confirmed or refuted by excavation under it to establish the presence or absence of Z Hole 8.

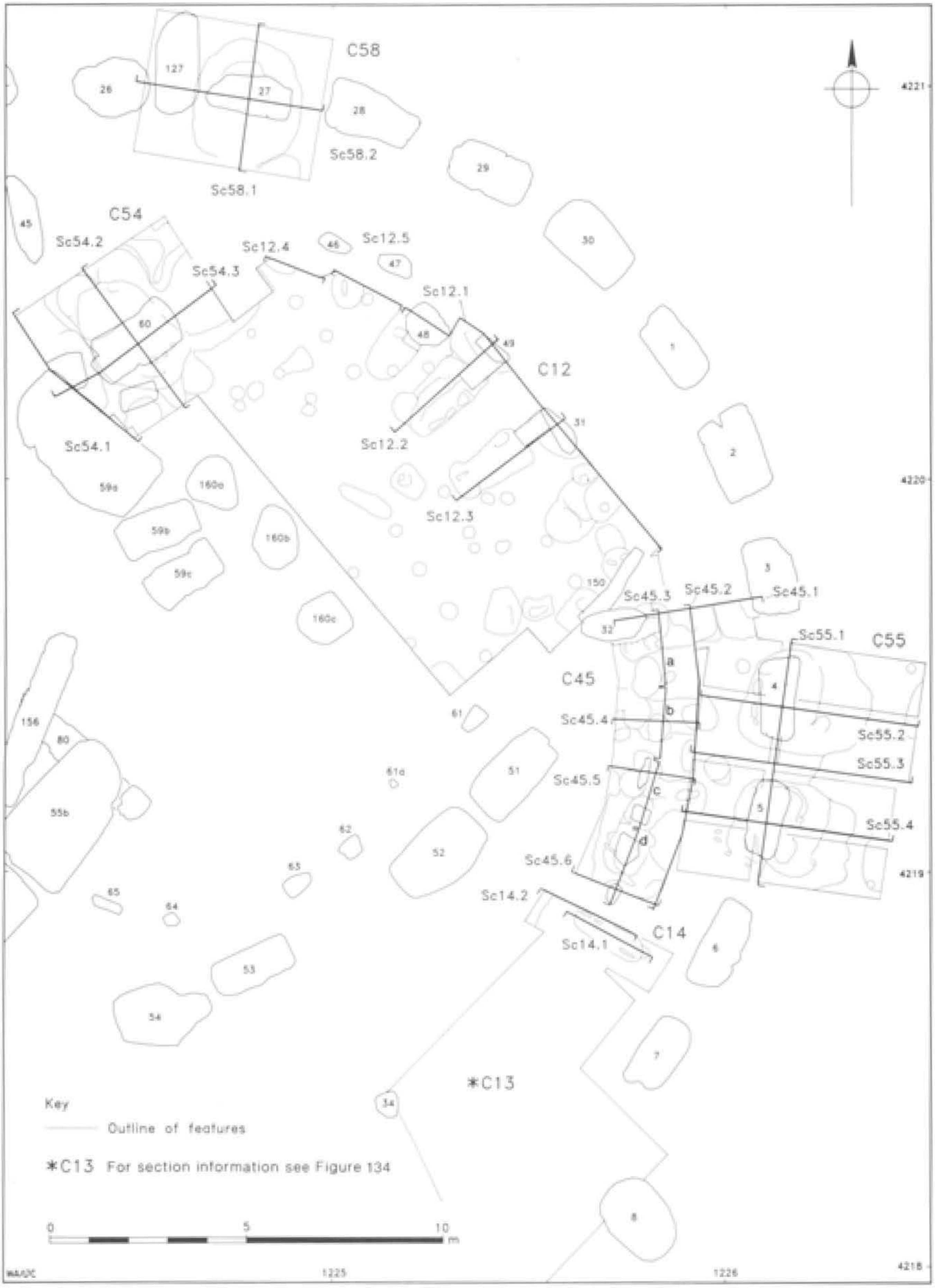



*Fig 129 Location of sections, north and east sectors*

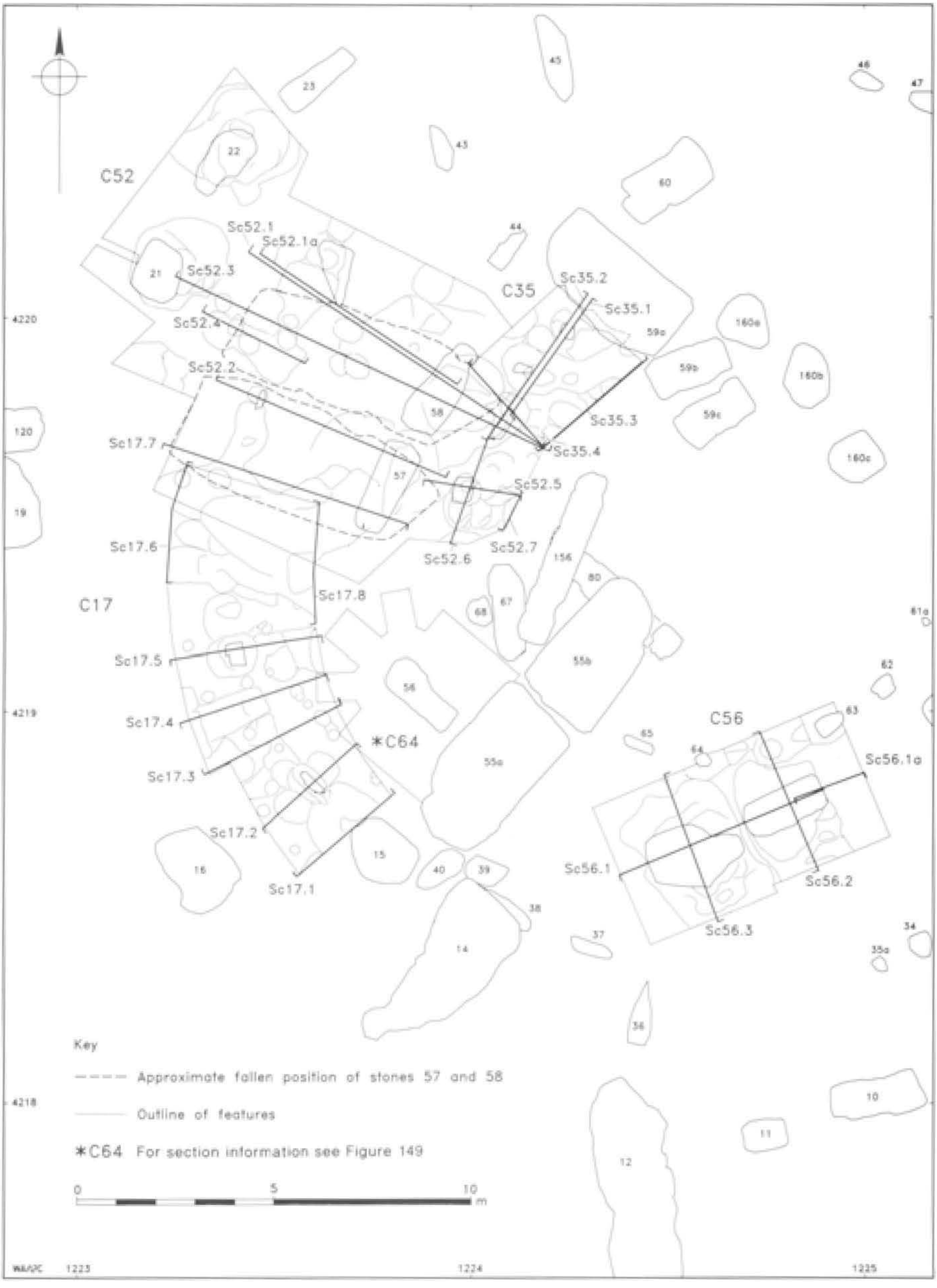



*Fig 130 Location of sections, south and west sectors*

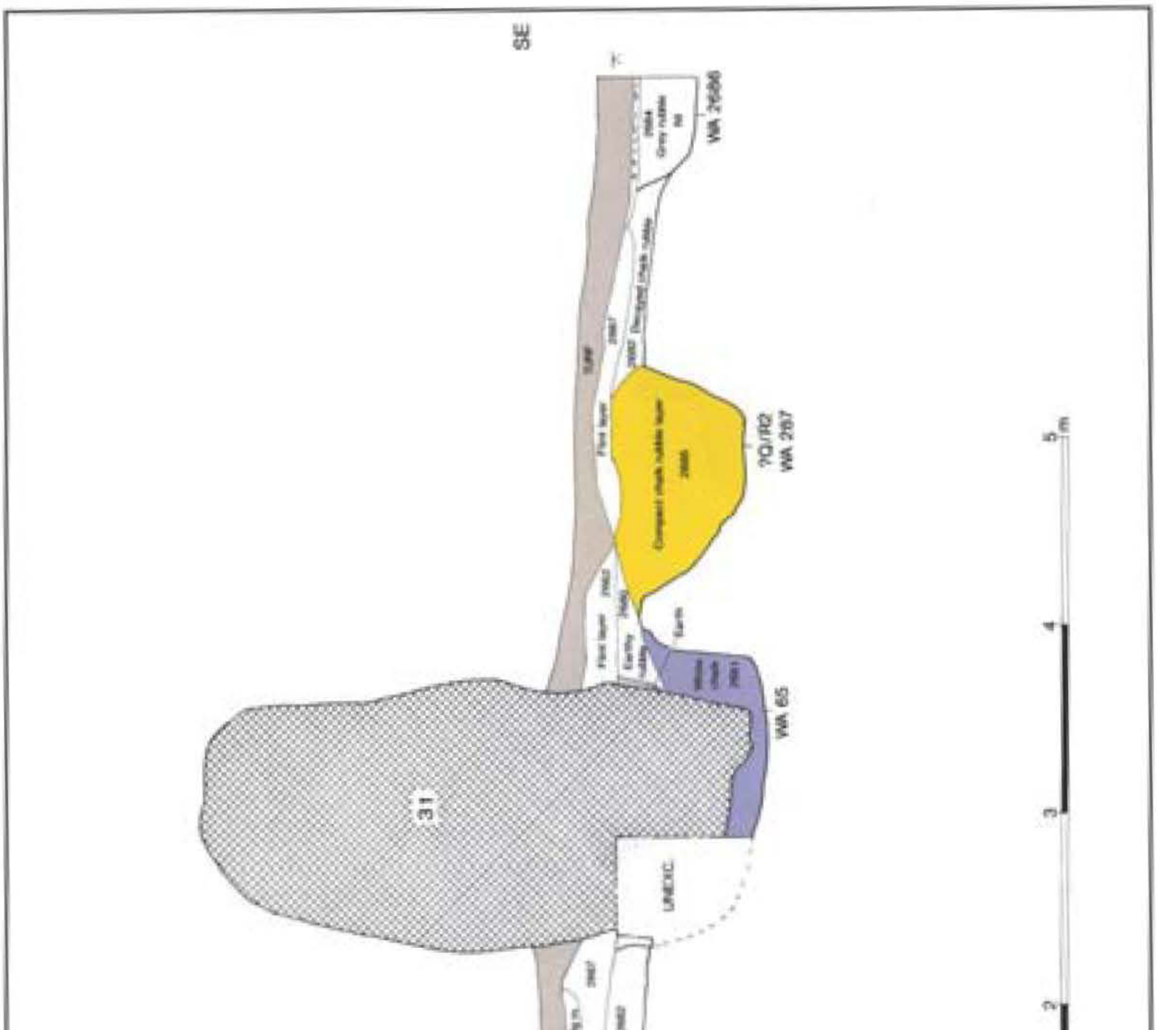



*Fig 131 C12, longitudinal section (for key see Fig 132)*

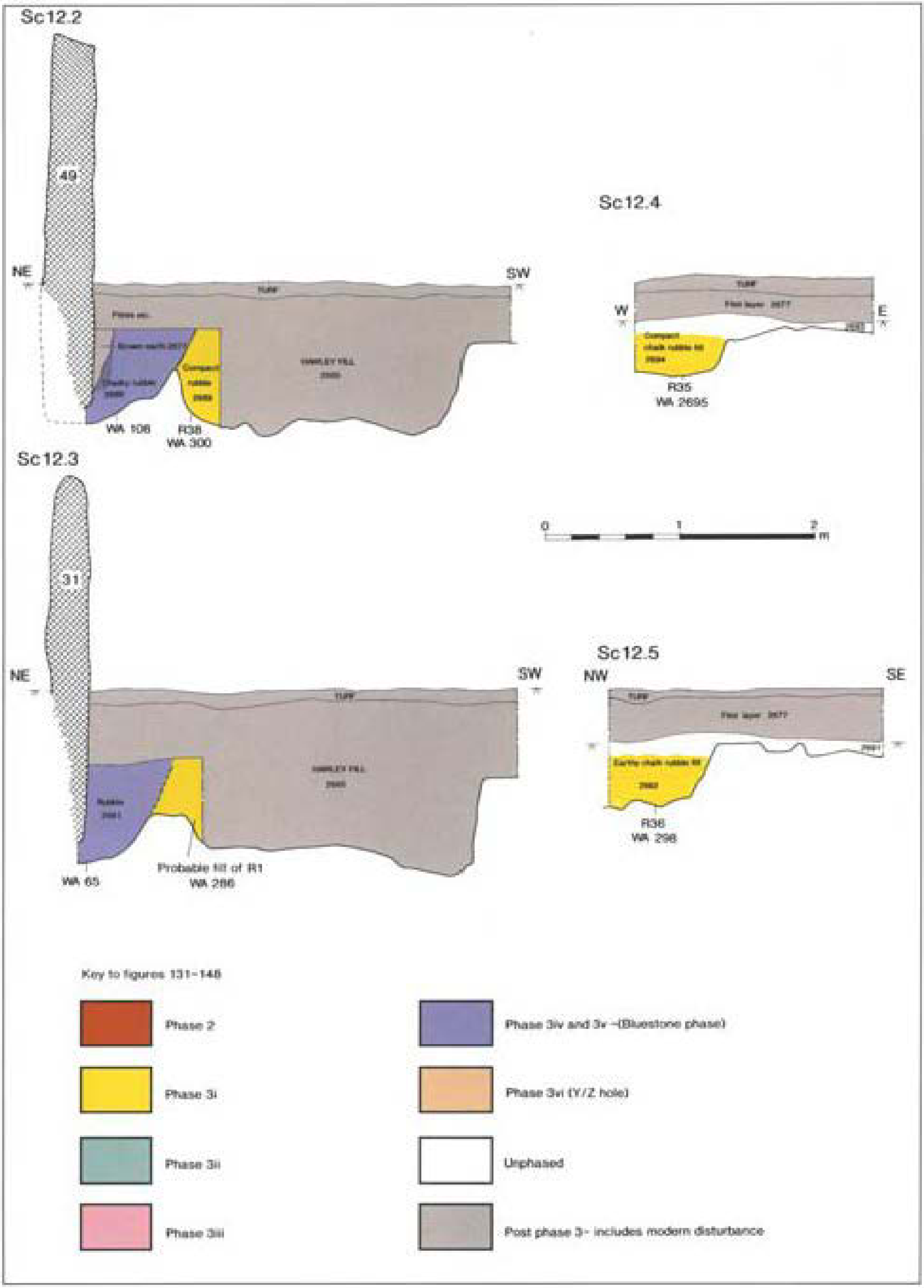



*Fig 132 C12, sections and key to all phased sections*

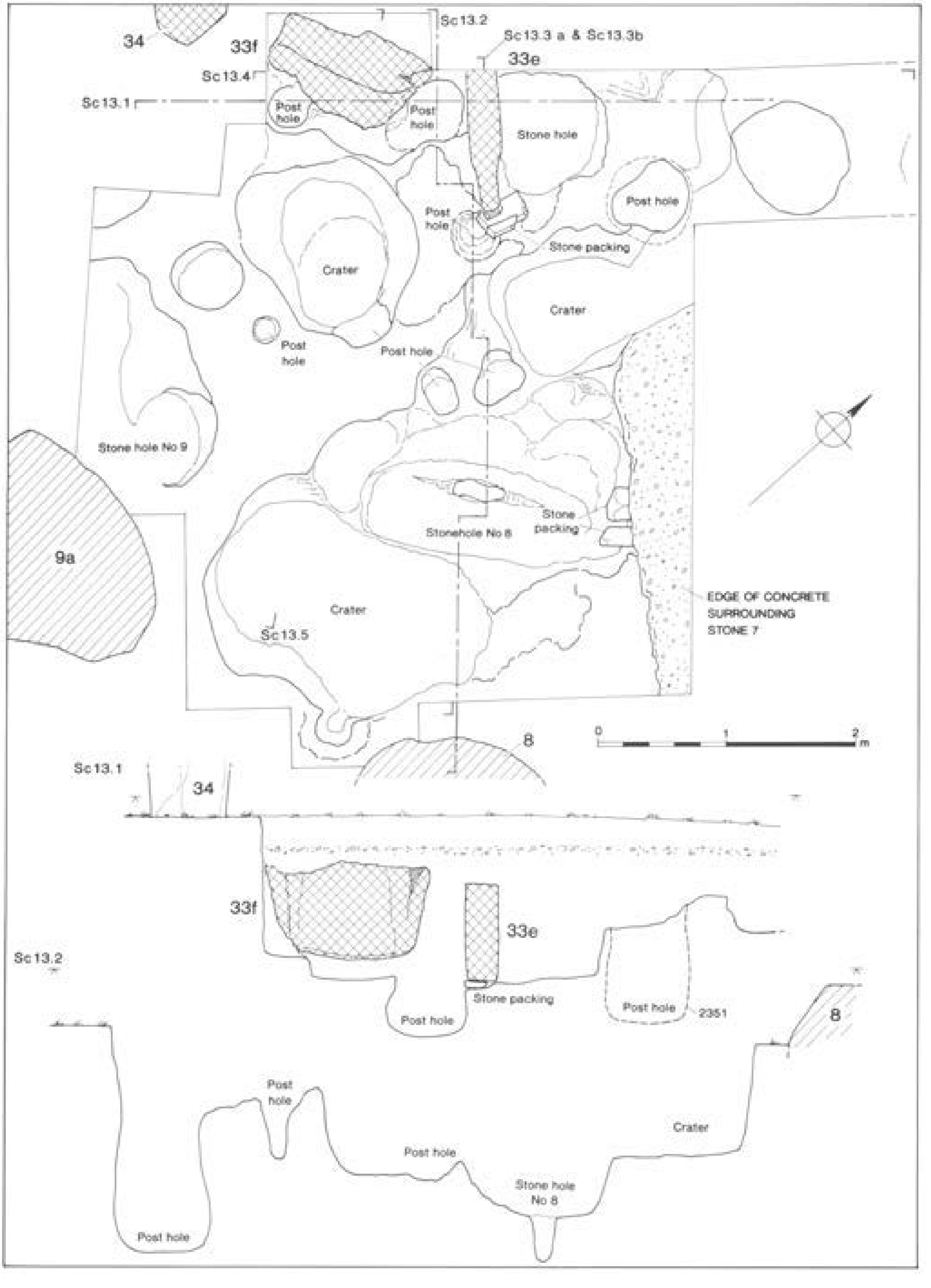



*Fig 133 C13, Plan and profiles of Hawley's excavations (see caption to Fig 134, below) (for key see Fig 132)*

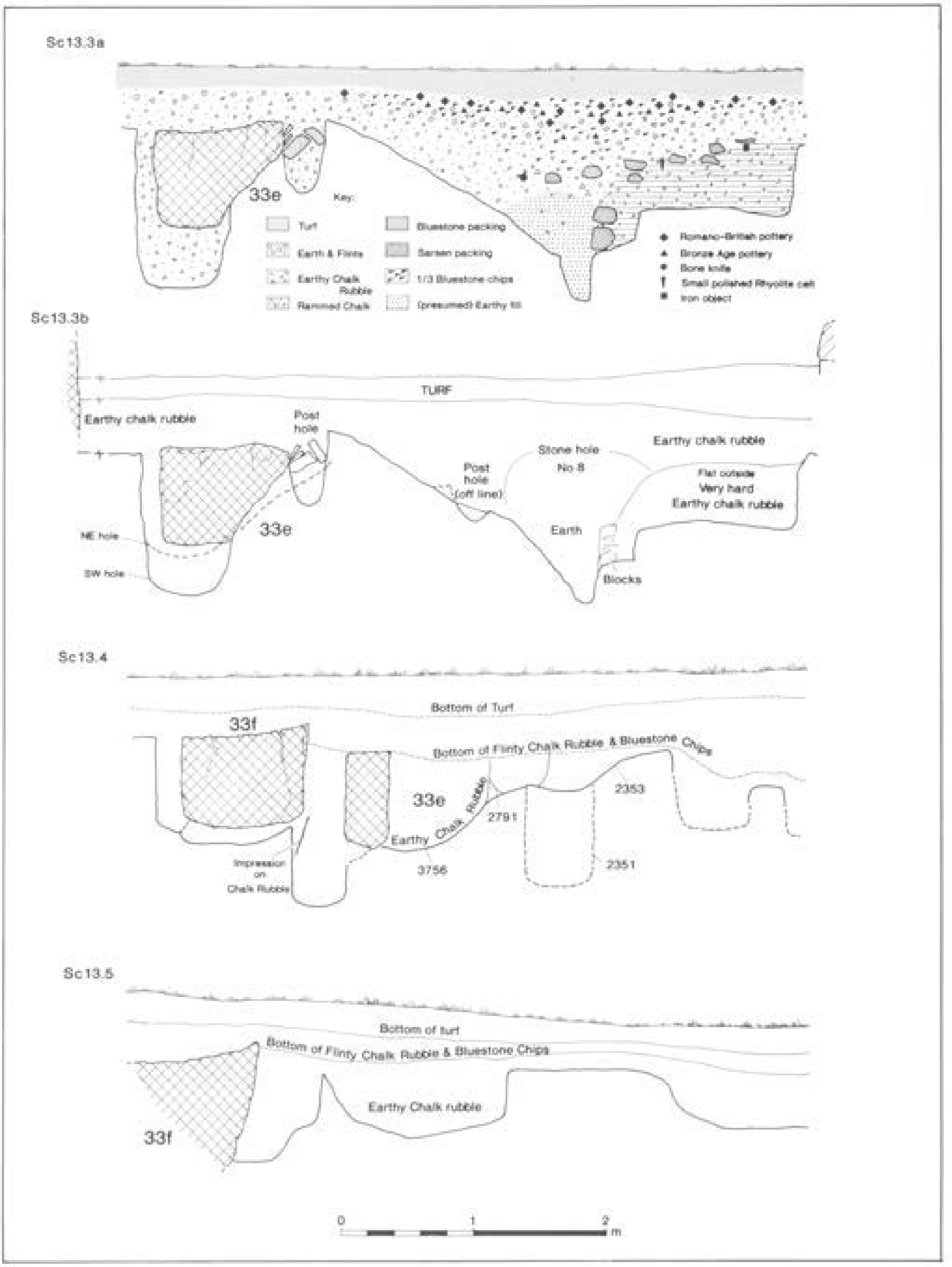



*Fig 134 C13: sections through the Bluestone Circle*

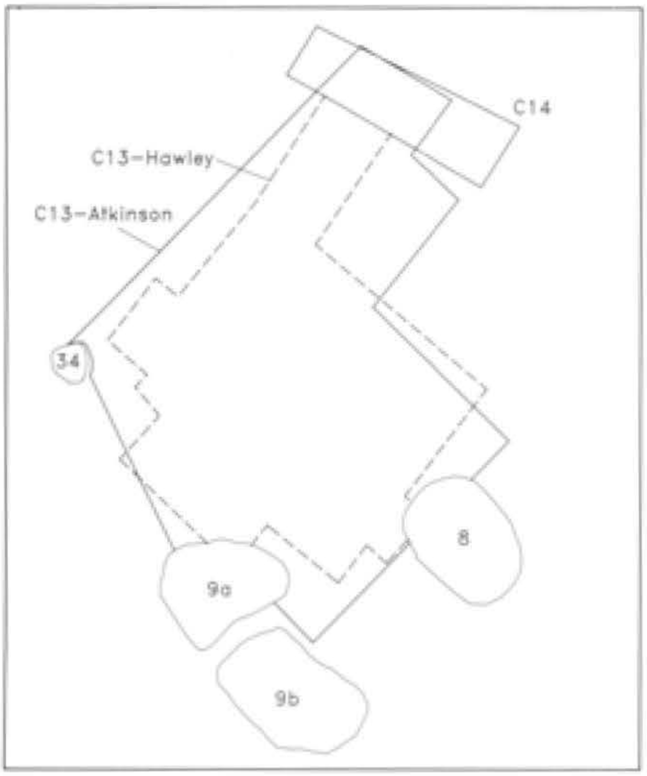



*Figure 134 (cont)*

Lt-Col Hawley rarely recorded sections through any features, but he made an exception in the complicated area around fallen Sarsen Stones 8 and 9 and standing Bluestone 34. He acknowledged that this area was difficult to record and interpret, remarking that 'an extraordinary state of things was revealed. The ground was honeycombed with post-holes and craters of all sorts, sizes and depths, many of them having been cut one into another in apparently successive periods of digging and suggesting a series of changes. The long continued burrowing of rabbits had increased the general confusion, making the difficulty of distinguishing the outlines of the holes far greater. I frankly confess that I have no explanation to offer in elucidation of this tangle, and I doubt if anybody will ever be able to explain it satisfactorily' (1926, 8). It is possible that even under modern conditions of excavation this area could never have been elucidated, because of the disturbances mentioned by Hawley; with the more primitive recording of the 1920s as the only record for most of it, it is impossible to produce a definitive interpretation. As there are several possible interpretations, between which it is impossible to choose, and because these differing interpretations in turn have different effects on the interpretation of major elements of the monument, the evidence and arguments relating to the three published sections, with two unpublished versions, from the Hawley excavations, are discussed here rather than by phase.

In brief, Hawley excavated along the line of the Bluestone Circle, uncovering Bluestone stumps and the holes for Bluestones in a nearly continuous line extending from standing Bluestone 34 anti-clockwise to standing Stone 33. He recognised some earlier postholes, cut by the Bluestone holes. The first Bluestone to be uncovered was Stone 33f of the Bluestone Circle. Hawley reports that 'When examining one of the early period postholes [probably 2345] it was found to be cut by a cavity holding the stump of a missing stone.

The stump was of shale or volcanic ash and reached about 4ft [1.22m] below the surface. It had been split longitudinally when the upper part had been broken of and the front piece having become detached, had now to be propped up. Close to it on the north-east there was another stump [33e], which, for some unaccountable reason, had been placed with the sides directed outwards ... It is strange that the stone should have been placed in that position, for had it been too wide for the interval (and it certainly would have been) a smaller one could have been substituted: perhaps it was so placed to give a wider interval for passing through the circle. It had been wedged with pieces of the same sort of stone on the east side, probably because an earlier posthole close by [probably WA 2340] made it insecure' (1926, 8-9).

Another earlier posthole was also noted between the two stumps (WA 2343). Excavating anti-clockwise Hawley comments that stoneholes were regularly spaced 'at the same short interval as had been noticed between the first stump and the standing stone 34' (*ibid*). They appeared to stand in 'what was practically a continuous trench with very short holes in the chalk rock, and the trench had been filled with rammed chalk rubble packed around the stones' (*ibid*). In the Diary Hawley describes finding two concentrations of bluestone chips, 'one lot was all rhyolite, the other all dolerite (the latter nearest to stump 2 (the long piece) first excavated) [ie Stone 33e]'. This seems to imply that in the area initially excavated, which extended only as far anti-clockwise as the edge of WA 2791 furthest from Stone 33e, there were two concentrations of bluestone chips presumably marking the sites of destroyed stones.

The only two features in this length of the cutting are WA 3756 and WA 2791, which gives a very narrow gap between Stone 33f and the putative stone in WA 3756. On the one hand Hawley's comment that Stone 33e certainly would have been too wide for the interval (*ibid*) seems to suggest that he did envisage a stone standing in 3756, but on the other he comments that 33e was placed the way it was to provide a wider gap to enable entrance to the interior (*op cit*, 9), although if 3756 was occupied by a stone there would be virtually no gap. The possibility that the stone chips nearest to Stone 33f derived from its partial destruction rather than from a separate stone cannot be supported, as Hawley states that the stump which was turned the wrong way was of volcanic ash and the the chips nearest it of dolerite.

The next two Bluestone holes, in front of Sarsen Stone 7, are clearly not the same features as the two concentrations of bluestone chips, as they are described separately by Hawley. The accounts given in the Diary and in the published report also appear to conflict (apart from the confusion caused by the change in the order in which the Bluestone stumps are discussed: stump 1 in the Diary is stump 2 in the published report and *vice versa*, because the Diary describes the stumps in the orderin which they were found, and the publication describes them in plan anti-clockwise). The report mentions a short hole for a Bluestone 2½ft (0.76m) from Stone 33e (ie the 'second stump' in the report), and nearly under it another deep hole which had been similarly filled up (*ibid*), but this is nowhere mentioned in the Diary. Conversely, the concentrations of bluestone chips are not mentioned in the report.

The section published as figure 2 by Hawley (1926) appears to be consistent with the published description of the 'short hole 2½ft from the second stump', with WA 2791 as this feature, but it does not show on Hawley's plan (Fig 133), presumably because, as shown on the section, it was cut almost entirely through the fill of an existing feature, WA 2353, although it may show on the 1964 plan (Fig 277). If this was a Bluestone hole, and there was even in 1964 no possibility of establishing that this was the case as its fill had been removed in its entirety, then WA 2353 must pre-date it, and therefore could be an R Hole. However, an alternative interpretation is that 2791, which must lie close to or be coincident with one of the concentrations of bluestone chips noted by Hawley, is the result of digging out a Bluestone, and represents destruction rather than construction, with 2353 forming the nearly continuous trench holding the Bluestones as noted by Hawley.

There is no evidence to either support or refute this, but neither interpretation successfully deals with the relationship of the hole WA 3756, filled with earthy chalk rubble (Sc 13.4), apparently cutting 2791, although the relationship as shown here is not clear. It would seem unequivocally to cut the fill of 2353. Unlike 2791, for which there is no description of the filling, it seems unlikely that 3756 is a post-monument feature, as its fill of earthy chalk rubble is comparable with, for instance, Q4, Q5 and Q6. It cannot be assumed that 3756 was intended for, or at any time held, Bluestone 33e. Hawley clearly did not consider that possible, hence his statement on the stone being too large to have fitted the gap if placed with its long side to the circumference of the circle. It must therefore have seemed reasonably secure in its present position and this is given some support by the original of the section published as figure 1 by Hawley (1926).

The published section, figure 1 (Sc 13.3a), which shows a longitudinal view of 33e, gives the impression that the stone may have been sitting within a recut of a feature, as it lies c 0.4m above the base of the feature it lies within.The original drawing, however, reproduced as Sc 13.3b, shows a line immediately below the stone; annotated 'NE hole' while the base of the feature is annotated 'SW hole'; this makes clear that the section is illustrating two features, the deep posthole WA 2343, south-west of the centre of Stone 33e, and either WA 3756, to the north-east, or a narrow cut around the stone itself which does not show on plan.

As the base of the stone more or less coincides with the base of 3756 (Sc 13.4) it seems reasonable to conclude that the stone may have been originally intended for that hole but was later turned on its axis within it, but equally there could have been another stone sharing 3756 with 33e, in which case 33e's position is original; the fact that in Fig 134, Sc 13.1 there appears to be a slight step between the cut of 33e and the main body of 3756 may slightly support the latter. If 3756 was shared, and 2353 also held a stone, then this would account for the two concentrations of bluestone chips noted by Hawley, although it would give no obvious reason for the turning of 33e, as it could not be an entrance to the circle, and the replacement of the stone with a smaller one or trimming it to size would seem to have been more reasonable options than turning it. It also does not accord with the description by Hawley of the nearest bluestone concentration being 2½ft from 33e, which matches the position of 2791.

Finally, it is perhaps possible that 3756 is an R Hole (R10), since its fill, earthy chalk rubble, is similar to that of some Q and R Holes (eg in C45), in which case 33e must lie within a cut not shown on section. If this is the case, however, it must be assumed that Sc 13.4 is incorrect. The relationship between 3756 and 2791 may be seen as ambiguous, and it is possible that both 3756 and 2353 are cut by 2791, which could therefore be a Bluestone hole, according to the description of such a hole in this position by Hawley. If this were so, WA 2353 would be R10, and 3756 R11, but these would not pair up with the much more easily recognisable Q10 and Q11 (Fig 80, WA 297 & 296); an alternative would be that 3756 is Q10,and 2353 a feature of unknown function, probably cut by 3756 and certainly cut by the putative Bluestone hole 2791. This would leave the second of the two bluestone concentrations mentioned by Hawley, which could therefore only be accommodated in 2353, which appears to contradict the section.

However, it must be borne in mind that the excavated features along this length must, since there is evidence that there were Bluestones along this length which are not in place now, include features created by destruction as well as construction. It cannot be assumed that when Bluestones were removed the stoneholes were neatly emptied out, nor that Hawley would in all cases have been able to distinguish if there were distinct robber feature , and given this it is probably now impossible to disentagnle the sequence of events in this area with any degree of certainty.

In summary, the possible interpretations are:

1 That Stone 33e is in its original position; with Bluestones in WA 3756, 2353, 2389, and 303; that the relationship shown in Sc 13.4 between 3756 and 2791 can best be interpreted as separate stoneholes within a near continuous trench, with the cuts as shown the result of destruction rather than construction; and no R Holes in this area, or none surviving.

2 That 33e was originally placed in 3756 but subsequently turned through 90°; otherwise as 1. This seems unlikely as Hawley specifically rejected it.

3 That 33e is in its original position but within a cut which does not show in section; that it cuts 3756, which is therefore probably an R Hole, possibly R11; 2791 is probably also an R Hole, although with no obvious Q Hole pair.

4 As 3, but the relationship between 3756 and 2791 may be shown incorrectly and 2791 may be a Bluestone hole; and 2353 an R Hole.

The first interpretation is considered most likely, on the grounds that it accounts both for the two concentrations of bluestone, and the fact that 3756 is too large for its hole, although its excavator clearly believed it to be in its original position.

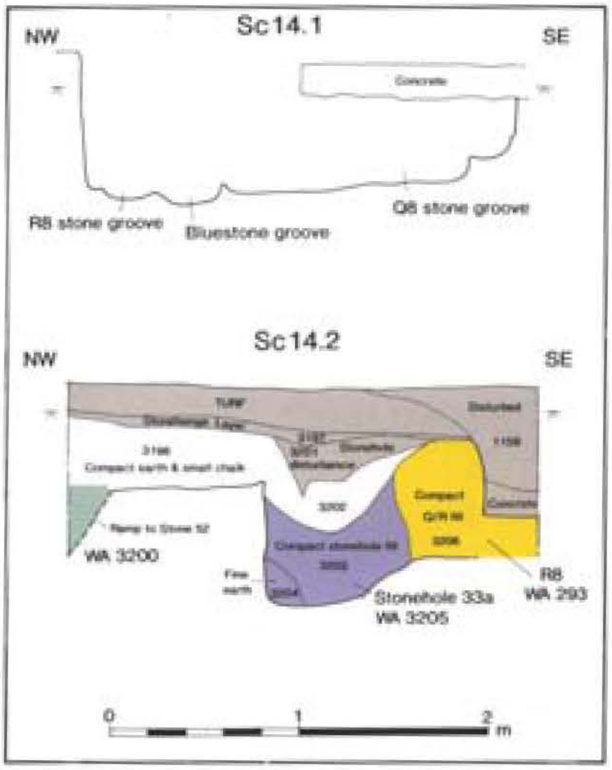
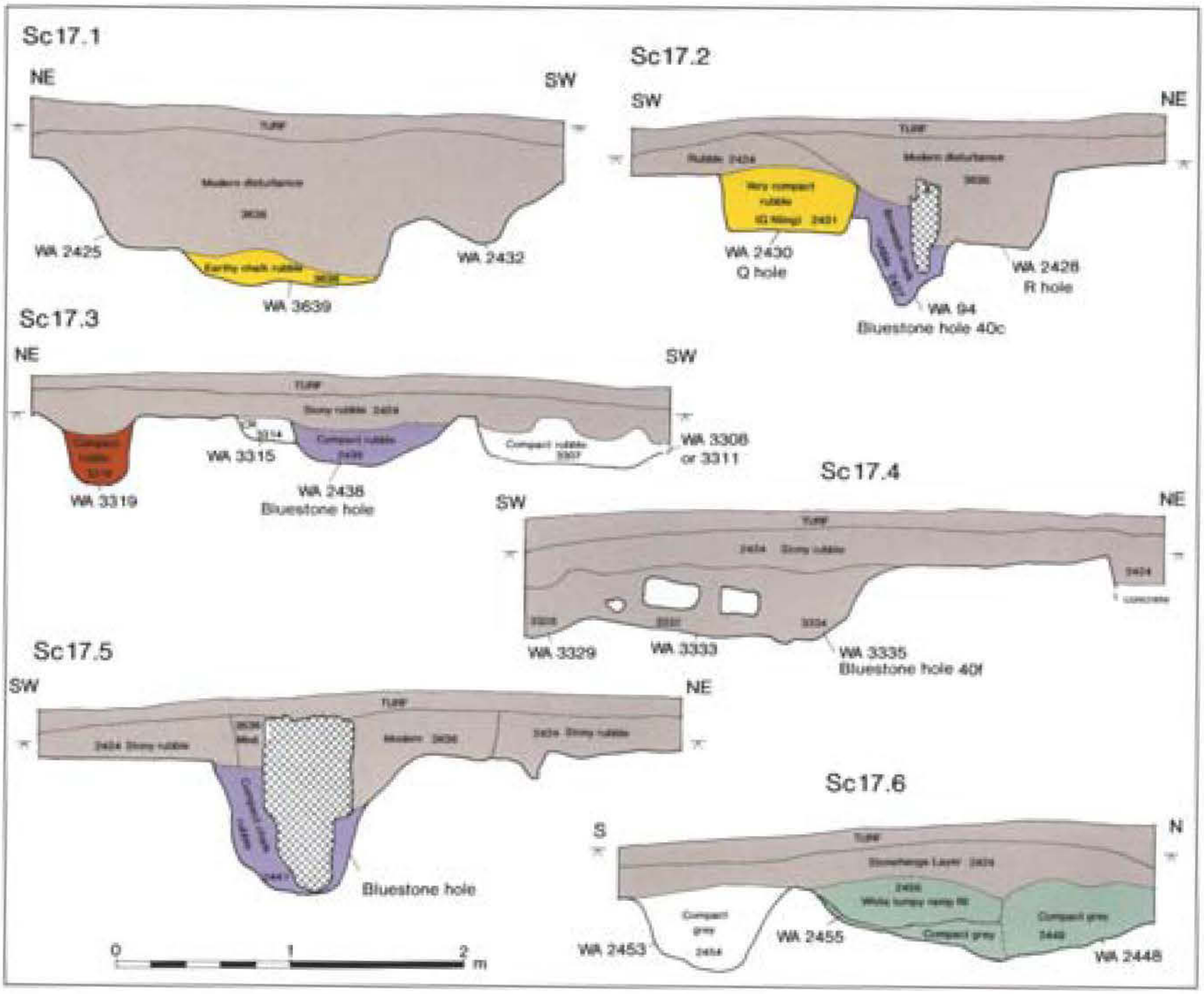



*Fig 135 C14, sections (for key see Fig 132)*

*Fig 136 (below) C17, sections (for key see Fig 132)*

These sections illustrate the area of disturbance (3636) excavated by both Hawley and by Atkinson *et al.* This feature (WA 3639 etc) is discussed in text under unphased features in the interior. The extent of the original feature is unknown because the later disturbance is likely to have enlarged it. The extent of the remaining undisturbed filling in the section (3638) suggests that it was almost of the dimensions of the surviving feature



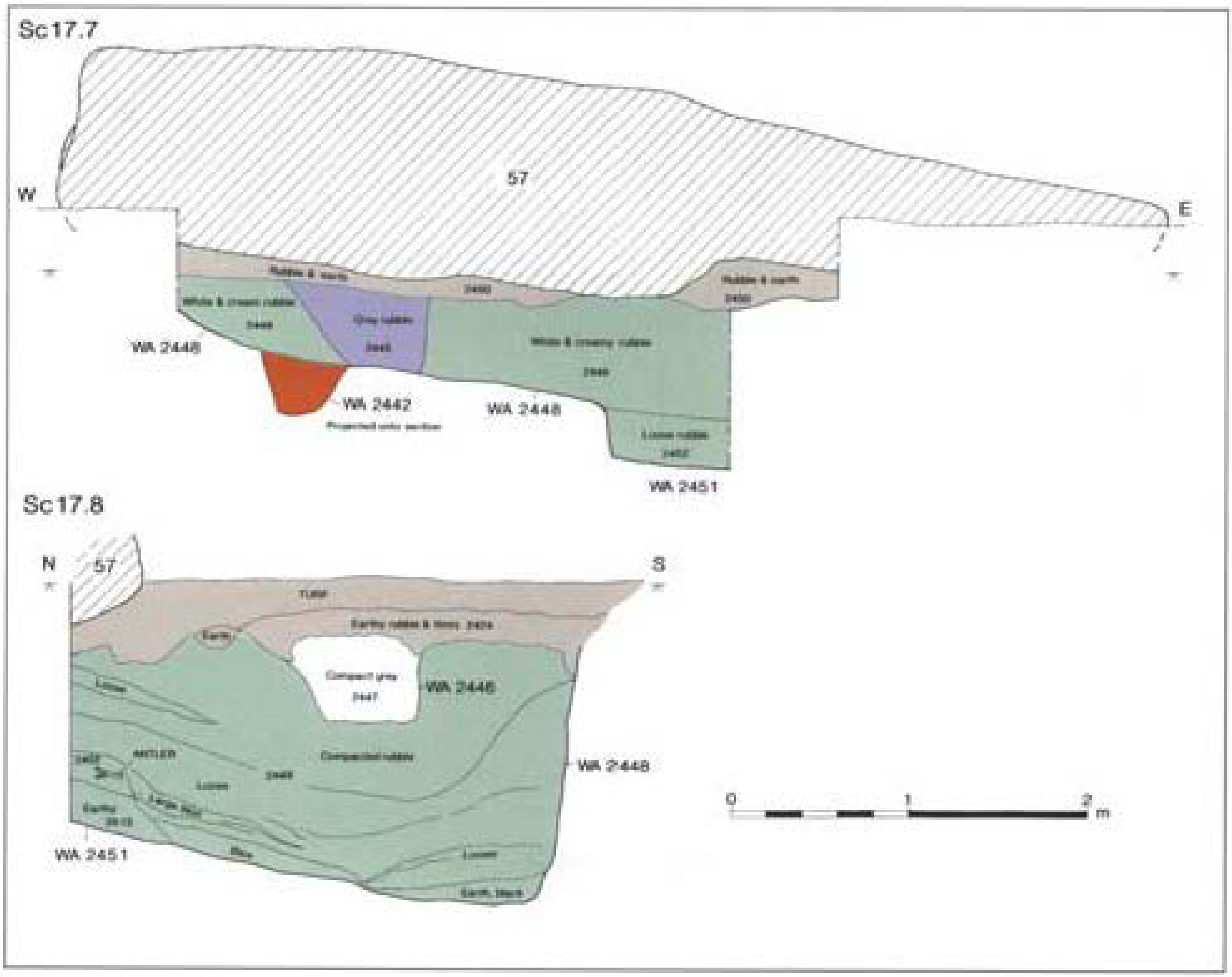



*Fig 137 C17, sections (For key see Fig 132)*

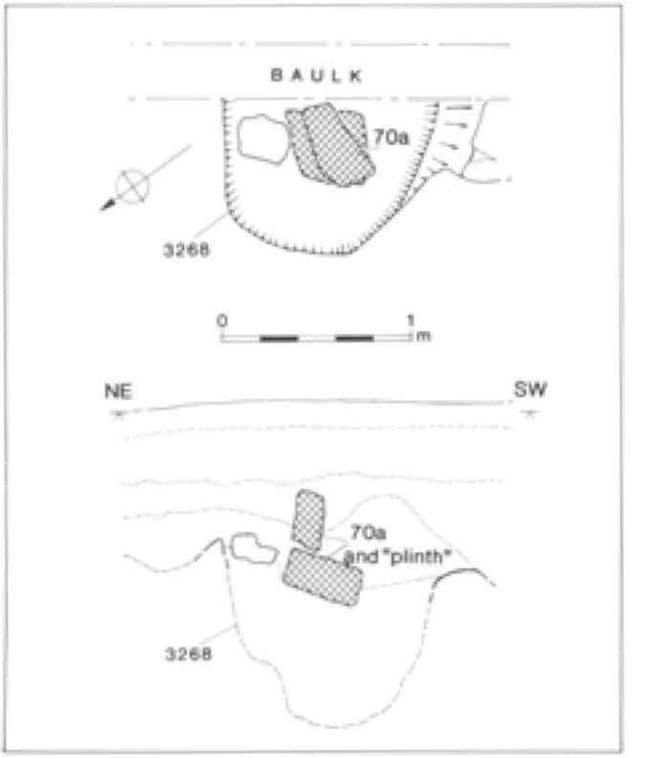



*Fig 138 C35, plan and section of plinth, sections (for key see Fig 132)*

Trench C35, excavated in 1956, contains some of the clearest stratigraphic evidence for the existence of settings of Bluestones pre-dating the surviving settings. Four sections (Fig 139), along two sides of the trench edge and both sides of the baulk, were recorded, and a further section – a post-excavation reconstruction by Professor Atkinson – has also been published (Lawson 1992, fig 3).

The earliest feature in the sequence is a curving feature, WA 3279. This is noted in the reconstructed section, but not on either the field plan or field section, as having stone impressions along its base. There are at least two of these within the trench, and there would have been space for another at the end of the feature, which has been removed by a later cut (WA 3268). The curved feature runs out of the trench to the north-east, where the fallen Stone 59A is still in place above its remaining length. It does not appear in C00, on the north-eastern side of Stone 59a, so must either terminate under the stone, or curve more sharply round in the surviving length than it does in the excavated length. Photographs (Fig 90) suggest that along some of its length at least the sides were sharply cut and approaching the vertical, but in the one section showing its cut (Sc 35.1) the side shown slopes up in steps in the lower half and as a gradual slope in the upper half. It is clear from the photographs, however, that this was a substantial dug feature, and not a naturally-occurring feature in chalk, or the result of tree-throw or other disturbance. The filling is described only as 'medium grey rubble' and the reconstructed section does not add further to this. There were apparently no finds, but a comment by Professor Atkinson in archive notes suggests that an attribution to his Phase II (here phase 3i) was considered by him to be reasonable.

There is one feature of the published reconstructed plan which differs from the archive drawing in the detail of WA 3279. In the archive drawing it appears that 3279 could have continued through to the northern side of the section, (ie to Sc 35.3), but it is clear from the section that it did not, and the published plan has been amended to show what seems to be an presumed end to the feature within the line of the baulk, which does not seem to have been removed.

The curved feature 3279 was cut by WA 3268, an oval feature filled, in its lower part, with loose grey rubble (Sc 35.3 and 35.1). This, according to Professor Atkinson, had clearly held a stone, the stone impression at its base being illustrated in the reconstructed section. The lower part of the hole appeared to have been backfilled with rammed chalk (Atkinson 1979, 211). There was no stone remaining in this stonehole, and the hole had been reused, at a higher level, for a Bluestone, labelled by Atkinson as Stone 70a. This seems to have lain within a recut (WA 3269) of the stonehole. The surviving stone, 70a, did not fall within the section, but its position is clear from a plan and from photographs (Fig 125). The stump (which did not survive above ground level) appeared to have been broken or damaged before its erection, and it was placed on a rough 'plinth' formed of its broken end (*ibid*). It is interpreted by Atkinson as being Stone 70a of the Bluestone Circle (*ibid*).

This interpretation may, however, be questioned on further examination of the relationship between WA 3274, the 'morganite' (WA 3266), and the stonehole for 70a (ie WA 3268 recut as WA3269). Section 35.2 (the north-facing section) shows that the reuse of Stonehole 3268 was as a cut, rather than the stone resting simply on the backfill WA 3267, and it also shows the filling of this recut, which is of cemented chalk rubble (ie the 'morganite', WA 3266) extending outside the limits of the stonehole. A comment by Atkinson (in archive for C17) describes 'morganite' as being puddled chalk, giving a concrete-like finish, and intended to seal the holes.

Although Stone 70a and its plinth are not shown in section, both the photographs (Fig 125) and the reconstructed section show them to have been set in the 'morganite'. This layer, WA 3266, is shown as cut by a feature which appears to be the original stonehole for Stone 70b (ie WA 3274). Stone 70b was not found *in situ*, having been disturbed, as shown also in Sc 35.2). In both sections it seems reasonable to interpret WA 3274 as the original stonehole and WA 3271 as the cut line of the disturbance.

There are no photographs which illustrate the relationship between WA 3274 and layer 3266, and as the description of both the fill of 3274 and layer 3266 are identical it is possible that the cut line was difficult to identify, but the cut of 3274 is clearly marked and must be regarded as accurate. Where relationships were in doubt, as in Sc 35.2 between the fill 3278 and cut 3274, it seems that they were sometimes not recorded, so the fact that it was recorded in this case suggests that it was clearly visible. If the stonehole for 70b cut the 'morganite' 3266 then doubt must be cast on stones 70a and 70b as being contemporaneous elements in a single plan. The only way this could be reconciled with the stratigraphy is to assume that the sequence shown in Sc 35.2 was produced by the constructional sequence of the Bluestone Horseshoe (ie that Stone 70a was erected before, but not long before, Stone 70b, as part of one plan).

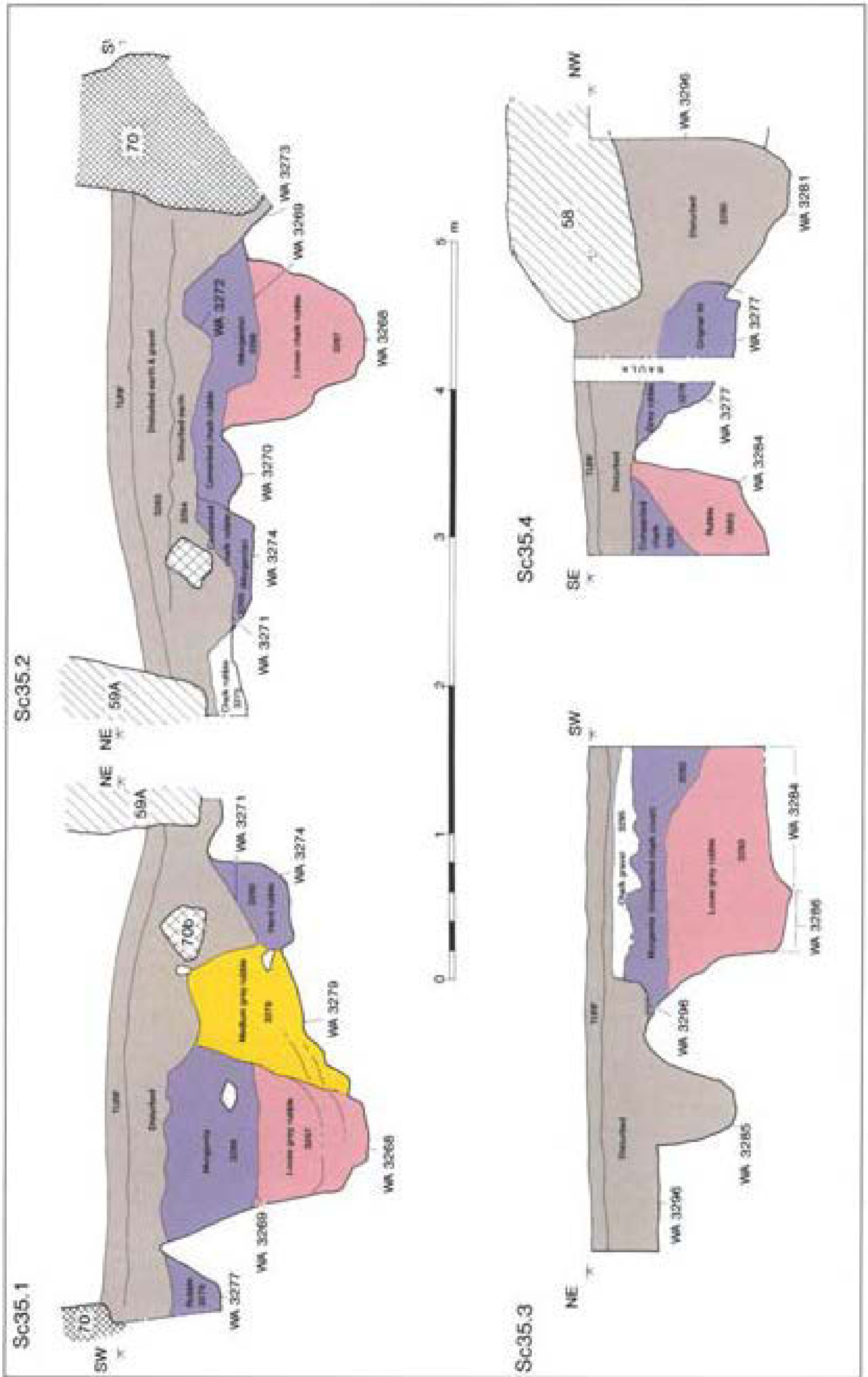



*Fig 139 C35, sections (for key see Fig 132)*

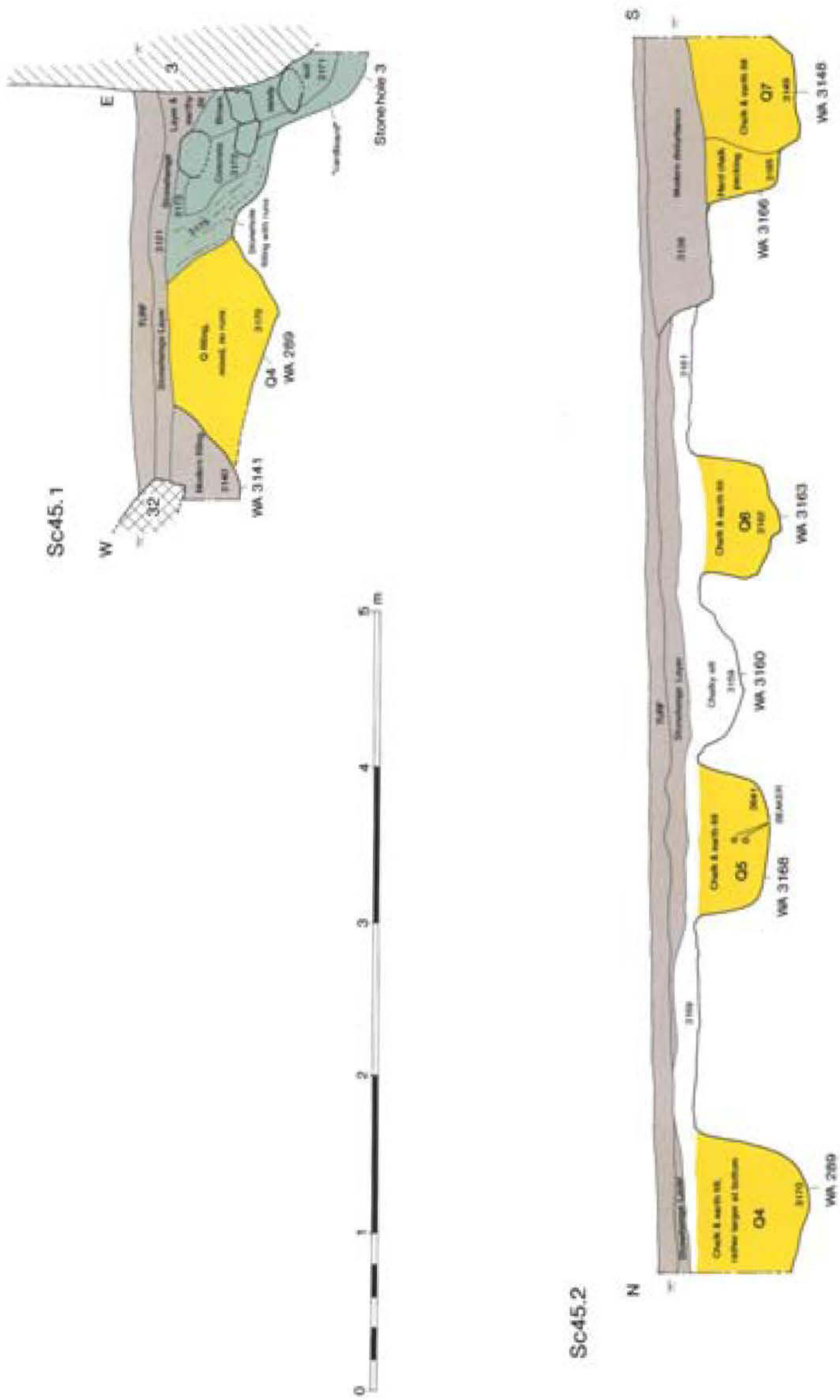



*Fig 140 C45, sections (for key see Fig 132)*


*Fig 141 C45, sections (for key see Fig 132)*

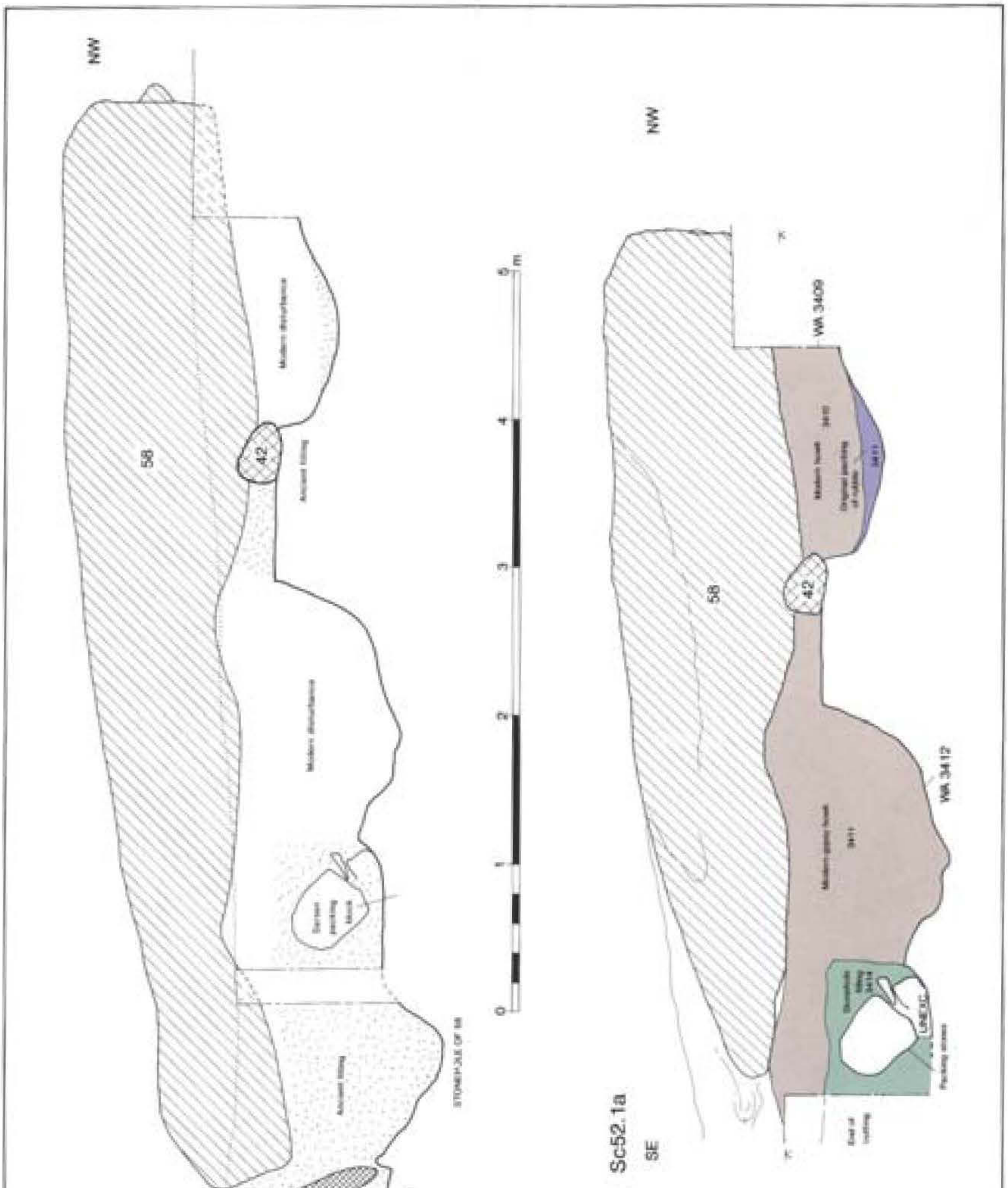



*Fig 142 C52, sections (for key see Fig 132)*

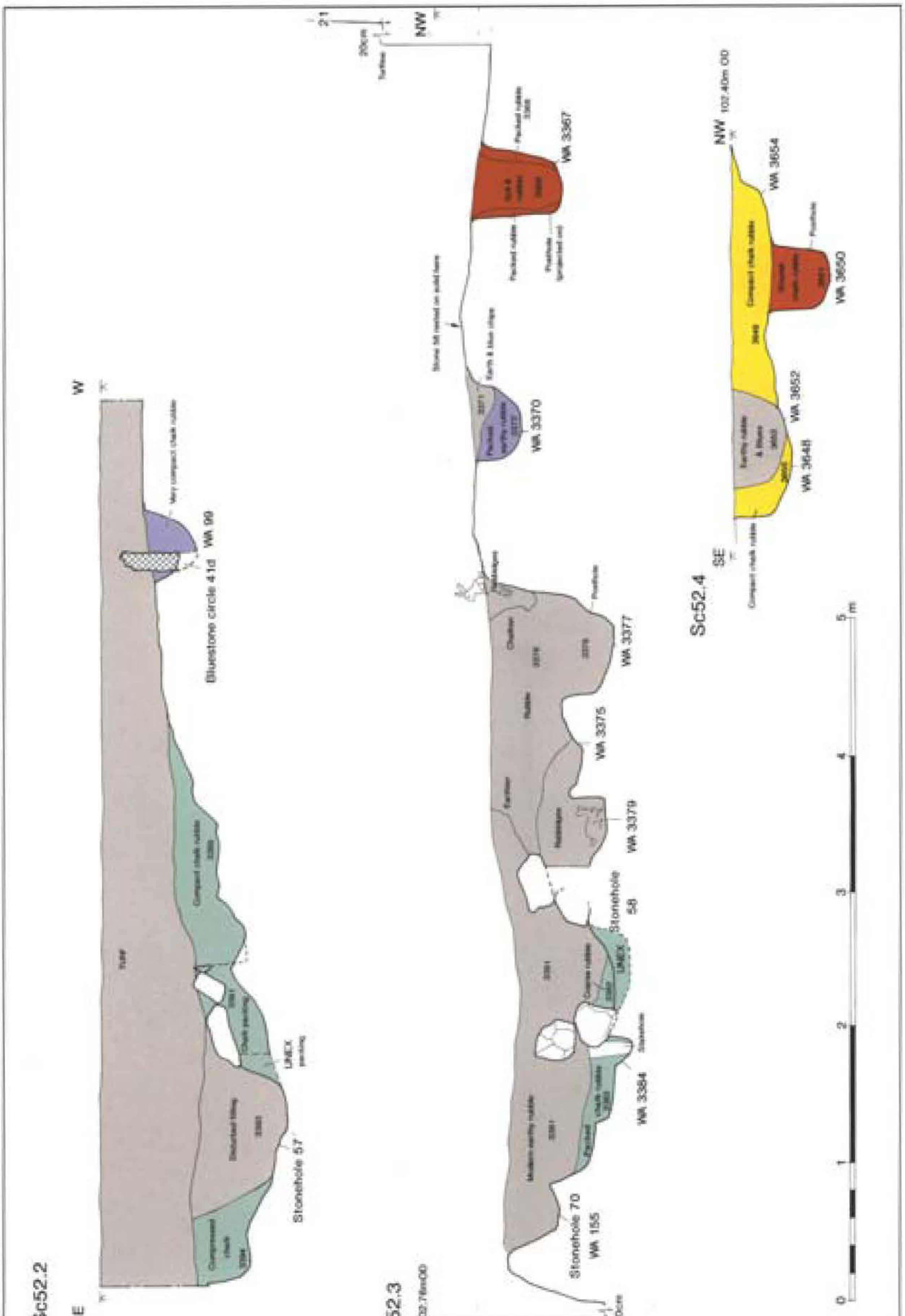
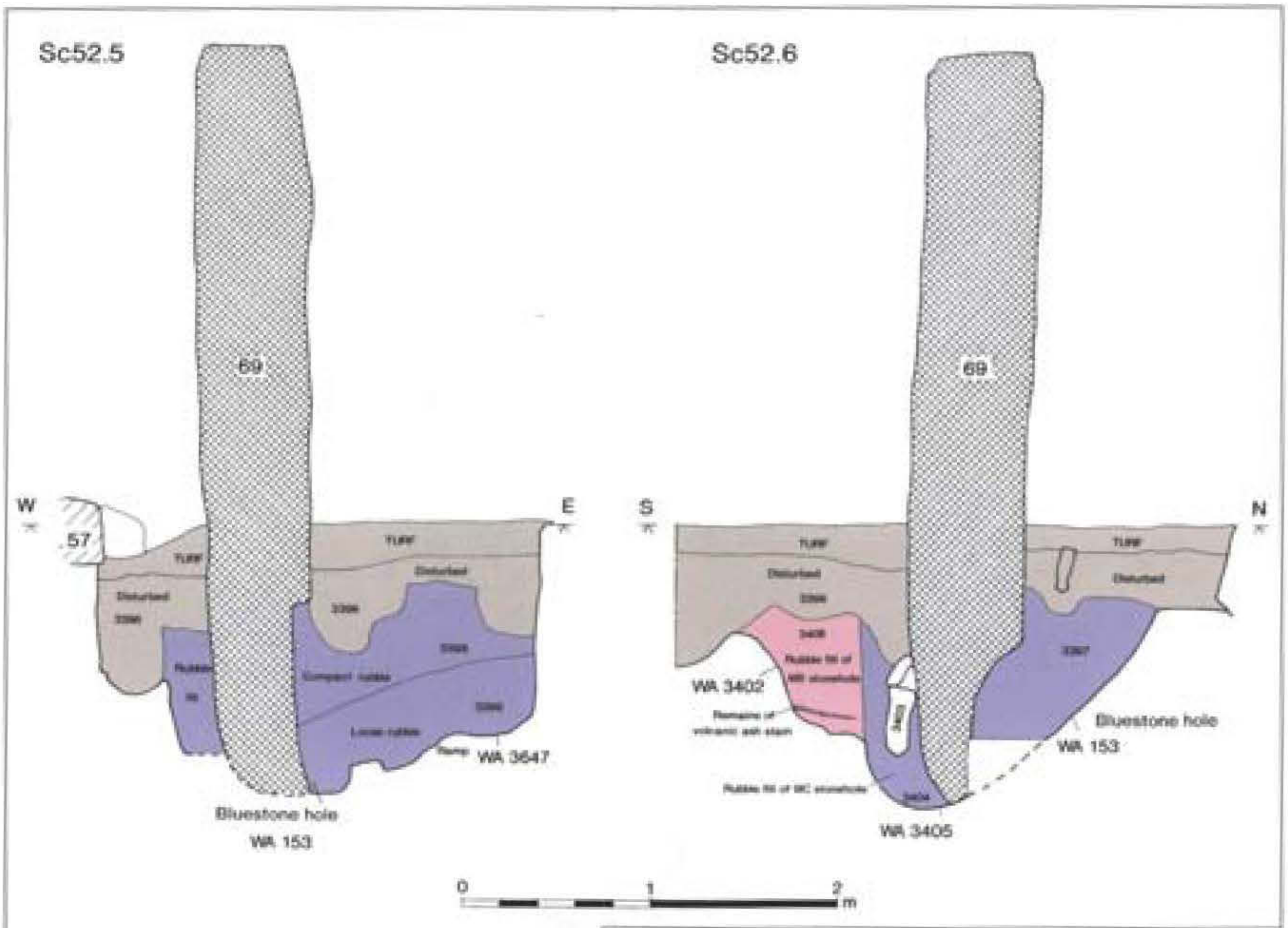



*Fig 143 C52, sections (for key see Fig 132)*



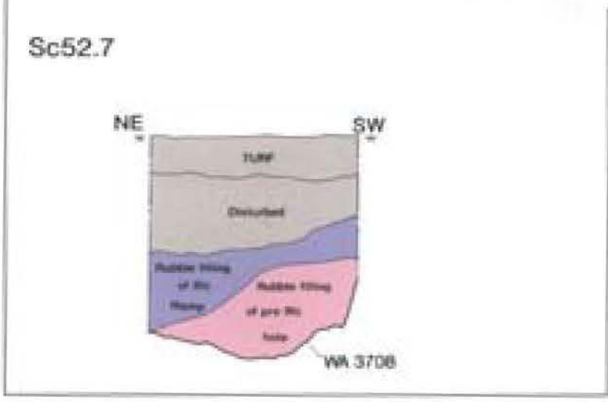




*Fig 144 C52, sections (for key see Fig 132)*

This section is labelled in archive 'SE face of cutting E of 69' and must therefore be of the length of cutting edge showing feature WA 3708 in section, although in length, it seems to fit the cut-off corner to the cutting between WA 3710 and WA 3708 (see Figs 91 and 111). The latter is annotated (phase) '?II' on the plan, but only as 'pre-IIIC' on the section because it is cut by the ramp for Stonehole 69 of the Horseshoe. It is not clear why it is placed earlier in the sequence on the plan.

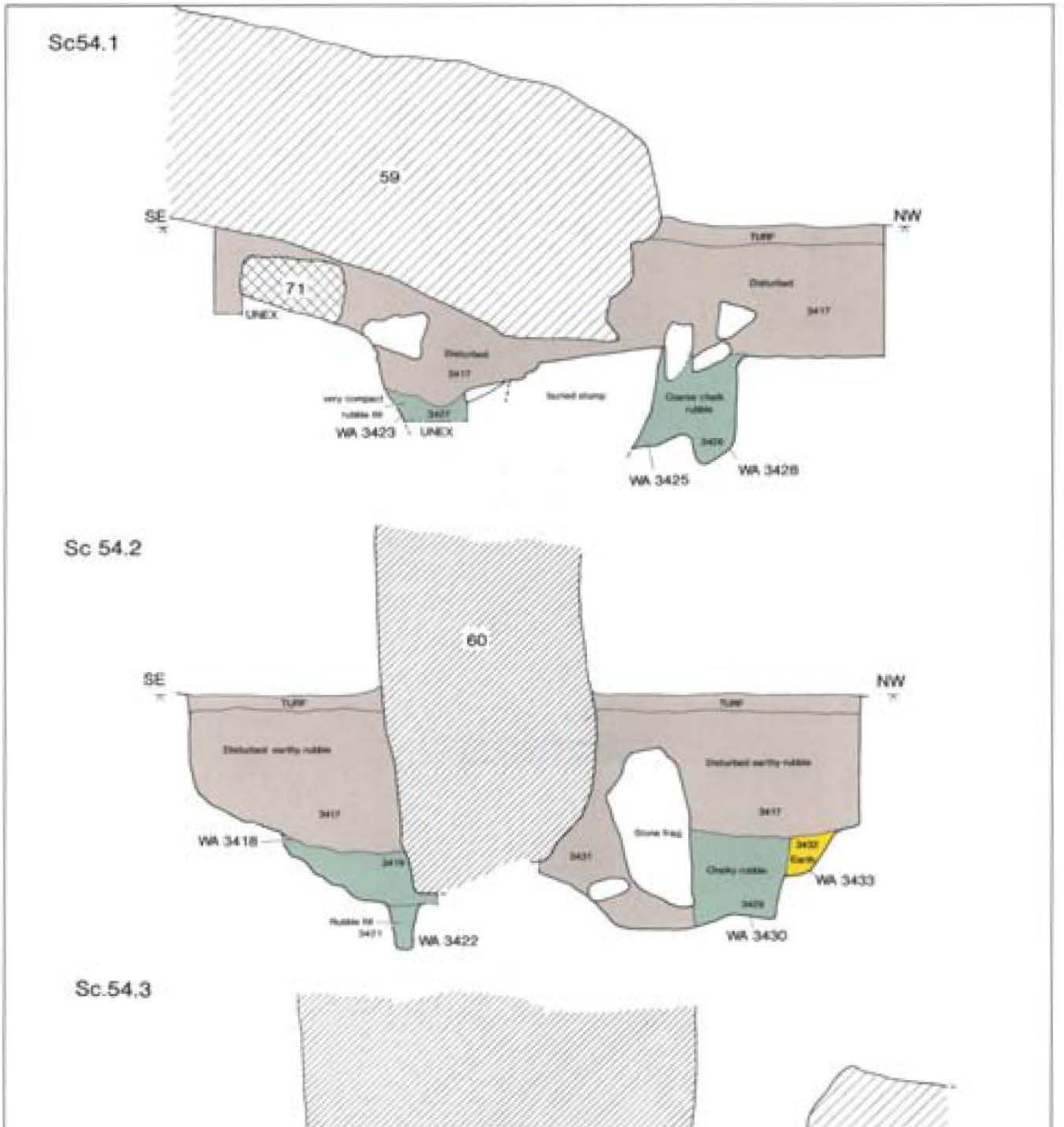



*Fig 145 C54, sections (for key see Fig 132)*

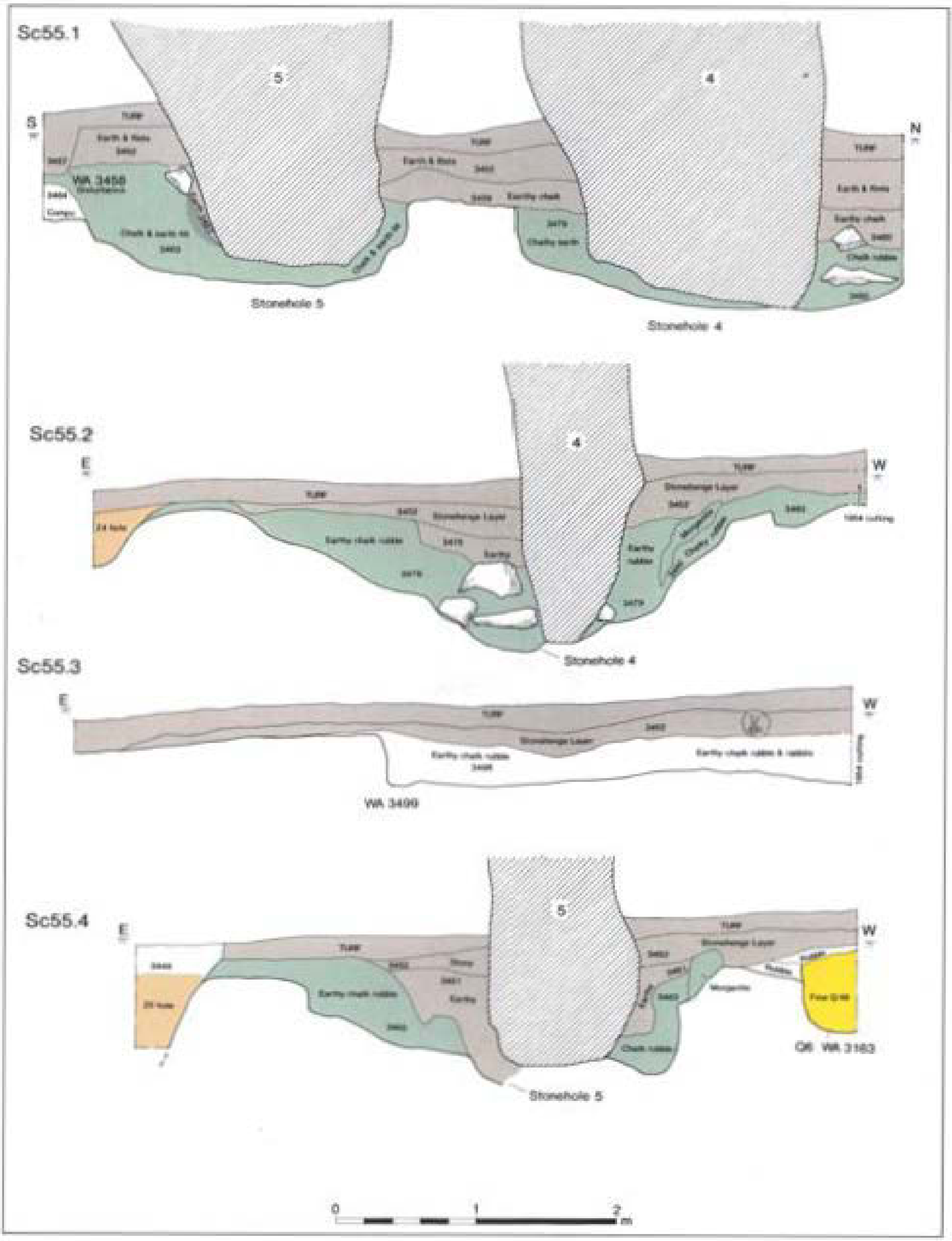



*Fig 146 C55, sections (for key see Fig 132)*

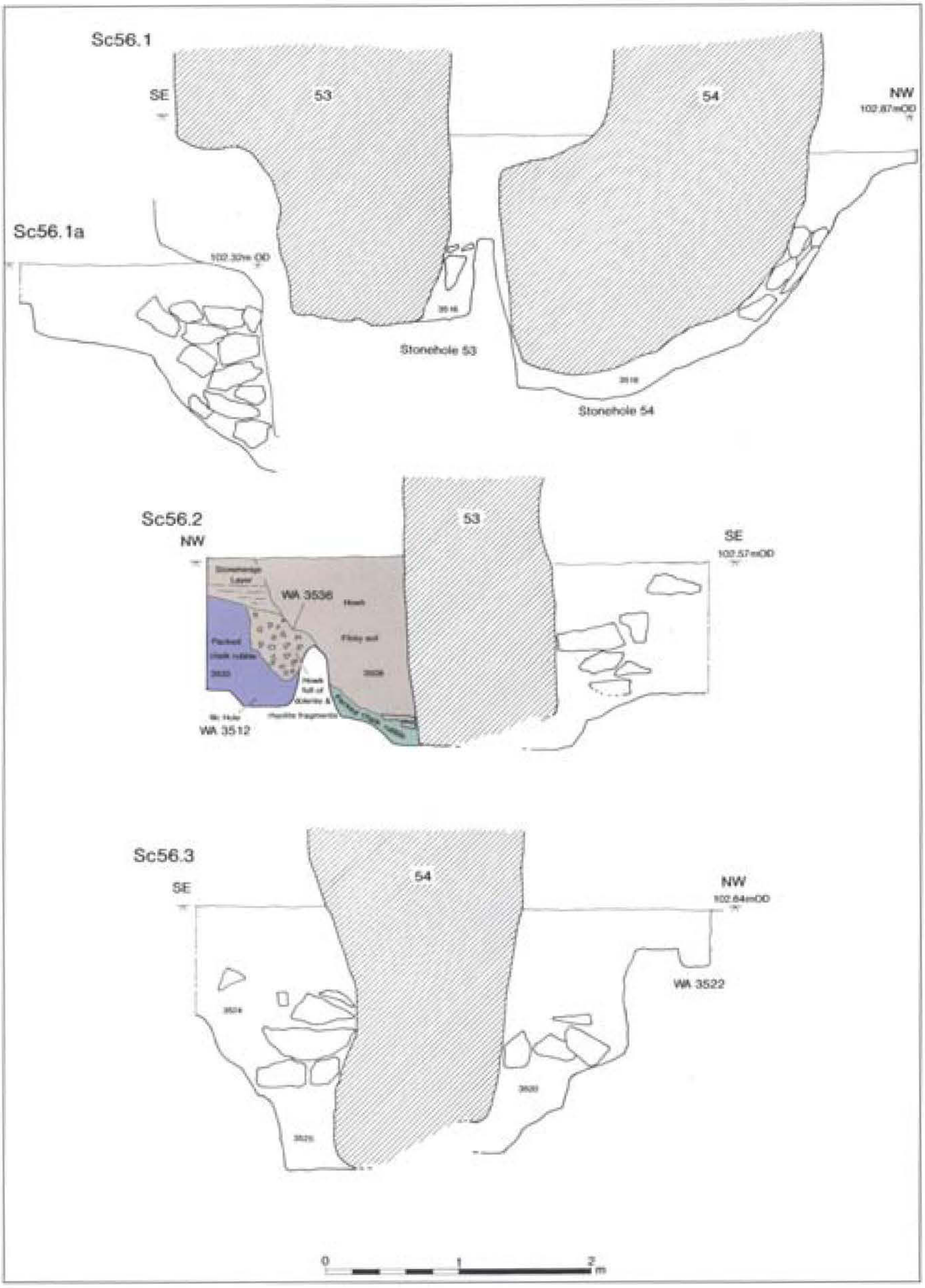



*Fig 147 C56, sections (for key see Fig 132)*

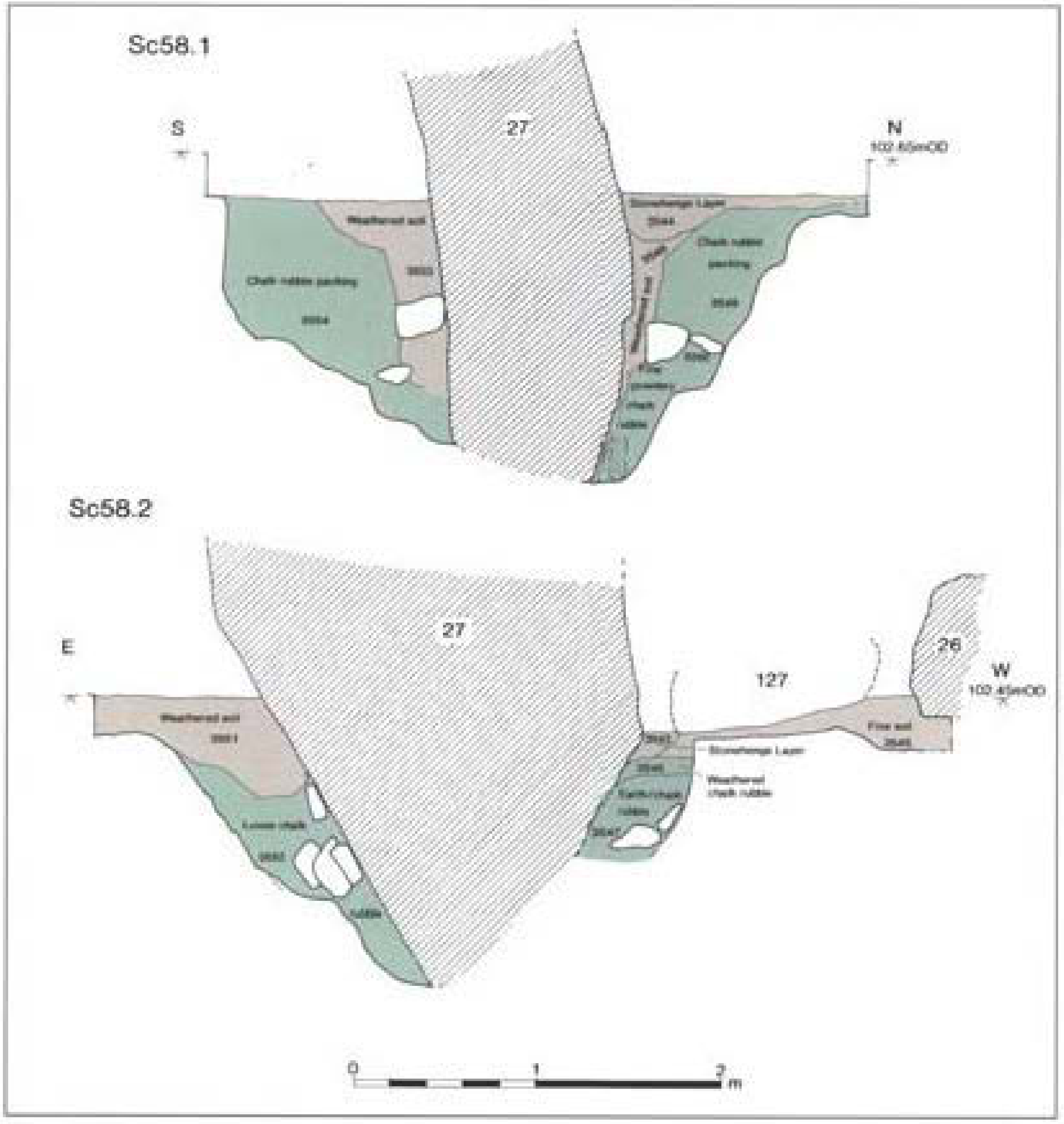



*Fig 148 C58, sections (for key see Fig 132)*

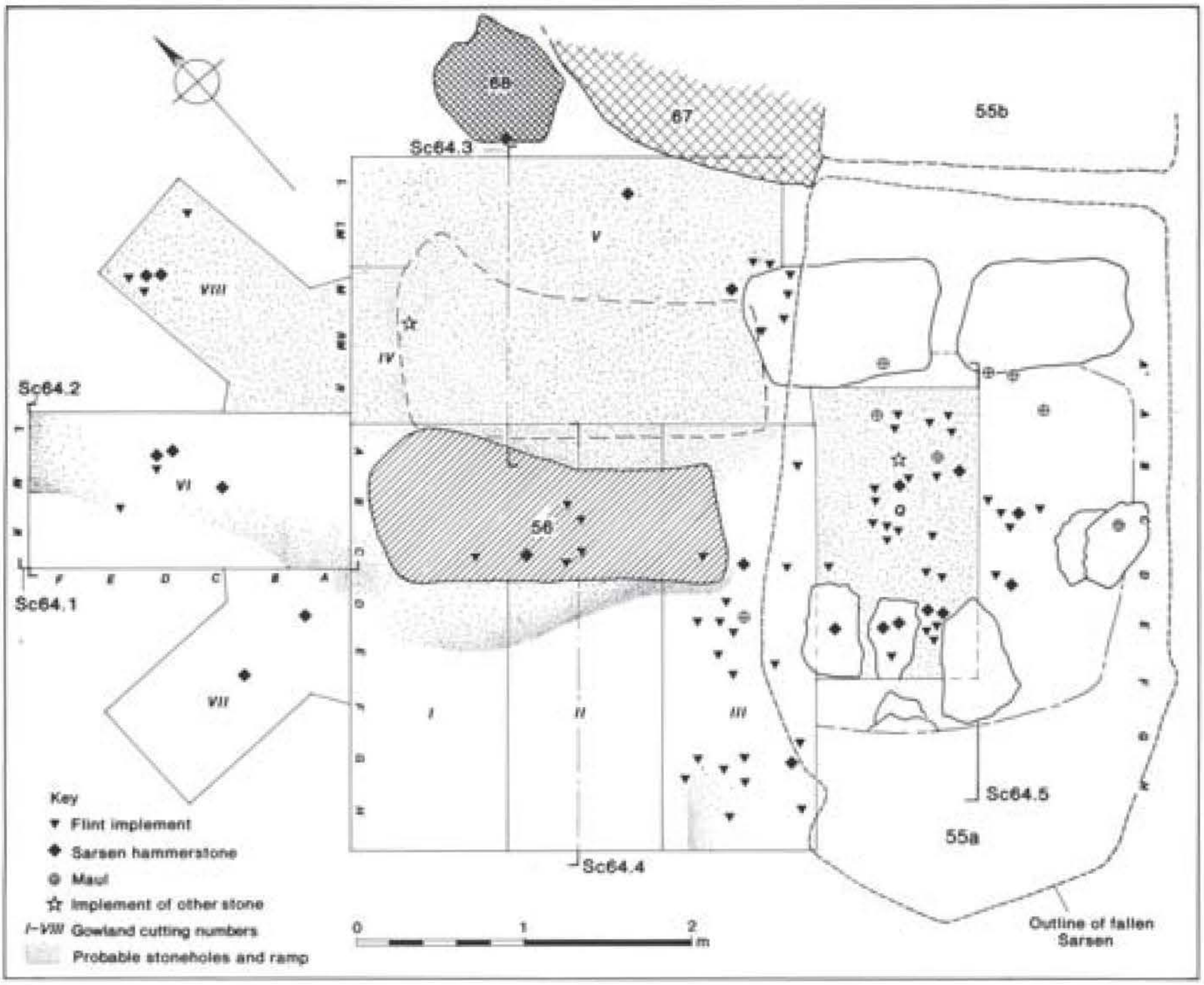



*Fig 149 C64 (Gowland), plan*

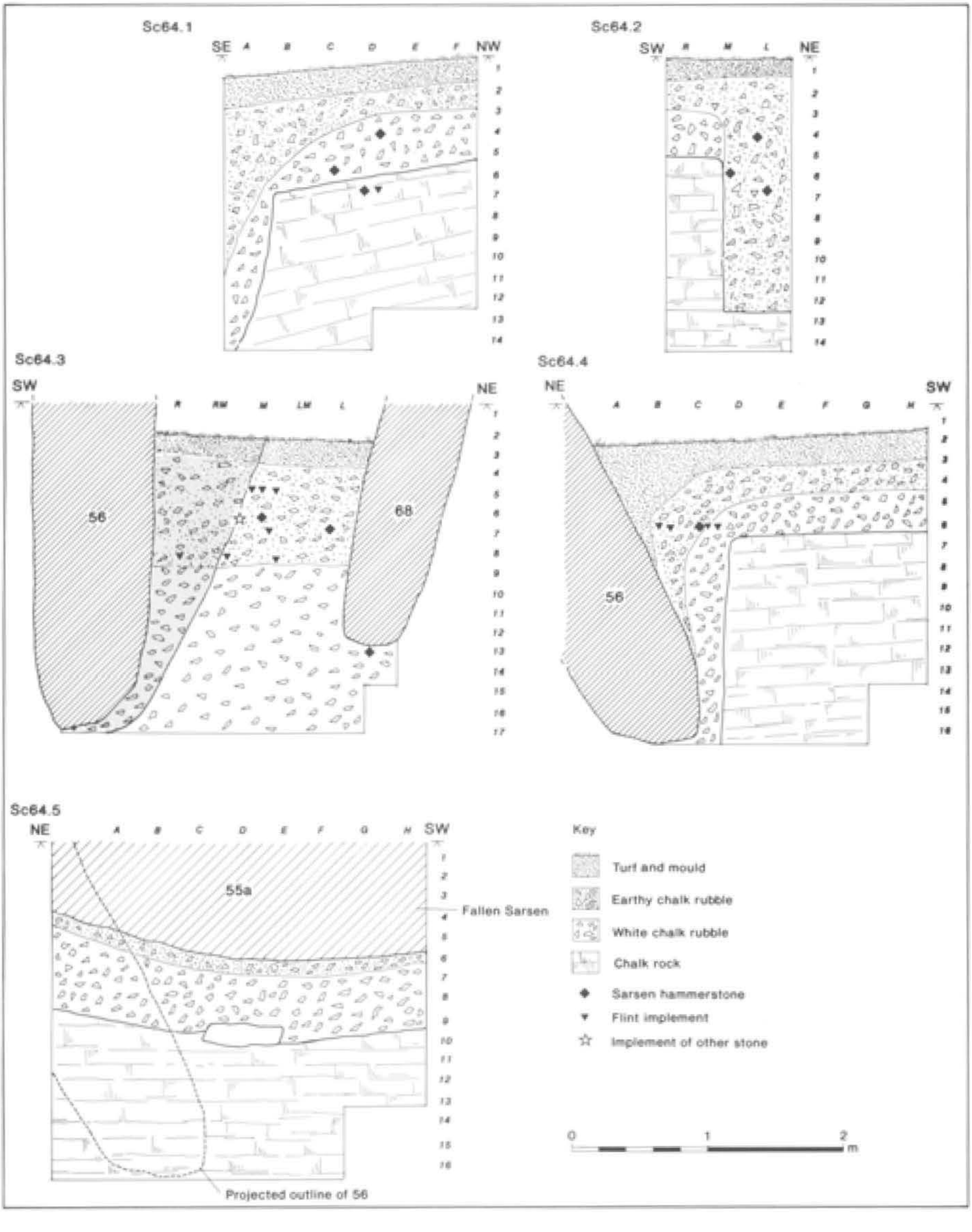



*Fig 150 C64 (Gowland), sections (see Fig 149 for positions)*

## Phase 3vi: Y and Z Holes

*by K E Walker*

The two concentric circles of pits known as Y and Z Holes were first identified and described by Lt-Col Hawley (1925, 26–31, 37–50) as a result of his excavations in 1923 (Fig 151–3). They were observed as patches of humus revealed in the chalk during the general trenching of the monument between the Bank and the Sarsen Circle. The outer circle of 30 holes (Y Holes) lies approximately 11m and the inner circle of 29 holes (Z Holes) approximately 3.7m outside the Sarsen Circle. On excavation they proved to be oblong or sub-rectangular 'wedge-shaped' holes 'with the long axis following the circumference of the circle in which they are set' (Atkinson 1979, 35). The average dimensions of those Y Holes for which information is available was *c* 1.7m by 1.0m at the top (consistently less at the base) and 0.9m in depth. For the Z Holes the average dimensions were *c* 1.75m by 1.5m at the top (again consistently less at the base) by 1.0m deep. As with other features, Lt-Col Hawley excavated these in a number of spits rather than on a stratigraphic basis.

Twelve Z Holes and 13 Y Holes were excavated in 1923. Four more of each were excavated in 1924 and one of each by Atkinson *et al* in 1953 (*see Figs 154 and 155, below*). Many contained a largely earthy fill ('humus down to the bottom'; Hawley 1925, 27). The location of a further two Y Holes (20 and 21) was confirmed in 1981 by a watching brief conducted by the Central Excavation Unit during stripping in advance of the laying of a footpath (C92). 'As the development in no way interfered with these features no excavation was considered necessary' (Bond 1983, 41).

Summary details of the excavated features are provided in Tables 19 and 20. Only a small number of section drawings of these features have been identified and one of these appears to show elements from YH29 and YH30 combined in one drawing (Figs 152 and 153).

The Y Holes were found to lie on average 5.6m apart, and the Z Holes at least 6.5m apart (centre to centre), although it should be noted that the spacing is irregular, particularly in comparison to that of the Aubrey Holes. It is supposed that each circle was intended to number 30 pits although only 29 Z holes have been identified. ZH8 was not found in its predicted location and Atkinson preferred to considered that it had deliberately never been dug (ie that the circuit of pits was never completed) rather than that it could not have been dug because Stone 8 had already fallen across the appropriate place, as had been considered by others (Atkinson 1979, 34, 83). Although they are not physically associated the two circles of holes are assumed to belong to the same phase of activity at the monument as they share characteristic distributions and shape.

Holes Y29 (originally YY) and 30 (Y) were the first two to be examined. The 'sharp' well-defined edges of these features and the antlers on the base of YH30 caused Hawley to conclude that the holes had never held stones (1925, 27). However, the edges of the other Y and Z Holes he examined were found to be 'slightly ruinous', which he took to mean that stones might have been extracted from them (*ibid*, 28). After excavating holes YH16 and ZH16, Professor Atkinson agreed with Hawley's original interpretation.

### Stratigraphy

Hawley recognised at least five stratigraphic relationships. ZH9 and YH9 were each found to cut a posthole. One (WA 1888) '... had been cut through when the pit Z [ZH9] was made showing priority of existence' (24/10/1923); 'There is a posthole [WA 2655] on the edge of Y9 cut into by making that pit' (1/11/1923). It should be noted that sections are preserved for both of these features but neither shows the relationship (Figs 152 and 153). The posthole cut by YH9 was itself cut by a grave (WA 1676). At least two Z Holes have been shown to be later than the Sarsen Circle. ZH2 apparently cut the ramp for Stone 2 (although the area had been partly disturbed by Hawley's excavation of the stonehole in 1921; C2.2).

> Today I tried for the inclines cut for Stones 29 to 2, removing turf and soil between them and the Z holes excavated last week ... at Z2 a hole which showed at the West corner of Z2 proved to be the incline ... The incline apparently began at about half the width of Z2 and is seen to slope downwards towards the base of Stone No 2 until it's (*sic*) course is arrested by our concrete bed around the base of that stone
>
> (2/7/1923)

ZH7 cut the ramp for Stone 7:

> Newall dug out no 7 hole Z circle today leaving a third of it in section. At the same time we opened the incline to No 7 Stone and got the edge or ridge formed by it and the Z hole. The Z hole was the later hole.
>
> (5/10/1923)

Again the stonehole had been previously excavated by Hawley in 1920 and concrete had been inserted to support the stone (C1). The relationship is shown on the section (Fig 152).

### Primary fill (Phase 3vi)

A thin layer of chalk rubble (often rather dirty with a large earthy component) was identified at the base and partly on the sides of all the Holes, with the possible exception of YH7 and YH30 and ZH11. This is interpreted as primary fill, the result of initial rapid physical weathering of the chalk soon after the Holes were cut (*cf* Bell 1990).

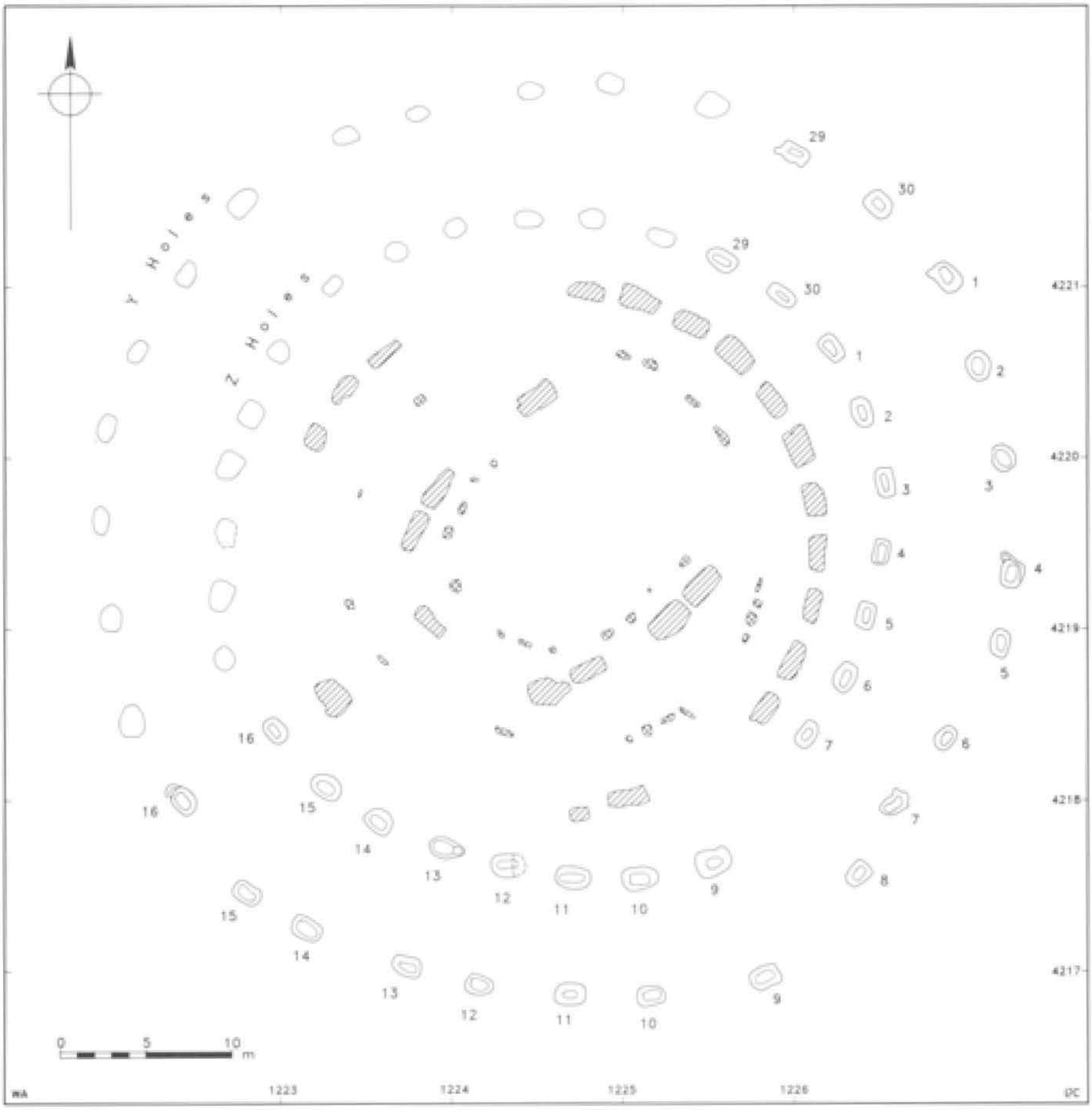



*Fig 151 Phase 3vi: Y and Z Holes in relation to the stones*

**Finds:** The majority of the finds from these holes were recovered from the secondary earthy fills. However, Atkinson argued that there was a pattern of

> a fragment or two of bluestone (almost always rhyolite) on the very bottom [ie in the primary fill] ... and perhaps if it is not too fanciful to see them as propitiatory token offerings, made as symbolic substitutes for the bluestones themselves, to ward off any evil consequences that might result, so to speak, from depriving the gaping holes of their rightful and expected contents.
>
> (1979, 84)

The occurrence of a small stack of antlers in the bottom of YH 30 could also be taken as evidence of deliberate deposition, perhaps reinforced by the position of this feature to one side of the phase 3 axis (*see Fig 79 and Serjeantson, Chapter 9*). Examination shows, however, that this pattern is not clear (Table 21) and that a significant number of holes apparently contained no material in the primary fill.

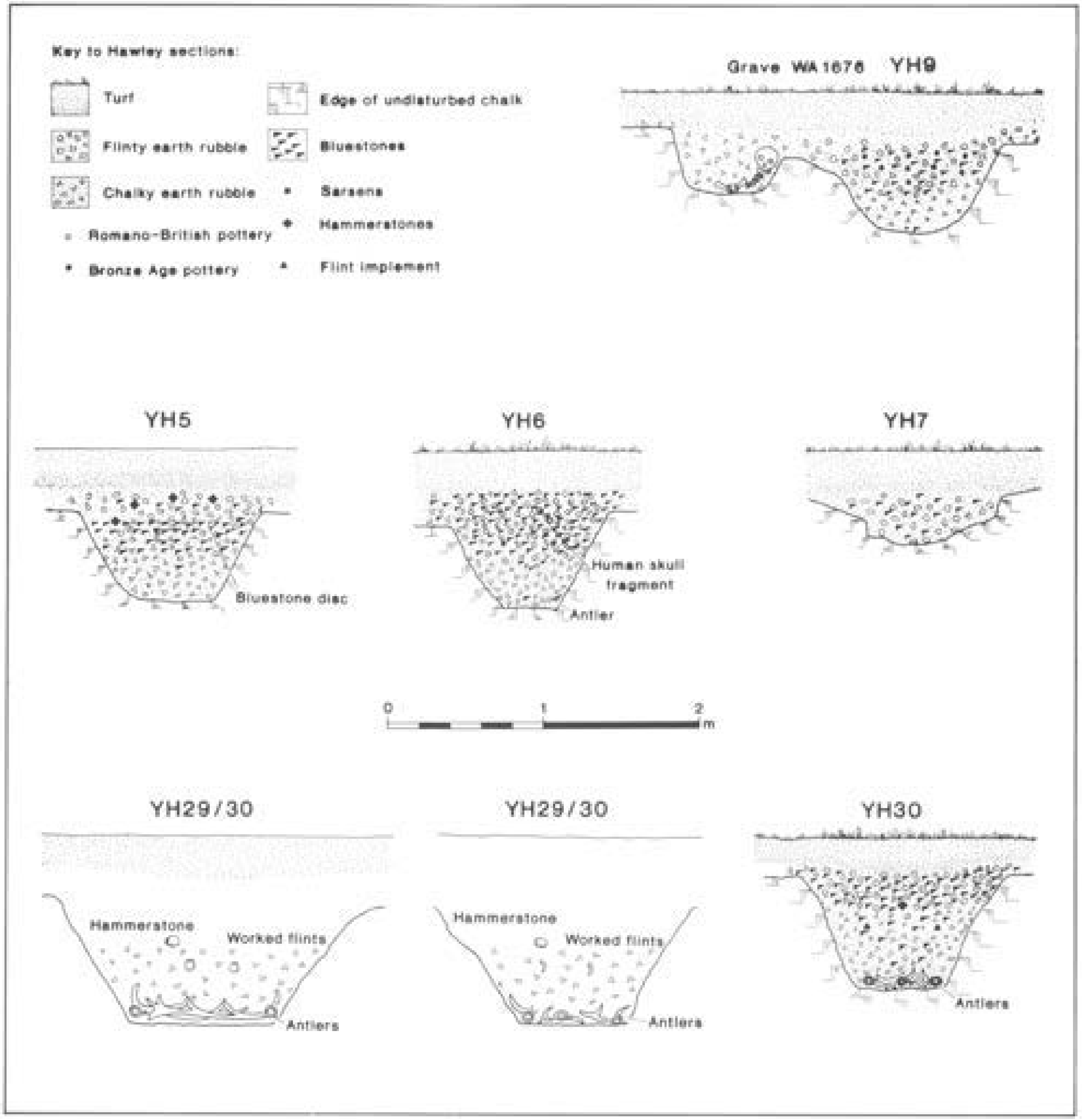



*Fig 152 Sections of Y and Z Holes. Scale 1:40*

The Hawley sections have been prepared from archive and published drawings. The identifications of objects are the excavator's own.

Posthole WA 1888, which was cut by ZH9, is not shown on the section drawing (Fig 153). The Diary apparently contains no information about the posthole shown on the section drawing for ZH10. It was published as posthole 8 (Hawley 1925) but on the MoW site plan (archive drawng no 59) it seems to be no 20 (*see Fig 69*). Posthole WA 2655, which was cut by YH9, is also not shown on the section drawing. This was, in turn, cut by the grave WA 1676. The section drawing for YH29/30 appears to show elements from YH29 (hammerstone, flint chips with smoothed edges, and a bluestone chip close to the base) and YH30 (antlers). These sections were originally labelled 'Hawley X', relabelled 'Y', and they may be draft versions of the section finally produced for YH30 (note the change in profile of the YH30 section).

On the plans and sections for YH16 and ZH16 (Fig 153) the numbers (1–5) are Atkinson's, taken from his prepared publication drawings.

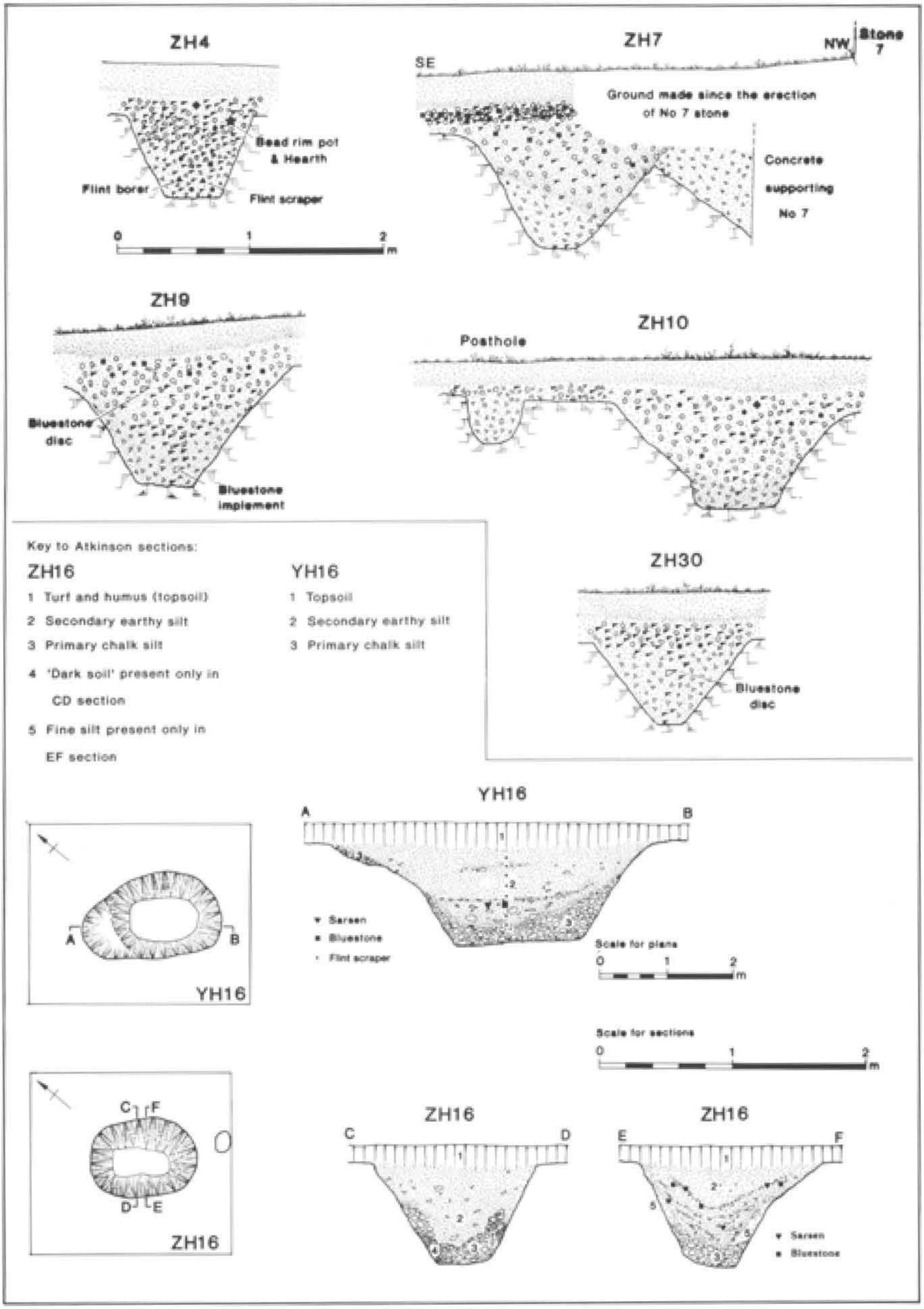



*Fig 153 Sections and plans of Y and Z Holes. Scale 1:40*

**Secondary fills (Phase 3vi+)**

The secondary fills of the Y and Z Holes appear to have been fairly uniform although the amount of natural flint varied (Figs 152 and 153). These earthy fills are characteristically described as 'reddish'. On the Hawley section drawings the typical secondary fills are described as 'flinty earth rubble', usually with a thin layer of chalky earth rubble (the primary fill) below. Atkinson describes the main (secondary) fill of YH16 as stonefree fine brown soil [with a thin layer of coarse chalk rubble, primary fill, on the base] (*ibid*, 35).

**Finds:** The finds from the secondary silts include a wide range of pottery, animal bone, antler, and metal objects of Romano-British (including coins). In addition, objects of medieval, indeterminate, and modern date were also recovered.

**Date**

By the end of his 1923 season of excavation Hawley had established that

> The New Circle Holes [Y and Z Holes] were made late and the stones of Stonehenge had been worked at or before the time they were made as chips were found on the bottom. They are newer than the post holes as these are shown to have been cut through by making the pits.
>
> (3/11/1923)

Following Hawley's excavations and prior to the excavation of YH and ZH16 (by Atkinson *et al* in 1953) the Holes were assumed to be of Iron Age date at the earliest (Atkinson 1979, 35). This was largely as a result of the concentration of late pottery at a relatively low level in the Holes (for example in ZH4, and YH11). Early, Middle, and Late Iron Age material was present. Relatively large numbers of Romano-British coarsewares and some finewares (including possible imports) were also recovered from these features, as were small quantities of Early–Middle Saxon (fifth–eighth century), early medieval (tenth/eleventh century), and medieval sherds (late twelfth–early fourteenth century).

The absence of ZH8 was also used to suppport the argument for a late date, the reasoning being that Stone 8 had already fallen over the space allocated for the Z Hole. Other indications of a relatively late date included the irregularity of the Y and Z circles which, it was suggested, could not have been scribed from a central point because the sarsen stones were already in place, an argument supported by the stratigraphic relationships identified by Hawley (ZH2 and ZH7) which confirm a post-Sarsen Circle date.

Following the 1953 excavation Atkinson believed that the posited Iron Age date was wrong. He assigned them to the 'almost wholly inferential IIIb' phase with a suggested date of 1500–1400 calendar years bc (1979, 81). He interpreted the Y and Z Holes as having been dug for a planned (but never completed) double stone setting for 60 of the posited 82 Bluestones, which were to be reused after having been removed from the Q and R Holes (*see above*). They were, he suggested, associated with but later than a dressed setting composed of the remaining 22 out of '82' Bluestones (*ibid*, 80–4; *see above*).

Detailed analysis of a vertical series of soil samples from the secondary fill of YH16 also independently suggested a Bronze Age date (Cornwall 1953 140). The general uniformity of the main fill (secondary silt) in YH16 (apart from a small amount of primary silt) together with an apparent continuity with soil surrounding the hole implied a natural deposition and the samples indicated a brown earth profile similar to that from Stanton Harcourt, Oxfordshire, where it was sealed below a Bronze Age round barrow. It has subsequently become clear that these silts represent a wind-blown deposit. Originally this was seen to imply a slow but continuous deposition rate. More recent evidence has suggested that such deposition may be quite rapid, resulting from the deflation and erosion of silty loessic soils exposed after harvest from large areas of tillage and open dry fields. This would indeed equate well with the evidence for increased arable farming in the later Bronze Age though it cannot be proved in this case. Examples demonstrable from excavated sites may include the upper ditch fills at Mount Pleasant and Alington Avenue, both in Dorset (M Allen, pers comm; *Chapter 8*).

Recent analysis has shown that earlier prehistoric pottery was recovered from the secondary fills of these holes. Sherds include Beaker (YH1, ZH1 and 4) and Late Neolithic/Early Bronze Age (YH1, ZH 2, 4, 9, 12, 14 and 15), Middle/Late Bronze Age (YH1, 3, 8, and 9, ZH1, 3–5, 7, 9, 10, 12 and 14 ), and Late Bronze Age (YH3 and 4) fabrics (*Cleal, Chapter 9*).

The cut and primary fill of both the Y and Z Holes have been assigned to phase 3vi on the grounds that they were intended as an alteration to the monument during its main period of use. Radiocarbon dates have been obtained from three of the five antlers recovered by Hawley from the base of hole Y30.

> There were five stag antlers resting on the bottom of the pit – they were entangled and difficult to remove. Two of them might have been picks, all were broken.
>
> (1925, 37)

The antlers were apparently deliberately placed on the bottom (*and see Serjeantson, Chapter 9*). The dates (UB–3822, 3341±22 BP, 1735–1530 cal BC; UB–3823, 3300±19 BP, 1675–1520 cal BC; UB–3824, 3449±24 BP, 1880–1690) are significantly different at a 95% confidence level. It is suggested that the last dated event (*see Appendix 2*) must be taken to indicate the date of the digging of the hole and that a mixture of 'fresh' and

**Table 19 Details of the Y Holes**

| *No* | *Con-text* | *Date exca-vated* | *Length (m) T = top, B = bottom* | *Width (m) T = tip, B = bottom* | *Depth (m)* | *Fills** | *Notes* | *Finds* |
|---|---|---|---|---|---|---|---|---|
| 1 | 226 | 18/6/23 | T 1.83; B 0.91 | T 0.86; 0.51 | 0.97 | earthy flint humus to 24in; reddish earthy chalk rubble 24in to 4in from base; chalk rubble 34–38in | rectangular, wedge-shaped, upper edges uneven. | sarsen, bluestone (piece 4in from bottom, 2 at 2in), flint, pottery, bone, iron nail |
| 2 | 227 | 18/6/23 | T 1.98; B 0.76 | T 1.52; B 0.46 | 0.74 | flinty humus to 24in, chalky earth rubble to base | shallow, irregular at top, sharply defined sides at bottom. No chips in lower rubble | sarsen, bluestone, flint, pottery ?iron ring |
| 3 | 228 | 19/6/23 | T 1.78; B 1.07 | T1.42; B 0.71 | 0.84 | flinty humus 'of a redder colour than immediately under the turf', humus & chalk, dirty chalk rubble | similar to 1 & 2 | sarsen, bluestone (piece nearly at bottom at 31in), pottery (RB at 30in), iron object, animal bone |
| 4 | 229 | 19/6/23 | T 1.73; B 056 | T 1.07; B 0.56 | 0.84 | disturbed, irregular cavity on NW corner (rabbit), flint humus (reddish), dirty chalk rubble | less regular ... the corners being rounded off | sarsen, bluestone, flint, pottery, human tooth, pointed (?worked) bone |
| 5 | 230 | 8/10/23 | T 1.65; B 0.86 | T 1.17; B 0.58 | 0.97 | humus, humus devoid of flints, earthy soil & chalk becoming more chalky, dirty chalk rubble | 'quantity of humus around the top of hole extending ... for 5 or 6 feet on all sides (ruinous top)' | sarsen, bluestone, flint, pottery |
| 6 | 231 | 8/10/23 | T 1.52; B 0.97 | T 1.07; B0.38 | 1.04 | humus becoming rather chalky to 19in, humus with little chalk & much flint, earthy flint rubble, earthy chalk | disturbed at top, much humus but less than YH5 | sarsen, antler, bluestone ('piece of Rhyolite rounded and dressed at 33in ... stag antler at 38in & a chip of Rhyolite – nothing lower'), pottery, 'human skull fragment' = animal bone |
| 7 | 232 | 11/10/23 | T 1.40 | T 0.91 | 0.63 | earthy matter & broken flints to 6in, very loose and chalky | shallow 'unfinished' | sarsen, bluestone, pottery, flint |
| 8 | 233 | 15/10/23 | T 1.67; B 0.97 | T 1.19; B 0.56 | 0.89 | humus, humus with broken flint, dirty chalk rubble | | sarsen, bluestone (chip of Rhyolite practically on bottom at 34in) |
| 9 | 234 | 16/10/23 | T 1.83; B 1.27 | T 0.99; B 0.53 | 0.94 | humus with broken flint, earthy chalk, dirty chalk whiter & cleaner towards base | larger & deeper than other holes, 'at end on South there is a small recess' | sarsen, bluestone (chip on bottom), flint, pottery, animal bone |
| 10 | 235 | 31/10/23 | T 1.63; B 0.97 | T 1.22; B 0.61 | 0.94 | humus with some broken flint, chalky humus, coarse earthy chalk | 'examined ... without any great result' | sarsen (1 piece sarsen only find in lower fill), bluestone, pottery, coin |
| 11 | 236 | 31/10/23 | T 1.67; B 0.84 | T 1.35; B 0.58 | 1.09 | earthy & rather chalky humus, similar earthy chalky rubble but more chalky, chiefly chalk (some earth) | examined ... without any great result. Sides rather more perpendi-cular than usual | sarsen, bluestone (2 sarsen & 1 rhyolite chip towards base), RB pottery (104 frags at 15in) |
| 12 | 237 | 11/9/24 | T 1.57; B 1.07 | T 1.04; B 0.66 | 0.86 | turf & humus very deep, chalk rubble | very regular, oblong/rectangular, sides rather steeper than usual | sarsen, bluestone (1 chip at 30in), pottery |
| 13 | 238 | 12/9/24 | T 1.70; B 1.12 | T 1.17; B 0.38 | 0.94 | humus, chalk rubble | 'v regular in the cutting side and angles, much sharper ... tapers to a narrower bottom' | bluestone, flint, pottery |

**Table 19 (cont)**

| *No* | *Con-text* | *Date exca-vated* | *Length (m) T = top, B = bottom* | *Width (m) T = tip, B = bottom* | *Depth (m)* | *Fills** | *Notes* | *Finds* |
|---|---|---|---|---|---|---|---|---|
| 14 | 239 | 3/10/24 | T 1.83; B 1.32 | T 1.24; B 0.74 | 0.84 | humus, v earthy chalk rubble, less earthy on base | long oval | sarsen, bluestone (1 chip rhyolite, dolerite & volcanic ash at bottom), pottery, coin |
| 15 | 240 | 3/10/24 | T 1.42; B 1.12 | T 1.07; B 0.51 | 0.89 | humus, flint humus, general chalk rubble, less earthy on base | | sarsen, bluestone, flint, pottery |
| 16 | 241 | 1953 | – | – | – | topsoil, secondary earthy fill, primary chalk silt | | sarsen, bluestone (some of both in secondary silt), flint, pottery, animal bone, glass, coins (no finds in primary silt) |
| 29 (YY) | 254 | 14/6/23 | T 1.98 or 2.03; B 0.81 | T 1.02 or 1.09; B 0.41 | 0.94 | flinty humus, ?earthy chalk/chalk rubble | | sarsen, bluestone, pottery |
| 30 (Y) | 255 | 14/6/23 | T 1.52 or 1.68; B0.81 | T 0.94 or 1.14; B 0.41 | 0.94 | humus, almost entirely filled with flinty humus | oblong, sides sloping upwards, v regularly cut, sharp squared sides & angles | sarsen, bluestone, flint, pottery, antler (two staghorn picks and three entire antlers resting on bottom entangled and difficult to move; 1925, 27) |

*Notes*:
*Descriptions, sometimes abridged, are taken from Hawley's Diaries and Atkinson's notes, Quotation marks indicate excavators' interpretation*
** = all measurements are BGL (Below Ground Level); fills listed from top to bottom*

**Table 20 Details of the Z Holes**

| *No* | *Con-text* | *Date exca-vated* | *Length (m) T = top, B = bottom* | *Width (m) T = tip, B = bottom* | *Depth (m)* | *Fills** | *Notes* | *Finds* |
|---|---|---|---|---|---|---|---|---|
| 1 | 256 | 28/6/23 | T 1.78; B 0.91 | T 1.17; B 0.38 | 1.07 | v flinty rubble, earthy chalk rubble getting chalkier & bigger lumps towards base | similar shape to others but rougher than 29 | sarsen, bluestone (piece rhyolite on base), flint, pottery, animal bone |
| 2 | 257 | 29/6/23 | T 1.78; B 0.76 | T 1.14; B 0.36 | 1.05/1.07 | flinty earth rubble, reddish earthy rubble, chalk rubble | v like ZH2 | sarsen, bluestone (piece of rhyolite at 39in), flint, pottery, animal bone, iron ring |
| 3 | 258 | 19/9/23 | T 1.83; T 1.02 | T 0.86; T 0.41 | 0.99 | dirty humus, reddish earth, reddish earth with large chalky rubble | | sarsen, bluestone ('several chips of all kinds some actually touching the bottom'), flint, pottery, metal object |
| 4 | 259 | 24/9/23 | T 1.52; B 1.02 | T 0.91; B 0.41 | 1.04 | dirty earth fill with flint with modern remains to *c* 14in, dark earthy fill (no flint) to base in centre, chalk rubble at sides | rough hearth at 18in | sarsen, bluestone, flint, pottery, iron nail, charred wood & level line of rough flints at hearth. 42 sherds bead-rimmed pottery 'foreign stone fragments were continually found and reached as far as 37in' |
| 5 | 260 | 25/9/23 | T 1.83; B 1.09 | T 0.97; B 0.38 | 1.02 | top rubble as in ZH5, dirty earth, chalk rubble | | sarsen, bluestone (piece foreign stone at 38in), flint, pottery, animal bone |

**Table 20 (cont)**

| *No* | *Con-text* | *Date exca-vated* | *Length (m) T = top, B = bottom* | *Width (m) T = tip, B = bottom* | *Depth (m)* | *Fills** | *Notes* | *Finds* |
|---|---|---|---|---|---|---|---|---|
| 6 | 261 | 26/9/23 | T 1.83; B 0.99 | T 1.14; B 0.36 | 1.07 | large flints & v flinty earth, earthy soil with broken flints, chalky rubble | disturbed at top during restoration of Stones 6 & 7 | sarsen, bluestone, flint, pottery |
| 7 | 262 | 5/10/23 | T 1.37; B 0.91 | T 0.89; B 0.53 | 1.09 | earthy fill with flint, earthy chalk rubble | cuts ramp of Stone 7 | sarsen, bluestone (throughout inc 2 on base), flint, pottery, iron objects |
| 9 | 263 | 24/10/23 | T 2.03; B 1.02 | T1.45; B 0.53 | 1.22 | earthy fill, earthy chalk rubble, mostly chalk | | sarsen, bluestone (oval rhyolite implement at 44in, small piece near bottom and 1 on base), pottery, animal bone |
| 10 | 264 | 29/10/23 | T 2.03; B 1.24 | T 1.27; B 0.61 | 1.14 | flinty humus, earthy chalk | | ?sarsen, bluestone, pottery |
| 11 | 265 | 29/10/23 | T 1.83; B 1.24 | T 1.32; T 0.58 | 1.02 | humus with flint, humus with a little chalk | a large well defined hole | ?sarsen, bluestone (2 chips rhyolite, 3 dolerite on base), flint, pottery, animal bone, metal object |
| 12 | 266 | 2/9/24 | ? | ? | 0.99 | v deep humus, dirty chalk rubble | partly covered by Stone 12. Part of 'exc carried out from the bottom upwards' | sarsen, bluestone (1 chip rhyolite on base), flint, pottery, iron nail |
| 13 | 267 | 18/9/24 | T 1.52; B 1.22 | T 1.17; B 0.74 | 0.99 | humus, dirty chalk rubble | cuts posthole WA 2419 | sarsen, bluestone (1 large rhyolite on base), flint, pottery, metal objects, animal bone (= human tooth). Finds in dirty chalk rubble at base |
| 14 | 268 | 7/10/24 | T 1.65; B 0.89 | T 1.22; B 0.58 | 0.99 | plain humus, flinty humus, earthy chalk rubble | oblong but corners not sharply defined, sides steeper than usuaul, bottom flat & smooth | sarsen, bluestone (1 rhyolite chip in rubble at base), flint pottery |
| 15 | 269 | 7/10/24 | T 1.75; B 0.81 | T 1.32; B 0.61 | 0.99 | humus, gravely humus, earthy chalk rubble | quite ordinary and like the last gave no information | sarsen, bluestone, pottery, animal bone |
| 16 | 270 | 1953 | T 1.63; B 0.91 | T 1.22; B 0.46 | 0.91 | turf & humus, secondary earthy fill, fine silt, coarse chalk rubble, primary chalk silt, fine silt | | sarsen, bluestone, pottery, animal bone, metal objects. Most finds from secondary silt, a few in coarse primary chalk rubble |
| 29 (ZZ) | 283 | 27/6/23 | T 1.88; B 1.07 | T1.22; B 0.46 | 1.09 | v flinty earthy rubble, earthy matter without flint, dirty chalk rubble | bottom level & even, hole wedge-shaped | sarsen, bluestone ('chip of rhyolite at 32in was followed by an interval without any until the bottom ... where there was one chip upon it') |
| 30 (Z) | 284 | 23/6/23 | T 1.78; B 0.91 | T 1.07; B 0.18 | 1.04 | turf & humus, flinty rubble, v earthy chalk rubble | v regularly cut hole disturbed by 1919 trench for crane support | sarsen, bluestone ('chips present throughout fill, piece of rhyolite at 39in, almost on bottom'), pottery |

*Notes:*
*Descriptions, sometimes abridged, are taken from Hawley's Diaries and Atkinson's notes. Quotation marks indicate excavators' interpretation*
** = all measurements are BGL (Below Ground Level); fills listed from top to bottom*

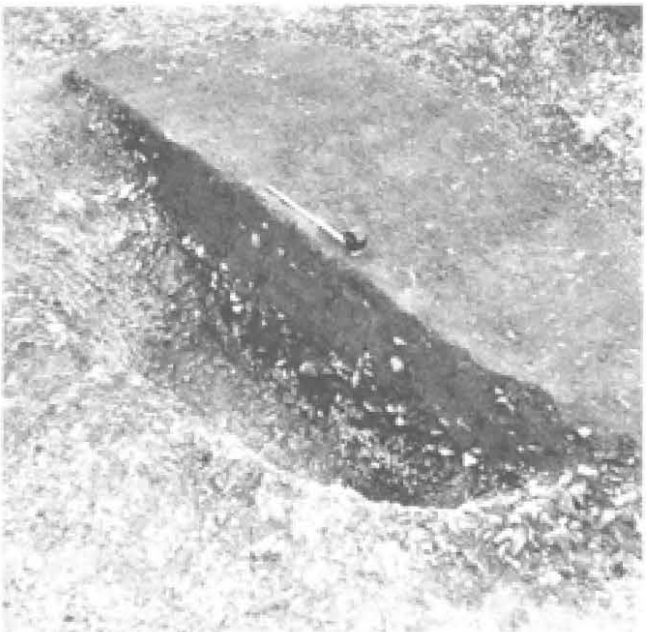


*Fig 154 Y Hole 16 under excavation in 1953 (P50830)*

*Fig 155 Z Hole 16 under excavation in 1953 ({P50824)*

curated antler was deposited. A previous radiocarbon date from another antler in this group (I–2445) is disregarded for reasons explained in Appendix 2. A radiocarbon date has also been obtained from antler retrieved by Hawley from hole ZH29. 'There was an antler on the east side of the hole. It stood upright with the burr on the bottom' (1925, 44). The date of 2030–1740 cal BC (OxA–4836, 3540±45 BP) is older than those obtained from the Y Hole. It is suggested, however, that as curated material appears to have been among the material deposited in the Y Hole it may also have been present in the Z Hole deposits. Unfortunately it was possible to date only a single antler from the Z circle so this must remain an assumption.

### Current interpretation

Taking together the similarities of the layout of the circles, shape of feature and the nature of fill, it is

**Table 21 Contents of the primary fills of the Y and Z Holes**

| *Finds, etc in primary fill* | *Y Holes* | *Z Holes* |
|---|---|---|
| Single rhyolite/dolerite chip within 2in (51mm) of the base | YH 8, 9 | ZH 5, 13, 14, 30 |
| Two chips as above | YH 1 | ZH 6, 7, 9 |
| Additional chips in close vertical proximity | YH 11 (2 sarsen, 1 rhyolite);<br>YH 14 (1 each of rhyolite, dolerite & volcanic ash)<br>YH 29 ('stone chips as far down as the bottom') | ZH 1<br>ZH 3 ('good many chips of all kinds some actually touching bottom')<br>ZH 10 ('2 in bottom 3in & 1 slightly higher')<br>ZH 11 (2 rhyolite & 3 dolerite on base, plus 3 rhyolite & 6 dolerite 'in same lower fill' (but not primary)) |
| Other objects in addition to rhyolite chip(s) | YH 3 (sherd RB pottery)<br>YH 6 (antler<br>YH 10 (1 sarsen chip) | ZH 1 (sarsen chips on base)<br>ZH 2 (sarsen, ironstone & 'a small snail shell on bottom')<br>ZH 16 (many bluestone chips with sarsen & 1 sherd pottery) |
| Antler, no rhyolite | YH 30 | ZH 29 |
| No finds in primary fill | YH 2, 4, 5, 7, 12, 13, 15, 16 | ZH 4 (finds on 'sides' of this hole only), 15 |

proposed that the two circles should continue to be regarded as representing the same phase of activity at the monument and as having been constructed as a late modification to the stone settings. Atkinson concluded (1979, 36) that 'the nature of the filling and the absence of any impressions of the bases of stones on the floor of the holes makes it quite certain that no stones were ever in fact erected in them'. Whether or not these holes were ever intended to hold stones, or whether they represent an abandoned setting, cannot be determined but it seems reasonable to conclude that the Y and Z Holes represent the last major phase of development of the monument.

## Unphased features in the interior

A number of features occur on field plans but lack any known stratigraphic relationships or in some cases any other details at all. These are therefore strictly unphasable. Some of these features appear to be stoneholes, and it seems reasonable to assume that many, and perhaps most, belong to the phase 3 use of the monument on the grounds that they are part of the obvious lithicisation of the monument; in some cases it would be difficult or impossible to fit them into the plan of the timber phase settings. None of them can be assigned with confidence to the stone settings of phase 3, however, and they are included here mainly to draw attention to the fact that there are features in the interior which cannot be fitted into the sub-phases discussed above, or into the main phases with any certainty.

The following descriptive list is not exhaustive as in many cases there is no information other than the plan. Unphased features are keyed on the overall plan of the monument interior (Plan 2) and are shown in greater detail on the phased sector plans (but are not highlighted in any of them) and in the reproductions of the field plans (Appendix 7).

### Description

Features are listed by sector and cutting from the north, clockwise.

**WA 3435, 3437 (3417), northern sector, C54:** There is an area of disturbance or a feature in the northern corner of this cutting for which no details are available. This may be part of the extensive area of disturbance noted in section (Fig 145, Sc 54.3).

**WA 3418, northern sector, C54:** No details available, as the feature shows only in plan and is not identifiable on the section which seems to have crossed it (Fig 145, Sc 54.2). It may have been part of the extensive disturbance in that area and its fill therefore indistinguishable from the disturbed fill around it.

**WA 3557, northern sector, C58:** Excavated in 1964, there are no details concerning this feature as it was not crossed by a section, has no spot height on plan, and was not commented on by Atkinson either in the archive or in print. This omission seems all the more unusual given that it occupies a position which seems to place it in the line of the Q Holes and it would thus have strengthened Atkinson's argument for the reality of that setting. Although *Stonehenge* had already been published, mention of it could have been made in one of the appendices. The fact that no mention of it was made strongly suggests that it must in some way have been obviously not a Q Hole. The absence of stone impressions was not taken by Atkinson as precluding a feature from being a Q/R Hole so this cannot be the reason and it is perhaps something more obvious, such as that it had modern material in it. Disturbed and modern features, however, appear usually to have been annotated as such on the plan, which is not the case here, and the question of its date must remain open.

**WA 2724, northern sector, C12:** Grave. A shallow cut was excavated in 1926 north of Stone 59. It was cut

> 2ft [0.61m] below the surface [and the] entire length of the cavity was 10 ft (3m) but the lower part of it showed a deeper cutting with a length of 8ft [2.4m] which was perhaps the original length.
>
> (25/8/1926)

Within it

> a quantity of human bones was come upon in a disordered mass, evidently thrown there carelessly ... mixed with the bones there were three pieces of medieval and one piece of Bronze Age pottery. At the sides, on a level with the bones, there was an illegible Roman coin, one piece of Bronze Age pottery, and two links of an iron chain. Under the bones were two pieces of tobacco pipe of Georgian period, one piece of bottle glass, one piece of medieval pottery, a small coin of Tetricus, and an ordinary pin [WA obj no 70] showing it to be either Georgian or very early Victorian, also a silver-plated brass chape of a knife or dagger [WA obj no 529], a plated saddle billet [probably WA obj no 80], a horseshoe nail, and a boot-protector, both of the Roman period, and 26 pieces of Romano-British and earlier pottery. The soil was rather deep below the bones, and further digging revealed a grave from which the bones had evidently been rifled.
>
> (1928, 170–1)

Hawley concluded that the grave had been disturbed in the Georgian period and further commented (*ibid*) that this grave

> closely resembled the grave found in 1924 (WA 1676) between two post-holes outside the circle to the east.

Professor Atkinson discusses both these graves, and concludes that there is no reason to suppose that the grave in C12 was other than prehistoric (1979, 62).

Clearly the area was very disturbed and none of the bone found by Hawley could be identified in the archive. Sherds of a Beaker which was finer than the majority of the assemblage were found apparently dispersed in this area, and it is possible that they represent a destroyed Beaker from the burial (Fig 196, P22, P23). The grave, as excavated by Hawley, varies in plan from the feature reopened by Professor Atkinson *et al*, the latter appearing more regular. Robert Newall apparently reported that Lt-Col Hawley sometimes overdug features (Atkinson pers comm) and that was perhaps the case here.

**WA 2748, northern sector, C12:** A rectangular feature, excavated by Hawley and re-excavated in 1956. Hawley describes it as not deep, but with well defined sides, especially on the western side. He postulated that it was the final stone of the Bluestone Horseshoe on that side but he had not at that time excavated on the western side of the Horseshoe, where there is no corresponding hole. When reopened the feature was recorded as 1ft (0.30m) deep in its deepest part and 8in (0.20m) deep in its shallower part. It was *c* 4ft (1.2m) long and of uncertain width as it lay partly below the fallen Bluestone 150.

**WA 2752, northern sector, C12:** Excavated by Atkinson. No details of filling. Probably *c* 14in (0.35m) deep below chalk surface (based on the spot height given and extrapolating from the area of R2, where the datum appears to be at chalk surface level).

**WA 2774, northern sector, C12:** Excavated by Atkinson *et al;* no details.

This area of the monument, that is the eastern side of C12, is interesting in that it is not possible to suggest a single interpretation with any confidence, and there are features which do not seem to fit easily within the recognised settings. This includes the area around the fallen Bluestones 32 and 150 (ie one of the two Bluestone lintels). Hawley recorded three features in the small area he opened around the two fallen Bluestones:

> one of them being that in which no. 32 [in the area of Q Hole 4, found disturbed by Atkinson] had stood, and close to it that of the next stone to the west [probably WA 2742]. Their top definitions had suffered, but the small craters in solid chalk below could be well distinguished. They were rather shallow, reaching 37 in. [0.94m] from the surface [although he comments that the ground may once have been deeper, as it is here 18in (0.46m) below datum, which is unusually low]. The third hole was towards the south [WA 2748], and the position of it suggested that the stones of the Horseshoe had been continued to the Foreign Stone circle, and it appeared to be a trench like that of the circle.
>
> (Hawley 1926, 13–14)

Hawley also makes the tentative suggestion that the lintel had been supported by stones in two of the holes just described, those now partly covered by the lintel (ie WA 2742 and 2748).

> I hazard a remote suggestion that it [the lintel 150] might have been placed on the last stone of the Horseshoe [ie in Hawley's interpretation this is WA 2748] and on a stone of the circle, perhaps the one on the west of it, which is nearly under it [ie Bluestone hole 2742] .... If this were so, the purpose of the lintel (with a similar one on the opposite side) would have been to link together the two groups.
>
> (1926, 13-14)

This passage is also interesting in shedding light on Hawley's approach to the monument, as he stresses how reluctant he is to suggest this setting, stating that

> I endeavour to abstain from theory as much as possible.
>
> (*ibid*)

**WA 3141, eastern sector, C45:** This may be the hole in which fallen Bluestone 32 stood, but the area has been disturbed in relatively recent times.

**WA 3160, C45:** This feature is shown in both plan and section (Fig 140, Sc 45.2); it was filled with 'chalky silt'. It appears to extend into C55, excavated five years later, but it is not shown in the plan of that cutting, although the field plan shows a feature erased in the part of C55 abutting the position of WA 3160.

**WA 2178, WA 3182, eastern sector, C45:** There are no details available for WA 3178 and WA 3182, which both extend out of C45 to the west, except that WA 3178 is about 0.35m, and 3182 about 0.3m, below chalk surface.

**WA 3186, eastern sector, C45:** No details other than its appearance on plan (Fig 278).

**WA 3501, C55:** Probable posthole, see Appendix 5.

**WA 2364, WA 2362, eastern sector, C13:** There are no details available for WA 2364, which was excavated by Atkinson *et al* in 1964. WA 2362 was also excavated in the 1964 season, and was only 0.09m deep below chalk.

**WA 3559, WA 3560, southern sector, C71, cutting for concrete pad around Stones 53 and 54:** This is marked on the field plan as a 'howk' and is therefore almost certainly relatively recent disturbance; it was 0.48m deep below the chalk surface. The edge of another feature (WA 3560) shows next to it, but there are no details given of this.

**WA 3565, southern sector, C72, cutting for concrete pad around Stones 53 and 54:** This feature, next to one marked on the field plan as an 'R Hole' (*see sub-phase 3i*) is marked as a 'howk' and is therefore almost certainly relatively recent disturbance. There is no spot height given for the feature.

**WA 3569, WA 3571, southern sector, C74, cutting for concrete pad around Stones 53 and 54:** The curved edge of a feature running out of the cutting to the north-west was revealed here. From the hachuring of the field drawing (Fig 288) it is clear that the feature was stepped, and that the bottom was not reached within the cutting. The spot heights show that the deepest part of the feature excavated was 3.1ft (0.94m) below what appears to be undisturbed chalk level; this is quite deep enough to be a stonehole, particularly as the feature continues to deepen to the north-west, but as so little was excavated this cannot be confirmed. WA 3571 is likely to be part of the same feature, as a shallower step or extension within it, as it is only 0.4 m below the level of undisturbed chalk.

**WA 3573, 3574, 3575, and 3579, southern sector, C75, cutting for concrete pad around Stones 53 and 54:** This complex of features is essentially a single feature (3574), lying largely within the excavated area, although extending out of it to the south, and with an apparently maximum depth of 0.67m below undisturbed chalk level. The deepest part of the feature, WA 3579, appears of a size and shape to be a stone impression, and is 0.12m deeper than the rest of the feature.

**WA 3582, southern sector, C78, cutting for concrete pad around Stones 53 and 54:** This is represented only by an apparently gently sloping side, running out of the cutting to the north and reaching a maximum depth of only 0.12m within the cutting. The shallowness of this is such that it would seem that this could be an irregularity in the chalk surface rather than a discrete feature.

**WA 3585/3583, southern sector, C78, cutting for concrete pad around Stones 53 and 54:** This is a single feature, extending out of the cutting to the south-east, and with a depth of 0.34m below chalk level, although it is not clear whether the maximum depth of the feature was reached.

**WA 3587, southern sector, C79, cutting for concrete pads around Stones 53 and 54:** This is a single feature, only the edge of which was excavated and which was only 0.24m deep within the cutting.

**WA 3359, western sector, C53:** Described in *Stonehenge* as 'a large hole which seemed to have been a stonehole. It was hardly deep enough to have held the Altar Stone itself; and its position suggests that it is one of a pair, set symmetrically either side of the axis' (Atkinson 1979, 212). There is no spot height for the feature on the field plan, and no section drawing, so that the exact depth is unknown.

**Features in C17, western sector:** A number of features along both the western and eastern sides of C17 (western sector) are not shown in section and have no recorded relationships. These features are shown in Plan 2 and 280–2. Even those which do show in the sections cannot easily be ascribed to phase as they lie outside the main settings identified and there appear to have been no finds to assist in their dating. Features WA 2453 (Fig 136, Sc 17.6), 3308 (Fig 136, Sc 17.3) and 3315 (Fig 136, Sc 17.3, not shown on plan) fall into this category. Only WA 3315 shows a relationship with a phased feature, a Bluestone Circle hole (WA 2438), but this may be illusory. Athough shown as a feature in section it apparently did not show in plan, as it does not figure in the field plan (Figs 280–2).In an archive note P Berridge records that Professor Atkinson was unsure whether it was a feature or decayed chalk, and that it might well have been the latter (Archive for C17).

WA 2434 lies on the line of the Circle, and could be a Bluestone hole. The identification of individual holes in this length of the circuit is very difficult due to the destruction and removal of stones. The large feature WA 2453 is more uncertain, as it is a substantial feature, quite possibly of prehistoric date, but it has no demonstrable stratigraphic relationship with the nearby ramp for Stone 56, although it would appear from the plan to have had one to the east of the section line.

On the inner side of the cutting, WA 3351 and 3349 do not show in section (as Fig 136, Sc17.5 must pass just to the north of the feature); it is not possible to estimate depths below chalk in this part of the cutting, because of a lack of spot heights on the chalk surface, but WA 3351 is similar in depth to the putative 'unfinished' R Hole WA 3347, and the trench-like feature WA 3349 is approximately 1ft (0.3m) shallower. This arrangement, including WA3347, is reminiscent of the Q/R 'dumb-bells', with WA 3351 rather than WA 3347 as the R Hole (ie the 'inside' element) and WA 3347 as the Q Hole, but cannot be identified as such with any confidence as it was not identified by Atkinson *et al* in the field. There are also several arguments against the identification: there are no details of the nature of the filling of 3351 and 3347; there are several obviously disturbed features in the cutting indicating post-monument activity in the area; it would lie inside the usual line of the Q/R features; and feature WA 3351 was not encountered in Gowland's cutting, suggesting that, in spite of its depth, it was not a substantial, Q/R Hole-type feature.

The cut WA 2446 clearly post-dates the filling of the ramp for Stonehole 56 of the Sarsen Trilithons, but it cannot be assigned to phase. There was no positive evidence that it was a recent feature, but that must be considered a possibility. Its fill is described only as 'compact grey' (Fig 137, Sc 17.8).

**WA 3270, WA 3688, and WA 3731, western sector, C52:** There are no details available for these features, apart from their inclusion on the plan of this cutting (Fig 285).

**WA 1676 (1678), C9:** Grave. A line of 11 postholes was identified by Hawley in 1923 extending from close to Z Hole 11 (*see Chapter 6*) of which

> the two end holes of the row towards the north-east [ie immediately outside Y Hole 9] had been united by digging to form a grave containing the bones of an adult person. The depth of the grave was that of the post-holes, namely 26 in. [0.66m] below ground level. The length was 5ft 4in., [1.53m] and the width at the upper end 24in., [0.61m] and at the lower end 17 in. [0.43m]. It was roughly cut in the solid chalk and barely large enough to contain the body, so that the neck and shoulders were forced into the grave, pressing the ribs together, and causing a very broken condition. The skull was broken owing to its being slightly above the side of the grave and only 16 in (0.41m) below the surface of the ground.
>
> (1925, 31)

There were no finds associated with the skeleton, and Hawley makes quite clear that there were no finds at all in the backfill of the grave.

> There were three stone chips in a layer above the grave, but the soil in the grave after sifting showed it to contain no object of any sort.
>
> (*ibid*, 32)

He also discusses the likely date of the grave, in terms of its relationships with features around it.

> I think it can be inferred that the grave was made after the purpose of the post-holes ceased to exist, for it is obvious that the posts could not have been there when the body was placed in the grave as there was barely room for it.
>
> (*ibid*)

Examination of the bone by Sir Keith Arthur of the Royal College of Surgeons showed it to be

> the skeleton of a man and of a type that he has become familiar with, occurring in the period about the time of the Roman occupation, or probably in the in the centuries immediately preceding it.
>
> (*ibid*, 32).

Professor Atkinson does not wholly support the dating of this burial as Romano-British, but points out that it appears from Hawley's description to have been an extended inhumation with the body face upwards and that

> the extended attitude (if such it was) and the somewhat perfunctory disposal of the body point to a date not earlier than the Romano-British period.
>
> (Atkinson 1979, 62)

### Discussion

Of the majority of the features in this category there is very little to be said, but several areas deserve to have particular attention drawn to them. In each case there are features which almost certainly have a place in the development of the monument, and probably belong within phase 3, but the exact role of each is not identifiable.

Three reasonably sized features in C12 (WA 2748, 2752, and 2774) almost certainly include stoneholes, and may all be stoneholes, yet do not seem to fit into the symmetrical arrangement of the northern end of the interior. Hawley's suggestion that features here (probably 2748 and 2742) held the Bluestone Trilithon with Lintel 150 seems unlikely, and at present there seems no obvious role for these features in the layout of the monument as it is currently understood.

Two features (WA 3569 and WA 3574), partially excavated in the small trenches for the concrete pads around the second Trilithon, hint that there may have been an inner setting on the eastern side of the interior. These features may be the eastern equivalent of some at least of the features discussed in 3iii, above (eg WA 3284, 3286, 3285).

It seems likely that the large feature WA 3359 may have been, as Atkinson asserts, for a pair to the Altar Stone, and certainly that stone's fallen position strongly suggests that it must have stood somewhere at the northern end of the interior. If the Altar Stone was felled by the fall of Stone 55, as seems probable, it is unlikely to have been moved since its fall, and its pointed end, which Atkinson argues is its base, lies at the end nearest hole 3359. Stone 55 appears to have had a very shallow hole, so it is perhaps mistaken to dismiss completely WA 3359 as the stonehole for the Altar Stone, but it is difficult to envisage how this question could be resolved, except by the excavation of the area where the putative paired feature would have stood.

Finally, the two graves are an intriguing aspect of the monument, although neither can be ascribed to a phase or sub-phase. Although there is no evidence that either are contemporary with the monument, both are in positions which suggest that they may have been important, WA 2724 lying across the axis, in front of the entrance, and WA 1676 along one of the 'façades' across the route from the southern entrance to the phase 2 monument. Hawley's description of the latter indicates clearly that it is likely to post-date the timber settings, and the lack of even stone fragments in the fill hints at a date early in phase 3, before the interior became littered with stone fragments. In both cases, perhaps, these features hint at a use of the monument not otherwise attested.

## The sequence at the periphery

*by Rosamund M J Cleal and K E Walker*

The major features around the periphery of the monument comprise (Plan 1) the Bank and the uppermost (tertiary) fill of the Ditch, the Avenue, the Heelstone and its Ditch, Stonehole 97, Stoneholes D and E, the Slaughter Stone, Station Stones, North and South 'Barrows', and a number of smaller isolated features. Only a few of these elements can be treated as part of a sequence, and are designated here and in the archive as belonging to sub-phases 3a, 3b, and 3c. All other features are assigned, and tentatively so unless otherwise specified, to phase 3 only (Table 68). The only recorded stratigraphic relationships which occurred between major elements of the monument are those between the Heelstone Ditch, the (southern) Avenue bank, and Stonehole 97, the sequence running: Stonehole 97 – Heelstone Ditch – Avenue bank. A number of other features have less certain relationships, and some others may be tentatively assigned to sub-phases on the less satisfactory grounds of symmetry of plan and relation to the axis of the monument. The Avenue is dealt with separately from the other peripheral features, apart from its final length close to the monument, where it forms an end to the short stratigraphic sequence identifiable there.

## Phase 3a

Stonehole 97 (Fig 156), identified by Pitts in 1979, stands at the head of the sequence, as it is tentatively identified as belonging to phase 3 rather than to an earlier phase and as possibly having held a stone which formed a pair with the Heelstone. These two stones would have stood on either side of the monument's axis as formed by the stone settings (*ie* passing between Stones 30 and 1 of the Sarsen Circle, and Stones 49 and 31 of the Bluestone Circle) and the centre based on the Sarsen Circle. It must be noted, however, that even with computer-aided plotting of the axes it is clear that the accuracy of any one axis plotted on those points must be regarded as having a considerable error margin (Fig 79), mainly because of the problem of whether to take the outline of the stones at ground level, at eye level, or at some other point. A small variation between two poss-

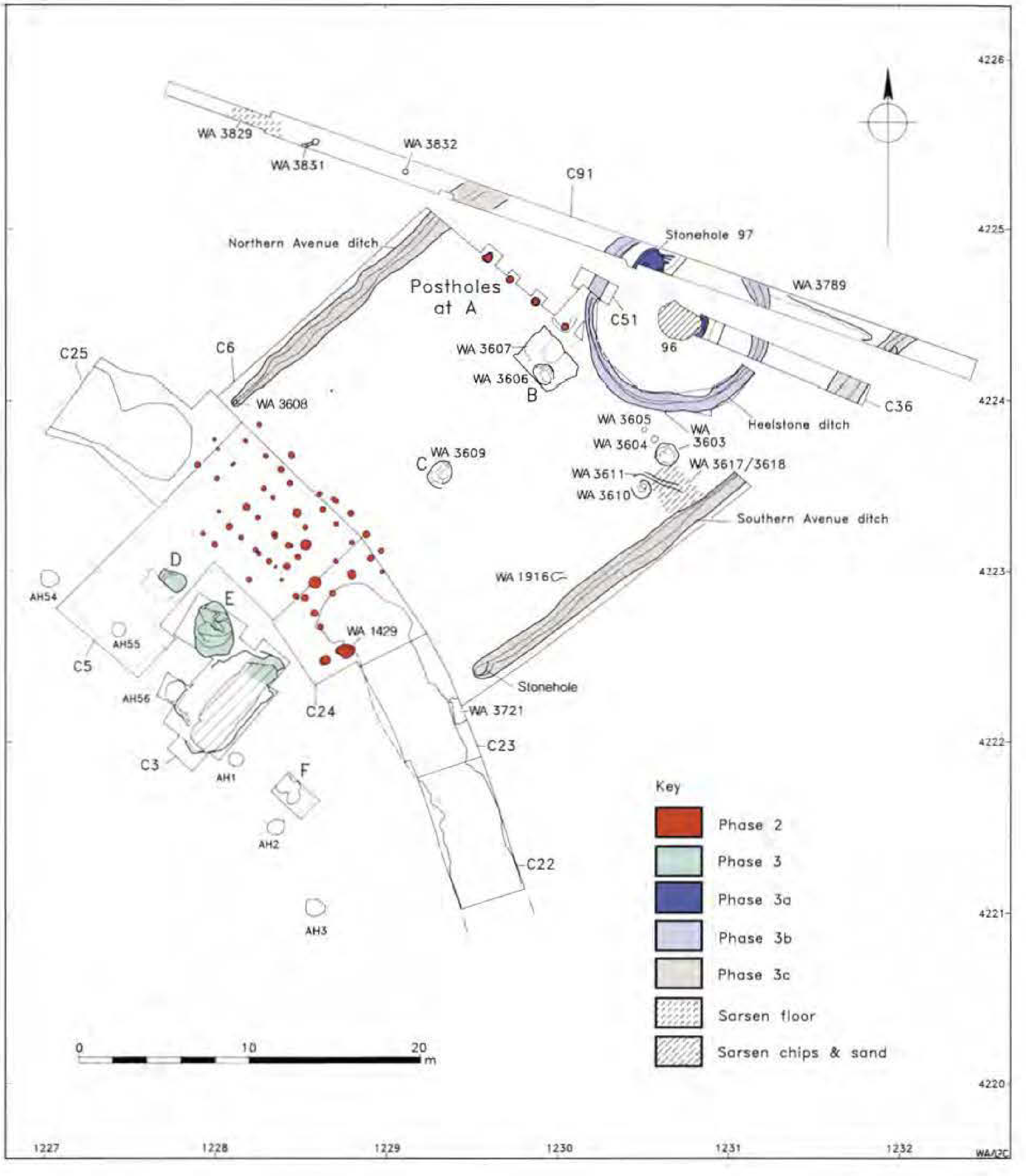



*Fig 156 Cuttings 5 and 6: phase plan showing all features*

ible axes at the centre becomes a much larger divergence at the periphery. It appears, on the basis of the best fit obtained from the available evidence, that the axis taken from the stone settings passes closer to Stonehole 97 than to the Heelstone, giving a rather asymmetric pairing around that axis. This does not necessarily imply that the two stones were not a pair, nor that they were unrelated to the axis, as it is perhaps a mistake to look

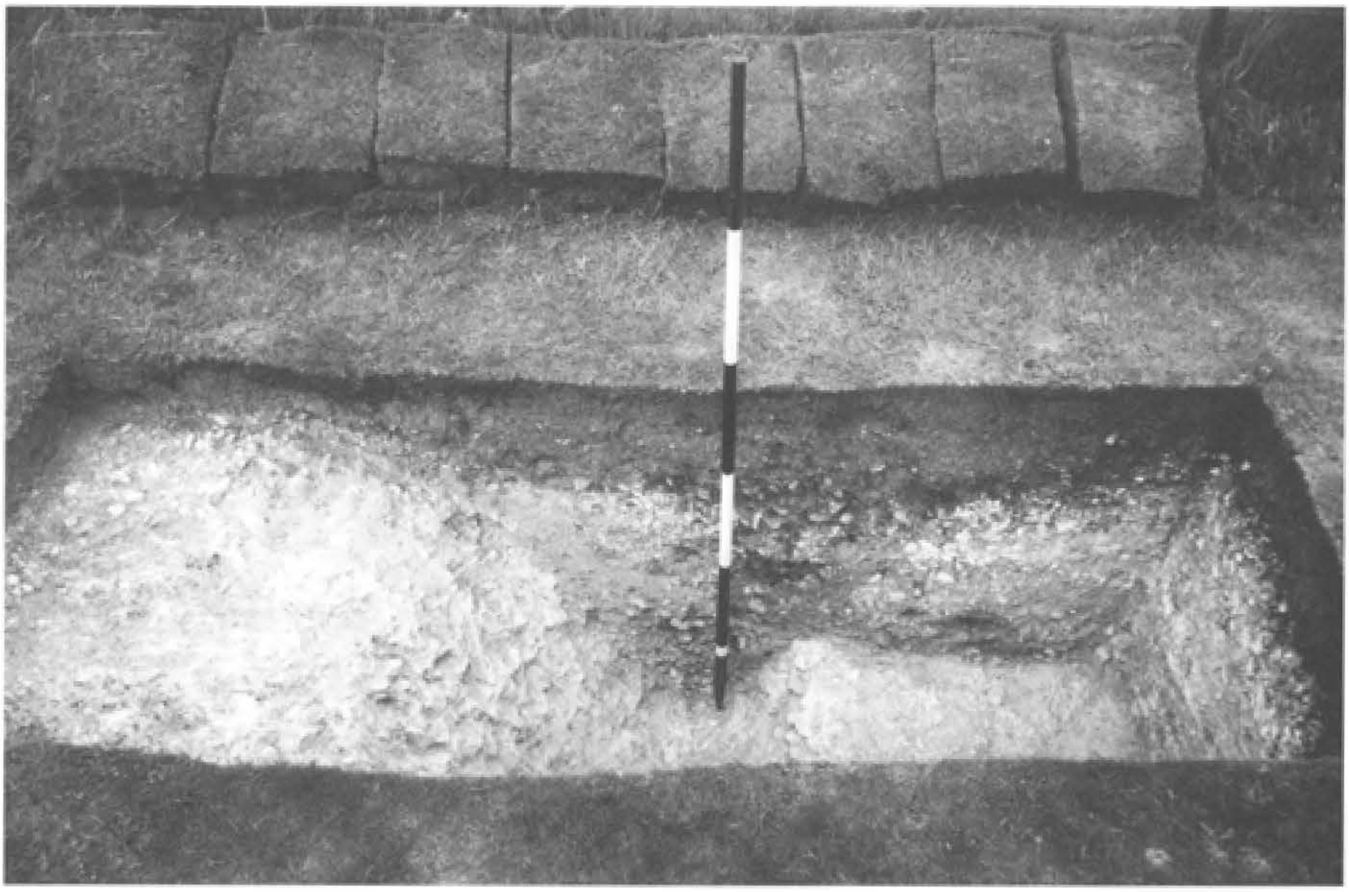


*Fig 157 Section through the Heelstone Ditch and Stonehole 97 in C51 (P51144)*

for exceptional accuracy in the laying out of the monument. If the main purpose was to bracket the rising midsummer sun, as seems likely, then the positioning of two stones here would have achieved that aim.

### Description

In the descriptions which follow the WA cut number is provided. WA context numbers are in parenthesis.

**Stonehole 97, WA 3787, C91:** Excavated in 1979 within a service trench cut along the roadside, but also almost certainly encountered in 1953 when it was interpreted as the ramp for the Heelstone (*see Fig 159*). The feature is extensively illustrated and described by Pitts (1982). It was incomplete, as it had been partly removed by the digging of the Heelstone Ditch, but was at least 1.75m across and 1m deep. On the base of the feature was a hollow which was recognised as the impression left by a standing stone (*ibid*). The fill was of two main deposits. A compact chalky deposit over the bottom of the feature was clearly the original packing around the stone, and some of this material appeared to have fallen into the hollow left by the stone on its removal. The remainder of the fill was of chalk, earth, and periglacial marl, and appeared to be backfill placed there after the removal of the stone.

Pitts argued that the supposed ramp for the Heelstone noted by Atkinson in C51 (1979, 203) was the same feature, and that this is likely to be the case is demonstrated by Figure 157. Pitts summarised the earlier discovery and his reinterpretation of it in the following terms.

> In 1956, Atkinson, Piggott and Stone excavated a trench to the west of the Heelstone (Atkinson 1979, 203–204). Here, they found a disturbance whose western edge, like that of stonehole 97, was removed by the Heelstone ditch [Figs 157 and 159]. The appearance of

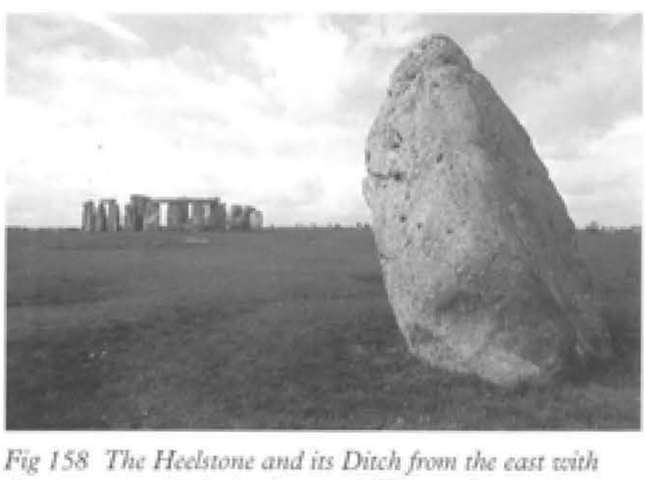


*Fig 158 The Heelstone and its Ditch from the east with the monument in the background (Wessex Archaeology)*

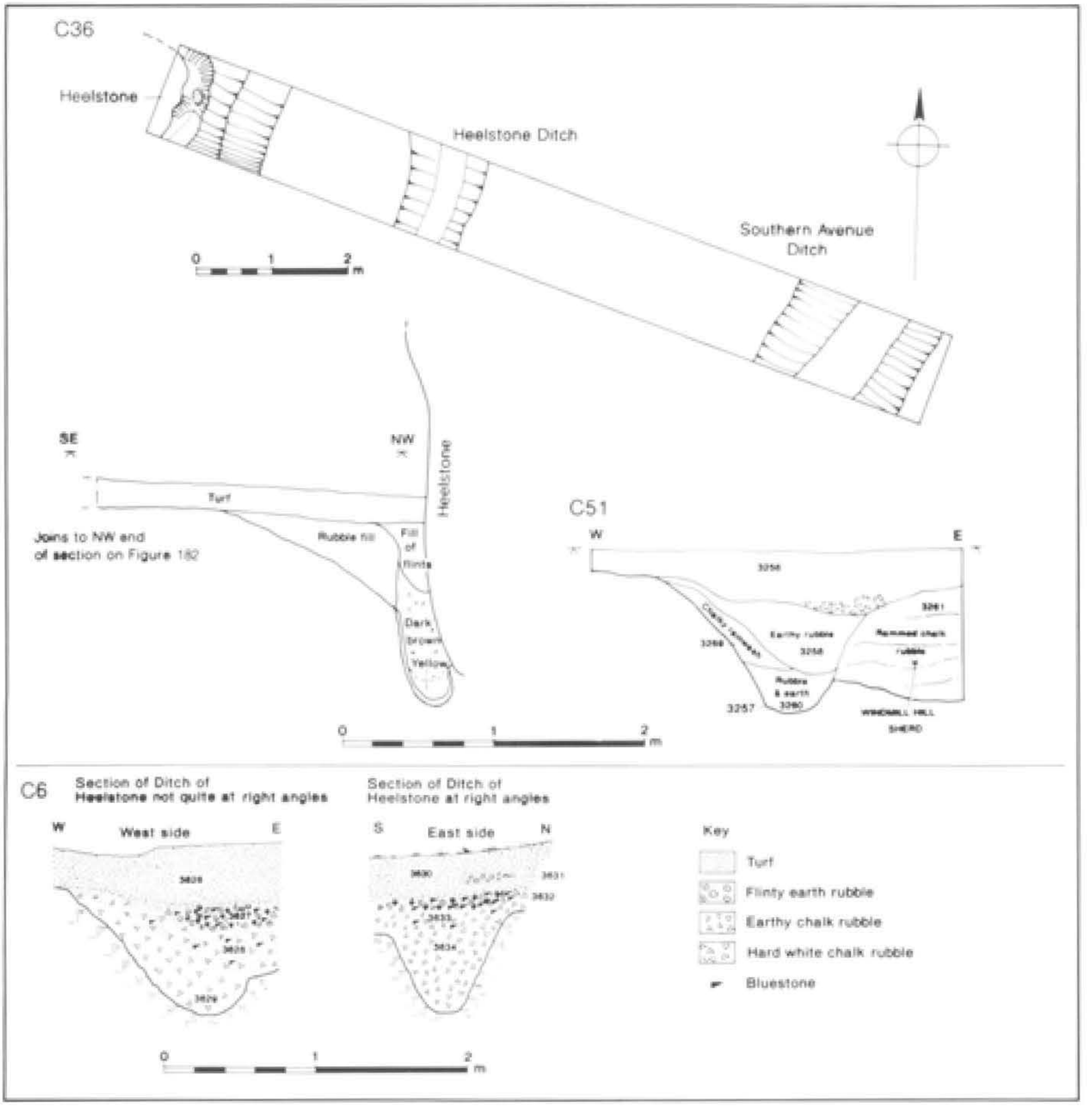



*Fig 159 Heelstone: C36 and C51, plans and sections*

> this feature is clearly similar to that of stonehole 97, and there is a strong possibility that it is in fact the same pit, not, as first suggested by Atkinson, the erection ramp for the Heelstone (Atkinson 1979, 203, and pers comm)
>
> (Pitts 1982, 82)

Pitts also suggested that if the two are the same feature, the stonehole would be around 5m long, which would make it similar in size to Stonehole E (Pitts 1982, 83). The original interpretation by Atkinson of the hole found in 1956 was a reasonable interpretation on the evidence then available, although it is interesting to note that Newall had suggested in 1929 that a stone might be expected in that position (Newall 1929a).

A single sherd of plain pottery, identified as Windmill Hill Ware, was found within the feature in 1956. The sherd has been re-examined (Cleal this volume) and is considered undiagnostic. It is a plain, soft, laminated sherd, probably containing some grog; it is clearly not Middle Bronze or later, but could be almost any date before the Middle Bronze Age. The soft, possibly grog-tempered fabric is not typical of earlier Neolithic fabrics in the area, nor of Peterborough Ware, but could be accommodated within either the Beaker or Grooved Ware traditions.

*Fig 160 Station Stone 91 from the south, c 1954 (P51629)*

Stonehole 97 was clearly cut by the Heelstone Ditch (Pitts 1982, 82, fig 5, section 21; Figs 157 and 159), but that cut only the undisturbed packing; the Heelstone Ditch could therefore have been dug while Stone 97 was still standing, although the weathering cone and upper fill of the Heelstone Ditch overlay the secondary fill of Stonehole 97 and must therefore post-date the removal of the stone (Pitts 1982, 82). The removal of Stone 97 seemed to have been carried out on the side furthest from the Heelstone in a direction between north-east and south-west, indicating that it could have been achieved with the Heelstone in place (Pitts 1982, 87).

**The Heelstone (Stone 96) and its stonehole, WA 163, C36:** In 1953 Atkinson excavated part of the hole (WA 163) in which stands the large natural sarsen block known as the Heelstone (Stone 96, Figs 156 and 158). Although complete dimensions are not available, his excavation showed the Heelstone to be *c* 16ft (4.88m) high with a further 4ft (1.22m) buried. The section prepared by Atkinson for publication (Fig 159) appears to show a posthole (WA 2959) cut into the edge of the Stonehole filled with contexts 3038, 3039, and 3040, and fill of the Stonehole 3037 and turf/topsoil context 3031. The accompanying plan indicates the presence of another feature, probably a stakehole, WA 3873 (fill context 3874) cut into the ?base of the Stonehole.

Following the filling of pit 97 the next certain event can only be the excavation of the Heelstone Ditch, but it is tempting to place the Station Stones also early in this sequence on analogy with the Heelstone and its Ditch. Like the Heelstone, two of the Station Stones are surrounded by ditches, of similar diameter and dimensions to the Heelstone Ditch (ie 10–12m in diameter and between *c* 0.5m (SB) and 1.2m (HD) deep, and 0.9m (SB) and 1.1m (HD) wide).

**Stonehole for Station Stone 91, WA 1682, C30:** Hawley opened a trench in 1923 to examine the pit in which Station Stone 91 (WA 166) stood (Figs 160–1). The hole was found to be 48in (1.22m) in depth, 56in (1.42m) wide from east to west and 83in (2.11m) from north to south although this last is an approximation because 'we could not excavate under the stone'. No plan has been found for this feature which had vertical sides and was filled with clay and chalk on the base with dirty chalk containing decaying antler and disturbed soil above. The Diary entry says:

> We dug down and around the base of this stone. The upper soil had already been disturbed by Cunnington's examination early in the last century and the disturbed soil was full of modern rubbish, broken bottles, crockery, Oyster shells and pieces of cocoa nut shells in fairly good preservation from the oil in them. This had been carried down for about 25 inches [0.63m] but did not reach to the solid chalk of the hole, neither had the solid chalk of the sides been tampered with so that we were able to get a good definition of the hole to where it passed under the side of the stone which lay partly in it. In the undisturbed portion there were the remains of a much decayed antler ... The dirty chalk was hard from compression by the weight of the stone at the sides and bottom. There was a little clayey matter of the nature of cement often before met with composed of clay and beaten chalk.
>
> (15/10/1923)

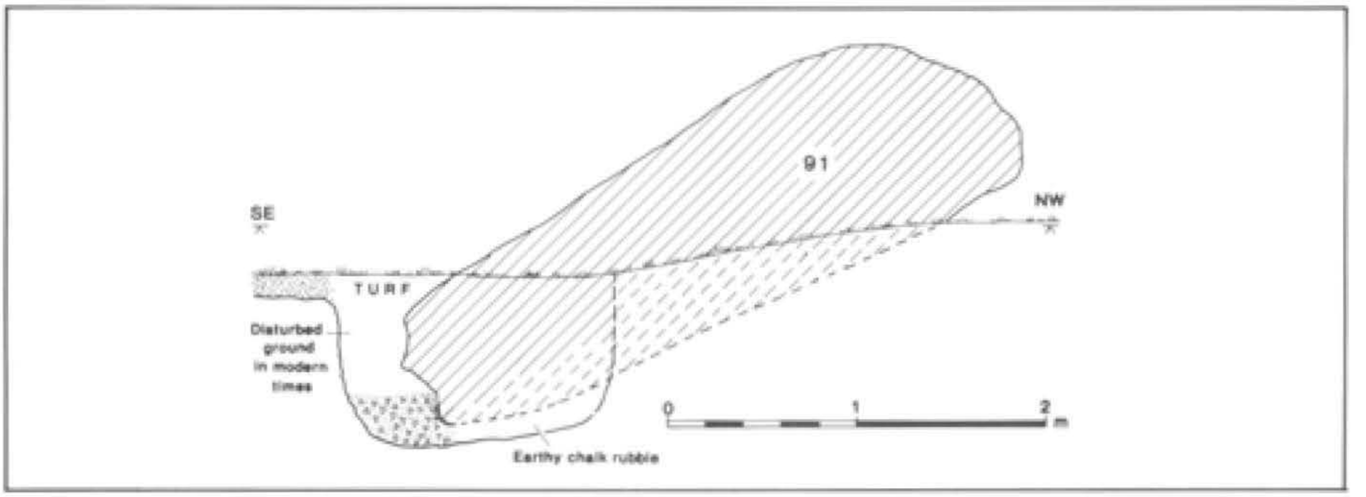



*Fig 161 Station Stone 91, C30, section*

**Stonehole for Station Stone 92, WA 167, C4:** Examined by Hawley in 1921, during his investigation of the area defined by the ditch of the South Barrow, this hole had been previously disturbed, apparently by Colt Hoare. Upon cleaning the hole prior to excavation Hawley noted that

> It is curiously shaped like a circle with a small rectangular cut on the north side thus. It appears roughly to be 7ft 6" [2.29m] north to south and 6ft [1.52m] west to east'.
>
> (12/10/1921)
>
> Upon digging it out it appeared as if a stone of a similar outline might have stood in it, but there is no reason for assuming this beyond the shape. The bottom of the hole was approached by two steps cut down from the rectangular cut on the north, but whether they had been made by Colt Hoare or previously, one could not tell. The hole was full of the spoil of the former excavation which had been returned to it which contained nothing except a piece of Diabase ... One or two stone flakes were met with but nothing else.
>
> (13/10/1921)

The published account states that

> Nearly in the middle of the place was a large hole. Sir Richard Colt Hoare mentions having opened it without result, consequently it was in a very disturbed state and afforded nothing of interest until it had been emptied. It was then seen that it must formerly have contained a large stone, perhaps about the size of the one lying near the rampart a little way to the east, and the bottom showed irregularities indicating the pressure upon it of an irregular base of a stone. On the north side, forming part of the hole, was an incline in the solid chalk for introducing the stone somewhat similar to those met with in the Stonehenge circle. The hole was about 4ft [1.22 m] deep.
>
> (1923, 15–16)

**Stonehole for Station Stone 94, WA 4039, C63:** A 2m square trench was opened by Thom and Atkinson in 1978 in order to define the edge of the stonehole for the missing Station Stone 94. The feature was not completely excavated, largely because of the proximity of adjacent Aubrey Hole 46. It may be noted that Newall suggested (1929, 82) that Colt Hoare may have excavated in the area of Aubrey Hole 46 whilst digging in the North Barrow. Probing suggested that the stonehole descended almost vertically (Ehrenburg, pers comm). A plan and section have been preserved (Fig 164) which show that the hole was filled with weathered chalk lumps in a soil matrix (context 4042) above which was humus enriched soil and turf. There is no evidence for finds having been retrieved from this feature.

An irregular disturbance/cut shown on the section (context 4043) may be natural as it appears to be filled with periglacial material. A large and apparently modern clinker-filled feature (WA 4045) annotated DOE (presumably Department of the Environment), is shown in the plan adjacent to the stonehole on its west side.

## Finds

Finds from this sub-phase are limited. 'The artefacts found in Pit 97 in 1979 were of flint or sarsen, with the exception of a small piece of glauconitic sandstone ... and a single ceramic grain less than 5mm across' (Pitts 1982, 82). Other than from the topsoil, the finds from the 1953 excavation of the Heelstone stonehole came from within 'flint gravel against Hele Stone' (*sic*) (context 3875) and from 'Hele Stone silt' (context 3038) (information in finds record, but recorded on bag as from 'earthy silt over anti-friction stakes'). Neither of these contexts is definitely contemporary with the erection of the Heelstone and can be regarded only as contemporary with or later than its erection. The flint gravel against the stone produced one sherd of comb-impressed Beaker (not illustrated; 1953 finds record S.53.77), and the silt produced six sherds, possibly of one vessel (1953 finds record S.53.96). Four of these are illustrated (Fig 196, P32–P34). Other finds included a sherd of a Late Bronze Age fabric (Q1) from the gravel, bluestone and sarsen fragments, and flint mainly from the upper part of the fill of a posthole (WA 2959, Fig 159) within the stonehole and from the upper part of the fill of the stonehole itself (1953 finds S.53.78–85).

Professor Atkinson refers to the Beaker sherds found next to the Heelstone, and notes that they were found in

> the fine earthy filling which occupied the space between the side of the stone and its stonehole. This earthy filling could only be accounted for by the decay of the anti-friction stakes which originally lined the side of the stonehole, and prevented the toe of the stone from digging into the side when it was hauled upright. The level at which the pottery was found made it clear that it could only have reached that position some appreciable time *after* the erection of the stone.
>
> (Atkinson 1979, 70)

Atkinson uses this as evidence that the Heelstone belongs to his Period I, as the Beaker sherds must belong to his Period II, but this argument is flawed. The presence of the Beaker sherds only indicates that sherds were able to enter the deposit at some time after the erection of the stone; it does not indicate that they were necessarily absent when the stone was erected. Unlike the case of the main Ditch, where a very large extent has produced no Beaker sherds and the absence can therefore be regarded as a real indication of the absence of Beakers at the time when it was filling, the absence of Beakers from this one stonehole cannot be regarded in the same light. For instance, Beaker sherds are not present in most of the Sarsen and Bluestone holes of the interior settings but are known to have been present at an earlier date because they occur in a pre-Sarsen feature (a Q Hole). In the present phasing the Beaker sherds are assigned to phase 3 and indicate only that the Heelstone was erected either within, or prior to, phase 3. The fact that several sherds of the same vessel occur could be regarded as an indication that they had not lain on the surface for long before incorporation within the feature, but this must be regarded as tentative.

Two of the three excavated Station Stone stoneholes were disturbed, though that for Station Stone 91 produced some poorly preserved antler in the 'undisturbed portion', 'the largest of the fragments lying close to the stone on the South side' (15/10/1923). Stonehole 92 had 'nothing but one or two stone flakes' (13/10/1921). There are no recorded finds from Stonehole 94.

### Discussion

It is impossible to identify points at which developments at the periphery may be equated with those in the interior, but on the grounds of symmetry it would seem reasonable to assume that the axis running between Sarsen Stones 1 and 30, which may already have been established between Q/R Holes 1 and 38, was in existence or was set up when Stone 97 and the Heelstone were put in place. This would place sub-phase 3a at the earliest contemporary with the Q/R setting and therefore at the beginning of phase 3, but it could be later in date and contemporary with the Sarsen Circle or with the subsequent alterations to the monument.

## Phase 3b

Stratigraphically the event following the digging of Stonehole 97 and presumed erection of Stone 97 is the digging of the Heelstone Ditch (Figs 157–9, 162). This is likely to have followed the removal of that stone but it could have been dug with the stone in place, as noted by Pitts (1982, 82 and above). Although the erection of the Heelstone does not have a demonstrable relationship with the ditch around it, it seems reasonable to presume that the stone precedes or is contemporary with the ditch, although this does rest on the assumption that the Heelstone and Stone 97 were a pair. An alternative but untestable interpretation is that Stone 97 stood alone and was subsequently moved to become the Heelstone, and the ditch dug around it then or later.

The ditches of the North and South Barrows are suggested as belonging to this phase purely on their resemblance to the Heelstone Ditch, an observation made by Professor Atkinson (1979, 78).

### Description

**Heelstone Ditch, WA 11, C6/36:** The Ditch is a narrow roughly circular feature, *c* 10m in diameter, which surrounds the Heelstone 12ft (3.66m) from its base (Fig 162). Two drawn sections of the Heelstone Ditch excavated by Hawley in 1923 (C6) have been preserved in the archive (Figs 159 and 183): the east side section shows basal hard white chalky rubble (with no bluestone chips) (context 3634), earthy chalk rubble (context 3633) (contains bluestone chips), flinty earthy rubble (context 3632), and turf (context 3630). The west side section shows hard white chalk rubble (context 3629), earthy chalk rubble (context 3628), flinty earthy rubble (context 3627), and turf (context 3626). The west section bears a particularly close resemblance to that excavated by Atkinson in 1956. The description of this area is complicated by the feature WA 3607, encountered by Hawley, which appears to have had a stratigraphic relationship with the Heelstone Ditch. It is described in detail, below, as sub-phase 3c or later, but it should be noted here as a large, irregular linear feature (WA 3607) crossing the Heelstone Ditch which appeared to be aligned on the Heelstone, although Hawley did not follow it to the stone for fear of causing the Heelstone to become unstable.

Hawley's published description of the Heelstone Ditch is that it was

> 4ft [1.2m] deep and 3½ ft [1.1m] wide with nearly perpendicular sides ... It was certainly a partly open trench at the time Stonehenge was built, as the masons' chips were found in the higher part of it. There were about 18 inches [0.46m] of dirty chalk upon the bottom and a much decayed horn pick, but no chips: above the silt they began to appear, sparingly at first but increasing in numbers as the filling rose to

*Fig 162 Section through the Heelstone Ditch (P51473)*

> the top ... there is a layer of broken flints around the Helestone immediately below the surface, about 9in [0.23m] thick, which contains all varieties of chips, and is evidently a layer of the time of Stonehenge.
>
> (Hawley 1925, 25)

In the Diary Hawley describes

> Digging out the circular trench round the Hele Stone [ie the Heelstone Ditch] finding nothing in the soil removed. The top of the trench [Heelstone Ditch or 3607] now comes up to the top of the solid chalk. Between this and the humus is a layer of humus with flint shingle which is noticable from where I commenced. This does not extend beyond the outside of the trench [?3607] but probably is continued up to the Stone. Evidently the stone movers cut to the Helestone with intention of moving it but for some reason desisted, probably too rough a stone or too deeply imbedded. They then filled in their trench [ie 3607] and covered the top of the area with flint shingle.
>
> (24/5/1923)

> ... I found the front part of a broken flint implement in the flinty layer the only thing yet found. A few Sarsen chips appear in the dirty chalk below the flinty layer, but none are found at more than 3 [0.08m] or 4 inches [0.10m] from the top of it. This chalky matter filling the trench probably fell in when the 2 big stones were removed [probably WA 3603 and WA 3606]. One animal bone about a foot from bottom of trench in the dirty rubble which filled the trench 10 feet [3m] from end of cut on east side. Only object met with. A part of a decayed horn pick and some flint chips were found on the bottom silt.
>
> (25/5/1923)

This is a confusing entry, as it seems to use the term 'trench' for both the Heelstone Ditch and for the area of disturbance or cut WA 3607 (*discussed below*).

Atkinson excavated two sections through the Heelstone Ditch; the section from C36 dug in 1953 is shown in Figure 183, below. It shows a compact chalk rubble fill (context 3036), overlain by the rubble makeup of the Avenue bank (context 3035), above which are shown a lens of flint and bluestone (context 3808), ?subsoil (context 3041), and topsoil (context 3031).

The second section through the Heelstone Ditch from C51, 1956 (Fig 159), shows rubble and earth on the base (context 3260), chalky rainwash on outer side (context 3259), and earthy rubble (context 3258) with ?turf/topsoil above (context 3256). Atkinson's excavations showed that the ditch was 'very narrow and steep sided' (1979, 75). He postulated that the ditch was 'a symbolic rather than a physical barrier, as it was refilled with rammed chalk rubble very shortly after it was dug, before any silt had had time to collect on the bottom' (1979, 30). Of significance for dating this feature was the recovery of a 'fragment of unweathered bluestone (rhyolite)' (Fig 183) from low down in the rubble fill of the ditch (*ibid*, 76).

In 1979–80 Pitts undertook rescue recording of a service trench running alongside the A344 (C91). The work was fully published (Pitts 1982). The trench offered another complete section across the Avenue (Fig 181, *below*) and also passed through two segments of the the Heelstone Ditch. The sections excavated by Pitts compare well with those excavated by Hawley. Pitts described the feature as having steep sloping sides and a narrow flat base, with upper earthy deposits overlying a thick layer of chalk intermixed with periglacial marl which covers all of the bottom and most of the sides. He suggested an alternative hypothesis to Atkinson's deliberate refilling of the ditch, 'natural silting for the greater part of the ditch is as acceptable' (*ibid*, 87). 'The few finds recovered from this chalky deposit were all of sarsen' (*ibid*, 88).

**North Barrow ditch and bank, WA 3255, 3251, 3595, C50:** The 'North Barrow' may have been investigated by Colt Hoare in the nineteenth century. In 1956 Atkinson opened a small trench *c* 4.55 x 1.22m (C50). The only details are taken from a section and plan (Figs 163 and 164). The North Barrow is a circular area defined by a small V-shaped ditch (WA 3255), *c* 0.85m deep and *c* 1.07m wide at ground level, with a low bank outside it. The ditch was filled with clean chalk rubble at the base and on the inner side with semi-dirty, fine rubble, and dirty chalk rubble above. The bank was composed of 'rubble and earth' (WA 3251) and now stands *c* 0.3m above ground level (Ehrenburg). A small gully running approximately east-west (WA 3595) is shown on the drawings and appears to lie beneath the rubble and earth bank.

**South Barrow, WA 304, C4:** The feature known as the 'South Barrow' (Figs 165 and 166) was investigated by Lt-Col Hawley initially by means of a rectangular trench in the north-east of the Barrow in 1920 (C4.1) and secondly in 1921 when the rest of the ditch and most of the interior were examined (C4.2). An area of the interior appears to be unexcavated, although the Aubrey Hole which lay within it (AH18) was opened in 1922.

The Barrow consists of a roughly circular area surrounded by an irregular V-shaped ditch of 10.8–11.7m diameter. The ditch (WA 304) was *c* 0.4m deep and 0.4–0.6m wide. It 'was very narrow and of no depth and ended at a sharp angle. It could not have been made for protection and was rather symbolic or intended for the reception of timber slabs or of flexible boughs in which case a dwelling is presumed' (12/8/1921). It contained chalk rubble with flints, with dark earthy rubble and turf above. 'It is not filled with yellow marl as it was found to be near the rampart, but this filling is of chalk, rather dirty, fairly compact but not hard' (20/10/1921). Yellow marl is mentioned in some sections of the Barrow ditch, apparently those where the ditch cuts the main Bank. 'There is a great deal of extremely hard yellow marl both in the trench and at the sides' (8/10/1921).

'There was a quantity of the yellowish marl met with in the Ditch about the site of the Pallisade [*sic*]. From the apparent artificial mixture of crushed chalk and clay I should imagine that this was used to secure the pallisade and that some of it was carried down into the Ditch ...' (8/10/1921). One sarsen chip and six bluestone fragments are reported from the Barrow ditch by Hawley, 'all at low level showing that they could not have found their way from the surface' (8/10/1921). Hawley's interpretation, both in his supposition that the 'Barrow' ditch held a palisade, and that some of the fill intended for holding this in place entered the main Ditch, must be queried. There seems no positive reason for supposing the ditch to have held posts on the basis of the recorded section (Fig 165), and Hawley seems to have based his interpretation only on the fact that the shallowness and small size of the ditch seemed to render it impractical as any form of barrier on its own. The main Ditch is closest to the 'southern Barrow' in Segments 15, 16, and 17, and in none of these segments is there material matching Hawley's description of the mixed crushed chalk and clay found in the 'Barrow' ditch. There appears to have been deliberate chalk backfill in Segment 15, but this is a phenomenon not confined to this segment (*see Chapter 6*). As bluestone fragments were found in the 'Barrow' ditch, and none were recovered from undisturbed Ditch filling, it is still the case that the Ditch filling and the 'Barrow' ditch filling could have been

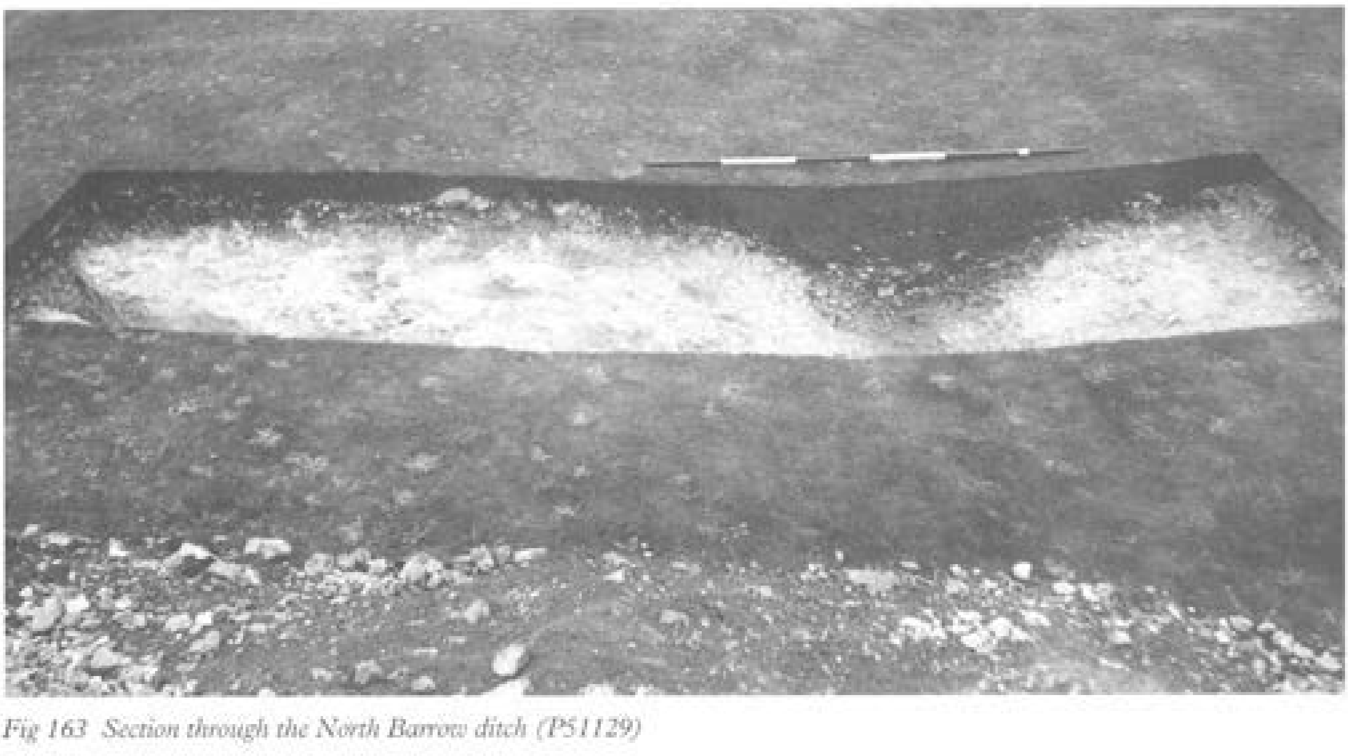


*Fig 163 Section through the North Barrow ditch (P51129)*

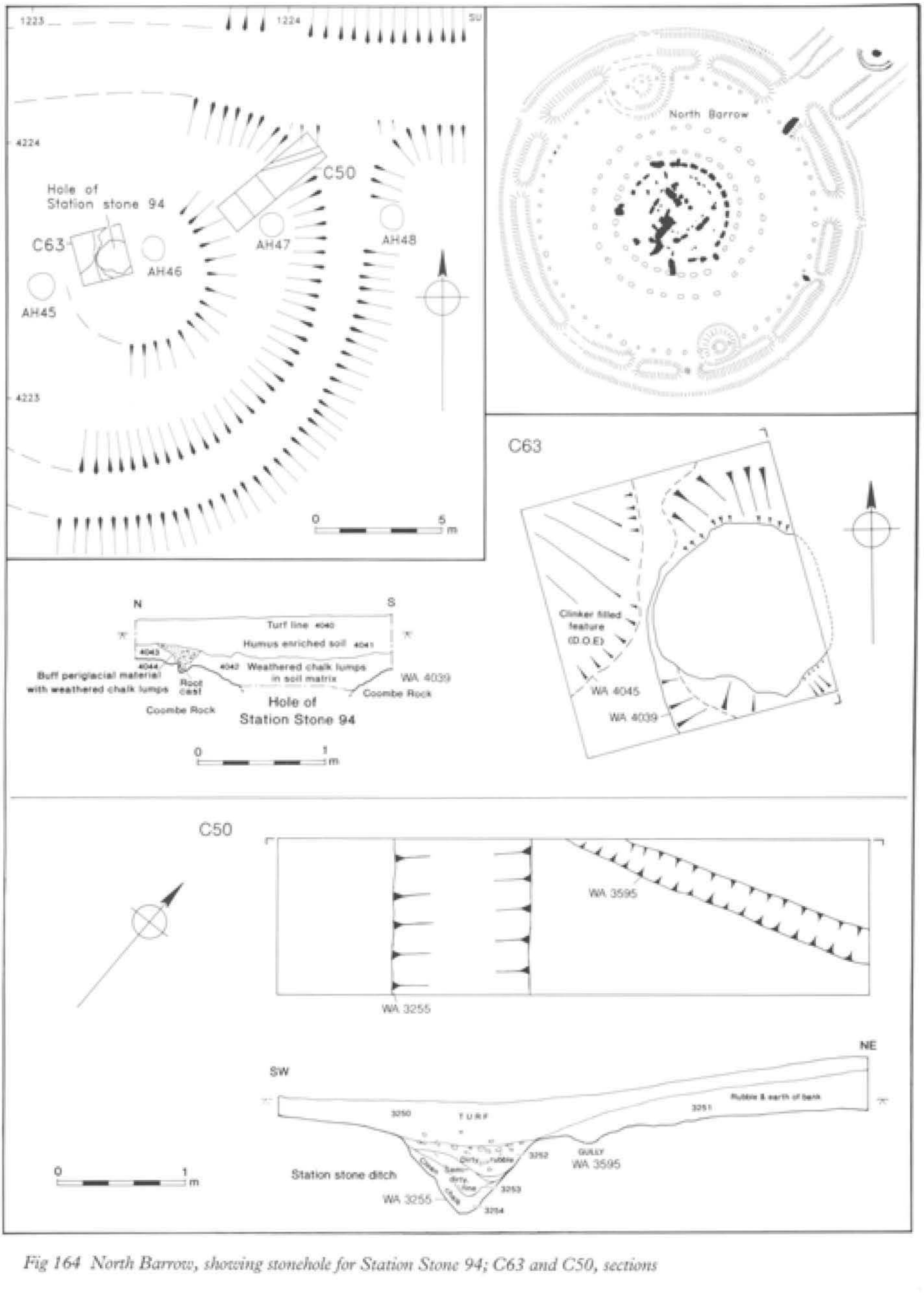



*Fig 164 North Barrow, showing stonehole for Station Stone 94; C63 and C50, sections*

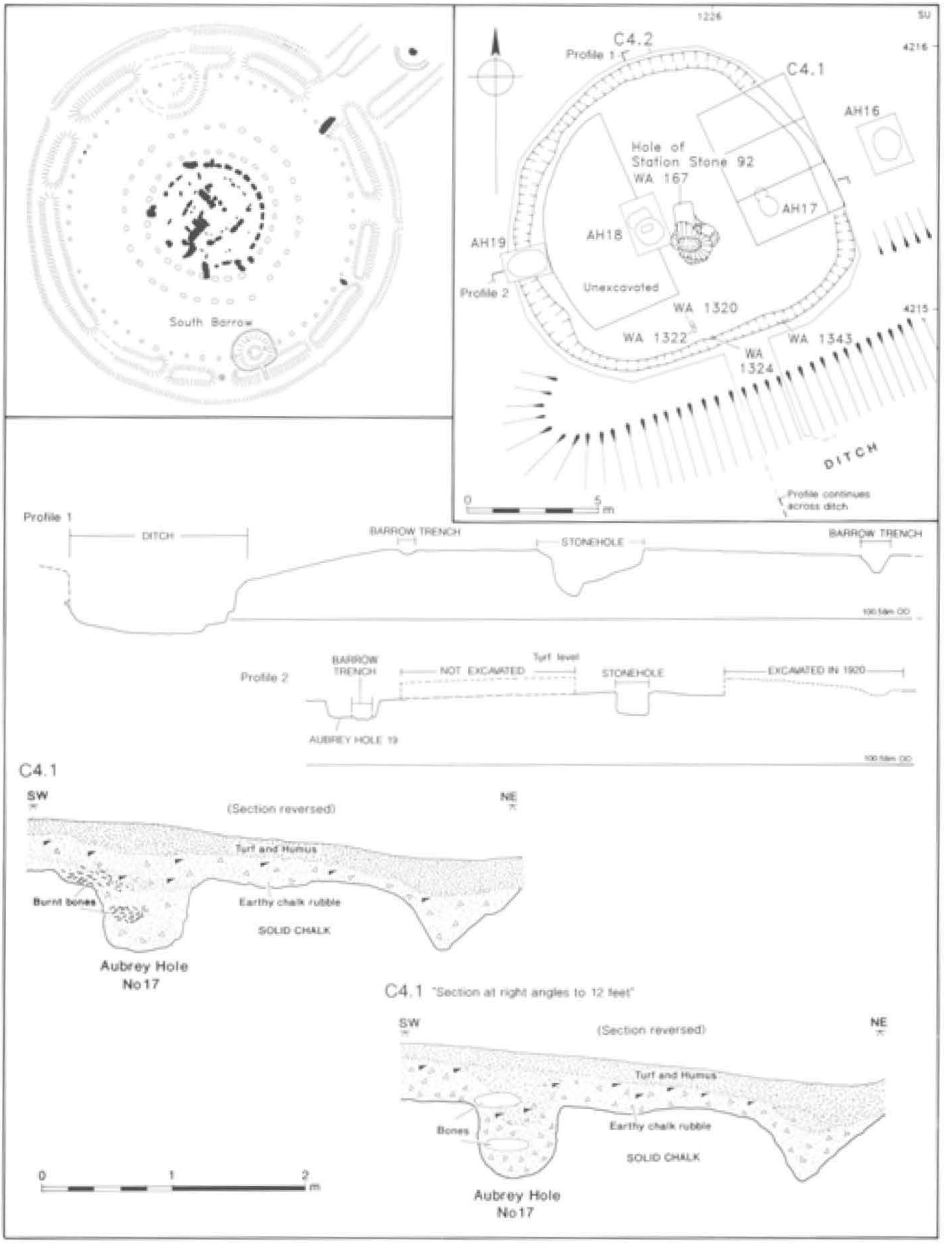



*Fig 165 South Barrow, C4 plan and profiles*

*Fig 166 South Barrow under excavation, looking south © Copyright Society of Antiquaries of London*

widely separated in time: the former in phase 2 and the latter in phase 3.

The record is unclear concerning whether a deliberate mound had been created within the area surrounded by the ditch. 'The natural chalk seems cut away slightly to make a slope from trench upward giving the appearance of a slightly rising mound' (11/8/1920). Peter Berridge suggests (in archive notes) that this statement indicates that there was a mound which had protected the chalk surface from natural weathering. Some preparation at least is indicated, as Hawley notes: 'Humus and rubble must have been removed from the area occupied by the Barrow before floor was made as the old line of humus would have shown – apparently the place was levelled upon solid chalk' (8/10/1921).

'The barrow soil is very shallow over the chalk rock, the curve of it from the ditch making it appear higher than it really is. The soil is of earthy chalk rubble with humus and turf over it, and the three combined do not exceed 14in [0.36m]' (Hawley 1922, 48).

Apart from the Station Stonehole and the Aubrey Holes there were four other features noted within the area enclosed by the Barrow ditch; two postholes (WA 1320 and WA 1322) and two small stake or postholes (WA 1324 and 1343). WA 1320 and 1322 are recorded as 'two roughly cut holes a little way inside 24" [0.64m] from palisade' (3/10/1921). The posthole or stakehole WA 1343 is shown on the outside edge of the ditch and WA 1324 on the inside edge; neither is mentioned in the Diaries. The stratigraphic relationships of these are unknown and there are no further available details.

The Barrow ditch cut Aubrey Hole 19, 'This conclusively shows that the Aubrey Holes had been emptied before the trench was made, possibly a long time before and the position of the hole not suspected' (8/10/1921), and a level layer within the enclosed area, formed of what appeared to be beaten chalk mixed with clay, covered Aubrey Hole 17 (8/10/1921). Hawley records the relationship between the South Barrow ditch and the main Bank as 'The rampart had been cut into nearly up to the crest to make room for an area which was found to be surrounded by a small trench of varying depth' (1923, 15).

### Finds

The primary fills of features of this sub-phase have produced few finds. In his excavation of the Heelstone Ditch, Hawley found 'one animal bone about a foot from the bottom of trench in the dirty rubble which filled the trench', and 'a part of a decayed horn pick and some flint chips were also found on the bottom silt' (25/5/1923). He noted that although chips of all stones were present in a flinty layer 8'8" (*sic*) below surface only a few sarsen chips were found in the dirty chalk below that layer and then only 3 or 4 inches (0.76–0.10m) from the top of it.

'The front part of a broken flint implement' was found in the flint layer (23/5/1923). From Atkinson's two excavations, a single piece of bluestone (S.53.75) was recovered from the lower chalk filling of the Heelstone Ditch, '6" [0.18m] from bottom' (context 3036). A single sarsen fragment (S.56.108) and a snail (S.56.107) are recorded from the 'ditch fill' (context 3886). Pitts recovered only a few finds of sarsen from the chalky fill of the Heelstone Ditch (1982, 88).

Two sherds of Iron Age/Romano-British Pottery, 1 flint, 5 animal bones, 11 bluestone fragments, and 1 piece of sarsen (S.56.87–92) were recovered from the 'ditch silt' of the North Barrow (context 3253). Also found were four bluestone fragments and one flint 'from the bank' (context 3251).

Hawley noted that from the 'South Barrow ditch', 'our finds were few' (12/8/1920). He records having found 'a large sarsen chip in the dark rubble' fill of the ditch (13/8/1920). He recovered one sarsen chip and two bluestone fragments 'all at a low level' (8/10/1921) but in the published report notes that 'seven rather large Stonehenge chips were found in the trench [ditch] in different places. One was sarsen and the others foreign stone. As these were on the bottom it might be concluded that they fell in before the rubble with which the trench was filled, and seems to indicate that the place had been made either at the same time as Stonehenge [ie the stone settings] or shortly after' (Hawley 1923, 15). One antler pick is listed in the Newall finds catalogue (no 4845, Berridge number DA172) as coming from the barrow ditch (on the north-north-west side) but is not mentioned in the Diary.

### Discussion

The occurrence of bluestone fragments at all three locations, low in the Heelstone and South Barrow ditches, and in the North Barrow bank, indicates not only that there were Bluestones present on the siteat the time these features were constructed, but that the frequency and distribution of fragments was such that they were entering features fortuitously, as there seems no evidence to support any of these three occurrences as deliberate deposition. This being so, it is very unlikely that these features were filling at the same time as the main Ditch fill was forming, as bluestone fragments are absent from that feature, and a period contemporary with or later than the first major alteration of the Bluestone setting (ie the dismantling of the Q/R setting) seems likely for the construction of these ditches.

### Phase 3b or earlier

A possible stonehole was found on the eastern side of the Avenue, possibly sealed beneath the Avenue bank, although the recording does not make the relationship absolutely clear.

**WA 3603, C6:** This feature appears on some archive material as 'Stonehole W'. It was excavated by Hawley in 1923 and lay *c* 7.31m (24ft) south-east of the Heelstone. It was 'crater-shaped', large, *c* 5ft (1.5m) in diameter and 4ft 6in (1.37m) deep, and 'may have held a large natural stone taken from it and dressed for Stonehenge' (Hawley 1925, 23). No details are available for the fill (context 3616) and no finds are mentioned. 'The original size and shape obliterated when stone was removed' (3–4/5/1923). It lay partly under a dump of sarsen chips and sand (contexts 3617 and 3618). The relationship with the Avenue bank is unclear from the details in the Diary.

**WA 3617, C6:** A layer of sarsen chips which partly overlay feature WA 3603 was excavated by Hawley in 1923.

> Upon turning from the [southern Avenue] ditch a large dump of sarsen chips was found, a few of them in the ditch resting on the silt, but most of them at the line of the Avenue bank, which was almost level here. Under the chips was much sarsen sand, and the great accumulation of them indicated the dressing here of a large stone. The fragments numbered 3,760 and were of all weights from 2 or 3 pounds [0.9–1.36kg] downwards. Some were the crust of a natural stone, other pieces were reddened by burning. There were five small hammerstones but no large mauls; perhaps after use they were carried away for similar work elsewhere.
>
> (Hawley 1923, 23)

**WA 3618, C6:** A layer of sarsen sand was found below WA 3617, 'under the chips was much sarsen sand' (*ibid*, 23).

The resemblance between the deposit of sarsen recorded here and the deposit excavated by Pitts was pointed out by Pitts (1982, 125), but although it is likely that the sarsen deposit and the stonehole over which it lay were sealed by the Avenue bank, it is not as certain as suggested by Pitts. Two points in Hawley's description lead to this uncertainty. First, his descriptions of stratigraphic relationships are rare, and when they occur he often describes the exact relationship in terms of which feature was created first, as when he describes a posthole cut by Y Hole 10 (Hawley 1926, 3).

Secondly, in his published description of the sarsen spread Hawley reports that sarsen chips, which he describes as being part of the same spread, lay on the Ditch silt (Hawley 1923, 23, cited above) as well as 'at the line of the Avenue bank, which was almost level here' (*ibid*). This presents two problems for the certain identification of this as a pre-bank feature. First, it is difficult to reconcile the fragments apparently high in the Ditch fill with a pre-bank position, the only possbility being that the spread was eroded from the soil on the interior side of the Ditch late in the history of the Ditch filling; and secondly, the description of the bank as being almost level indicates that it survived here as only a very low feature and that therefore the sealing of a sarsen spread by it might have been difficult to establish with certainty. In the light of this, and of the fact that Hawley does not specifically state that he thought the sarsen spread and the stonehole pre-dated the Avenue bank, the relationship cannot be regarded in the same light as, for instance, the postholes at 'A' where Hawley notes that the Avenue bank passed over one and partly over another 'showing existence previous to the Avenue' (1925, 24).

## Phase 3c

The last element identifiable in the sequence is the construction of the Avenue. This part of the monument is considered in detail for the majority of its length by Montague, below. Here only its length between the present road (A344) and the main Ditch of the monument is discussed.

The Avenue ditches, which run north-west from the main entranceway, were first excavated by Lt-Col Hawley in 1923, and he seems to have thought that he had encountered the eastern ditch some time before he actually struck that feature. (Note that in this report the Avenue ditch which approaches the western side of the entrance is termed the 'northern' ditch and that approaching the eastern side is termed the 'southern' ditch, *see Montague, below, and Plan 3 for an explanation.*) It is apparent from his description of his excavation of the enclosure Ditch as it approached the line of the Avenue that he did not then know what was the relationship between them. There was presumably no indication on the surface of whether the Avenue stopped short of the enclosure Ditch or crossed it; this may have been largely because the area was quite disturbed, as indicated by the early hachured plans. He describes how, as the excavation approached the line of the Avenue

> the top of the counterscarp had been laid bare for a width of 2ft [0.60m] in order that a good view of the avenue end, both in plan and section, might be obtained. The details shown were, however, disappointing, for when the south-east trench of the avenue appeared it presented an insignificant-looking, angular section in the bank about 18 in [0.46m] deep and 3ft [0.90m] wide in top measurement, the apex of the angle cutting a groove in the solid chalk below. Where the extremity of the groove approached the ditch it ended at 8in [0.20m] from its side, leaving a ridge of undisturbed chalk, and indicating that the ditch was of earlier construction. The contents of the ditch showed that there had been no attempt to carry the avenue across it nor was there any sign of it on the opposite side. The avenue bank was barely discernible and it is rather doubtful if it came quite to the edge of the ditch. It gave the impression than when making it the builders allowed their work to fade out as they approached the edge. The ditch continued an unaltered course independently of the proximity of the avenue.
>
> (Hawley 1924, 30)

Although it would be consistent with the phasing for the Avenue ditch to cut the Counterscarp Bank, it is not at all clear that the feature, the groove (WA 3721) described by Hawley, was the Avenue ditch or that the bank approached the enclosure Ditch closely. The Diary entries seem to present a different interpretation, and the field plan and published plan for C6, the large-scale excavation of this area, show the Avenue ditch ending some eight or nine feet (*c* 2.5m) from the upper edge of the enclosure Ditch (Fig 156; Hawley 1924, plan on p 31). On first reading it is tempting to consider Hawley's '8 in' as an error for '8ft'. This cannot be the case, since Hawley's description of the relationship between the groove and the enclosure Ditch does not make sense if the 'ridge' between the two was not so much a ridge as a gap 8ft (2.4m) wide and there is a feature which ends less than a foot (0.3m) from the Ditch edge (WA 3721). (This is also discussed below in relation to the Avenue where detailed descriptions are given of the Avenue as excavated by Hawley in cutting C6.)

The stratigraphic relationships of this length of the Avenue can be summarised as:

1 the terminal of the northern Avenue ditch apparently cut a posthole which formed part of the northernmost line of postholes across the main causeway (WA 3608) (Hawley 1925, 23),

2 the Avenue bank sealed one of the postholes at 'A' (*see Fig 183, below*) completely and partially sealed another (*ibid*, fig 1; Fig 156, Hawley 1925, 24),

3 the Avenue bank tail overlies the Heelstone Ditch fill in C36, but this is in turn overlain by a deposit of flints which Pitts argued was also prehistoric in date (Fig 156; Pitts 1982, 82, 90). Pitts's argument is based on the fact that in his eastern section through the Heelstone Ditch he found nothing but prehistoric finds in his layer 9 and the lower half of layer 7, with a relatively stonefree soil above, in the upper part of his layer 7 (*ibid*, figs 8 and 9). He suggests that layer 7 is the A horizon, and 9 the A/C horizon of a soil which developed over the chalky primary fill of the Heelstone Ditch (which he considers to have formed naturally, but fairly rapidly). There were many sarsen fragments in layer 7, but most of the struck flint was in the lower half of layer 7, an effect which Pitts argued accorded with Cornwall's argument that worm-sorting does not disturb an archaeological succession but merely compresses it (Cornwall 1953, 140). 'It follows ... ' argued Pitts, that as the sarsen flakes are lower than most of the struck flint, 'the sarsen fragments must derive from prehistoric working, as they would have started their journey down through the soil before the flint flakes (undeniably of prehistoric origin) were deposited.' Although it could be argued that the struck flints might be redeposited, it seems unlikely that they are, as 'the few recent artefacts ... lie at the top of the vertical artefact succession,' and Pitts's interpretation seems a reasonable one (Pitts 1982, 90).

In addition to the struck flint remarked upon by Pitts, there was also a considerable amount of unworked flint in layer 7 (*ibid*, fig 8). Pitts observes that these flints were mixed in with the artefacts, and notes that this indicates that they cannot therefore be a recent deposit as if that was the case they would above the artefacts. He comments that this is an important point because in Atkinson's 1953 excavation (C36; Fig 157) 'this deposit of flints was seen to overlie the tail of the Avenue bank ... It follows that the majority of artefacts in the secondary fill of the Heelstone Ditch became incorporated in this fill after the Avenue had been constructed, and that perhaps the secondary fill itself postdates the Avenue bank' (*ibid*, 90). If correct this need only imply a fairly short time span between the digging of the Heelstone Ditch and the construction of the Avenue bank (ie a period during which only the primary fill of the Heelstone Ditch had time to form, a process which on the basis of other chalk cut ditches seems likely to have been a few years' duration at most), and such a short chronology is not incompatible with the interpretation and dating suggested here.

### Finds

Lt-Col Hawley clearly recovered few finds from the Avenue ditches, as he notes 'They have contained nothing whatever hardly a piece of natural flint. Stone chips are found in the upper humus and pieces of hammerstone but the lower part is dirty chalk rubble evidently fallen and washed in from the surface of the Causeway. There is nothing whatever in this' (7/4/1923). But earlier he had noted of the northern ditch: 'Avenue Ditch NW chips and fragments of Bronze Age and RB pottery are found at usual level 15–16 inches [*c* 0.4m] ... There was a staghorn pick at 8′1″ feet [sic] [2.46m] from the end it was on the bottom and poor specimen at 26″ [0.66m] B.G.L.' (22/3/1923). The pick is also later noted as 8′ 4″ [2.54m] from the end (*ibid*). Another pick is noted at 12 feet [3.66m] from the end nearest the monument and '1′9″ [0.53m] B.G.L. bottom' (25/3/1923).

There appear to have been very few finds recorded by Hawley from the southern Avenue Ditch fill, though there were many finds from the soil above it, including sarsen flakes from the concentration WA 3617 (*see Montague below and Table 24*). In his published account (1925) he recorded that

> two decayed horn picks were found at the bottom of the west [northern] ditch and one in the east [southern] one, and there were flint chips in both of them.
>
> (1925, 23)

### Radiocarbon dates

The overall dating of the Avenue is discussed elsewhere (*below, this chapter*). The few newly available dates do little to resolve the question of whether the Avenue was constructed as one, albeit long-term, operation or in two or more stages, but none of the dates is as late as those obtained by Atkinson (*see Appendix 2*). It seems clear that it was constructed in its entirety during phase 3 of the monument and is unlikely to have post-dated *c* 1900 cal BC, ie, to have been constructed very late in the phase. This indicates that sub-phases 3a and 3b, both of which post-date the appearance of Bluestones on the site, must also fall within the centuries between the appearance of Bluestones and *c* 1900 cal BC.

## Phase 3 activity around the Ditch circuit

Hawley's description of the fills and finds from the Ditch make it quite clear that there was almost no pottery it its primary or secondary filling and that what little there was can be identified as Grooved Ware (*Chapter 9*). At several points around the circuit, however, he notes the presence of Beaker pottery, sometimes in concentrations, either resting immediately on the 'silt' (ie the top of the secondary fill) or in the layers above it. In some cases there are clearly later finds mixed with the pottery and the Beaker sherds must be regarded as having been redeposited. However, there are some cases in which there appear to be *in situ* deposits, and it is possible that there are stratified deposits above the 'silt' as defined by Hawley, that is, in the Ditch tertiary fill, which is known not to have been created or disturbed by ploughing, as the site has not been cultivated.

The occurrence of such finds in the Ditch may be summarised by the Ditch segments (Fig 36) above which they lie; some concentrations of artefacts and other finds which may belong to phase 3 but do not include Beaker pottery are also included:

**C42/3, Ditch Segment 98 (Fig 37):** One sherd (5g) of Beaker, two sherds (8g) of Middle–later Bronze Age pottery.

**C24, Ditch Segment 1 (Fig 39):** No Beaker sherds were recovered from above this Segment, but the copper alloy awl (WA obj no 491; Fig 241, 1) which may be of Early Bronze Age date (*Lawson, Chapter 9*) was found here, and may have been dropped or deposited within phase 3.

**C28, Ditch Segment 3, Hawley's section 1 (Fig 40):**
'Ten associated small pieces of Beaker pottery' on the surface of the Ditch silt, below the humus (Hawley 1928, 149–50).

**C28, Ditch Segment 4, Hawley's section 4 (Fig 40):**
One small piece of Beaker and 12 'roughly worked flints' were found in the upper layer, that is, above the ditch silt (Hawley 1928, 150).

**C28, Ditch Segment 6, Hawley's section 6 (Fig 41):**
Twelve associated pieces of Beaker pottery were found 'in the top of the silt' (Hawley 1928, 151)

**C28, Ditch Segment 12, Hawley's section 18 (Fig 45):**
Hawley noted an area of apparent *in situ* deposit on top of the Ditch silt in this section. He describes how

> below the humus line and where it joins the silt at 22" (0.56 m] below ground level and 30in [0.76m] from [the line separating the 17 and 18th sections [see Fig 44], at the centre there was a large lump of sarsen weighing about 40lbs [*c* 18 kg] partly embedded in the silt and below it and touching it a smaller fragment. Close to these was a patch of soil about 18" [0.46m] diam. stained by fire. Close to these and on a level with the small fragment of sarsen and close to it was a large axe hammer of rhyolite at 27" [0.69m]. The soil here in the silt area is very loose and it was observed that towards the end of the previous section the soil was loose and browner than usual for some distance down and those conditions are now found to be continued into this section.
>
> (13/8/1925)

It seems that at least the rhyolite artefact (no longer identifiable in the collections) was in the Ditch silt, but from Hawley's observations and his own interpretation it seems likely that in this length of Ditch the silt had been disturbed and redeposited and that the object is related to activity post-dating the upper fill. Hawley makes this clear when he comments, later in the same entry:

> the discovery of the axe hammer actually in the silt and below the true humus layer shows that the foreign stones must have been here certainly at the very beginning of the Stonehenge period [ie in Hawley's terms contemporary with the stone settings in the interior]. If the silt had been stratified it would point to their advent prior to that period, but the soil which ought to be silt where the axe was found, is the chalky unstratified humus of a small superficial disturbance probably about the early part of the Stonehenge period.

**C28, Segment 13, Hawley's sections 19–20 (Fig 45):** In addition to a 'small patch of cremated bones' found at the centre of the Ditch, which lay within a small scoop in the 'chalky loose silt at a depth of 17 to 20 inches B.G.L. [*c* 0.49m]' and covered only with humus, there were in another spot part of a human jaw, and two fragments of skull (all apparently unburnt), with some animal bones. In the same passage in the Diary Hawley notes 'a slab of Rhyolite and part of a rough hammer or celt ... both these rested on the silt and were covered with humus' . A foot [0.3m] from this Hawley notes another thin slab of Rhyolite about 9 inches [0.23m] across and close to it another Rhyolite axe 'roughly made like the last'. Both these were resting on the Ditch silt and were covered in humus, and close to them was a burnt area about 10 inches [0.25m] across (August 1925, entry for sections 19 and 20). It is very tempting to identify this as an episode of implement production from some of the Bluestones, and as production of these tools seems more likely, on typological grounds, to have been of Late Neolithic or Early Bronze Age date rather than later, it is likely that this occurred during Phase 3.

**C29, ?Ditch Segment 23 or 24 (Figs 46 and 47):** A single Beaker sherd was recovered from the 'upper layer', that is, above the 'silt' (Hawley 1928, 163).

**C29, probably Ditch Segment 27:** A single sherd of Beaker pottery was noted, with a barbed and tanged arrowhead, recorded as the 'only one met with throughout the excavations' (Hawley 1928, 164). A flint serrated flake or blade was also found in this length of the Ditch (*ibid*).

### Bank

The only pottery apparently from phase 1 contexts in the Bank were two sherds from within the chalk rubble of the main bank in C43.1 (1954). One sherd is probably Beaker, the other completely indeterminate. The presence of the Beaker sherd is contrary to the expected phasing, as Beaker occurs nowhere else on the site earlier than phase 3.

The Bank must, on commonsense grounds, be largely assigned to the same phase as the digging of the Ditch, but it is possible that it was added to at some stage. The obvious occasion for this might be the excavation of the Beaker-period grave, in Ditch Segment 98, but that was not cut down right into the chalk rubble primary fill and therefore it seems unlikely that upcast from that event would have passed unnoticed in the excavation of the Bank. Alternatively, it is possible that there is some post-depositional disturbance in this area, or, as the sherds are so small, that they were introduced by burrowing animals. This at least fits with the Beaker-period burial nearby, and the sherds may have been deposited or discarded in association with that event.

## Unphasable features at the periphery assigned to phase 3

### Stoneholes D and E, and the Slaughter Stone

*by Rosamund M J Cleal*

Professor Atkinson considered Stoneholes D and E (Fig 156) to be contemporaneous and early in the monument's history on the grounds that they lie symmetrically on either side of the axis of the first monument (*ie* the axis based on the circle of the Bank and Ditch and the centre point of the causeway; Fig 79; Atkinson 1979, 71). He also suggests that the stones in these holes may have been moved to occupy Stoneholes B and C after the construction of the Avenue and that the Slaughter Stone (Fig 167) was erected with a pair to it standing in Stonehole E when the main sarsen structure in the interior was constructed (ie his IIIa phase and present sub-phase 3ii; *ibid*, 215). These two stones would have bracketed the later axis of the monument, that is, the axis formed by the centre line of the Avenue, which is shared by the central stone settings (with a larger gap between Sarsens 1 and 30 than between the other Sarsens of the Circle; Fig 79). This interpretation can now be reviewed.

## Description

**Stonehole D (context1463):** Excavated by Hawley in 1922, who describes it as

> 3½ ft [1.06m] below the ground level of the passage, and cross measurements gave 5ft [1.52m] by 4ft 9in. [1.14m]; there was a very good flat impression of the stone on the soft chalky matter which had been packed between the stone and side of hole on the west side. The edge of the hole was but little more than a foot and a half [0.46m] from that of the Slaughter Stone [ie Hawley's interpretation of Stonehole E], but as the latter had been much enlarged when extracting the stone, the two would probably have had an interval between them when standing.
>
> (Hawley 1924, 36)

The filling was of

> dirty earthy matter chiefly crushed chalk in which some clay seems to have been mixed [contexts 1464 and 1465]: There was reddish soil with clay around the sides and the same is met with in the small post holes and stone holes on the Causeway.
>
> (14/11/1922)

Hawley considered that the area around the hole had not been much disturbed since the removal of the stone, as there was part of an antler in the topsoil above it and two others

> could be seen at the sides and the soil was extremely dense and compact, but the surface of the causeway had been destroyed by the removal of the stone for some distance around the hole and in the direction of the big hole [Stonehole E] on the E of it.
>
> (14/11/1922)

**Stonehole E, WA 1132, C3:** Excavated in 1920 when Hawley was examining the area around the Slaughter Stone (C3). The hole was found when the mound immediately to the north-west of the Slaughter Stone (Fig 168) was excavated. The mound was composed of loose rubble and the excavators were

> surprised to find it descending well below ground level: the result being that we came upon a very large hole roughly 10ft [3.0m] in diameter by 6½ft [2.0m] deep which we gradually excavated. We found a coin of Claudius Gothicus in the upper layer, but nothing interesting until we reached the bottom, where two deer-horn picks were resting against the curved side (figure 13).
>
> There was a large slab of stone standing on end near the middle, resting on the bottom. The material was very soft sarsen which crumbled if pinched between thumb and finger. There can be no doubt that a large stone once stood in the hole, but when it was taken out, and why, cannot be stated. The impressions of irregularities on the stone's base are very noticeable, both on the sides of the hole and upon some firmly compacted rubble on the bottom, which have rather a resemblance to an impression of the base of the Slaughter Stone, but I cannot state definitely if this is so, and the movement of taking the stone out must have distorted some of the impressions. The slab at the bottom appears to be too perishable for a standing stone and may be a piece flaked off a packing block.
>
> (Hawley 1921, 36, fig 13)

Two features are described by Hawley, apparently within the fill of Stonehole E.

> There were two long holes about two and a half inches [0.065m] in diameter and about 3ft [0.91m] long which may have been caused by sticks which rotted away and left casts or they may have been handles of picks discarded as digging sticks with points [contexts 1133, 1135].
>
> (2/6/1920)

**Slaughter Stone hole, WA 1127, C3:** The area around the Slaughter Stone had been extensively disturbed before Hawley and Newall examined it in April 1920 (C3; Fig 168). This is partly because some attempt appears to have been made to bury the stone in the past and partly the result of investigations by William Cunnington early in the nineteenth century (*Chapter 8*). The evidence for the stone having stood upright has recently been reviewed by Burl (1994) and is discussed below. Hawley describes finding

> a cavity for about 3ft or 4ft [0.9m or 1.2m] around the stone, evidently [Cunnington's] work, but one could see that the stone had been buried earlier in a pit very roughy dug in the solid chalk and just deep enough to allow the soil to cover it at ground-level. Perhaps the intention had been to bury it deeper, but the hole was not made long enough, consequently the top and bottom rest on sloping chalk and cause a void of about 10in [0.25m] under it. This void was filled with dirty rubble containing much modern rubbish, evidently returned by Cunnington. There could be little doubt about this, as we found a bottle of port wine left under the stone, presumably by him out of consideration for future excavators. The seal was intact, but the cork had decayed and let out nearly all of the contents.
>
> (Hawley 1921, 34)

## Radiocarbon dates

The antler picks from Stonehole E have produced two radiocarbon dates:

OxA–4837, 3995±60 BP (2860–2350 cal BC)
OxA–4838, 3885±40 BP (2490–2200 cal BC)

These dates are from separate antlers and provide an estimated date for the stonehole of *2480–2200 cal BC*. Its construction therefore lies within phase 3, most

*Fig 167 The Slaughter Stone, looking north-east, with the Heelstone beyond (Wessex Archaeology)*

probably after the construction of the Sarsen Circle (*see Appendix 2*) and not with the original enclosure of Bank and Ditch, as previously supposed.

**Stoneholes D, E, and the Slaughter Stone: discussion**

There are three main problems in considering these features in relation to the monument:

1 did the Slaughter Stone stand upright in a hole, and if so, where?
2 which of the three features are contemporaneous, or are they isolated features?
3 with what are they contemporary elsewhere in monument?

A further question is: when was the Slaughter Stone partially buried and why? This, however, may relate more to the post-monumental use of the site than to one of the monumental phases.

Burl has recently argued on the basis of evidence from literary and artistic sources that the Slaughter Stone stood as an upright pillar as late as 1666 (ie the date of John Aubrey's plan of the monument; Burl 1994, 88) and his argument is a convincing one. Burl also proposes that the Slaughter Stone should be assigned to the same phase as the main sarsen monument, on the grounds that it is a dressed sarsen (*ibid*, 90).

Burl also provides a comprehensive discussion of the evidence for whether there was a companion stone to the Slaughter Stone and whether it was still standing at a comparatively recent date. He concludes, largely on the grounds of late Tudor sketches of the monument, that there was a stone standing close to the Slaughter Stone inside the line of the Bank and Ditch and that this is likely to be the stone in Stonehole E (*ibid*, 90–1). He goes on, however, to conclude that there were another two stones across the entrance: the stone in Stonehole D, and another stone to the south-east of the Slaughter Stone, balancing D, and so forming a symmetrical setting. The stonehole at D is incontrovertible, but Burl's interpretation of the evidence provided by Hawley is not supportable.

Burl writes that 'Hawley thought it probable that its stone [ie the stone in Stonehole D] once had a south-eastern counterpart whose hole had been destroyed. This would have created a setting of four stones across the entrance, the two tall centre stones, 95 [ie the Slaughter Stone] being flanked by two lower ones in a line at the entrance' (*ibid*, 90, quoting Hawley 1924, 36). The support for this depends on rather selective quotation from Hawley, as the passage reads in full:

> The lines of the postholes [on the causeway; see Chapter 6] run toward the sites of these stones, and as there are three groups of post-lines it seems very probable that there may have been a *third* [present writer's emphasis] stone south-east of the Slaughter Stone; but the hole which held it would have been obliterated when the pit was dug for the Slaughter Stone. Presuming that this was so, the three stones would have stood in a line at the entrance and in the circumferential line of the crest of the rampart.
>
> (Hawley 1924, 36)

The confusion appears to be over Hawley's interpretation of Stonehole E, which in his description of the excavation of the feature he makes clear he thought likely to have held the Slaughter Stone (Hawley 1921, 36; *see description, above*). In the passage quoted here describing a likely setting of three stones, he is clearly assuming that the Slaughter Stone had stood in Stonehole E, and the other, putative, stone south-east of the *standing* Slaughter Stone would have stood in a hole since destroyed by the digging of the pit for the Slaughter Stone, that is, beneath the present position of the Slaughter Stone.

The interpretation favoured here is largely that of Hawley, that is, that there were three stones across the main entrance, and that their positions were in some way linked to the settings of the postholes. As Hawley comments, the lines of postholes appear to run roughly

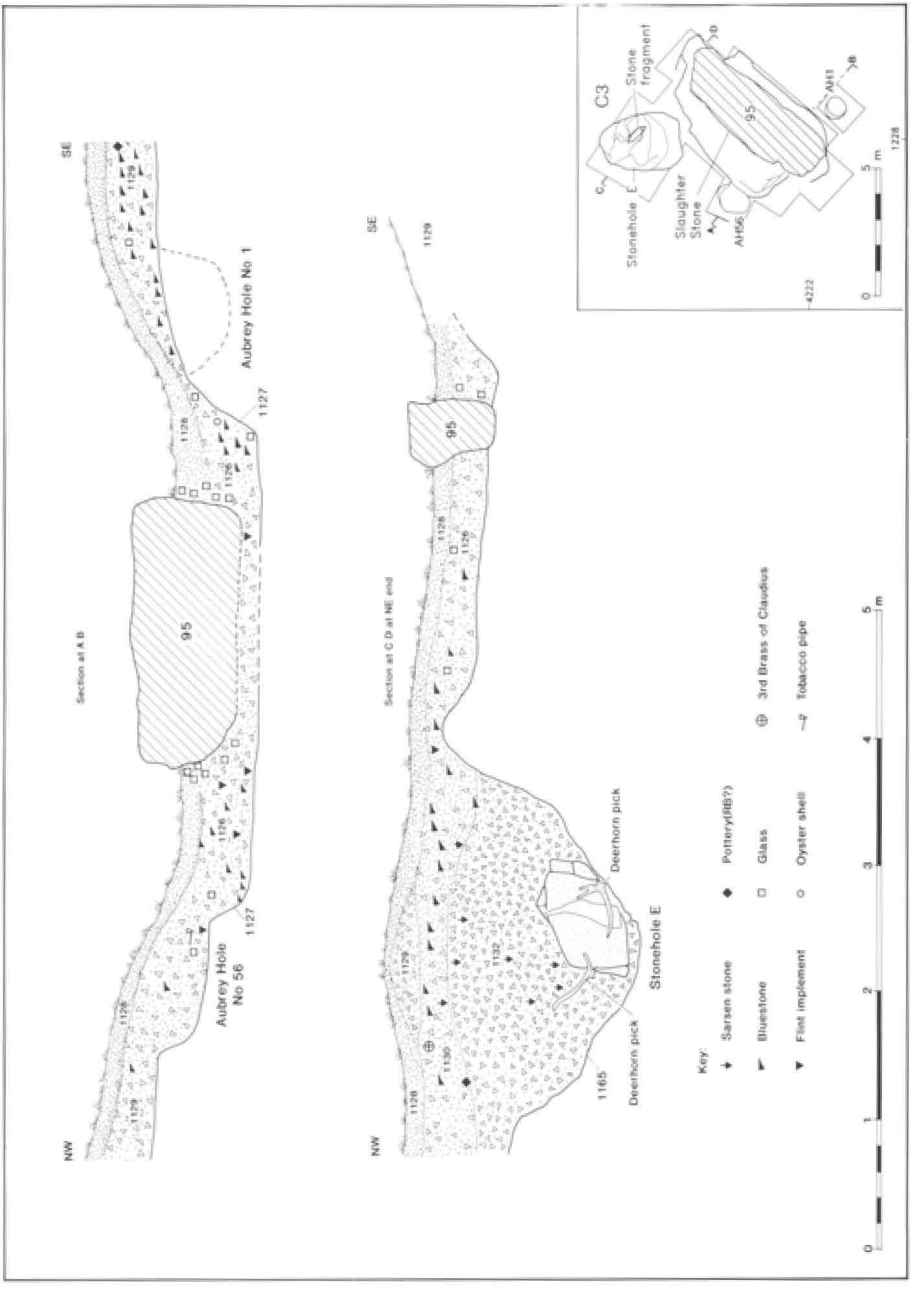



*Fig 168 Sections through the Slaughter Stone and Stonehole E, C3*

towards the stones, and it is possible to see that the two narrow passageways postulated as marking the entrance in phase 2 (*Chapter 6*) run towards the gaps between the stones (allowing for the fact that we do not know the exact location of the Slaughter Stone's original hole beneath its present site, and that Stonehole E has been damaged).

Given that the dating of at least the younger of the two antlers lies within phase 3, and that the plan does not seem to line up exactly (and indeed it is difficult to envisage both the timber and stone settings standing together as one would seem to have detracted from and obscured the other), the most likely interpretation is that the stone setting replaced the timber one. As in the interior of the monument the stone setting would seem to echo the timber one and to be continuing the general principle, but in the new medium.

Subsequently Stones D and E were removed, possibly in quite recent times, and perhaps to ease passage across the monument. The cart-ruts found by Hawley are across the western part of the entrance and could have followed that route because all three stones were standing, as it avoids even the westernmost, Stone D. The removal of Stones D and E would have made entry even easier, but the Slaughter Stone, as the easternmost stone, may have been allowed to remain as it was furthest from the track. Its date of burial remains unknown, but the fact that it was partially buried rather than removed altogether may well be connected with its location, that is that it was not on the line of the track.

### Isolated features

*by K E Walker*

Between the Avenue ditches, south-east of the Heelstone lie the following (Fig 156 and Plan 1):

**WA 3604 (3619) and WA 3605 (3620), C6:** A pair of possible postholes excavated by Hawley in 1923 to the north-west of WA 3603. Scant details are available; 'one or two small holes near might have been for steadying the legs of some timber contrivance for moving the stone' (*ibid*, 24). No finds are recorded. It is not clear whether these were sealed beneath the Avenue bank.

**WA 3611 (3625); C6:** A feature excavated by Hawley in 1923 is marked on both an archive plan (no 59) and the published version (Hawley 1925, pl ix) as a gully-like depression to the south-west of WA 3603. No details were found in the archive and no finds are recorded.

**WA 3610 (3624), C6:** This feature was excavated by Hawley in 1923. It lay south of gully WA 3611 to the south-west of WA 3617/8. 'I examined today finding, in apparently solid chalk, a rough hole 8" x 5" [0.20 x 0.13m) which descends to an uncertain distance and is filled with dirty fine chalky matter ... Depth of the hole below ground level is 2' 6" [0.76m]' (23/4/1923). No finds are recorded.

**WA 3606 (3621), C6:** This feature which appears on some archive drawings as 'Stonehole B' was excavated by Hawley in 1923. It was *c* 24ft (7.31m) from the south-west of the Heelstone. It appears to have been large, 3ft 9in by 4ft 6in in diameter and 4ft 6in deep (1.14 x 1.37 x 1.37m), disturbed, and filled with dirty earthy chalk rubble. 'In all probability it was a fairly large stonehole as also was the one east of it, close to the trench [WA 3603], but both have been ruined in getting the stones removed. Probably they were never very well cut holes' (3–4/5/1923). There are no recorded finds from the fill of this feature, and 'in this case there was no dump of chips, [*see WA 3603*] but some of hard grey sarsen were scattered around the spot' (Hawley 1925, 24). The excavator implies that this feature pre-dates the larger adjacent feature, WA 3607.

**WA 3607, C6:** This was excavated by Hawley in 1923. It was a disturbed area on the north-west side of the Heelstone and adjacent to WA 3606. It is described thus by Hawley:

> This seems to be a broad cut made by the people who took out the stones. It is about 4 feet [1.2m] deep and filled with humus grading into dirty chalk rubble ... There is a layer of flints below the humus and between it and the dirty chalk rubble below. This occurs over the soil returned to the cutting that was made towards the stone and shows that the flint layer was placed there subsequently. It contains chips of all the Stonehenge stones showing that it was placed there at the time or shortly after Stonehenge was erected.
>
> (17/5/1923)

> ... the cutting made by stone movers passes over [the Heelstone ditch] and is continued to the Hele stone [*sic*] but I cannot follow it for fear of weakening the foundation of the Stone and am now ten foot [3m] from it and dare not go nearer.
>
> (19/5/1923)

The published version reads:

> A good deal of disturbance seemed to have taken place around the second large stone-hole [WA 3606] which could not be accounted for either when originally setting up the stone or by removing it later. This disturbance took the form of a trench with wide sloping sides about 9ft [2.74m] wide, which had been made from the stonehole towards the Helestone, in the direction at first rather to the left but afterwards advancing to the west side of the Stone ... The wide cutting seems to have been made about the Stonehenge period, because the soil returned to it contained chips of all the varieties of stone. Two theories for making it are presented. The first is, that after removing the stone from no 2 hole [WA 3606] the workmen cut a wide trench to the Helestone for inspecting it, intending to take it down also, but finding it unsuitable they left it alone. The second is, that that they moved the stone from no. 2 hole and made it the Helestone. The latter idea I do not consider tenable, because no. 2 hole is not big enough to have held a stone so large as the

> Helestone; so for present I incline to the first theory and think the Helestone may have formed one of a group independent of Stonehenge.
>
> (Hawley 1925, 25)

Atkinson (1979, 203) says that this feature was earlier than the Heelstone Ditch and was probably the erection ramp for the Heelstone (and later identified as Stonehole 97 by Pitts, see above, sub-phase 3a).

**WA 3609, C6:** This feature was excavated by Hawley in 1923. It is shown on some archive material as 'Stonehole C'. The Diary shows that Hawley changed his mind about this feature 'which now appears as a large hole and was certainly a stone hole'. In the margin is a typed note 'not able to prove it a stone hole' (7/5/1923). The published reference to this feature is

> Nothing resulted from trenching the intermediate part of the Avenue between the two cuttings: it was quite barren. A hole was found close to the edge of the first cutting, but it was of very irregular form and did not appear to be the result of human labour, nor was it in a position that was referable to anything, and I am inclined to think that it was a hole in which a thorn bush may once have grown.
>
> (Hawley 1923 26)

It is shown on Archive drwg no 60 (traced from MoW plan 123/71) as a stonehole. No finds are recorded.

**WA 1916, C6:** This was apparently excavated by Hawley in 1923. It is marked on an archive plan (no 59) but not on the published version of that plan (Hawley 1923, pl ix). It may be the feature referred to in the Diary as a rough hole 'in side of top of Avenue bank, dimensions 8" by 5" [0.20 x 0.13m] descends 3' 3" [0.92m] ... probably a place where a bush had grown' (14/4/1923). There is no evidence for any finds.

### Features north-west of the Heelstone

**WA 3789 (Pitts's 'Gulley A'), C91:** This feature was excavated by Pitts in 1979 and was fully published in 1982 with other features excavated both then and in 1980. Those features published by Pitts are here only summarised. A gully was excavated running roughly north-west to south-east between the Heelstone Ditch and the Avenue ditch. 'Stratigraphic relationships between Gulley A [*sic*], on the one hand, and the Avenue ditch and the Heelstone ditch on the other were sought. It was felt at the time of excavation that the gully was dug through the top of the Heelstone Ditch, and was itself bisected by the Eastern Avenue ditch. In neither case, however, was the situation clear' (Pitts 1982, 82). The fill was described as being 'compact chalky' (*ibid*, 82), fully consistent with this feature being prehistoric. However, its alignment parallel to the modern road suggests that it could be much more recent.

**WA 3829 (Pitt's 'Stone Floor'), C91:** This feature was excavated by Pitts in 1980. It lay 'some 12m outside the Avenue' and was interpreted by the excavator as structural evidence. It consisted of a probably natural hollow filled with a homogeneous layer which included sarsen working debris, burnt flint, and bone fragments (context 3830). 'The trench ... passed through a shallow hollow containing large quantities of stone fragments ... Many artefacts were also found on either side of this feature, but nowhere was the dense packing of stone within the hollow repeated' (*ibid*, 99). It is suggested by the excavator that the fine material present within the layer 'argues most convincingly for the floor being the undisturbed relict of prehistoric activities' (*ibid*, 99). Diagnostic material was identifed as being of Late Neolithic date and it was suggested that the presence of burnt flint within the 'floor layer' and some 'very comminuted charcoal fragments' recovered from soil samples indicated the presence of a hearth. This feature was compared with one excavated by Hawley (WA 3618) in C6.

**WA 3831 and 3832 (Pitts's Features 3 and 4), C91:** Two shallow features *c* 0.4m in diameter were recorded. These have been interepreted as truncated postholes: 'Feature 3 which appears to lie at the end of a thin gully ... is located on the immediate edge of the Stone Floor. Feature 4 ... is some 6m to the east. Both pits could be footings for posts; their fills were undifferentiated' (*ibid*, 102).

### Other miscellaneous features between the Bank and the Y Holes

**WA 1853, C31:** This feature, which appears on some archive material as 'Stonehole F', was encountered in 1923 when Hawley was trenching between the Bank and the stone settings. It was situated outside the Aubrey Hole circle between AH1 and AH2, 13ft (3.95m) from the Slaughter Stone and on the slope of the Bank. The hole was 4ft 2in (1.27m) deep and 42in (1.07m) wide. No finds are recorded.

> I cannot yet say what the length may be as I have stopped excavating to let it weather but the soft soil still appears on both sides E and W but on the N and S I have the solid chalk side. Humus descended 18" [0.46m] after that there was very hard yellow clayed chalk for about a foot [0.31m] then dirty powdering and lump chalk to the bottom. The humus contained chips of all the Stonehenge stones but there are none deeper than the humus. So far the hole has given no object of interest. There is a spur of solid chalk projecting from South side at the bottom.
>
> (8/8/1923)

**WA 1773 (1767), C7:** The feature referred to in some archive material as 'Hole G' was found to lie between Aubrey Holes 7 and 8 during general trenching in 1923 (Plan 1).

> On the rampart side the soil below the rubble was noticed to be soft. An excavation of this was followed down 4ft [1.21m] to solid chalk through rather grey mealy chalk with lumps of previously excavated chalk [context 1767]. The edges of the hole East and West were met with but the sides longitudinally with the rampart have yet to be explored. It is 4ft [1.21m] deep corresponding in this respect to the place near the Slaughter Stone [Stonehole F, WA 1853].
>
> (16/8/1923).

No finds are recorded.

**WA 1272, C18:** This is depicted on some archive material as 'Hole H'. It was excavated in 1920 when a trench through the Ditch and Bank was extended to examine a feature which was at first taken to be Aubrey Hole 14. It was 3ft 5in (1.04m) deep and 4ft 6in x 5ft 3in (1.37 x 1.60m) in diameter, although 'the sides were in a disturbed and rough condition, so that the original hole may not have been so large'. It apparently 'contained a good deal of yellow chalk rubble' and but also earthy rubble and mould over the hole.

> Newall opened a hole on the S.E. of circular earthwork finding a deep hole evidently for a stone. It is a strange looking place, as there is a smaller hole attached to the larger one, and a substance similar to the mud wall stuff of the British Villages comes out of it probably used for packing the stone.
>
> (24/2/1920)

The diary is annotated in Newall's handwriting 'now called 'The Bush Hole' probably a natural Hole caused by a growing bush'. Finds from this feature included 3 chips from sarsen mauls, 8 coloured stone fragments, and a single piece of Romano-British pottery (24/2/1920).

Hawley describes having deturfed a five foot (1.5m) square area in 1923 (C31.1) to examine 'a hollow sounding spot on slope of rampart a little to the East of the Slaughter Stone also without result' (20/7/1923). Berridge assigned this a feature number (F209), but no WA context number has been issued as it does not appear on any plans. No finds are recorded.

## Phase 3 periphery: discussion

The difficulties of phasing the interior are repeated, but in a more extreme form, in the phasing of the periphery. There are problems both in establishing whether features are contemporary with each other, and in establishing a sequence for those groups of associated features. The sequence of associated features presented here must be regarded as no more than a 'best fit', and many possible compositions could be suggested. The short and largely stratigraphic sequence offered as subphases 3a, 3b, and 3c, however, may be given slightly more weight, although the beginning and end of this sequence are uncertain and it may be argued that its inception pre-dated the beginning of phase 3.

In the past the Heelstone has been recognised as being probably an early feature (Atkinson 1979, 71) but this was also the case with Stoneholes D and E, of which the latter now has a confident phase 3 date, and the dating of the Heelstone on the basis of a *terminus ante quem* provided by the Beaker sherds in replacement material has already been discussed and questioned (*above*). There is, then, no firm evidence for the Heelstone being of early date, and if it was one of a pair with 97 this is even less likely, as they lie around the later axis of the monument. The positions of the postholes at 'A' would also seem to militate against Stone 97 and the Heelstone standing at the same time as that timber setting. Even if the Heelstone is envisaged as having stood alone a very asymmetric overall setting results if the postholes at 'A' held posts at that time. In summary, then, it seems much more in keeping with the layout around the entrance and with the general and well attested 'lithicisation' of the monument to view the Heelstone and Stone 97 as an early development of phase 3.

It cannot be certainly established that Stone 97 and the Heelstone ever stood as a pair, although the symmetry of the arrangement around the phase 3 axis suggests that they did, and the reasons for the removal of Stone 97 are likewise uncertain. The disturbed area, WA 3607, is one of the least well defined features, and Hawley's interpretation of it as being later than the Heelstone Ditch cannot be accepted without reservation. Professor Atkinson considered that this disturbance was the ramp for the Heelstone, and was in fact cut by the Heelstone Ditch, but it seems that Pitts's interpretation, that both his Stonehole 97 and Atkinson's Heelstone ramp are the same, is correct, as the drawn section of the former (Pitts 1982, fig 5) and photograph of the latter (Fig 157) suggest a strong similarity between the two sections. Hawley's description of the relationship between the Heelstone Ditch and the disturbance is not clear, and it is possible that either his feature was also part of Stonehole 97, and was cut by the Heelstone Ditch, or that another episode altogether is represented.

> The circular trench [the Heelstone Ditch] was open until the disturbance here took place [ie 3607] in getting the 2 stones out [ie the stone in Stonehole 3606 and probably 3603] . It was partly silted in during the work and a chip or two were amongst the dirt which fell in. Later soil was returned to the broad cut [ie 3607] and at the same time the circular trench was completely filled.
>
> (Hawley 25/5/1923)

From this it seems that the Heelstone Ditch fill was not clearly cut by the feature, and given this, and the at times poor stratigraphic recording of the Hawley excavations, it seems that this reported stratigraphic relationship must be regarded with grave reservations. It does at least seem clear, however, that 3607 did cut the easternmost surviving posthole of the postholes at 'A' (16/5/1923).

If the sequence presented here is correct, the reduction to one of the Stone 97 and Heelstone pair and digging of the Heelstone Ditch may have been connected with the encircling of two of the Station Stones with ditches, and this is perhaps connected in some way with the major remodelling of the monument with sarsen stones and the removal and perhaps re-working of the Bluestones of the Q/R setting. It is clear that bluestone fragments were widely scattered across the site by this stage, since they occur in the Heelstone and South Barrow Ditches, and in the North Barrow Bank.

This does not account for any of the isolated features, at least one of which, WA 3603, is likely to pre-date the

Avenue bank. Even in this case the stratigraphic relationship cannot be regarded as beyond doubt for the reasons given above in the description of it, but the evidence is more convincing than in the case of WA 3607. Hawley considered WA 3603 to be a stonehole, and the large number of sarsen fragments (a total of 3760) and sarsen sand from the area do strongly suggest that a stone was either dressed or broken up in the vicinity. Other features on this side of the Avenue are not so clear in their function, as WA 3610 is not described in detail and Hawley seems not have considered it likely to be a stonehole, and WA 1916 was considered certainly not to be. In this context it is worth noting that the geology is complicated and that there are certainly periglacial features in the area, as encountered in 1978 under the main Bank (Evans 1984). It was also apparently noted in conversation by Robert Newall that Hawley often overdug features (Professor Atkinson pers comm) and this too could account for some amorphous features which did not produce any archaeological material, particularly in areas where the nature of the underlying chalk might have made the identification of features particularly difficult. This cannot be the case, however, with the disturbed area WA 3607, as it contained both sarsen and Bluestone fragments.

Pitts (1981a) has drawn attention to the possible existence of a circle of stones situated between the Aubrey Holes and the main enclosure Bank, and this raises the problem of possible stoneholes elsewhere around the periphery. Pitts included in this putative circle, the existence of which he bases on the observation of hollows by Aubrey (that is, the same observation which is generally associated with the 'Aubrey Holes'), Holes F, G, and H, together with the holes for presumed Station Stones 91 and 93 (Pitts 1981a, 21). These have all been described (*Walker, above*). Neither Hole F nor Hole G produced finds, although there were finds in the layers above them. The description of Hole F is that it was 'on the slope of the bank', which seems to indicate that it cut the main Bank and must therefore be later than the construction of the Ditch. Only Hole H was described by its excavator as being a natural feature, Newall regarding it as a bush hole (annotation in Newall's hand to the Diary entry of 24/2/1920). This was a considerable feature, only slightly shallower than Holes F and G (1.04m as compared with 1.27m and 1.21m), and if this was correctly identified by Newall it is equally likely that the two others were similarly caused.

A feature which has a far more convincing claim to have held a stone is WA 1429, on the lip of Segment 1 of the Ditch. This has been considered in phase 2, as it certainly cut a layer of phase 1, the dark layer, and may also have cut the chalk backfill, analogous perhaps to the nearby postholes of the north-eastern setting which, it has been argued, may also have cut the backfill. This feature contained human remains and as such it would seem to fit more with the later stages of phase 2 or the early stages of phase 3 than with the main stone settings of phase 3. Like posthole 44 to its south, it also contained human bone, described by Hawley as comprising skull fragments, vertebrae, and small bones mixed with ox bones (Table 57, HB11/12 and HB13) and was perhaps dismantled at the same time as posthole 44. As its stratigraphic position is uncertain, however, it should also be noted in this context as another possible stonehole in the entrance area.

In Atkinson's account of the monument, one other feature, Stonehole C (WA 3609) is given considerable weight, equal almost to that accorded to Stoneholes D and E (Atkinson 1979, 66). It is interesting, therefore, to note that Hawley doubted whether this feature had held a stone. As described above, Hawley on first encountering the feature considered it to be a stonehole, but added a later note to his Diary entry to the effect that he was unable to prove that it had held a stone. His last word on the feature, in his published account, distinctly favours the interpretation of it as a natural feature, probably caused by tree or bush roots (Hawley 1923, 26). If it was a stonehole, then it seems reasonable to link it with Stonehole B and with the Avenue, as both lie along the mid-line of the Avenue, but it must be regarded as an uncertain feature.

The Avenue lies at the most recent end of the short sequence of sub-phases proposed, but even with the new radiocarbon dates available it is not possible to refine the dating of its construction which took place over a period of *190–640 years* (*see Appendix 2*). The dates indicate, however, that it was built during phase 3 and it seems likely to be broadly contemporary with some of the later alterations to the monument, but earlier than the Y and Z Holes (*see Appendix 2*). The other relationships of the Avenue (ie apart from its place in the stone sequence 3a–c) establish that it was later than both the postholes at the north-east entrance and those at 'A', both assigned here to phase 2. An unexplained feature of the southern Avenue ditch, however, is a putative stonehole at the terminal, described by Hawley in his published account as 'the ditch on the east side began in a round hole 2½ ft [0.76 m] wide and about the same depth in the chalk rock, and had suffered but little from destruction' (Hawley 1925, 23) and in the Diary described as a stonehole (29/3/1923; *see Montague, below*).

It must be borne in mind that Hawley's identification of features as stoneholes is not always reliable, not least because the features may have been difficult to interpret. It cannot be assumed that clear stone impressions would be visible in all cases, although where present there may obviously be less doubt as to the function of the hole. It is worth noting that many of the postholes in the north-eastern entrance were first recorded as 'stoneholes' by Hawley (Diary, March–May 1923) and in the case of the hole at the end of the Avenue ditch, a round hole with a diameter and depth of *c* 0.76m would make a perfectly acceptable posthole. If it was a posthole, it is clear only that it could not be part of the array at the entrance, as it is *c* 8m to the east. There is no obvious pattern into which a stonehole (or a posthole) could fit, and it was not paired with a similar feature in the other terminal, where there was a much smaller feature which Hawley identified as a posthole of the entrance setting cut by the Avenue ditch. It is not clear whether Hawley detected or suspected a stratigraphic relationship between the Avenue ditch and the 'stonehole', although the description seems to imply that the two were contemporary. On the evidence available, therefore, the existence of a stone in this position cannot be confirmed, but neither can it be refuted.

The problem of the possible stonehole at the end of the Avenue ditch exemplifies the general problem with features around the periphery. Not only is it impossible to establish associations between isolated features with any confidence but there are also several cases where some doubt exists that the features were of archaeological rather than natural origin. This being so, it is clear that the sequence at the periphery must be regarded as the weakest element in any exposition of the monument. Nevertheless, the 'best fit' presented here, with a phase 3 dating for almost all the stone elements and a short sequence linking, at least, Stone 97, the Heelstone Ditch, and the Avenue, is based on the most reliable evidence available and gives some indication of events at the periphery, while the radiocarbon dates now available for Stonehole E enable the nature of the main entrance to the stone monument to be established for the first time.

## Construction and use of the Avenue

*by R Montague*

In the discussion that follows, the Avenue has been divided into 'zones', purely for convenience of description. The zones (A–G) are not based on archaeological or topographic features, but on the areas where excavations have been concentrated and the intervening more sparselyinvestigated or uninvestigated areas (Plans 3 and 4). A total of 20 investigations has been carried out in the years between 1919 and 1980. As elsewhere in this volume each excavation is referred to by its Cutting number (C). The excavations are summarised in Table 22, together with a brief digest of the archival material available. All the surviving section drawings are illustrated in three ways as described in Chapter 1, above; first as exact copies of the field drawings with their original annotations, reproduced at a common scale (1:40) with some sections reversed in order that all sections can effectively be viewed in the same direction, as if travelling towards the monument; secondly as 'rationalised' sections (1:40); and thirdly as schematic interpretations of the bank material and the ditch fills divided into primary, secondary, tertiary, and recuts (1:80). In some cases photographs of the sections have been included to aid interpretation.

Detailed discussion of the sections is provided in the accompanying captions. To avoid confusion, the two Avenue ditches are called the 'northern' and 'southern' ditches throughout, from their relative positions as they pass through the King Barrow groups. This is necessary because the eastern ditch at the river Avon end of the Avenue has become the western ditch by the time it reaches the monument, and vice versa (*see Plan 3*). The zones are ordered from the river Avon towards the monument. The traditional and often cited interpretation of the Avenue, proposed by Crawford (1923a) after the discovery of the Avon end of its course, is summarised by Atkinson.

> It appears to be a processional way linking Stonehenge with the River Avon, and ... its inception may have had something to do with the hauling of the bluestones from the river to the monument.
>
> (1979, 67)

If this is correct the Avenue was used for processing towards the monument rather than out and away from it. This has determined the ordering of the zones in this report. The zones and excavation areas are shown on Plans 3 and 4.

The discussion which follows deals with the past and present landuse of the area encompassing the Avenue (which has considerable bearing both on the differential survival of the monument along its course and on the timing and position of some of the excavations), its morphology, the nature of the ditch profiles and fills, the banks and the interior area, the artefacts recovered, chronology, relationship with Stonehenge, and parallels with other sites.

### Physical description

When newly constructed, the Avenue comprised twin parallel banks, with quarry ditches on the outer side of each. This arrangement echoes the internal bank of the enclosure Ditch of Stonehenge itself. Measurements taken during various excavations suggest that over the full length of the Avenue the ditches gradually converge as they approach Stonehenge. Near the Avon end Clay (C89) calculated the distance between the mid points of the ditches to be *c* 34m. Further north, near the crossing of the A303, Crawford's (C105) measurement was *c* 34.5m. Thereafter the measurements decrease gradually to just under 21.5m at the terminals (see below for details). Geophysical surveys carried out between the Stonehenge terminal and a point *c* 100m east of Stonehenge Bottom confirm this trend (*Appendix I*).

The Avenue runs for nearly 1km north-west in a more or less straight line from the river Avon at West Amesbury towards a group of now flattened, approximately east–west oriented barrows (Amesbury 100–102 and Amesbury 131–3, listed in Grinsell 1957). Between this group of barrows to just east of the trackway running between the Old and New King Barrows, the Avenue curves gently to the west (*c* 500m). It is from about this position that Stonehenge first becomes visible, on the skyline to the left of an observer moving towards the monument, and remains so for the rest of the journey apart from a short stretch at the elbow (*see Chapter 3*). From King Barrow Ridge it heads west-north-westwards in a straight line for some 850m before curving more abruptly to the south-west (the bend here is referred to as the elbow) at Stonehenge Bottom and heading in another straight line for the final 530m stretch towards Stonehenge. This final stretch of the Avenue is the most regular, with parallel banks and ditches of even width.

For *c* 167m at the eastern end, between the river Avon and the site of George Smith's 1973 excavation of the northern ditch (C87), the course of the Avenue is largely unknown. In the area of garden and shrunken medieval village earthworks to the south of West Amesbury House, between the house and the river Avon, there are two linear earthworks which appear to be on the alignment of the Avenue (Mark Corney, RCHM(E), pers comm and in prep), although only further investigation will reveal if they are indeed part of it. These earthworks are probably the same as those visible in an aerial photograph taken by the RAF in July 1921 (Fig 169).

The study by O G S Crawford of this series of photographs taken along the length of the Avenue by the RAF established the existence of the Avenue east of King Barrow Ridge. Crawford wrote of earthworks visible in an area to the north of the West Amesbury House:

> in a grass field between it [the Stonehenge to Amesbury road] and West Amesbury manor there are two banks. One of them is clearly an old field-boundary; the other (a few feet east of it) is quite different and much wider and flatter. It is in exact alignment with the eastern side of the Avenue, and may be the bank of it.
>
> (1924, 58)

North of the Amesbury–Stonehenge road, and travelling westwards along the Avenue to a point *c* 600m west of King Barrow Ridge and *c* 200m east of the elbow, the Avenue is visible only as the soil- and cropmarks which indicate the position of the ditches. There is no trace of the banks in this area. Further west, the Avenue survives as extant earthworks, with both the banks and ditches visible as surface features. The division between cropmark and earthwork survival is marked by a modern field boundary (Fig 170).

At the elbow there is a low mound, close to the outer edge of the southern Avenue ditch. This is known as Newall's Mound, referred to as such by Atkinson on his 1953 contour survey and section drawing through part of the mound, and later by Evans in C62, his reopening of the trench with Atkinson (1984). It was so named by Atkinson in honour of R S Newall, who first recognised

*Fig 169 The Avenue at West Amesbury looking north. Both ditches of the Avenue are visible to the north of the Amesbury–Stonehenge road, just to the west of some buildings. In the southern part of the field at the bottom an earthwork appears to be aligned with the northern Avenue bank. It can be seen south of the recessed gateway opposite West Amesbury House. South of the walled garden an earthwork which is possibly the southern Avenue bank can be seen (O G S Crawford, 1921, © Crown copyright reserved)*

it: 'I am very interested to hear of the mound abutting on the avenue, of which I was not aware. Can you give me more precise details of its location? It would, as you suggest, be well worth while doing a section at this point, if permission can be obtained, and I should like to include this in my programme' (letter from R J C Atkinson to R S Newall, 8/6/1953).

In this area the northern Avenue ditch is crossed by the 'Oblique' ditch and bank, a short linear feature some 37m long, aligned from north-east to south-west. Another ditch, called the 'Gate' ditch by Atkinson (1953) because it headed for a gate in the field boundary, runs parallel to the Avenue for a short distance. This ditch is a continuation of the Palisade Ditch discussed in Chapter 6, above, and its fuller extent as transcribed by the RCHM(E) is shown on Plan 3.

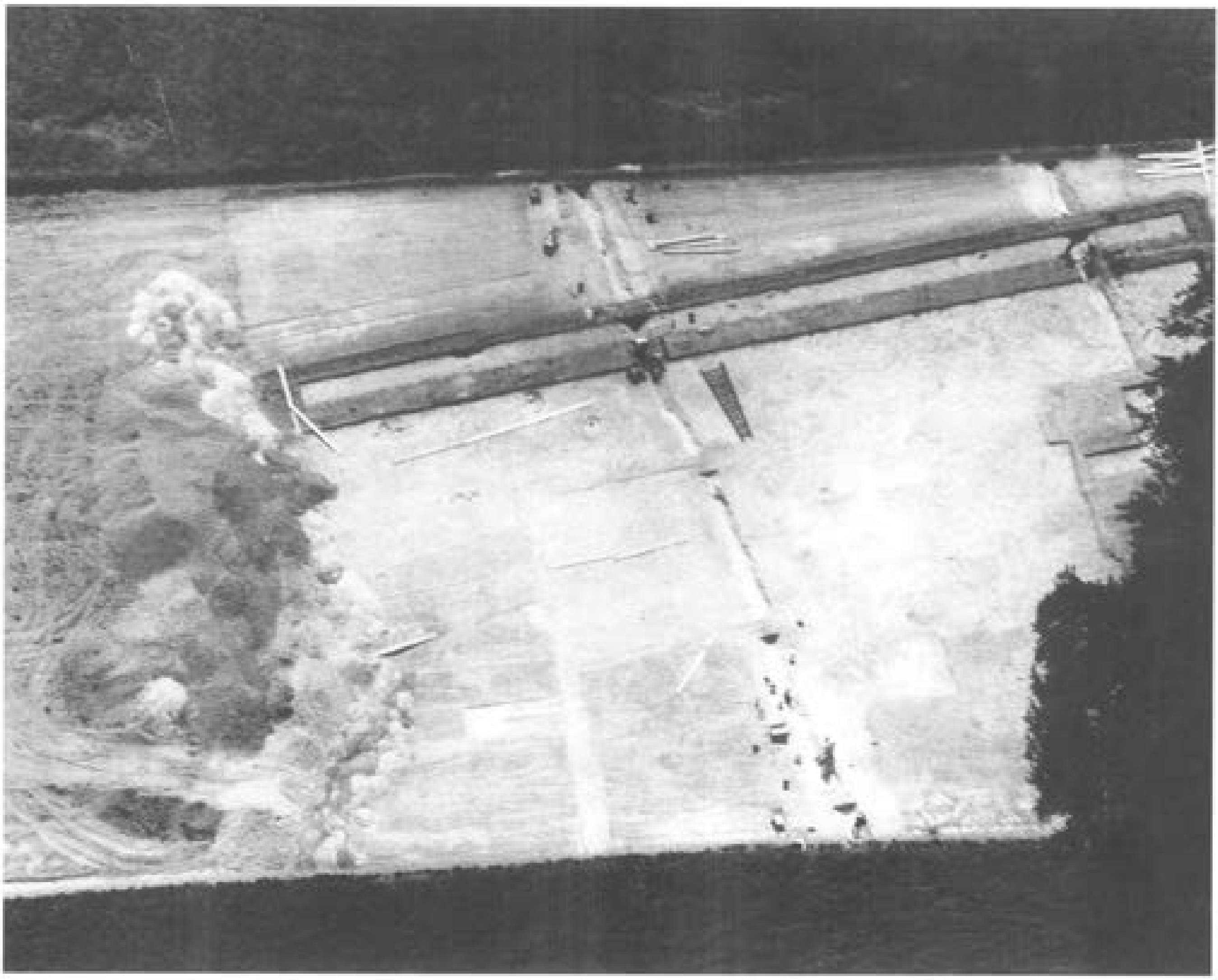


*Fig 170 The Avenue: the Vatchers' excavation of C86 in 1967, looking north. The south-facing section of the northernmost of the two baulks was illustrated (Fig 174) (RCHM(E), ©Crown copyright reserved)*

## Previous and present-day landuse

A description of the development of the landuse of the area of the Avenue can be found in the 1979 RCHM(E) volume. The following brief summary is largely culled from that source.

### Agricultural

Little is known of prehistoric and Roman-Saxon period agricultural activity in the area of the Avenue. It runs to within 300m of Vespasian's Camp (*see Fig 1 and Plan 3*), an Iron Age hillfort which was probably used in the post-Roman period before the establishment of the settlement on the site of the present town of Amesbury (Bond 1991, 385–410). Amesbury itself is likely to have developed some time after the sixth century at a crossing-point over the river Avon below Vespasian's Camp. The first documentary record of Amesbury is as a royal estate, bequeathed by King Alfred (died 899) to his younger son Ælthelweard, and it is likely that the estate had been a royal possession for a considerable time before Alfred's death. In the medieval period almost the entire course of the Avenue east of King Barrow Ridge was under cultivation in the open fields of the manors of Amesbury Countess and West Amesbury (*ibid*, 395–6, fig H1). The eastern end of the Avenue near the river Avon lay under the (now shrunken) medieval settlement of West Amesbury, with wet meadows, converted to water-meadows in the seventeenth century, running up to the river's edge.

By around 1725 the area immediately to the west of King Barrow Ridge had been converted from downland to arable cultivation (*ibid*, fig H2) and in 1734 a document relating to the Homeward Farm in West Amesbury (WRO 283/142) mentions 'Part of Stonehenge to be ploughed 20a(cres)' (RCHM(E) 1979, xvi).

In 1765 the parkland of Amesbury House was extended, taking in land from the open fields north of the Amesbury–Stonehenge road as far west as, and including, the New King Barrows. In 1771 all this land was under pasture but by 1781 the park pale had been dismantled and the land returned to arable (Bond 1991, fig H3; RCHM(E) 1979, xx–xxi). The small clumps of trees in the fields extending from Vespasian's Camp westwards to King Barrow Ridge (Plan 3) first appear on the 1:10,560 (6-inch) first edition of the Ordnance Survey map of 1887 (surveyed 1879; Bond 1991, fig H6; RCHM(E) 1979, xxi). Several of these clumps impinge on the southern Avenue ditch (*ibid*, pls 8 and 9; OS 1:2500 map, 1972 edn), and the excavation of this ditch by the Vatchers in 1967 (C86) was constrained by the position of one of these clumps.

The area west of King Barrow Ridge is known as Countess Court Down in the documents and maps of up to *c* 1840 (Bond 1991, 409, figs H2 and H5), but by the middle of the nineteenth century the slope to the west of the King Barrows, leading down to Stonehenge Bottom, was probably all ploughed (RCHM(E) 1979, 13). The differing survival of the Avenue earthworks also suggests that the straight (western) Avenue section up to the western bend has probably not been intensively ploughed. The excavations by Atkinson and Evans in 1978 at the elbow (C96 and C62) identified plough furrows and a possible lynchet in the areas of the northern and southern Avenue ditches (Evans 1984, 24; fig 24). Bond suggests that the denudation of the Palisade

**Table 22 Excavations of the Avenue, in chronological order, with details of surviving archives**

| *Zone* | *Year* | *Excavator* | *Cutting* | *Description* | *Exact position known* | *N ditch sections* | *S ditch sections* | *Post-exc plans* | *Written archive* | *Graphic archive* | *Photographic archive* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| G | 1919 | Newall | 103 | Water pipe along S side of A344. Both ditches | Y | Profile only (1) | Profile only (1) | N | N | prim/ 2ndry | N |
| D | 1923 | Crawford & Passmore | 88 | Between Old & New King Barrows. Both ditches | N | N | N | N | 2ndry | 2ndry | prim* |
| C | 1923 | Crawford & Passmore | 104 | ?S of A303. Both ditches | N | N | N | N | 2ndry | 2ndry | prim* |
| B | 1923 | Crawford & Passmore | 105 | N of Amesbury–Stonehenge rd. Both ditches | N | N | N | N | 2ndry | 2ndry | prim* |
| G | 1923 | Hawley | 6 | Nr Heelstone. Both ditches | Y | Y (1) | Y (1) | Y | prim/ 2ndry | prim/ 2ndry | prim |
| A | 1927 | Clay | 89 | S of Amesbury–Stonehenge rd. Both ditches | N | Y (1) | Y (1) | N | 2ndry | 2ndry | N |
| G | 1953 | Atkinson | 36 | S ditch & Heelstone | Y | – | Y (1 oblique) | Y | 2ndry | prim/ 2ndry | prim |
| E | 1953 | Atkinson | 95 | N ditch & 'Oblique' ditch | Y | See note | – | Y | 2ndry | N | prim |
| E | 1953 | Atkinson | 39 | N ditch 'butterfly cutting' | Y | See note | – | Y | N | N | prim |
| E | 1953 | Atkinson | 40 | S ditch & Newall's mound | Y | – | Y (1) | Y | N | prim/ 2ndry | prim |
| G | 1956 | Atkinson | 48 | NE of A344. Both ditches | Approx | Y (1) | Y (1) | N | N | prim | prim |
| A | 1956 | Atkinson | 90 | To locate Avenue nr Avon** | Y | – | – | – | N | Y | N |
| A | 1956 | Atkinson | 106 | To locate Avenue nr Avon** | Y | – | – | – | N | Y | N |
| C | 1967 | Vatchers | 86 | A303/Amesbury Bypass. Both ditches | Y | Y (5) | Y (3) | Y | N | prim | prim |
| G | 1968 | Vatchers | 83 | SEB cable trench, N of A344. Both ditches | Y | Y (1 oblique) | Y (1 oblique) | Y | 2ndry | prim | N |
| A | 1973 | Smith | 87 | N ditch nr Avon | Y | Y (6 publication) | – | Y | 2ndry | 2ndry | N |
| A | 1973 | Smith | 109 | To locate S ditch nr Avon (unsuccessful) | Y | – | – | – | 2ndry | 2ndry | N |
| E | 1978 | Atkinson & Evans | 62 | S ditch & Newall's Mound (reopening of C40) | Y | – | Y (1) | Y | 2ndry | prim/ 2ndry | N |
| E | 1978 | Atkinson & Evans | 96 | N ditch at elbow | Y | Y (1) | – | Y | 2ndry | prim/ 2ndry | N |
| G | 1979/ 80 | Pitts | 91 | S of A344, Both ditches and Heelstone ditch | Y | Y (disturbed) | Y (2) | Y | prim/ 2ndry | prim/ 2ndry | prim/ 2ndry |

*Notes:*
* *Photo of one of the three trenches, not clear which one;* ** *Atkinson did not find the Avenue, but see text and Fig 171*
*N ditch sections C95 & 39: marked on Archive drwg no 159 but not surviving in the archive*
*prim = primary; 2ndry = secondary*

Ditch, running for 1100m in a north-east to south-west orientation from *c* 500m west of Stonehenge up to just beyond the western bend of the Avenue, was caused by short-term cultivation, although this does not seem to have formed part of an extension of the open-field system (Bond 1991, 417). To the east of this the Avenue banks do not survive but the ditches are visible as cropmarks (RCHM(E) 1979, fig 5).

### Roads

Various tracks and roads cut the course of the Avenue. Working eastwards from Stonehenge, those in use today are the A344, the track on the western side of and parallel to the New King Barrows, the A303, the Amesbury–Stonehenge road, an unnamed road in West Amesbury village, and the road which runs down the Woodford Valley to Stratford-sub-Castle (all three unnumbered). In addition, various tracks and roads are documented from the medieval period onwards, though few survive today.

The old Amesbury–Market Lavington road crossed the Avenue at Stonehenge Bottom just to the east of the western bend. In 1740 Stukeley published his observations on the area of Stonehenge made between 1719 and 1724, writing that the Avenue was 'much obscur'd by the wheels of carriages going over it, for a great way together' (Stukeley 1740, 35–7; RCHM(E) 1979, 13, pl 5 and map 3).

A track leading south-westwards from Durrington entered the Avenue at the western bend and followed along the interior to Stonehenge, and is visible today as a hollow-way within the northern Avenue bank (RCHM(E) 1979, 13, map 3). The earthworks of the mid-eighteenth-century road (*see below*) blocked this track, but it seems to have been re-established by later use (RCHM(E) 1979, xxii). The existence of this trackway, combined with the alignment of the Palisade Ditch, which ran parallel to it at this point, led Stukeley to postulate the existence of a northern extension to the Avenue leading towards the Cursus (Stukeley 1740, 35). The idea of a northern extension became entrenched in the literature (Hoare 1812, 158 and fig; Petrie 1880, 8, pl ii; Crawford 1923a, 1924, 58) and was not dismissed until the publication of *Stonehenge* in 1956, recording the results of the excavations of Atkinson *et al* at the western bend in 1953. However, as discussed below, it is unlikely that Atkinson's excavations at the bend were extensive enough to disprove conclusively the existence of a northern branch, and the idea was not finally dismissed until 1990, when the Ancient Monuments Laboratory carried out a geophysical survey in the area (*see below and Payne, Appendix 1*).

In the mid-eighteenth century a new road was partially built, though probably little used, representing the rerouting of the Amesbury–Market Lavington road as a result of the enlargement of the parkland at Amesbury House (RCHM(E) 1979, 31–2; Bond 1991, fig H3). The remains of this road can be seen as parallel earthworks which cross the Avenue some 450m north-east of the centre of the monument. Aerial photographs show it was still used as a trackway in 1921 (Fig 179, below).

The present-day A344 from Amesbury to Shrewton, which cuts across the Heelstone ditch and the Avenue just to the north of Stonehenge, is 'almost certainly a creation of the early 1760s when most of the roads in the area were turnpiked and its very straight alignment supports such a view' (*ibid*, xxiii).

## Excavations

The zones are marked on Plan 3 with detailed plans of the four main areas of excavation provided on Plan 4. Absolute levels (given in metres above Ordnance Datum) were available for only one of the section drawings illustrated, that of the southern Avenue ditch in C91 (Pitts's 1979–1980 excavations near the Heelstone).

### Zone A: Excavations in the area between the river Avon and the Amesbury–Stonehenge road

Five excavations have been carried out in this zone, which measures some 325m in length. In 1927 R C C Clay excavated two trenches (C89; Fig 173), one over the presumed location of each ditch, to establish the position of the Avenue 'at the southern edge of the field which lies between (the Amesbury–Stonehenge road) and the farm buildings of West Farm, Amesbury' (Clay 1927, 342). Both Avenue ditches were encountered, the distance between them, measured from centre to centre, being 110.5ft (33.68m).

In 1973 George Smith excavated a 35m length of the northern Avenue ditch, just to the north of West Amesbury House (C87; Fig 172). In the same investigations a trench positioned with the intention of locating the southern Avenue ditch was unsuccessful (C109).

In 1956 R J C Atkinson excavated 'two small trenches ... close to your own area of excavations' (letter from Atkinson to George Smith, 9/6/1974), 'somewhere not far north of West Amesbury House' (Smith 1973, 46). The additional archive material which became available after Professor Atkinson's death included a plan showing the location of these two trenches. Both were intended to intercept the northern Avenue ditch, one just to the south of the Amesbury–Stonehenge road (measuring 12ft (3.7m) by 3ft (0.9m)), and the other, measuring 14ft (4.3m) by 3ft (0.9m), situated some 15m to the north of and across a small road from the area excavated by George Smith. The location of the two trenches shown on Plan 3 is approximate.

Along with the trench plans are two section drawings, both showing the 'north faces' of the trenches (ie the south-facing sections). Both also show a feature cut into the natural layers (Fig 171). The sections are labelled 'upper' and 'lower', presumably relating to the relative positions of the two trenches (C90, the more northerly of the two, is also the higher as the field slopes down towards the south, and is therefore likely to be the 'upper' cutting). The feature shown on the section draw-

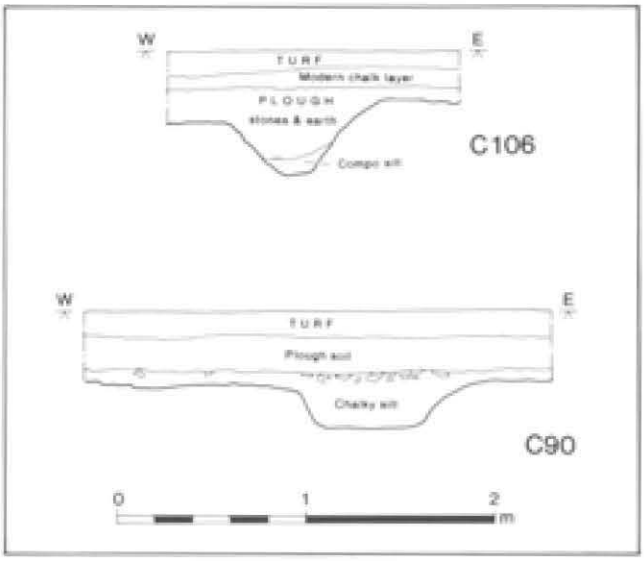



*Fig 171 Unidentified features in the vicinity of the Avenue, C90 & 106: field sections*

ing for C106 was not planned, but in section it is a V-shaped feature 11–17in (0.28–0.44m) deep with a narrow flat base and with a ?primary fill of 'compo silt' below 'stones and earth'. The feature shown on the section drawing for C90 is even shallower (9in, 0.23m) with a wider flat base. The fill is 'chalky silt', with no layer differentiation. This feature was also not planned. There is no notation on either of the sections to suggest any interpretation.

The trenches did not find the Avenue ditch: 'Atkinson and Piggott's 1956 excavation ... failed to find the continuation of the Avenue ditches (Atkinson, pers communication)' (Smith 1973, 46); 'the results were negative' (S Piggott, pers comm); and in response to a request from George Smith asking about the availability of any bone or antler from the excavations, Atkinson wrote 'Piggott and I had none from our two small trenches of 1956' (letter dated 9/6/1974).

**Zone B: Excavations in the area between the Amesbury–Stonehenge road and the A303**

This relatively straight stretch of the Avenue measuring some 350m is largely uninvestigated. In 1923 O G S Crawford and A D Passmore conducted three exploratory excavations to confirm the course of the Avenue as identified from aerial photographs taken by the RAF in 1921. The most easterly of these (C105) was a trench 'immediately north of the road from Amesbury to Stonehenge, near some new cottages' (Crawford 1923b). A trench was dug over each of the ditches with the central area left uninvestigated. The ditches were 113ft (34.4m) apart. The profile, fills, and any finds were not described or illustrated.

**Zone C: Excavations in the vicinity of the A303**

Two excavations have been carried out in the vicinity of the A303. In 1923 Crawford and Passmore excavated one of their three exploratory trenches (C104) somewhere in the area. The exact location is not known. It is described by Crawford as 'near the middle ... near a clump of trees ... at the moment it is a stubble field' (*ibid*), and a rough diagram showing the location places it at about the southern edge of the present-day A303. The trench covered the whole width of the Avenue. The southern Avenue ditch is described as 'a V-shaped cutting filled with earthy soil', and the northern ditch as 'another similar cutting ... eighty-four feet (25.6m) east of the first'. Neither section was illustrated.

Finds 'on the bottom of the ditch where we first found it (*ie* the southern ditch) comprised several pieces of flint which had been chipped by human agency ... clearly contemporary with the making of the ditch.' (*ibid*). It is not known whether these flints were collected or, if so, where they are now.

In 1967 Faith Vatcher, assisted by her husband, directed an excavation (C86; Fig 174) on the course and prior to construction of the A303. The excavation covered an irregularly shaped area some 52 x 41m, and investigated both Avenue ditches and the area between them (Fig 170). The presence of a clump of trees to the north probably necessitated the excavation of a shorter length of the southern Avenue: it may have been felt that any archaeological remains would have been too root-damaged to warrant excavation. A small slot trench to confirm the course of the Avenue was positioned to the north of the trees. The Avenue ditches varied in distance apart from 24.5 to 26m, measured from centre to centre.

**Zone D Excavations in the area between the A303 and the elbow**

This zone comprises most of the northern arc of the Avenue from the present-day A303 up to a point just to the east of the elbow. Measured along the line of the northern Avenue it is some 1500m in length. Only one excavation has been conducted in this area, the westernmost of Crawford and Passmore's 1923 trenches. This excavation (C88) was situated between the Old and New King Barrows, with the southern Avenue ditch being identified at a point 257ft (78.33m) north of the ditch of the northernmost King Barrow, and the northern ditch a further 68ft (20.73m) to the north. It is not clear whether the Avenue ditches occurred within one cutting across the entire width of the monument or in two smaller trenches. Stukeley's measurements were used to position the excavation(s) over the ditches and 'no unnecessary digging was required' (Crawford 1923b), suggesting that two small trenches were excavated. Once again, the profile, fills, and any finds were not described or illustrated.

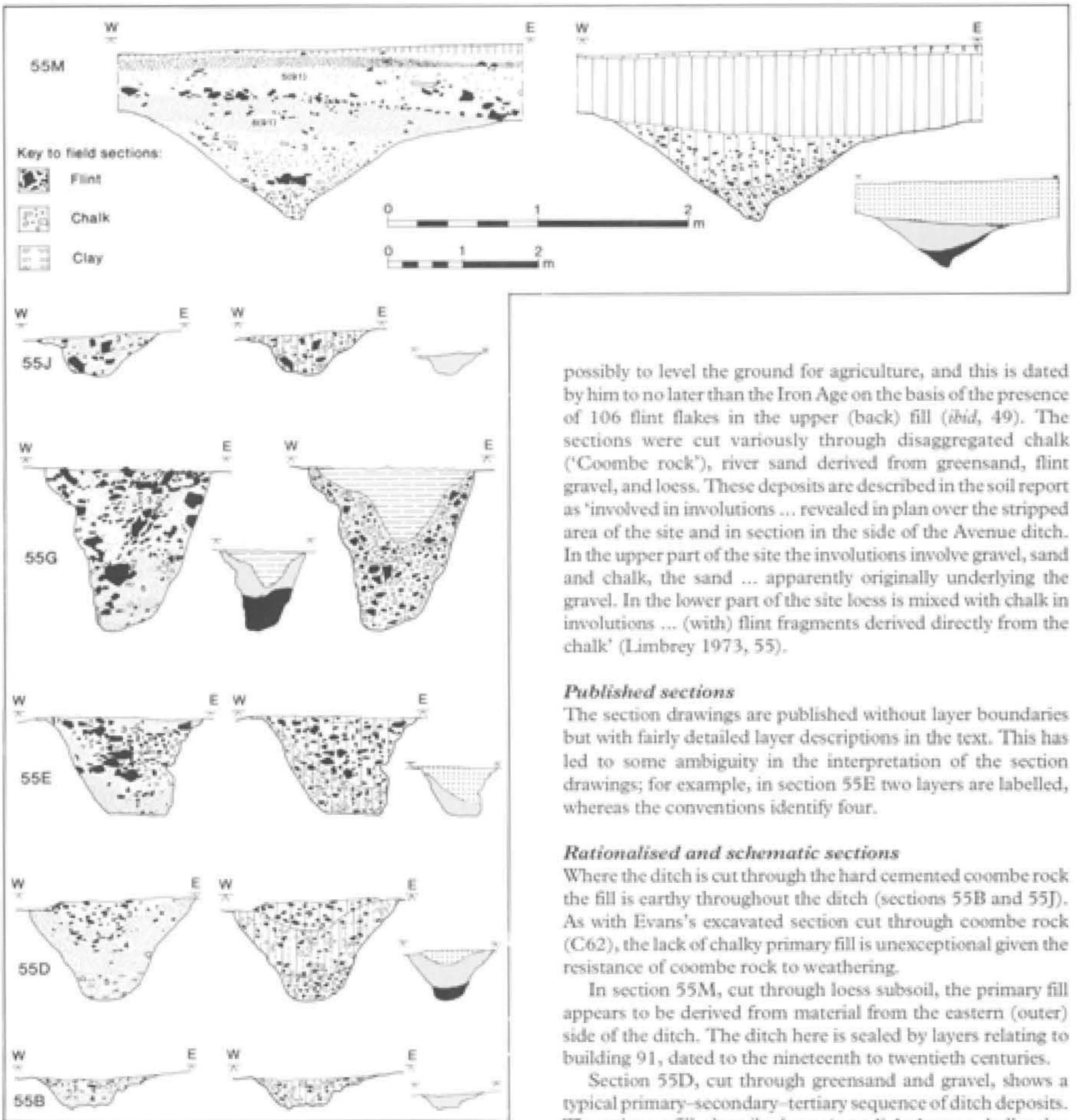



*Fig 172 The Avenue, C87, Smith 1973: northern ditch sections*

Three of the six sections of the northern ditch are published here reversed – Smith's sections 55B, 55D, and 55M. In order to obtain as full a view as possible of the evidence, it had been intended to refer to the original field drawings, currently housed at Salisbury Museum. Unfortunately these were not available for study at the time of writing. All comments below are therefore based purely on the published evidence.

Smith excavated a 37m length of the northern Avenue ditch, and published 6 of the 12 sections shown on the post-excavation plan (Smith 1973, fig 3). The bank did not survive in this area. Smith also identified an area of deliberate back-filling of the ditch (layer 3 in his segments 55 E, F, and G), possibly to level the ground for agriculture, and this is dated by him to no later than the Iron Age on the basis of the presence of 106 flint flakes in the upper (back) fill (*ibid*, 49). The sections were cut variously through disaggregated chalk ('Coombe rock'), river sand derived from greensand, flint gravel, and loess. These deposits are described in the soil report as 'involved in involutions ... revealed in plan over the stripped area of the site and in section in the side of the Avenue ditch. In the upper part of the site the involutions involve gravel, sand and chalk, the sand ... apparently originally underlying the gravel. In the lower part of the site loess is mixed with chalk in involutions ... (with) flint fragments derived directly from the chalk' (Limbrey 1973, 55).

### *Published sections*

The section drawings are published without layer boundaries but with fairly detailed layer descriptions in the text. This has led to some ambiguity in the interpretation of the section drawings; for example, in section 55E two layers are labelled, whereas the conventions identify four.

### *Rationalised and schematic sections*

Where the ditch is cut through the hard cemented coombe rock the fill is earthy throughout the ditch (sections 55B and 55J). As with Evans's excavated section cut through coombe rock (C62), the lack of chalky primary fill is unexceptional given the resistance of coombe rock to weathering.

In section 55M, cut through loess subsoil, the primary fill appears to be derived from material from the eastern (outer) side of the ditch. The ditch here is sealed by layers relating to building 91, dated to the nineteenth to twentieth centuries.

Section 55D, cut through greensand and gravel, shows a typical primary–secondary–tertiary sequence of ditch deposits. The primary fill, described as a 'very light brown chalky clay with numerous small chalk lumps, chalk granules and a few small angular flints' also contained two bands of material 'representing the incorporation of humus in the fill' (*ibid*, 48). Such bands typically form in the primary fills of ditches during the initial, rapid silting (*see Allen, Chapter 1*).

Smith identified an area of deliberate backfilling, represented by his layer 3 in segments 55E, F, and G, of which 55E and G are illustrated. In both illustrated sections the Avenue ditch is cut through greensand and gravel. In section 55G, with a very steep eroded profile, a deep layer of greensand primary fill has accumulated (Smith's layer 5), overlain by a sandy earth secondary fill (layer 4). The posited backfilling of this ditch (layer 3) is reinterpreted in this section as being the filling of a recut which cuts into the secondary fill. The boundary between the two layers (4 and the overlying 3) is too steep to have formed by natural silting and must represent some sort of disturbance to the secondary fill. In section 55E, the lower fill (layer 4) is interpreted as secondary rather than primary due to its earthy nature.

The posited backfilling (layer 3) is interpreted here as the normally developed fill of the recut, as it seems that the presence of the flints can be explained by other factors than deliberate backfilling. The flints could, for example, have been knocked into the ditch (deliberately or otherwise) by the passage of both animals and/or humans along the side of the ditch, with silting continuing around the flints. Out of the three sections cut through greensand and gravel and illustrated by Smith, the flintiest is 55G, downslope of the other two, and the least flinty is 55D, which lies upslope of them. The flints in the fill may therefore result from weathering.

Smith wrote that 'such directional silting as there was, in 55E and F, suggests that the bank was on the western (or inner) side of the ditch' (*ibid*, 49). Of the six illustrated sections, it would seem that in four the silting is more or less symmetrical (55B, D, G, and J); and in in one from the western (inner), side of the ditch (55E) the silting appears to be derived from the eastern (or outer) side of the ditch (55 M). Silting from the outer side of the ditch was also observed by Clay in his excavation of the northern Avenue ditch nearby (C89).

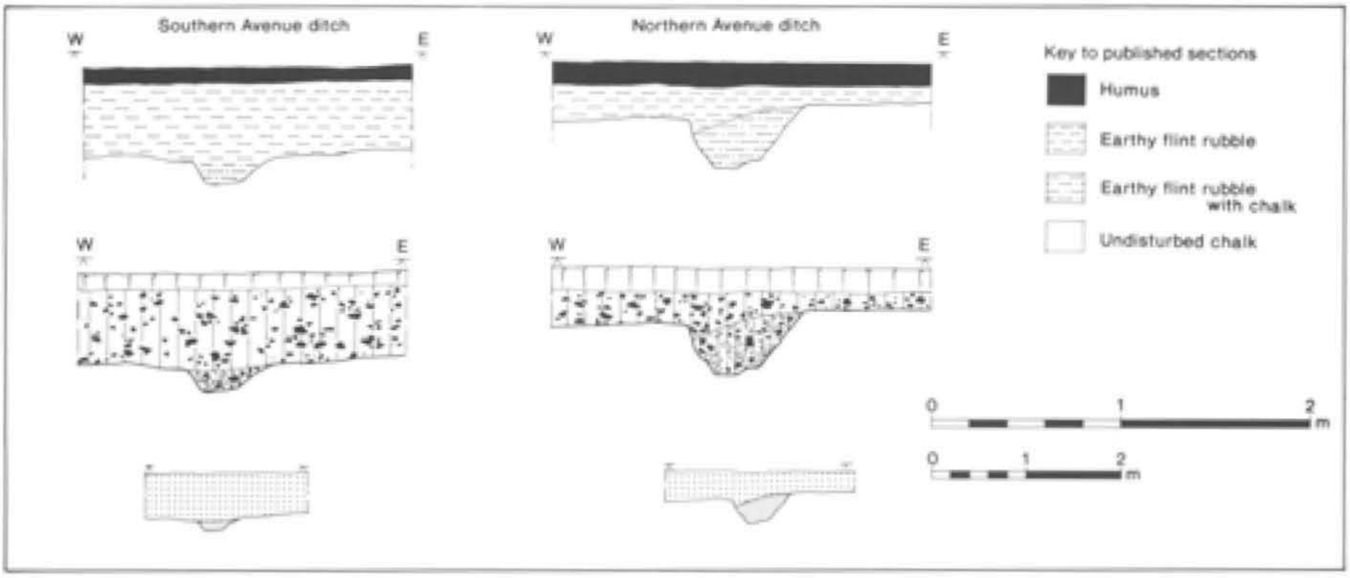



*Fig 173 The Avenue, C89, Clay 1927: ditch sections*

The precise location of these sections is uncertain and it is assumed that the two trenches were positioned at right-angles to the course of the Avenue. Clay (1927, 342–4) observed that the silting of the northern Avenue ditch appeared to be derived from material on the outside of the ditch. In neither case was there an indication of a bank. Clay also reports that 'some search was made along the outer edge of the Avenue but no stone or post holes were found'. The natural deposit was chalk, and Clay noted that 'the (southern)... ditch of the Avenue was found in that portion of the field which had been cultivated up to recent times. Consequently the humus and topsoil was deeper over that area' (*ibid*).

***Published sections***

No original field drawings are available.

***Rationalised and schematic sections***

The northern ditch fill is described in the text as 'a sloping silt of earthy flint rubble with a considerable admixture of chalk', and the southern one as having 'a quantity of chalk in its composition'. Both of these fills are interpreted here as secondary because of the presence of an earthy component and the absence of any recognisably different layer at the base of either ditch which could represent the primary fills.

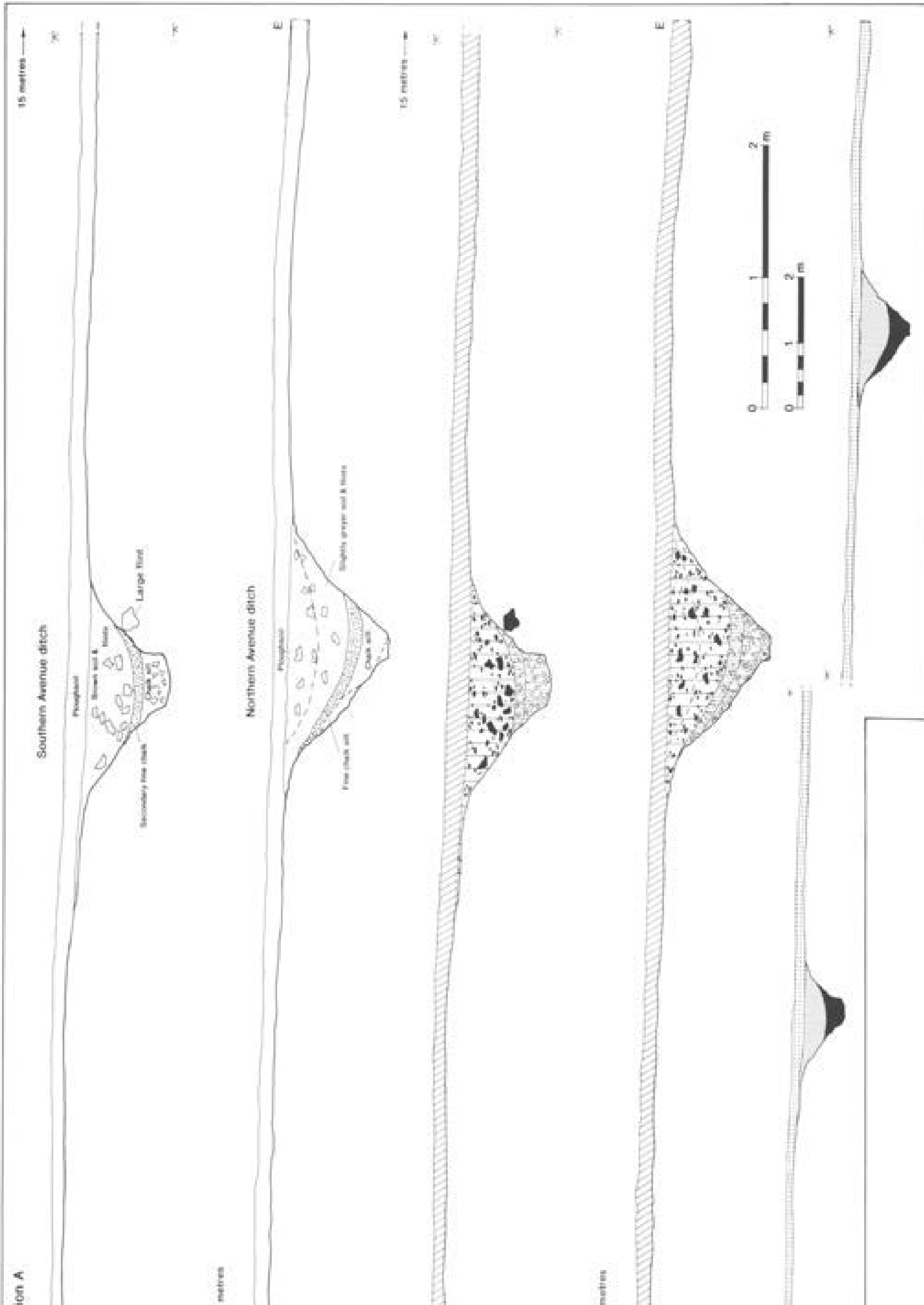



*Fig 174 The Avenue, C86, Vatchers 1967, long ditch section*

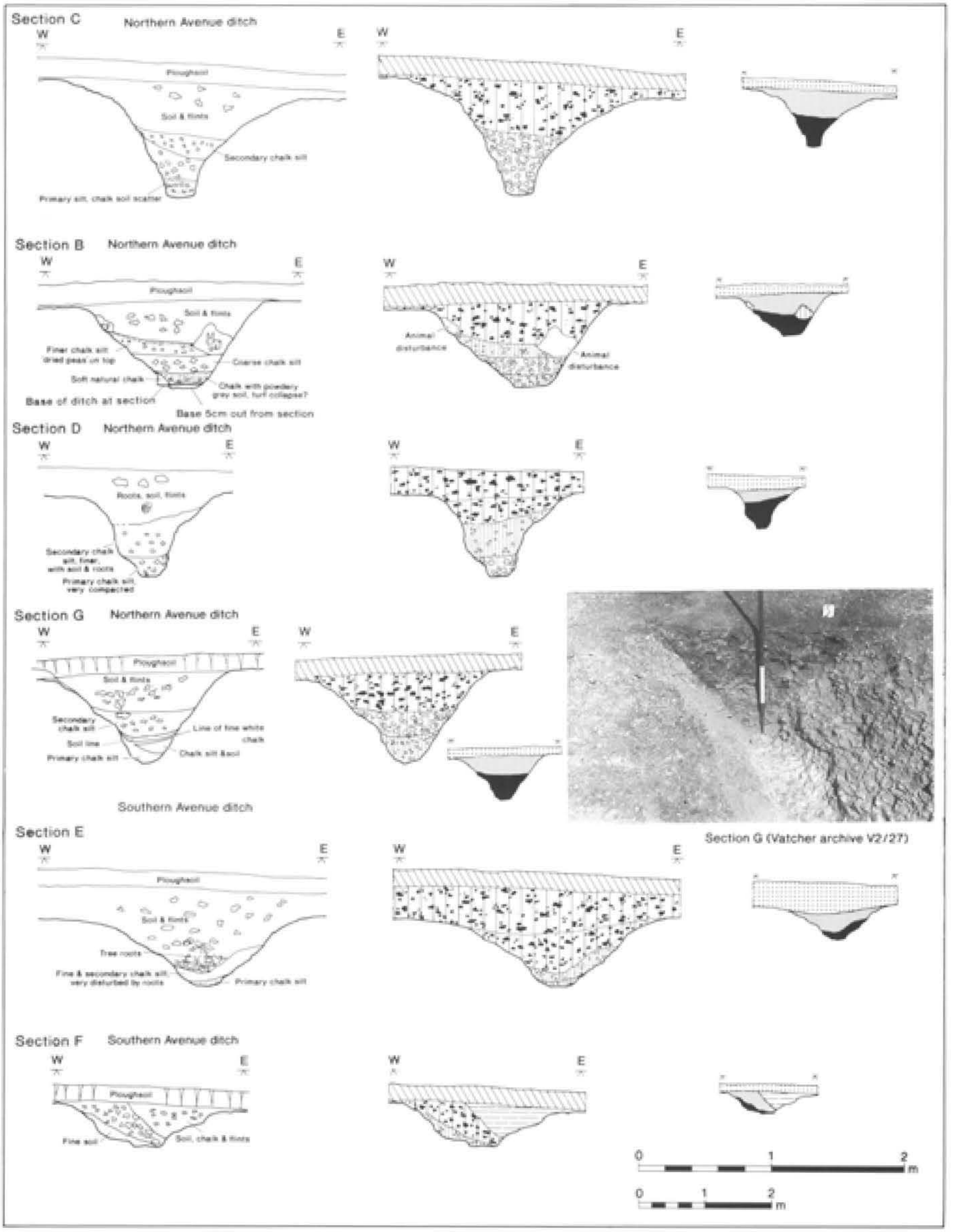



*Fig 174 (cont) The Avenue, C86, Vatchers 1967: ditch sections*

*Fig 174 (opposite)*

Five of the seven sections published here are reversed (Archive drwg nos 553A and 553C–F).

***Field drawings***

Eight section drawings exist, including one long section across both Avenue ditches and the interior (Archive drwg no 553A). Three of the illustrated sections (553C–E) could be definitely matched to sections on the post-excavation plan (archive drwng no 552, *see Plan 4, Zone C*). Of the five remaining sections two were duplicates (553A and H). It was not possible to relocate the position of the four others (553A, B, F, and G) with absolute certainty, because of occasional errors occurring in the notation of direction, lack of given measurements, or clearly inaccurate measurements (*eg* placing the section outside the excavation area); comparison with available photographs proved inconclusive. The suggested positions for these sections are therefore those that fit best with all the evidence (details available in archive). There is no information available in the excavation archive about the natural subsoil through which the Avenue was dug in this area, but from the nature of the fills (chalky) and the photographic evidence, it was either chalk or coombe rock.

***Rationalised and schematic sections***

Section A, the long section across both ditches, has been cropped at either end and a 15m length of the interior has been omitted. Although the layers described as 'fine chalk silt' are sometimes prefixed with 'secondary' on the field drawing, they are considered part of the primary infilling of the ditch. In one field drawing (553E) there is no division between the secondary and tertiary fills: this has been added. In another there is an unannotated layer (553F), which could be a coarse chalk silt from the schematic conventions used on the original drawings but has been interpreted as a secondary fill bearing in mind the depth of the deposit and the profile of the ditch. This is truncated by a recut, filled with a 'soil, chalk and flints' deposit, unlike the usual 'soil and flints' secondary filling of the ditches. No evidence for bank material, bank shadows, or protected surfaces is shown.

**Zone E: Excavations at the elbow**

Five excavations have been carried out within an area *c* 70m in length in this part of the Avenue: two to investigate the relationship between the southern Avenue ditch and Newall's Mound (Atkinson *et al*, 1953, C40; Fig 175; Atkinson and Evans 1978, C62; Fig 176), one to investigate the relationship between the northern Avenue ditch and the 'Oblique' ditch, and 'to settle once and for all, if possible, the question of the existence or otherwise of Stukeley's 'Cursus Branch', by digging a trench across its presumed line' (letter from Atkinson to R S Newall, 8/6/1953) (Atkinson 1953, C95, no section drawings survive), and two others of the northern ditch (Atkinson *et al*, 1953, C39 (no section drawings survive); Atkinson and Evans 1987, C96; Fig 177). The 1953 excavations involved two additional trenches, one through the 'Oblique' ditch (C38) and the other through the 'Gate' ditch (C37; no section drawings survive). The 1987 excavations also included C97, across the 'Gate Ditch' (Fig 76).

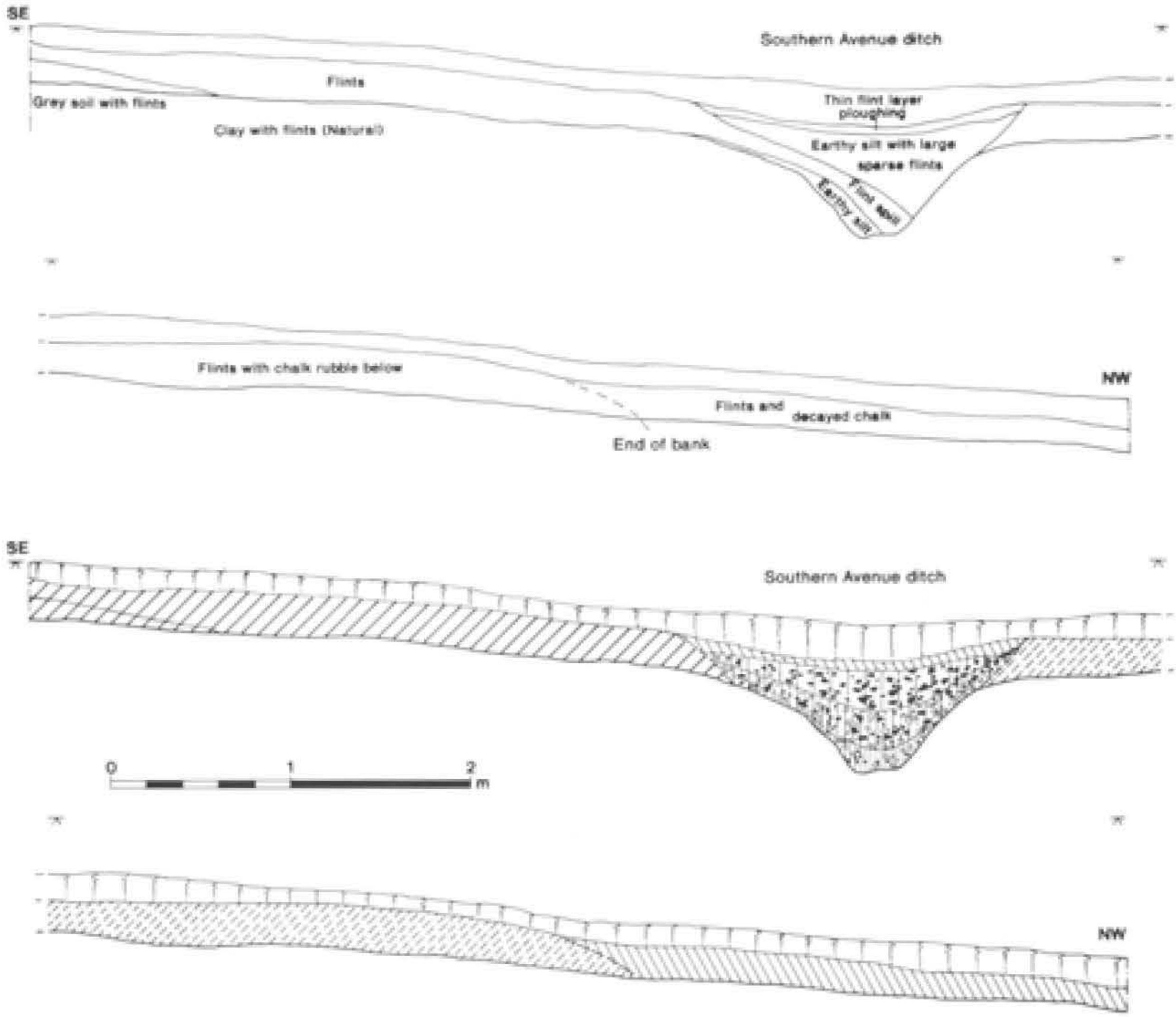
The distance between the northern and southern ditches at the elbow is 22.67m (Evans 1984, fig 22). The surviving archive for the areas excavated in 1953 consists of a post-excavation plan with the position of section drawings indicated, some photographs, and one section drawing (that of C40). The photographic archive for these areas is not sufficiently detailed to illustrate the chronological relationship between the 'Oblique' ditch and the northern Avenue ditch. Atkinson wrote 'One of these ditches [ie the 'Oblique' ditch] is certainly, and the other [ie the 'Gate' ditch] probably, of much later date than the Avenue itself' (Atkinson 1979, 67), although none of the evidence for the observed relationship, whether stratigraphic or artefactual evidence, or based on a combination of the two, is now available. The RCHM(E) *Stonehenge and its Environs* volume (1979, 13) states of the 'Oblique' ditch: 'its sharper form, and the evidence of test excavations, show that it is of relatively recent construction, perhaps later than Colt Hoare's time (*c* 1810) since it is not mentioned by him'. However, as Colt Hoare did not mention the parallel banks of the mid-eighteenth-century unfinished road either, the omission of the 'Oblique' ditch does not necessarily imply that it did not exist at the time he wrote his observations.

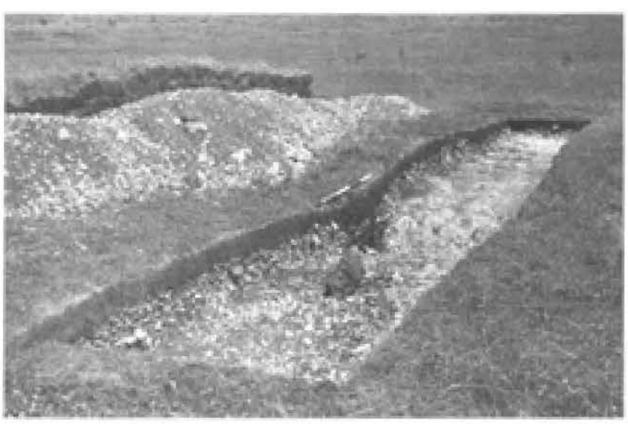
**Zone F: Straight stretch of the Avenue running south-westwards towards Stonehenge**

The greater part, some 450m, of the straight stretch of the Avenue has not been excavated. The banks are still extant in this area, although interrupted by the parallel banks of an eighteenth-century road (RCHM(E) 1979, 31–2). Geophysical surveys have been carried out in this area (*Appendix 1*) indicating the possible presence of some features within the Avenue.

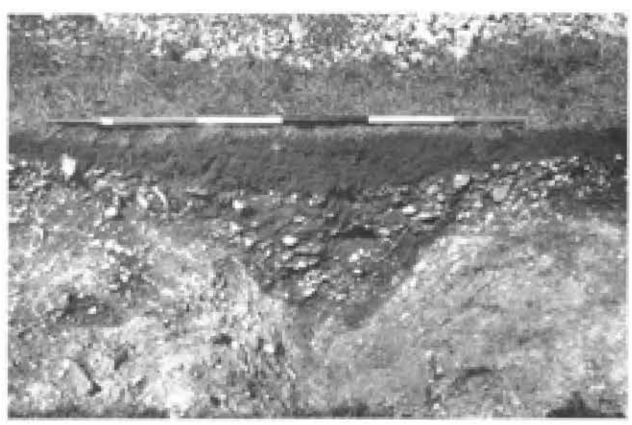
**Zone G: Excavations close to the monument**

Six investigations have been carried out in this zone within a stretch approximately 56m long at the western (Stonehenge) end of the Avenue. In 1919 R S Newall drew the profile of a water main trench on the south side of the A344, showing the Heelstone Ditch and both Avenue ditches (C103). This is not illustrated in this volume (Archive drwg nos 64 and 121). In 1956 Atkinson *et al* excavated a trench across both Avenue ditches and the area between (C48; Fig 178), at a point '372 feet [113.4m] north-east of the centre of Stonehenge' (measurement given on an annotated section). The distance between the two Avenue ditches at this point is 73ft (22.3m). Three of the investigations resulted from



Southern Avenue ditch in C40 looking north-west (P51491)



(P51495)

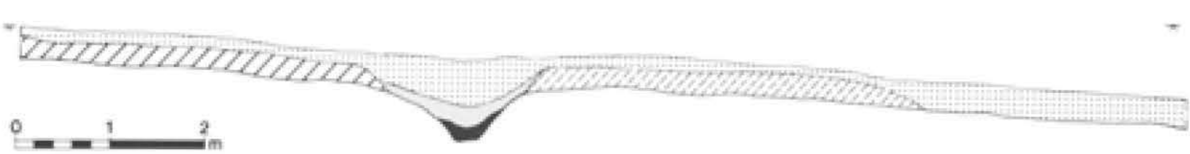



*Fig 175 The Avenue, C40, Atkinson et al 1953: ditch sections*

*Fig 175 (opposite)*

This section and the photographs are published here reversed.

***Field section***

The south-west facing section of the southern Avenue ditch and Newall's mound (to the south-east of the Avenue ditch) shows an asymmetrical fill entering the ditch from the south-east (*ie* outer) side of the Avenue, derived from the 'flints' layer, and the Avenue ditch cutting the layer of 'flints with chalk rubble below'. Atkinson interpreted this layer as the bank material, as its boundary with the layer to the north-west is annotated 'end of bank'. There is no notation on the drawing to suggest the interpretation of the 'flints' and 'grey soil with flints' layers in the region of Newall's mound. The fill of the trench described as 'earthy silt with sparse large flints' originally contained more large inclusions (most probably either flint or chalk), as indicated by the holes in section shown in the photograph.

The photographs of the oblique view of the entire section may also be compared with the field section. The natural is described as clay-with-flints, whereas it is described by Atkinson and Evans in their recut of this trench (C 62) as coombe rock. In the photographs the exposed natural is chalky.

***Rationalised and schematic sections***

The interpretation of this section is largely based on the photograph, with the subsequent redrawing of existing and new layer boundaries transcribed from the slightly oblique photograph for the ditch section itself. The photographs of the complete section are not detailed enough to allow checking of the boundaries shown for the layers on either side of the ditch and so interpretation of these areas is based on the existing layer boundaries as drawn by Atkinson. It is suggested that the 'flints with chalk rubble below' layer to the north-west represents a bank 'shadow' (*see text for description*). It is taken that the 'flints' layer and the 'grey soil with flints' to the south-east of the ditch are the material forming Newall's mound, with the grey soil layer as the core. The relationship between the two is uncertain.

The oblique photograph of the trench shows what appears to be a large lump of sarsen in the south-eastern end of the trench. This may have been contained within the 'flints' layer, and was possibly left *in situ* for the final excavation photograph.

The fine chalky silt primary fill of the Avenue ditch is slightly asymmetrical and possibly mainly derived from the 'flints with chalk rubble below' layer to the north-west (*ie* from the inner (bank) side of the Avenue). The more chalky secondary layer seems to contain material derived from both the inner bank shadow layer and the outer Newall's mound layer. The tertiary fill/soil layer is deeper over the ditch.

The nature and purpose of Newall's Mound were not determined from the excavation. One possibility is that it was a marker point for the laying out of the Avenue, which in this area turns tightly towards Stonehenge. The monument itself is invisible here, as the ground rises sharply for a distance of 50m or so. From the elbow Newall's mound appears on the crest of the rising slope, close beside the southern Avenue ditch (*see Chapter 3 for further discussion*).

***Note on C40 and C62***

There are certain irreconcilable differences between the two excavations of this section of the Avenue ditch and Newall's Mound as presented in Evans's description and the 1978 section drawing and in the 1953 section read in conjunction with the photographs.

In the 1953 photograph the two flinty layers on either side of the ditch do not appear to be continuous. This is also suggested by the field drawing and by the reinterpretation of it here. It is suggested that the flinty layer to the south-east of the Avenue ditch forms part of Newall's Mound, given the location of this feature on the post-excavation plans (RCHM(E) 1979, fig 5, Archive drwg no 159) and the photographic evidence. In contrast, Evans illustrates a more or less continuous flinty layer over the length of the trench (his layer 2, annotated as layer 3 on Fig 176, described for the most part as a flint horizon, with a clay-loam element and occasional sarsen fragments at the south-eastern end (*ibid*, 24, figs 23 and 24)). Evans does not interpret the flinty layer as forming part of the mound material. He states that there is no age relationship between Newall's Mound and the Avenue ditch, and this is confirmed by the 1978 drawing. The mound material, described as 'a mixture of large flint nodules and clay-loam' (*ibid*, 24) peters out at a distance of *c* 2m to the south-east of the Avenue ditch. This may be equivalent to the 'grey soil with flints' layer at the south-east end of the 1953 section, about 3m from the edge of the ditch. There also appears to be evidence for a 'bank shadow' in both section drawings.

the digging of service trenches parallel to the A344. In 1968 Faith and Lance Vatcher oversaw the excavation of an electricity cable trench on the north side of the A344, cutting through both Avenue ditches (C83; Fig 180). In 1979–80 Michael Pitts directed a salvage excavation ahead of the laying of a telephone exchange cable and a water pipe, almost immediately to the north of the water pipe trench observed earlier by Newall. Both Avenue ditches were recorded (C91; Fig 181).

South of the A344 two other excavations explored the Avenue. In 1923 Lt-Col Hawley excavated a large area of both Avenue ditches, including the terminals and the area between (C6; Figs 183 and 184). The area was slightly irregular in plan, with maximum dimensions of 22m along the length of the Avenue ditches and 25m in width (*Fig 184, below*). He noted that the Avenue ditches were 'variable in distances' (12/6/1923) but that 'their distance apart where they began [ie at the terminals] was 70ft [21.34m]' (1925, 23). In 1953 Atkinson *et al* excavated a trench across the southern Avenue ditch and Heelstone ditch, C36 (Fig 182).

## Morphology

A survey of other Avenues leading to stone circles shows that the banks of these monuments are variously built of stones, timber, or (rarely) earth. They are always a positive, highly visible feature within the landscape (Burl 1993). The ditches are a by-product of the quarrying for

*Fig 176 (opposite)*

***Published section***
This trench, Atkinson and Evans's Cutting I, was an almost exact reopening of C40 (RCHM(E) 1979, fig 5, and Archive drwg no 159). The south-west facing section of the 1953 excavation and the north-east section of the 1978 excavation were illustrated, the two trenches covering a maximum width of *c* 2.3m. According to the RCHM(E) plan, the 1978 trench extended *c* 1.8m further south-eastwards than the 1953 trench, whereas comparison of the two sections indicates that the 1978 trench extended only *c* 1m further south-eastwards from the Avenue ditch than did the 1953 trench.

The field section was drawn in two parts by different excavators, and hence there are different notations and styles in the field version for the same deposits, with the periglacial feature drawn on the south-eastern part of the section but not continued into the north-western side. This section was published by Evans (1984), who also split it in the same place into two separate figures with separate captions and a non-unique numbering system (*eg* layer 3 on the south-eastern side referred to the mound material and on the north-western side to the fill of the Avenue ditch). In the published version illustrated here a unique numbering system has been imposed which exactly retains the layer descriptions given in the 1984 published captions.

The flint inclusions shown in both layers 2 of the published section (comprising 'dark flinty clay loam' (here, layer 2); and 'flint horizon' (here, layer 3)) are schematic as they are not shown on the original field drawings.

No Avenue bank material was identified, although there was a suggestion of the protected surface where the bank had once been. The field section identified a layer of material, marked 'weathered surface', directly above that marked 'trace of bank' on the published section. This layer has been reinstated in the rationalised and schematic sections discussed below, as it was felt that it may have represented the 'bank shadow' (*see discussion in text*).

***Rationalised and schematic sections***
The fill of the southern ditch is very earthy. It is described as 'non-calcareous, consisting of large flint fragments in a clay-loam', overlain 'by a succession of flinty and non-flinty horizons'. The lack of a chalky primary fill and total infilling with an earthy secondary fill is not exceptional as this section was cut into coombe rock. The overlying flinty and non-flinty horizons are interpreted as the tertiary/soil layers resulting from agricultural activity. This activity probably also accounts for the replacement of the true Avenue bank material with the posited bank shadow.

the bank material but also serve to reiterate the boundaries marked by the banks.

### The Avenue banks

The Avenue banks exist as slight upstanding earthworks for 750m at the western end of the Avenue, up to *c* 190m east of the elbow, and possibly for 50m in the field just to the north of the river Avon at the eastern end (RCHM(E) in prep). In the central part of the Avenue there are no traces of the banks as earthworks.

No bank material is identified in the section drawings from excavations conducted east of the field boundary which marks the end of the surviving earthworks. Six of the excavations recovered evidence for some form of bank material or protected surfaces marking the former position of the banks (C40, C62, C48, C83, C36, and C6), all in the area between the elbow and the Stonehenge terminal.

In no case is there any indication of a buried soil beneath the banks. In C96 it is likely that the absence of a bank is the result of agricultural denudation, since both plough furrows and a possible lynchet are identified on the section drawing, and in C91 no bank material was identified. The survival of the bank as a positive earthwork feature of the Avenue from the monument to just beyond the western bend is undoubtedly a result of less intensive agricultural activity in this area.

In this survey of the banks a distinction has been made between undisturbed bank material and a 'bank shadow'. The relict bank comprises chalky rubble. In some areas a raised area of chalk rubble mixed with quantities of soil and stones was excavated but was not considered to be undisturbed bank material *sensu stricto*. This may be the remnants of the former bank, comprised of mixed chalk, soil, and bank material, or the protected area of soil etc, beneath the former bank which had not suffered such severe erosion by cultivation. These areas have been referred to as 'bank shadow' throughout this volume and are thought to represent the mixed and ploughed remains of the bank. This distinction is important in recognising the preservation of the bank at the excavated locations and the potential of undisturbed buried soils. If the records are ambiguous they have been recorded as bank shadow, since this does not imply good preservation of either bank or buried soil contexts.

The Avenue bank proper appears to survive only on the south side of the A344, near the monument, at C36. No written archive survives of Atkinson's excavation of C36, but the section drawing through the southern bank is annotated with 'chalk spill' and the layer is drawn using the convention used elsewhere to denote chalk rubble. The photographic evidence (archive) suggests a very chalky bank.

Hawley's C6 section drawing is a little more problematical – what has been interpreted in this volume as bank shadow also appears on the field section to contain bluestone chips in the very top of the layer and is described as an earthy chalk rubble. The underlying layer (described as hard white chalk rubble by Hawley and interpreted here as weathered chalk) is not bank material because it is cut by the postholes which Hawley

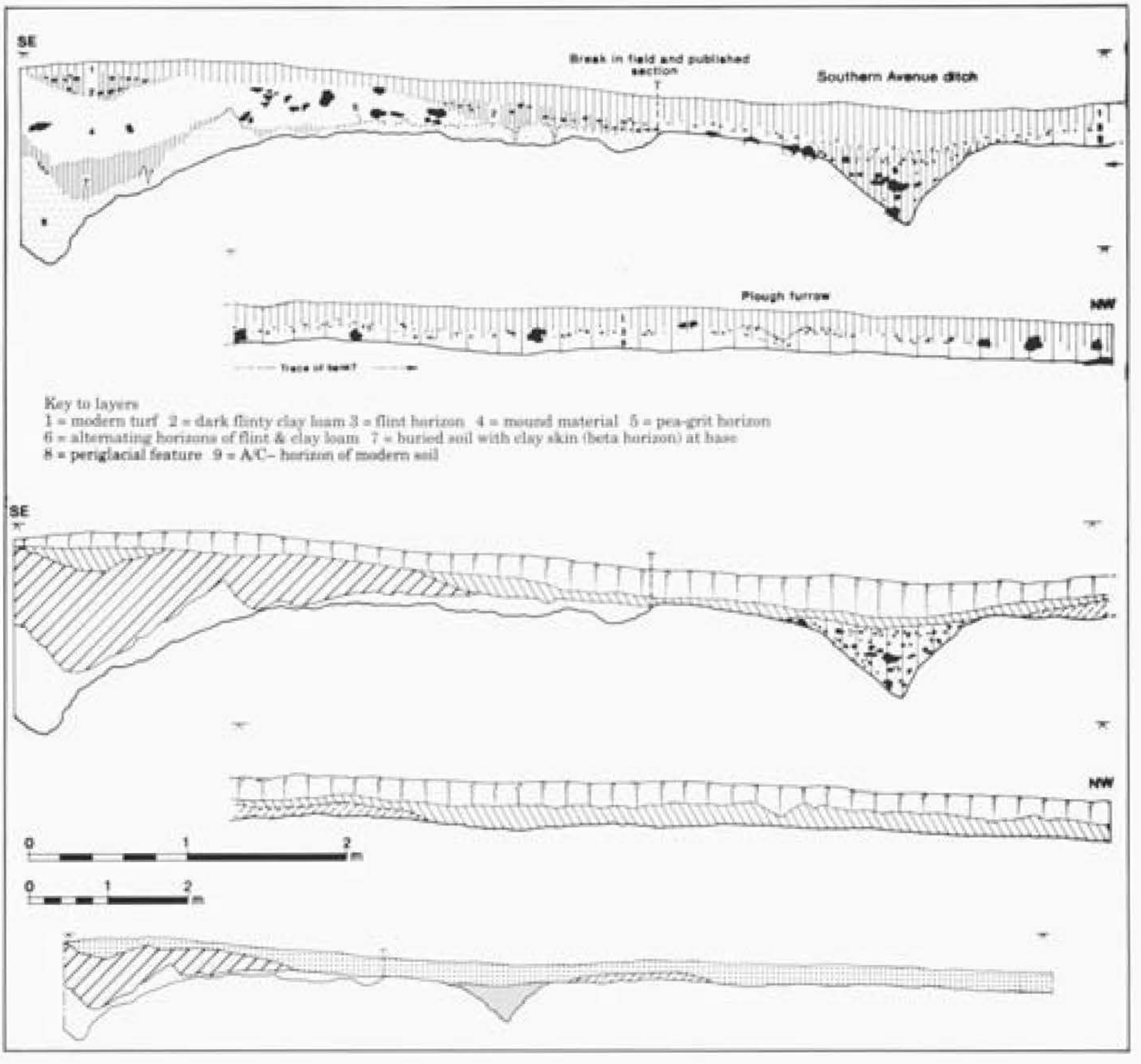



*Fig 176 The Avenue, C62, Atkinson and Evans 1978, ditch sections*

explicitly states were sealed by the bank. The ambiguity of the evidence makes interpretation uncertain and for this reason the bank in this area has been interpreted as a bank shadow rather than undisturbed bank.

In all cases the banks are shown as internal to the ditches, apart from C83 where there is apparently bank material on the outer side of the northern ditch and possibly in the same position at the southern ditch. A clue to the possible former position of the banks in this area may be afforded by the direction of silting into the Avenue ditches. However, it must be remembered that primary silting does not necessarily have to be derived from the bank, especially if there was a berm between it and the ditch.

In his excavation of the Avenue near the Avon (C87) George Smith (1973, 49) wrote that 'such directional silting as there was ... suggests that the bank was on the western (or inner) side of the ditch', and cites two sections. Of the six illustrated sections, it would seem that in four the silting is more or less symmetrical; in one it appears to be derived from the eastern (or outer) side of the ditch, and in one from the western (inner) side. From these ambiguous results it is not possible to state the position of the bank with any certainty. The direction of silting, as illustrated by the 27 available section drawings, is summarised in Table 23. Ten of these suggest an internal bank and three are ambiguous, with one section so deeply recut that the original direction of

**Table 23 Direction of silting in the section drawings of the Avenue ditches**

| *Cutting* | *A* | *B* | *C* | *D* | *Total* |
|---|---|---|---|---|---|
| C87 | 1 | 1 | 4 | – | 6 |
| C89 | – | 1 | 1 | – | 2 |
| C86 | 4 | 1 | 3 | – | 8 |
| C40 | – | – | 1 | – | 1 |
| C62 | – | – | 1 | – | 1 |
| C96 | – | – | 1 | – | 1 |
| C48 | 2 | – | – | – | 2 |
| C83 | 1 | – | – | 1 | 2 |
| C91 | – | – | 1 | – | 1 |
| C36 | – | – | 1 | – | 1 |
| C6 | 2 | – | – | – | 2 |
| Total | 10 | 3 | 13 | 1 | 27 |

*A = Silting from inner side of ditch; B = silting from outer side of ditch; C = silting direction ambiguous from section drawing; D = recut destroying evidence for direction of original silting*

silting could not be ascertained. Only three show directional silting that may suggest an external bank, all towards the eastern (Avon) end of the Avenue.

### Breaks in the banks and ditches

The 1:2500 1991 RCHM(E) transcription from aerial photographs of the earthworks and plough-levelled archaeology of the Stonehenge area shows several breaks in the line of the Avenue. In addition to breaks caused by various roads, tracks, and field boundaries, there are several areas where the line of one or both ditches is not apparent. To the east of the field boundary marking the change from earthworks to soil/cropmark the southern Avenue ditch is not apparent on the ground (though it is sometimes visible from the air) for a distance of *c* 110m. Between King Barrow Ridge track and the area of barrows 100 and 131 the southern Avenue ditch is again not visible on the ground; it is obscured by a clump of trees, and there is a small break in the line of both ditches just to the north of the Amesbury–Stonehenge road.

Virtually all the breaks in the course of the Avenue are probably the result of modern features such as tracks and roads, fencelines, or tree clumps. It is debatable whether smaller breaks would be visible from aerial photograph evidence, but no breaks in the course of the ditches were discovered in any of the excavations. It is therefore suggested that the entire length of the Avenue originally consisted of unbroken banks and ditches, allowing neither ingress or egress through formalised entrances along the course of the Avenue, but only from Stonehenge itself or from the Avon terminal. (This does not exclude the possibility of climbing over the low banks and shallow ditches to exit or enter the Avenue along its course.)

### Avenue ditches

From a survey of all the drawn sections of the Avenue excavations it can be seen that the profiles of the ditches are variable along their course (it must be borne in mind, however, that three of the sections are oblique, and hence the true profiles of the Avenue ditches and fills are not shown. These sections are those illustrated for C6, C36, and C83, all at the Stonehenge terminal of the Avenue). Hawley commented on the nature of the Avenue ditches that he excavated at C6: 'They were carelessly made, their line was very wavy and their depth irregular' (Hawley 1925, 23). This irregularity in the ditch profile is seen in all the areas where sizeable stretches of the Avenue have been opened up (C87, C86 and C6) and is also suggested by the results of geophysical survey (*Appendix I*).

It has also been suggested that the Avenue in the western straight stretch is 'the most regular both in alignment and width' (RCHM(E) 1979, 11). This observation appears to be based on the evidence of the earthworks rather than of the few excavations in this area. The irregularity of the eastern part of the Avenue can clearly be seen in aerial photographs (*ibid*, pl 8, shows the somewhat sinuous line of the northern Avenue ditch) and the plan of the ditches excavated at C86 is fairly irregular. However, the terminals of the Avenue ditches at the Stonehenge end are also somewhat irregular; and the fact that less than 1% of the Avenue has been excavated in plan means that the possibility that the Avenue ditches were irregular in the western stretch as well should not be discounted.

**Profile:** The ditches are generally V-shaped or have a rounded bottom and are cut through either chalk or coombe rock along most of their course. At the Avon end, the ditch profiles differ markedly within a small area as they pass over areas of coombe rock, greensand and gravel, and loess subsoils (Smith 1973, 46). The Avenue ditches vary in width between 0.36m (C87) and 2.3m (C86), and in depth from 0.15m to 1.06m (both C87). In the largest area excavation of the Avenue ditches (C86, Plan 4, Zone C) it can be seen that the ditches are irregular in width, profile, and alignment, although they are generally approximately parallel.

In his excavations at the Avon end (C87), George Smith encountered three different subsoils – greensand and gravel, hard cemented coombe rock, and clayey loess. Smith argued that the greater depth of the northern Avenue ditch in the area of greensand subsoil, which is easier to dig than the other two subsoils, suggests that the ditch was dug as a quarry for bank material rather than as an object in itself (Smith 1973, 49). However, it could also be argued that the ditch was deeper in these areas simply because it was easier to dig. In C86 (Fig174; Plan 4), the plan and profile of the ditch dug through undescribed natural deposits, probably either chalk or coombe rock, are very irregular. This suggests that regularity of the ditch was not a primary consideration, at least at the eastern end of the Avenue.

**Primary fills:** For the definition of primary, secondary, and tertiary fills used throughout this report see Chapter 1. Schematic diagrams of the fills are provided for each illustrated section and detailed comment on the fills of each ditch section is provided in the captions as appropriate.

Apart from the excavations near the river Avon, with their differing natural bedrocks, the primary fill of the ditches along the course of the Avenue, cut through coombe rock or chalk, consists of either a fine chalk silt or a coarser chalk rubble. In some excavations (eg C87, Fig 172, 55C and D) and C86 (Fig 174, 553G), various soil lines were incorporated within the primary fills. In some cases, in areas of coombe rock, the primary fill is absent, an unremarkable feature given the hard cemented (and therefore more erosion- and weathering-resistant) nature of this rock.

**Secondary fills:** The secondary fills are generally distinguishable by their much earthier nature. In one case (C91: Fig 181) a buried soil was identified by the excavator at the top of the secondary fill.

**Tertiary fills:** The tertiary fills have been included with ploughsoil and topsoil deposits in the interpretation presented here. In some cases the ditches have been entirely filled by the primary and secondary fills, and there is no tertiary fill proper in these areas. Where the ditch is incompletely filled, the tertiary deposits infill the slight concavity above the secondary fills. This concavity might have been formed either by the silting process itself or by post-depositional slumping and compaction.

**Possible recuts and deliberate backfilling:** Any discussion of recutting and maintenance activities relating to the Avenue ditches must bear in mind that less than 1% of the total area of the ditches has been excavated and no generalised comments can be made. Three areas of possible recuts have been identified in the excavated areas, two in the north ditch and one in the south.

George Smith states that 'there was at no point any evidence of re-cutting of the ditch' in C87, Zone A. However, he does identify three areas, in his segments 55E, F, and G (Fig 172), of what he suggests is deliberate backfilling (Smith 1973, 49). The upper fill in each of these segments, layer 3, 'contained a large amount of large flint nodules and smaller flints, more than could be expected to have silted in naturally', and he therefore interpreted this layer as deliberate backfill 'probably ... to level the ground for agriculture'. In the illustrated section of 55G (Fig 172), the boundary between layer 3 and the underlying layer 4 is at a very steep angle.

If it can be assumed that layer 4 is a naturally silted layer as opposed to deliberate deposition, it is very unlikely that this boundary could have been produced naturally at such a steep angle. It is therefore likely to represent some sort of disturbance or recut. Its fill, layer 3, may have been deposited very quickly, resulting in the distribution of flints noted by Smith, but the interpretation of the simple filling-in of the already nearly silted ditch needs adjustment given the evidence for some kind of disturbance prior to the deposition of layer 3.

The presence of 106 waste flakes in layer 3 in segment E allowed Smith to date the event represented by layer 3 in segments 55E, F, and G to no later than the Iron Age (*ibid*, 49). Analysis by Harding (*Chapter 9, below*) has shown that the flints, which include some refitting pieces, are consistent with a Late Neolithic/Early Bronze Age technology.

In summary, therefore, it seems that some modification, or more probably maintenance, of the Avon end of the northern Avenue ditch took place but that this consisted of a localised episode of recutting rather than backfilling. Moreover, the presence of diagnostically Late Neolithic/Early Bronze Age flintwork in the recut fill confirms that this activity took place within what may be assumed to be the period of use of the Avenue rather than later, a suggestion also in keeping with the results of the the new suite of radiocarbon dates (*see below and Appendix 2*).

The three ditch sections concerned are all cut through greensand and gravel rather than chalk or coombe rock and it therefore seems reasonable to suggest that the recutting represents a episode of ditch or bank maintenance in areas prone to more rapid silting than elsewhere.

A recut of the northern Avenue ditch in the excavation area of C86, Zone C, is suggested by one of the section drawings (Fig 174, section F). The photographic archive for this excavation is comprehensive but sadly uninformative. It would appear from the drawing that part of the secondary fill of the ditch, which is not annotated, has been truncated, and that the recut was filled with a deposit similar to the tertiary fills which developed elsewhere in the area. The angle between the secondary fill and the overlying layer is too acute to result from natural silting and must therefore represent a recut.

A recut of the southern Avenue ditch is also suggested by the section drawing of the excavation of the electricity cable trench in Zone G, north of the A344, C83 (Fig 180). The typical tripartite fill sequence is clearly illustrated in the northern ditch, but the sequence in the southern ditch is quite different, as is its profile. The primary fill appears to have been truncated, and the recut, which has a rounder profile and more gently sloping sides, is completely filled with an undescribed deposit. This excavation area is *c* 9m distant from C91 to the south-west and *c* 15m from C48 to the north-east. In both cases an undisturbed sequence was recorded in the southern ditch, as can be seen in the section drawing for C91 (Fig 181) and the photographs of the section for C48 (Fig 178). This suggests that the recutting episode was very localised.

It is not known how long the ditches were kept clean after construction. If, as Smith has suggested (Smith 1973, 49), the banks were the main focus of the Avenue and the ditches served solely as quarries for the bank

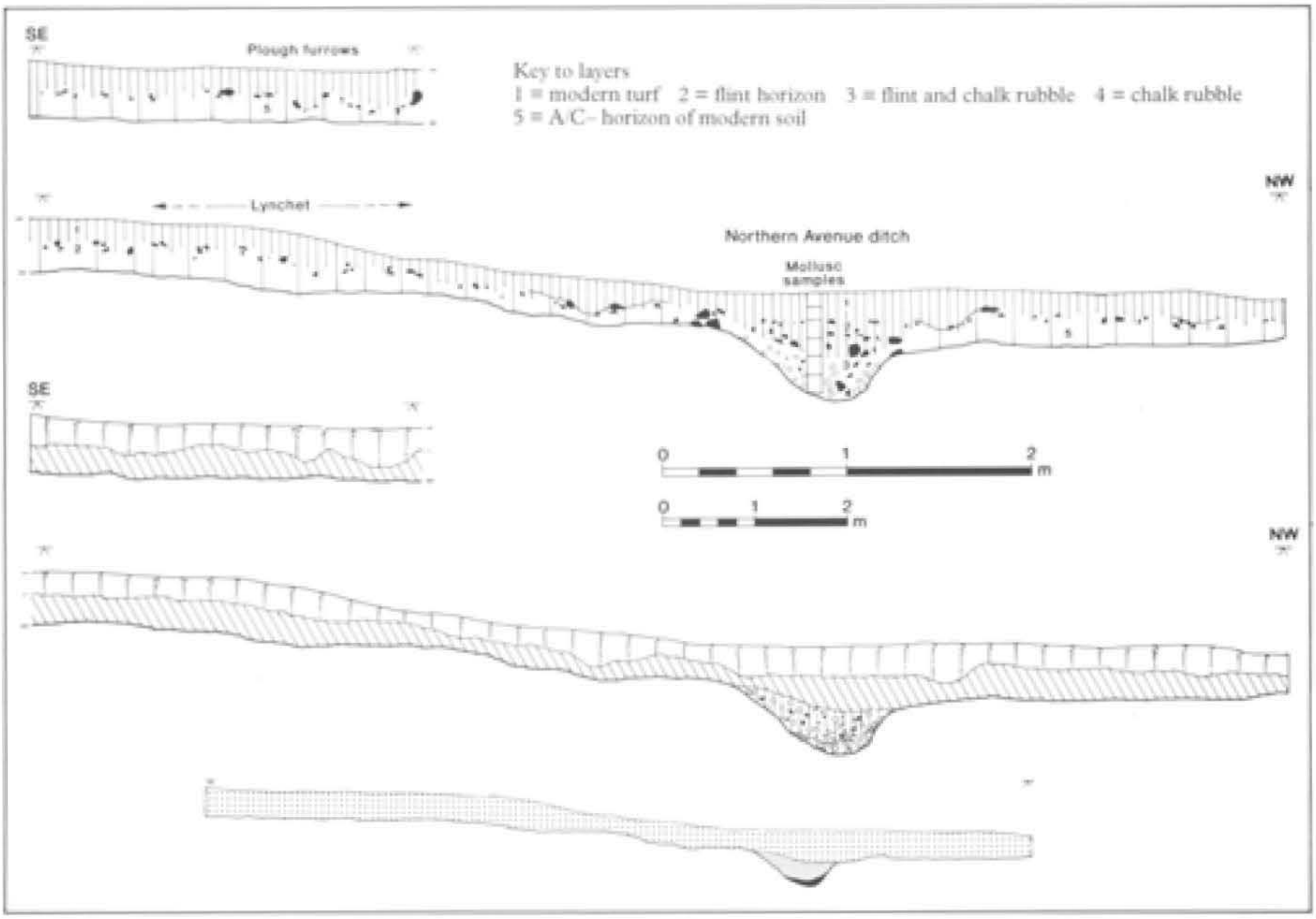



*Fig 177 The Avenue, C96, Atkinson and Evans 1978: ditch sections*

***Published section***

This is the published north-east-facing section of the northern ditch (Atkinson and Evans' Cutting II) and represents the rationalisation of the original field drawings by Evans (1984). The layer descriptions on the field drawing (Archive drwg no 706a), those given in the publication figure caption (Evans 1984, fig 24), and those given in the text description of the layers sampled for molluscs are slightly at odds, *eg* layer 5, the primary fill, is described on the field drawing as 'compact chalk and loess fill', in the published figure caption as 'chalk rubble', and in the text description as 'very chalky loam, flints sparse'. No bank material is identified, nor any area on the original field drawings that could be interpreted as such (unlike C62 above). The natural deposit is identified on the field drawing as cwm (*sic*) rock.

***Rationalised and schematic sections***

Evans states that the lower part of layer 2 is possibly 'the vestiges of a buried soil' and that the upper part is a ploughsoil. The description of lower layer 2 suggests that this is an upper secondary fill and that the upper part of layer 2 is a tertiary fill. This section well illustrates the classic ditch fill sequence of primary– secondary–tertiary deposition.

material, the impetus to clean out the ditches regularly would presumably be less than if the ditches were accorded primacy. Within the excavated areas of the Avenue ditches the consistency with which the sequence of fills formed suggests that once weathering of the Avenue ditches was allowed to proceed unimpeded it continued uninterrupted apart from the three small areas of recutting (and perhaps other unknown areas) discussed above. These episodes might also relate to maintenance of adjacent areas of the banks themselves, though there is no evidence for this within the areas excavated. This suggests that wholescale refurbishment of the Avenue ditches did not take place and that the maintenance of the Avenue was not a prime objective by the end of the Early Bronze Age. This interpretation, based purely on the physical and artefactual evidence, fits well with the new radiocarbon evidence (*see below*).

The post-excavation plan of C86 shows a 'posthole in side of ditch cut into primary silt' in the southern ditch, and a 'later hole cut into ditch ... brick (?Tudor) in disturbed hole' in the northern ditch (Plan 4, Zone C). As it is not stated whether the posthole was also cut

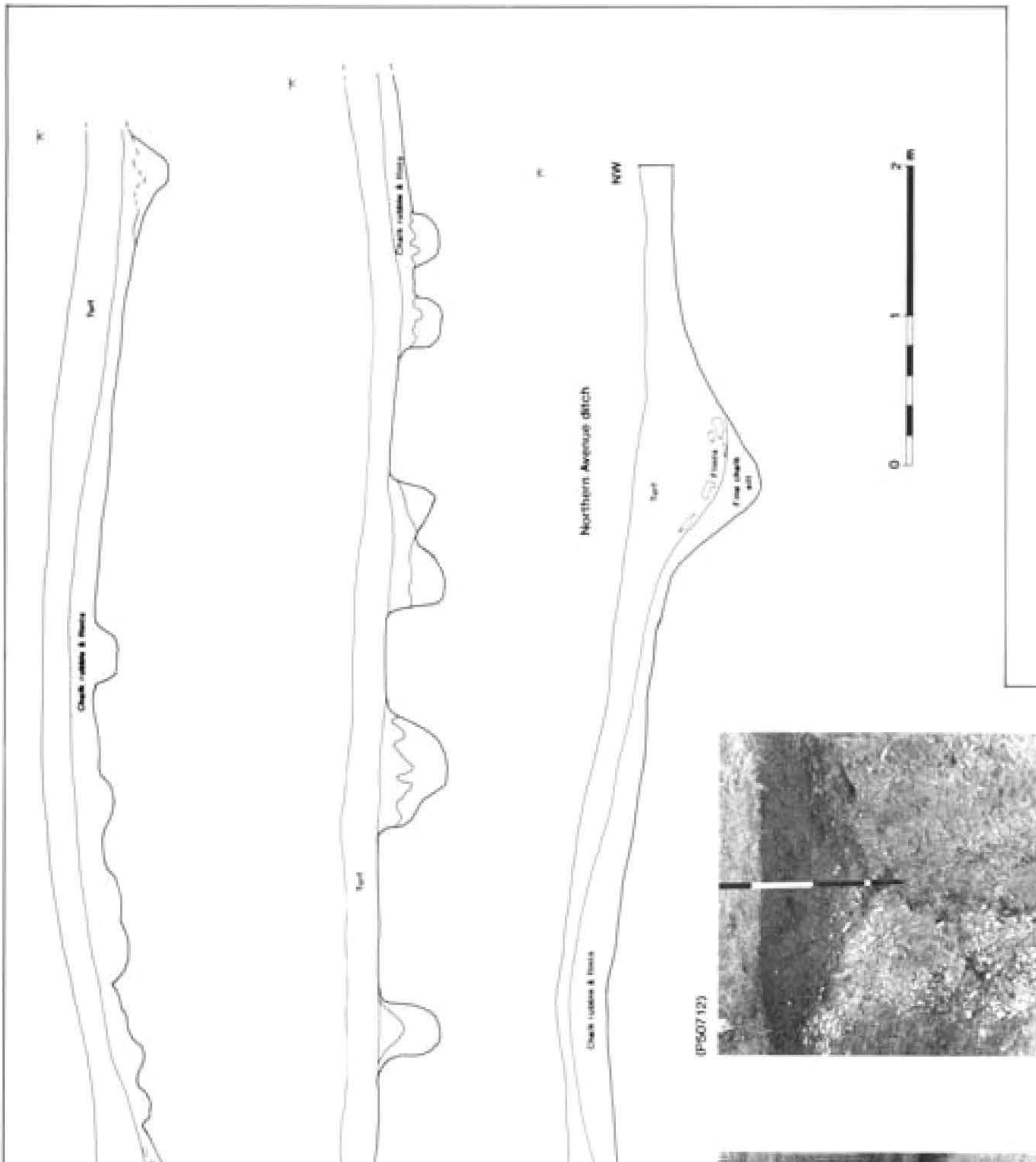



*Fig 178 The Avenue, C48, Atkinson et al 1956: ditch sections*

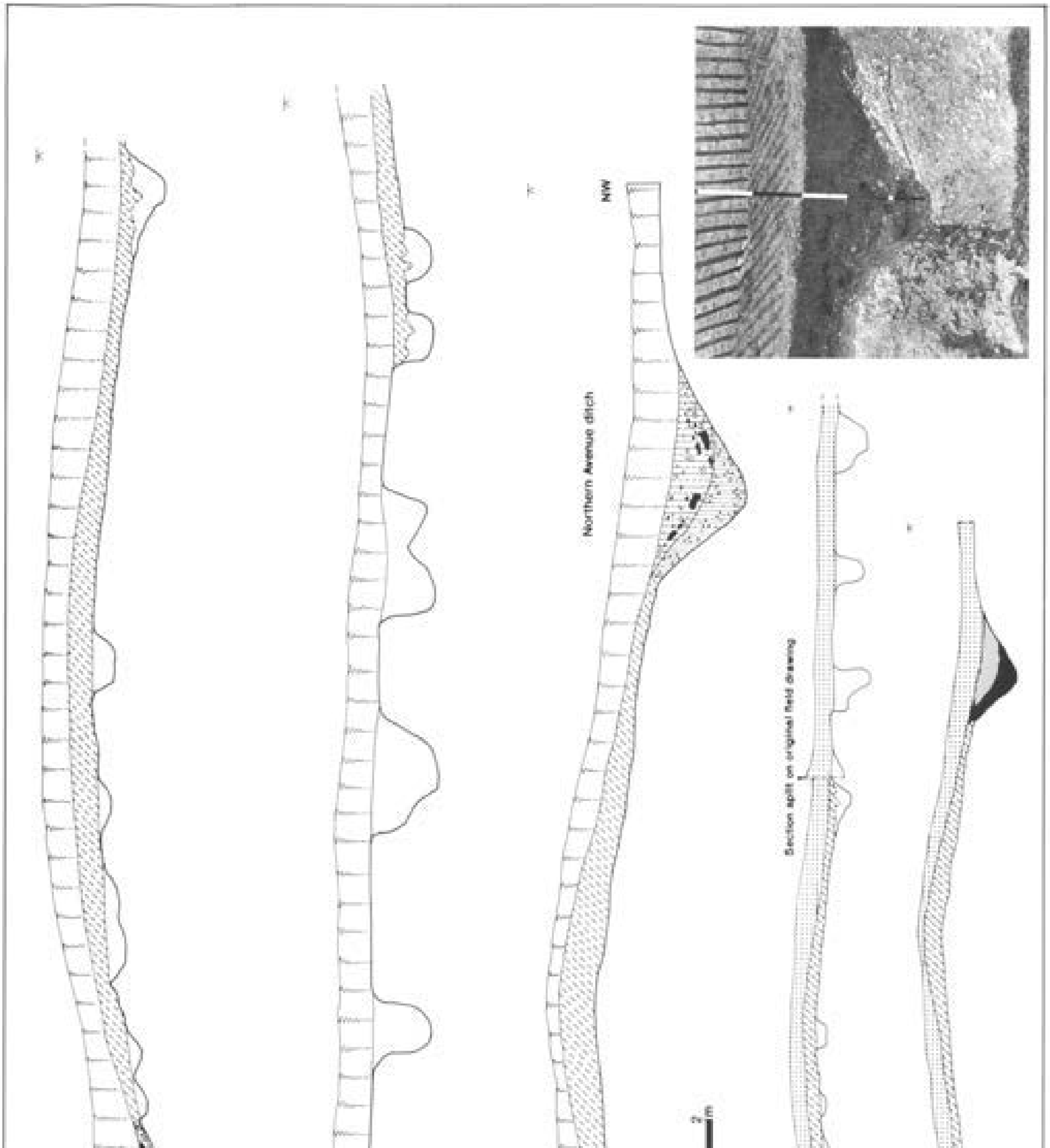

SE
Southern Avenue ditch
NW
Northern Avenue ditch
Section split on original field drawing
0 1 2 m
0 1 2 m

*Fig 178 (cont)*

through the later ditch fills, or solely through the primary fill, this feature remains undated, whereas the 'hole' is clearly post-medieval or modern disturbance.

**The Stonehenge terminal:** In one of his 1922 excavations of the Stonehenge Ditch (C23) Hawley excavated what he considered at the time to be the southern Avenue ditch terminal, approaching close to, but not impinging on, the northern side of the Stonehenge Ditch cut. He described his findings thus:

> Worked out the slight depression where the Avenue Trench appears in the counterscarp bank: it looks very insignificant.
> (31/7/1922)

> Remains of Avenue where bank comes in appear upon the solid chalk as a layer about 3 inches deep composed of loose chalk and rather large flat flints.
> (29/8/1922)

> The south-east trench of the avenue ... presented an insignificant-looking, angular section in the bank about 18in. deep and 3ft. wide in top measurement, the apex of the angle cutting a groove in the solid chalk below. Where the extremity of the groove approached the ditch it ended at 8in. from the side, leaving a ridge of undisturbed chalk, and indicating that the ditch was of earlier construction. The contents of the ditch showed that there had been no attempt to carry the avenue across it, nor was there any sign of it on the opposite side. The avenue bank was barely discernible and it is rather doubtful if it came quite to the edge of the ditch.
> (1924, 30)

Hawley read a paper on the findings of his 1922 season in 1923 and published this in 1924. The next section of excavations, in 1923, clearly showed that the Avenue ditches terminated some distance from the main Stonehenge Ditch and that the feature which he had recognised as the Avenue ditch cutting through the Counterscarp Bank was, in fact, another unidentified feature (*Chapter 7, above*). Nevertheless, Hawley published his original interpretation even after he had himself disproved it, together with a plan showing both the supposed Avenue from the 1922 season and the true course of the Avenue from the 1923 one (Fig 156).

The terminals of the Avenue ditches in fact lie some 3m distant from the edge of the Ditch. The northern Avenue ditch appeared to have cut an earlier posthole:

> [The northern Avenue ditch] ended quite abruptly in another post hole in same line as the others and it seems as if the hole side had been cut away when starting the ditch from here (or ending it).
> (22/3/1923)
>
> The small ditch on the west side seemed to have been begun by cutting into one of the post-holes of the last row of the palisade
> (1925, 23)

whereas the southern Avenue ditch terminal was marked by a larger feature:

> The trench begins at a stone hole ... the hole is 3 feet diam by 3 feet deep [0.9 x 0.9m] and rather resembles the Aubrey holes as it has chalk on the sides and bottom and no doubt held a stone.
> (29/3/1923)
>
> The ditch on the east side began in a round hole 2 ft wide and about the same depth in the chalk rock, and had suffered but little from destruction.
> (1925, 23)

*Fig 178 (opposite)*

***Field section***

No written archive, location, or post-excavation plans survive but post-excavation photographs show that the trench, which appears to be 6ft (1.8m) wide, was positioned at right-angles to the alignment of the ditches. The irregular features shown on the section in the area between the two Avenue ditches can be seen in the photographs to be parallel sub-linear features, aligned approximately north-west to south-east. These are almost certainly periglacial features (Pitts 1982; Evans 1984; Wessex Archaeology 1991; 1993). In the field drawing the southern ditch contains one fill, the northern ditch two.

***Rationalised and schematic sections***

These are based on a combination of the original field drawing and the photographic archive. In the photographs it can be seen that the southern Avenue ditch has a chalky primary fill which seems to be slightly asymmetrical, sloping in from the bank (inner) side of the ditch. The lower part of the primary fill is rubbly, whereas the upper part is a chalky silt. The secondary fill has a much earthier content with fewer flint and chalk inclusions than the primary fill but significantly more than the virtually stone-free tertiary fill/topsoil horizon.

The northern Avenue ditch is similarly asymmetrical with a fine chalk silt primary fill. The nature of, and distinction between, the secondary and tertiary/topsoil layers are similar to that in the southern ditch. There are no detailed photographs of the section in the area of the banks although the general shots show that they are well defined as earthworks, with a rise in the protected natural surface underneath the bank material. On the section drawing the layer in the area of the bank is labelled 'chalk rubble and flints', although not specifically labelled as bank. It is suggested that these low eminences are 'bank shadows' rather than the original bank material (*see text*).

For a fuller discussion of the excavations in this area see below.

### The interior of the Avenue

Four long sections across both Avenue ditches and the interior of the Avenue are illustrated: C86, C48, C83, and C6. In addition, C91 spanned both ditches, but only the southern, undisturbed ditch was illustrated. In C36 the southern Avenue ditch was excavated and almost half the width of the interior up to the Heelstone was excavated. Only the northern Avenue ditch was excavated at C87 (Zone A), but here too the excavation area included part of the interior, in an irregular area measuring 37m by 32m. Two more of the above excavations involved the opening up of fairly large areas, both somewhat irregular: C6, an area measuring *c* 21.6 x 25m; and C86, an area measuring *c* 52 x 41m (Plan 4). C36, C48, C83, and C91 were all narrow trenches.

The interior of the Avenue near the northern ditch at C87 was dotted with features, all of which either post-date the construction of the Avenue or are undated. There are a few Iron Age and Romano-British features but most are post-medieval and modern, relating to the settlement of West Amesbury. On the post-excavation plan for C86, in contrast, the interior area of the Avenue is entirely devoid of features (Fig 170). The photographs of C48 show the interior scoured by approximately parallel sub-linear features, which are also shown, though not annotated, on the section drawing. These are interpreted as periglacial in origin. The post-excavation plan of C83 shows two narrow, apparently linear, features, aligned parallel to the Avenue ditches, some 6.7m (22ft) from the southern ditch in the interior area. These features are not annotated, and their interpretation remains uncertain. Pitts's excavation near the Heelstone (C91) revealed several features in the interior of the Avenue.

As well as excavating part of the Heelstone ditch, the excavation revealed Gulley A (*sic*), running between the Heelstone ditch and the southern Avenue ditch, and Stonehole 97. In C36, Atkinson *et al* excavated the portion of the Heelstone ditch exposed in the trench and part of the stonehole as well as the southern Avenue ditch. When excavating C6, Hawley did not strip the interior area entirely (Figs 8 and 11), but in the areas he did strip down to natural he exposed part of the Heelstone ditch, three stoneholes, six postholes, a bush hole, a large 'trench', and two undescribed features. These features are described earlier in this chapter.

This brief survey shows that in the excavated areas of the Avenue interior features seem to occur at the Stonehenge terminal (some of which, like the postholes in C6, almost certainly pre-date the construction of the Avenue), and also at the Avon end, relating to Iron Age and later settlement. Geophysical survey of a *c* 220m stretch of the Avenue, conducted in 1979–80 just to the north-east of the A344 (Bartlett and David 1982, 90–3; *see Appendix 1*), identified several anomalies, including four possible pairs of features grouped 175–200m north of the A344. Two possible pits were also recorded on the banks (*ibid*, 93 and fig 11; Figs 264 and 265). Other weaker anomalies 'may simply represent slight natural irregularities in topsoil cover' (*ibid*, 93). Further anomalies in the interior of the Avenue were recorded in the vicinity of the elbow (*Payne, Appendix 1*). Obviously these features cannot be fully described and interpreted until they have been excavated, nor can anything be said of what might have lain outside the earthwork.

In the section drawing of C83 small shallow features can be seen on either side of both Avenue ditches, although their relationships with the ditches are ambiguous (Plan 3, Zone G). Pitts interpreted these as possible 'holes left by the removal of flint nodules' (Pitts 1982, 94). On the post-excavation plan of the same area it can be seen that there are two sub-circular depressions on both sides of the southern ditch, and three, including an elongated oval feature, on the edges of the northern ditch. Their depths are marked as between 4 and 6 inches (0.10–0.15m). They could be interpreted, as Pitts suggested, as the depressions remaining from where flints within the chalk were encountered and removed during the construction of the ditches, or alternatively as shallow stakeholes in the edges of the ditches.

Clay remarked in his report on the excavations near the Amesbury–Stonehenge road (C89) that 'Some search was made along the outer edge of the Avenue but no stone or post holes were found' (1927, 242).

## The possible northern branch

The idea that there might have been a northern branch of the Avenue was first posited by William Stukeley (1740, 150), and later reiterated by (among others) Colt Hoare, Petrie, and Crawford, all of whom published plans showing its position, branching off at the elbow of the Avenue and heading more or less directly towards the Cursus. Colt Hoare wrote:

> [it] appears undoubtedly to lead towards the CURSUS, though its traces become very faint soon after it has quitted the eastern line up the hill: it seems to have pursued a bending course towards the CURSUS, but I could not perceive that it pointed to any decided opening in that work.
>
> (1812, 158)

On both Colt Hoare's and Crawford's somewhat stylised plans and Petrie's more accurate one, the northern extension heads almost due north.

The trackway to Durrington, which ran up the Avenue from Stonehenge, branched out of the Avenue at the elbow, heading off almost due north (*see Plan 3*). It seems that the disruption to the Avenue earthworks here, combined with the parallel path of both the Palisade and the 'Oblique' ditches at this point, was interpreted by Stukeley as evidence for the northern branch. It may be

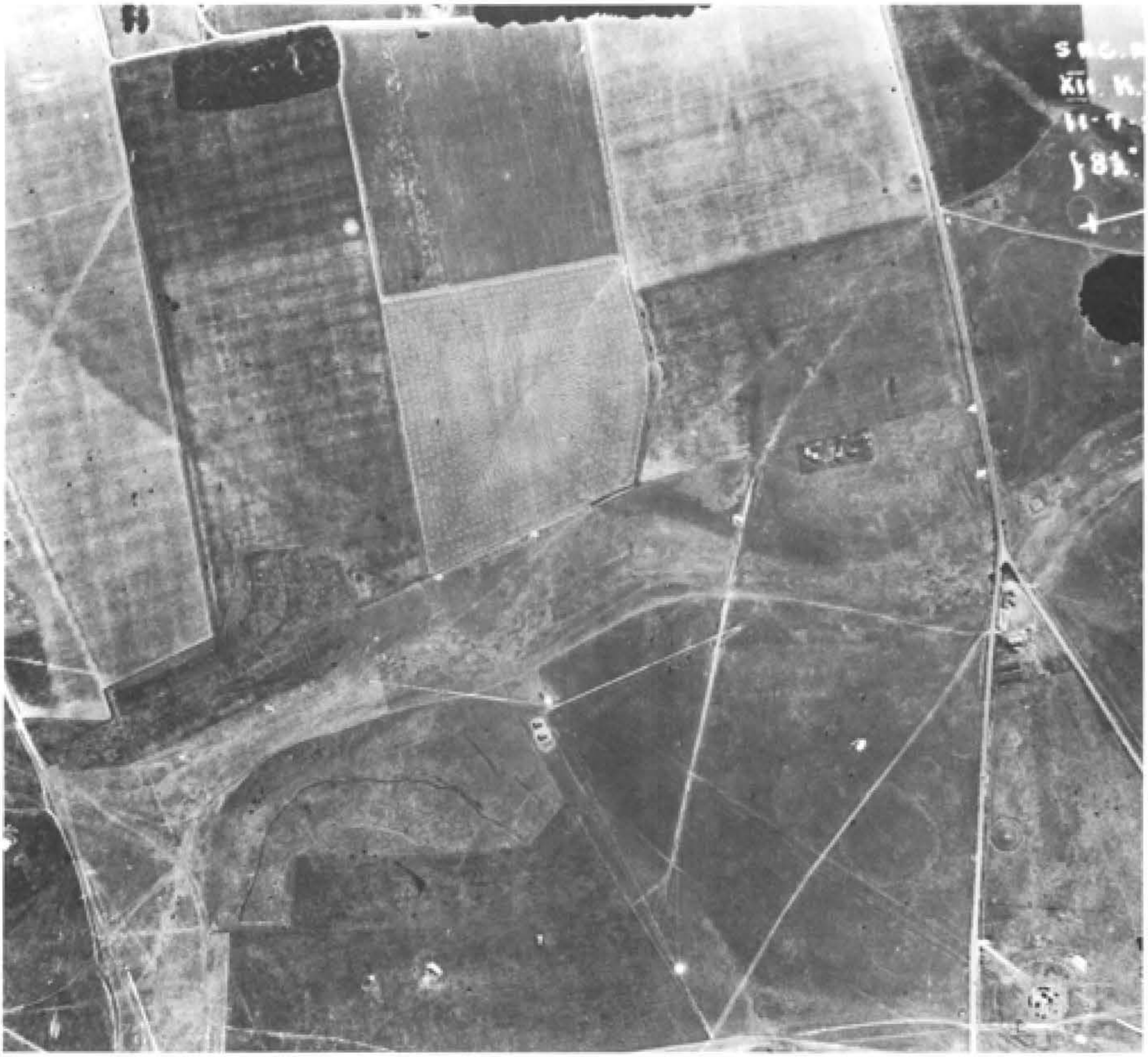


*Fig 179 The Avenue between Stonehenge (bottom right) and King Barrow Ridge (top) in 1921 (east to the top). The line of the old roads crossing the Avenue are clearly visible. The elbow is in the lower centre of the photograph where the white fencelines meet the two water troughs. The Avenue can just be seen climbing towards King Barrow Ridge. The amorphous dark linear mark running north-east from the elbow is the so-called northern branch (RAF, 1921; © Crown copyright reserved)*

that the 'Oblique' ditch is somehow connected with the trackway, perhaps as a drainage feature, rather than with any prehistoric activity at this point.

Aerial photographs taken in 1921 show a soilmark running along the bottom of the dry valley leading from the north-east down into Stonehenge Bottom (Fig 179). This soilmark runs in a north-easterly direction in an almost straight line, about 5° to the east of the line of the Avenue projected north-eastwards beyond the elbow. It is noticeably different from the sharp lines of the Avenue, appearing as a rather diffuse feature which in places comprises two separate sub-parallel marks. It is also noticeably wider than the Avenue. A copy of the 1923 edition of the Ordnance Survey 6-inch map of the area is annotated thus: 'Mr Crawford has previously attended this on the ground and states it is a watershed', with a further annotation by J F Stone: 'the NE extension of the Avenue [to SU 1340 4310] ... shows distinctly in the new plough as two dark lines'. It seems that Stone wrote 'watershed' mistakenly instead of 'watercourse', as the soilmarks are in a valley rather than on a ridge, but the sub-parallel lines of the soilmark are not consistent with

**Table 24 Finds from within the Avenue ditches and bank material, including disturbance'**

| *Cutting* | *Pottery* | *CBM* | *Flint* | *Burnt flint* | *Animal bone* | *Antler* | *Bluestone* | *Sarsen* | *Other stone* |
|---|---|---|---|---|---|---|---|---|---|
| C87 | 1 | – | 176 | 13 | 12 | 2 | – | – | – |
| C104 | – | – | 'several' | – | – | – | – | – | – |
| C86 | 14 | 4 | 3 | – | 13 | 2 | – | – | 3 |
| C83 | – | – | – | – | 4 | 1 | 8 | 3 | – |
| C91 | 2 | – | 32 | – | – | – | 3 | 23 | – |
| C36 | 1 | – | 1 | – | 7 | – | 10 | 20 | – |
| C6 | present but not quantified | – | present but not quantified | – | – | 3 | present but not quantified | present but not quantified | – |

*Notes:*
*Table does not include finds from the topsoil over the Avenue*
*Finds for C91 are those listed in the published report (Pitts 1982)*
*CBM = ceramic building material*

waterborne deposits, nor do they represent colluvial deposits (M Allen, pers comm). It seems that the marks are likely to be geological in origin, although investigation, such as geophysical surveying and/or archaeological excavation, is desirable to confirm their nature.

It can be seen that two separate features have been interpreted as the northern branch of the Avenue: the old Durrington trackway heading northwards from the elbow, its path emphasised by the Palisade and 'Oblique' ditches, and the straight soilmarks heading north-eastwards. Atkinson stated that the results of his excavations at the bend showed that 'Stukeley's northern branch has no real existence' (1979, 67). Here he investigated the relationship between the 'Oblique' ditch and the northern Avenue ditch, and excavated three additional trenches through the 'Gate' ditch, the 'Oblique' ditch and the northern Avenue ditch (Plan 4, Zone E). In *Stonehenge* Atkinson states that Stukeley

> allowed his too enthusiastic and not over-critical imagination to work upon portions of two ditches, neither of them connected with the Avenue or with each other, which here run parallel for a short distance ... one of these ditches is certainly, and the other probably, of much later date than the Avenue itself.
>
> (1979, 67)

The archive from these excavations is unfortunately incomplete, and does not allow us to assess on what basis, artefactual or stratigraphic, or a combination of the two, Atkinson based his conclusion. However, his general conclusion that the northern branch has no real existence is supported by a geophysical survey carried out at the western bend by the Ancient Monuments Laboratory in 1990. The plot of the results (Figs 264 and 265) shows both the Avenue ditches and the Palisade/'Gate' ditches clearly, with no other obvious linear features of archaeological origin in the area.

## Finds

Seven of the excavations of the Avenue produced finds (Table 24). Details of the location of the finds within each cutting are in archive. The most striking feature is the general paucity of finds from the Avenue. This was noted by Hawley in his diary.

> Both trenches ... have contained nothing whatever hardly a piece of natural flint. Stone chips are found in the upper humus and pieces of hammerstone but the lower part is dirty chalk rubble evidently fallen and washed in from the surface of the Causeway. There is nothing whatever in this.
>
> (7/4/1923)

No obvious concentrations of artefacts are apparent and there is no unambiguous evidence for deliberate deposition. In C6 three antlers were found on the bottom of the northern Avenue ditch, two within 4ft (1.22m) of each other (wrongly attributed to both ditches in the excavation report; Hawley 1925, 23), an antler on the base of the southern Avenue ditch in C83, and a bovine pelvis from just above the floor of the southern ditch at the area of C86 (Fig 184). It is possible that these are evidence for deliberate deposition or alternatively that they were discarded with no motive other than rubbish disposal.

Pottery from the primary fills comprises an undiagnostic sherd from C87 and an earlier Neolithic sherd and two tiny fragments of possible ?Beaker pottery from C86. The secondary fills produced a single indeterminate prehistoric sherd and one later Neolithic or Early Bronze Age sherd from C86, two 'Roman' sherds from


*Fig 180 The Avenue, C83, Vatchers 1968: ditch sections*

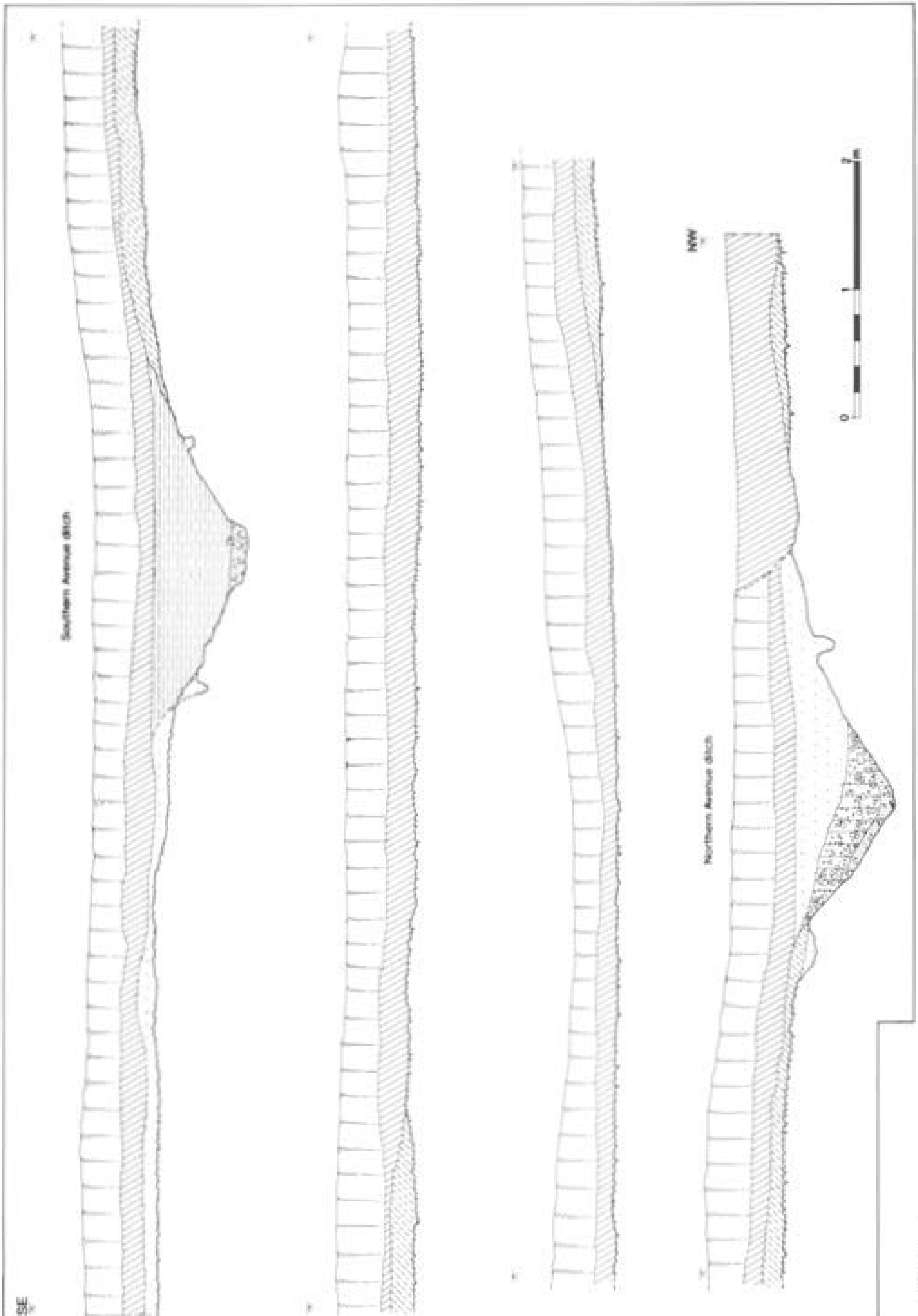



*Fig 180 (cont)*

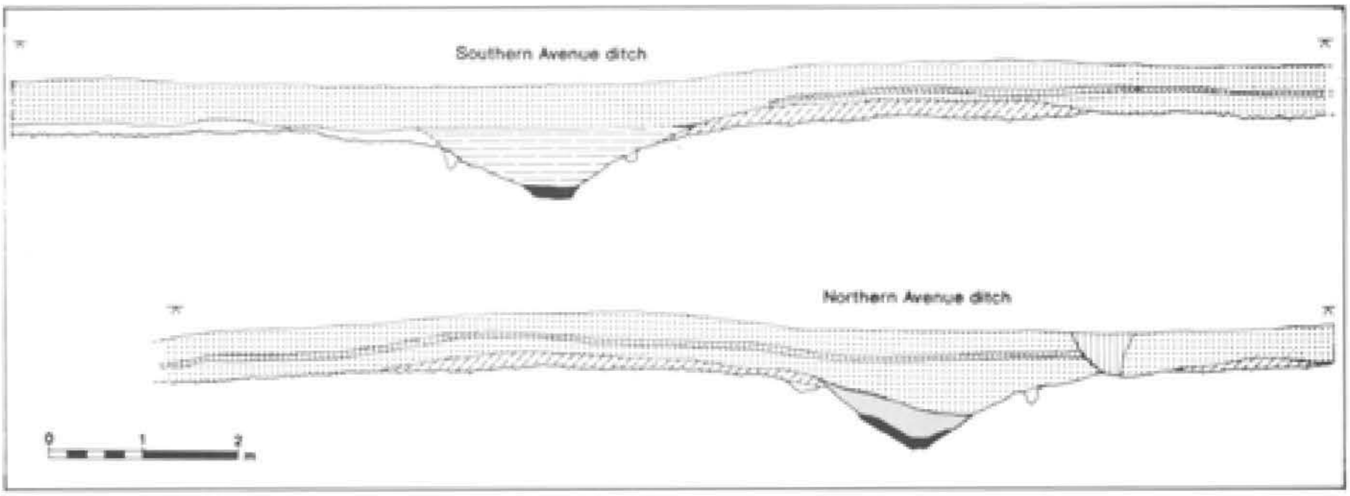



*Fig 180 The Avenue, C83, Vatchers 1968: ditch sections*

This north-east facing section is oblique. An interpretative version of this section drawing, reversed for comparative purposes, was published by Pitts in 1982 (fig 12).

***Field section***
A 2ft (0.6m) length of the field section was not drawn; the missing area occurred where the section was split on the page. The assumed layer boundaries have been dotted in at this point. The 'bank material' overlies weathered chalk.

***Rationalised and schematic sections***
It is suggested that the southern Avenue ditch was recut. The profile is markedly different from that of the northern Avenue ditch; it is much rounder in profile, with the sides at a shallower angle, and the sequence of deposits is quite different. The northern ditch contains a straightforward primary–secondary–tertiary sequence.

Although the posited tertiary fill of the northern Avenue ditch is not described on the section drawing, the general sequence compares well with that of the segment of the northern ditch excavated by Hawley in C6. However, in the southern ditch there appears to be a remnant of primary fill, truncated by the recut, which is in turn completely filled with an undescribed deposit. It is possible that the thin undescribed layer on the north-western edge of the southern ditch is a remnant of the original secondary fill of the ditch, but as this is uncertain it has been interpreted here as part of the recut. The antler submitted for radiocarbon determination (HAR-2013) was recovered from the truncated primary chalk silt.

Bank material is shown on the field drawing on the outer and inner sides of both ditches, although that on the south-eastern side of the southern Avenue ditch is not shown as a discrete layer and is annotated 'weathered and bank', whereas the other three are discrete and are variously labelled 'bank material', 'bank', and 'chalk bank'. Accordingly, the three discrete areas labelled 'bank' have been interpreted as bank shadows (*see text*). The 'weathered and bank' layer has not been interpreted in this way as it was not a discrete layer and because the excavator noted a weathered content in it, unlike the other three.

C91, and a Romano-British sherd from C36. The tertiary fills produced sherds ranging in date from later Neolithic–Early Bronze Age to post-medieval.

It is also notable, though hardly surprising, that fragments of bluestone are present in the ditch fills only near the Stonehenge terminal. The distribution of the bluestone within the Avenue ditch fills shows that they occur no earlier than the secondary fills, whereas one piece of sarsen occurs in the primary fill in C83 and is recorded on the original section drawing (Fig 180).

> Bluestone fragments were also retrieved from the topsoil at C48, C91, and C6. In addition, Crawford picked up a piece of bluestone during a walkover of the area where the Avenue passes through the Old and New King Barrows, prior to his excavation of the Avenue.
>
> (Crawford 1923a, 11)

## Chronology and dating

### Stratigraphic evidence

The Avenue bank overlies the Heelstone Ditch. This relationship was observed by both Hawley (C6) and Atkinson *et al* (C36). The Heelstone Ditch contained bluestone, thus providing a *terminus post quem* for the construction of the Avenue. The 'Oblique' ditch is stated by Atkinson to post-date the Avenue (Atkinson 1979, 67) although it is uncertain whether the basis for this statement was stratigraphic or artefactual evidence, or a combination of both.

### Artefactual evidence

As stated above, only a small number of datable finds was recovered from the primary fills of the Avenue ditches including one possibly Early Neolithic sherd and two of possible Beaker date (all from C86). It is possible

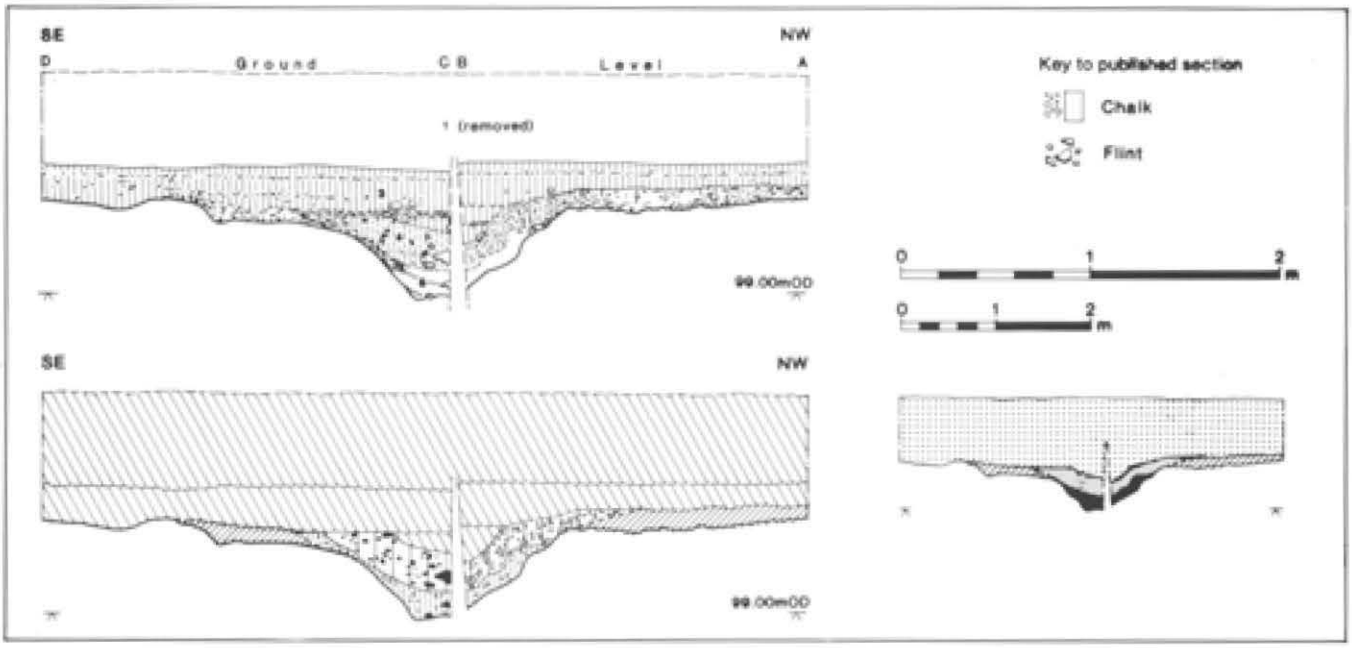



*Fig 181 The Avenue, C91, Pitts 1979/80: ditch sections*

This section is published here reversed.

***Published section***

The southern ditch section is stepped to allow a section at right-angles to the alignment of the ditch. The northern Avenue ditch section was not published as it was badly disturbed. Pitts also noted that 'a distinct rise in the chalk was noted in the area of the missing banks ... but it was clear that the banks themselves had been totally destroyed' (Pitts 1982, 94). Pitts comments that the section recorded through the southern ditch showed 'a clear stratigraphic pattern of primary, secondary and tertiary fills' . The overlying layer 1 is described as 'soil ... (which) contains material thrown up from recent service trenches and roadwork activities'.

***Rationalised and schematic sections***

The original field drawings and the excavation day-book were consulted in the preparation of these sections. Interpretation of the field and publication drawings was complicated by the fact that new layer numbers were issued for the publication text and section drawings and it was not always possible to correlate these with the original numbers used in the field.

In Pitts's published section of the southern Avenue ditch and Gulley A (*sic*), the layer to the north-west and south-east of the ditch is labelled 'layer 7', which is described elsewhere by Pitts as being the upper secondary fill of the Heelstone ditch (1982, 89, fig 5), characterised by the presence of many unworked flint fragments (*ibid*, 90). On the published section layer 7 is not keyed as a flinty layer and a reading of Pitts's published description of this area, combined with the section drawing and the post-excavation plan, suggests that this layer is likely to be the fill of Gulley A. In the day-book this layer, on the north-west side of the ditch, is suggested to be the fill of F2 (ie Gulley A; entry for 1/6/1979), as is the layer on the south-east side (field section 9, drawn 5/6/1979).

In both the field and the published section the relationship between the material on the outside of the ditch (the fill of Gulley A) and the ditch fill is uncertain. However, Pitts comments 'it was felt at the time of excavation that the gulley was ... bisected by the eastern (ie southern) Avenue ditch. In neither case, however, was the situation clear'. In the field drawings layer 4 on the south-eastern side is labelled as 'mid brown/slightly yellow soil with many small flint fragments, and occasional large natural nodules', whereas in the north-western area it also contains chalk fragments, hence the difference in the nature of the fills in the rationalised drawings.

The schematic drawing shows a clear sequence of primary–secondary–tertiary fills in the ditch which agrees with Pitts's interpretation. Pitts noted that the upper part of layer 4, the secondary fill of the ditch, was a buried soil.

that the earlier Neolithic sherd is redeposited. The later fills contain very small quantities of later Neolithic to modern material. A total of 106 flint flakes from the tertiary fill 55E (3) in C87 are Late Neolithic–Early Bronze Age in date (*Harding, Chapter 9*). Some of these flakes refit, suggesting dumped knapping debris, and they probably do not pre-date the final infilling of the ditch in this area of the Avenue by any great length of time. As discussed above, they suggest strongly that any recutting of the ditches in this area occurred as maintenance during the main period of use of the monument and not as a feature of later landuse.

### Evidence from the ditch fills

Although each excavator described the results of his/her work on the Avenue in slightly different terms and the various section drawings are inevitably not identical, the rationalised sections presented alongside the field drawings show that the ditch fills were more or less consistent in all the excavations. The only exceptions of any note are those of C87, at the Avon end, where the ditches were cut through varying subsoils. Despite the very small proportion of the monument that has been examined archaeologically there seems to be no evidence for repeated episodes of maintenance or substantial modification to the ditches or banks which with very few, probably localised, exceptions, seem to have been allowed to silt naturally. Nor is there much evidence of 'activity' within the ditches, of the sort that is so clearly apparent in the Ditch at Stonehenge itself. The Avenue ditches, and the interior where examined, are remarkably clean by comparision (*see discussion, below*).

Overall, the evidence suggests that the Avenue was constructed and used in one main phase of activity, within and presumably as part of phase 3 of Stonehenge itself. There is no obvious indication from the excavations either that the Avenue was built in episodes over a long period of time, or that it was realigned and extended from the western bend after an initial period of use. There is no clear archaeological evidence for a northern extension from the elbow.

### Radiocarbon dating: existing radiocarbon dates and their use

In the early editions of *Stonehenge* the Avenue is dated to Atkinson's period II on the basis of the apparent relationship between the Stonehenge terminal and the backfilling of the main Ditch to widen the entranceway 'in order to bring the width of the earthwork into line with the width of the Avenue' (1956, 63), and the stratigraphic position of sarsen mauls in the Ditch in relation to that backfilling, which showed that the building of the Avenue had to have taken place before period III. Atkinson concluded that the Avenue was contemporary with his double Bluestone circle, constructed as a processional way for the Bluestones to be hauled from the river Avon to the site, and thus he saw no difficulty in attributing the full extent of the Avenue to this period:

> ... the final stretch should be aligned on the intended axis of the monument. However, the axis points well away from the landing-place on the river bank, so that the Avenue had to be laid out in more than one alignment, so that eventually it joined the river to Stonehenge without too many abrupt changes of direction, and without forcing the hauling-parties to negotiate unnecessary steep slopes.
>
> (1956, 66)

The two-stage development of the Avenue proposed in the 1979 revision was largely based on four radiocarbon dates. In this later version period II (dated on Atkinson's own calibration of his dates to '2100–2000 BC'), the straight section outwards from Stonehenge, was constructed first and the rest of the Avenue was added in Atkinson's period IV ('1100 BC'), the final event in the construction and modification of Stonehenge.

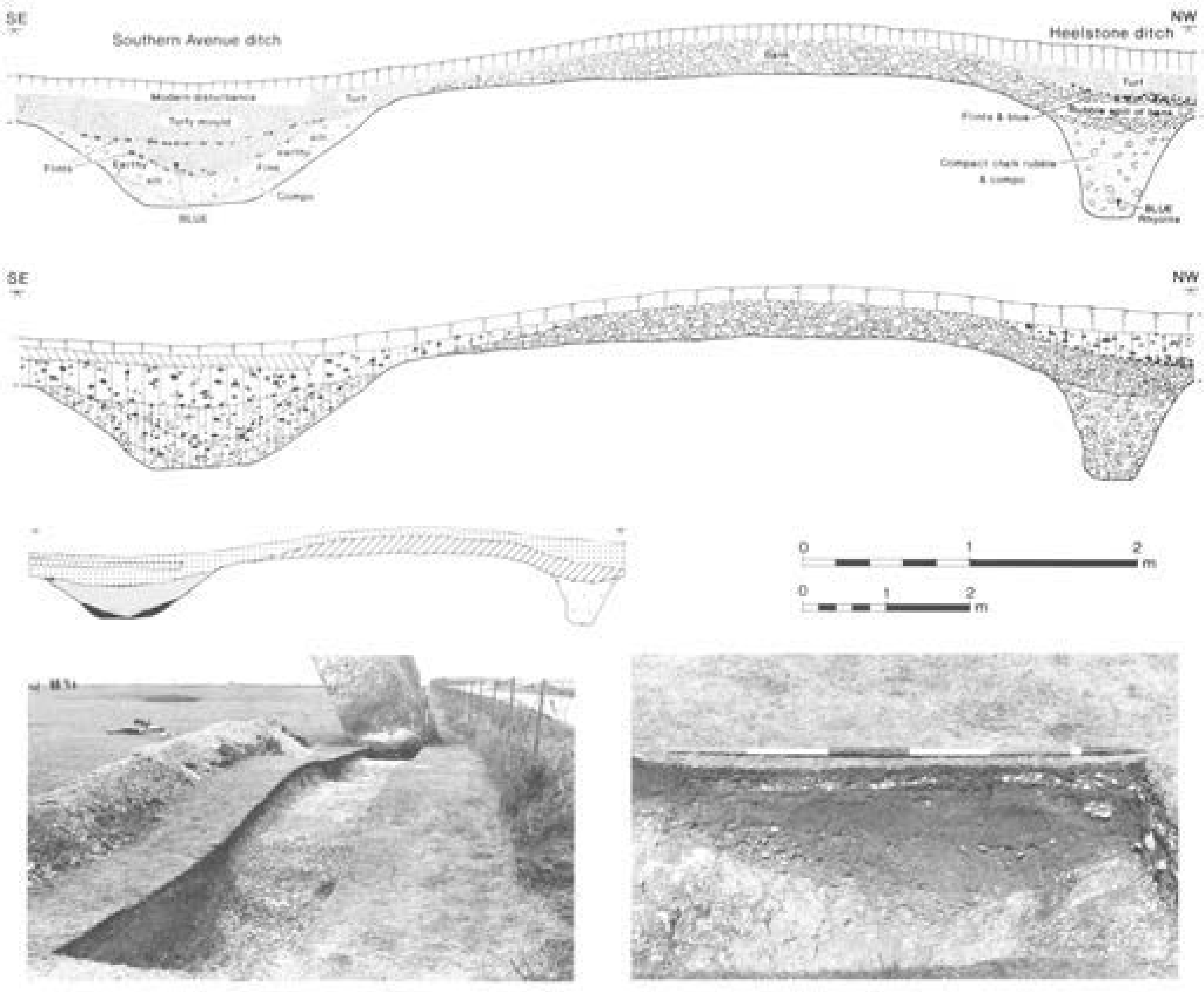
> The radiocarbon dates for the Avenue suggest that it is of two periods of construction, the first straight stretch from Stonehenge being built in period II, as far as the nearer margin of Stonehenge Bottom, about a third of a mile from its beginning outside the entrance of the surrounding earthwork. The remainder, from Stonehenge Bottom to West Amesbury, seems to have been added much later, about 1100 B.C. This implies that after the final rearrangement of the bluestones in period IIIc the use of Stonehenge continued for at least five centuries and perhaps more. The latest period of use, from 1100 B.C. onwards, must thus be defined as period IV.
>
> (Atkinson 1979, 214–5)

However, Atkinson had already considered the possibility of a two stage construction when he wrote, in 1953, of his intentions for that season's excavations at the western bend

> to cut sections longitudinally through one ditch of the Avenue at the first bend N.E. of Stonehenge, to determine if possible whether the whole thing was dug originally in one go, or whether the last stretch leading up to Stonehenge is a later addition
>
> (letter from R J C Atkinson to R S Newall, 8/6/1953).

The only records that remain in the excavation archive are a post-excavation plan and some rather inconclusive photographs, and there is no comment in *Stonehenge* to indicate whether this objective was achieved. It is uncertain whether any changes in the construction or silting of the ditches were distinguished especially since the trenches excavated at the elbow covered such a small area that it would have been difficult to detect such changes.

Of the four radiocarbon dates available to Atkinson, two came from excavations towards the Avon end of the Avenue (BM–1079, 3020±180 BP, from C87, George Smith's excavation in West Amesbury; I–3216, 2750±100 BP, from C86, the Vatchers' excavation at the site of the present-day A303), and two from close to the Stonehenge terminal (HAR–2013, 3720±70 BP, from C83, the Vatchers' excavation of an electricity cable trench, and BM–1164, 3678±68 BP, from C6, Hawley's




Southern Avenue ditch with Heelstone ditch beyond (P51529)

(P51531)

*Fig 182 The Avenue, C36, Atkinson et al 1953: ditch sections*

***Publication section***

A photocopy of two segments of the original field drawing exists but the bank area is missing. The publication section is reproduced here as it provides the complete profile. This version of the section has obviously been rationalised, with a few extra details added. In drawing up the publication version for this report primacy has been accorded to the field drawing where possible. (Following the death of Professor Atkinson the original field drawing was discovered in his personal archive.)

This north-east facing section is at a slightly oblique angle to the alignment of the ditch and shows a symmetrical ditch fill. There is no face-on photograph of this section and the existing oblique views are not particularly informative. There are face-on photographs of the south-west facing section, 4ft (1.2m) distant. A post-excavation plan also exists.

***Rationalised and schematic sections***

The rationalised section is based partly on the field drawings (where layers are described), partly on the publication section, and partly on the oblique photograph. The primary fill is derived from both sides of the ditch. It is assumed that the lower part of the 'turfy mould' is in fact the upper secondary fill, marked by a thin flinty layer. The sequence illustrated is a straightforward primary–secondary–tertiary one. The bank material is not annotated in the publication section but from the convention used it seems to have consisted of a chalky rubble ('rubble of bank' on recently discovered field drawing).

***Interpretation based on the photograph***

Contrasting strongly with the illustration of the north-east-facing section, the photograph of the south-west-facing section shows a markedly asymmetrical fill, with the primary fill derived mainly from the north-western (inner bank) side of the ditch. At the top of the secondary fill is a layer of ?flints.

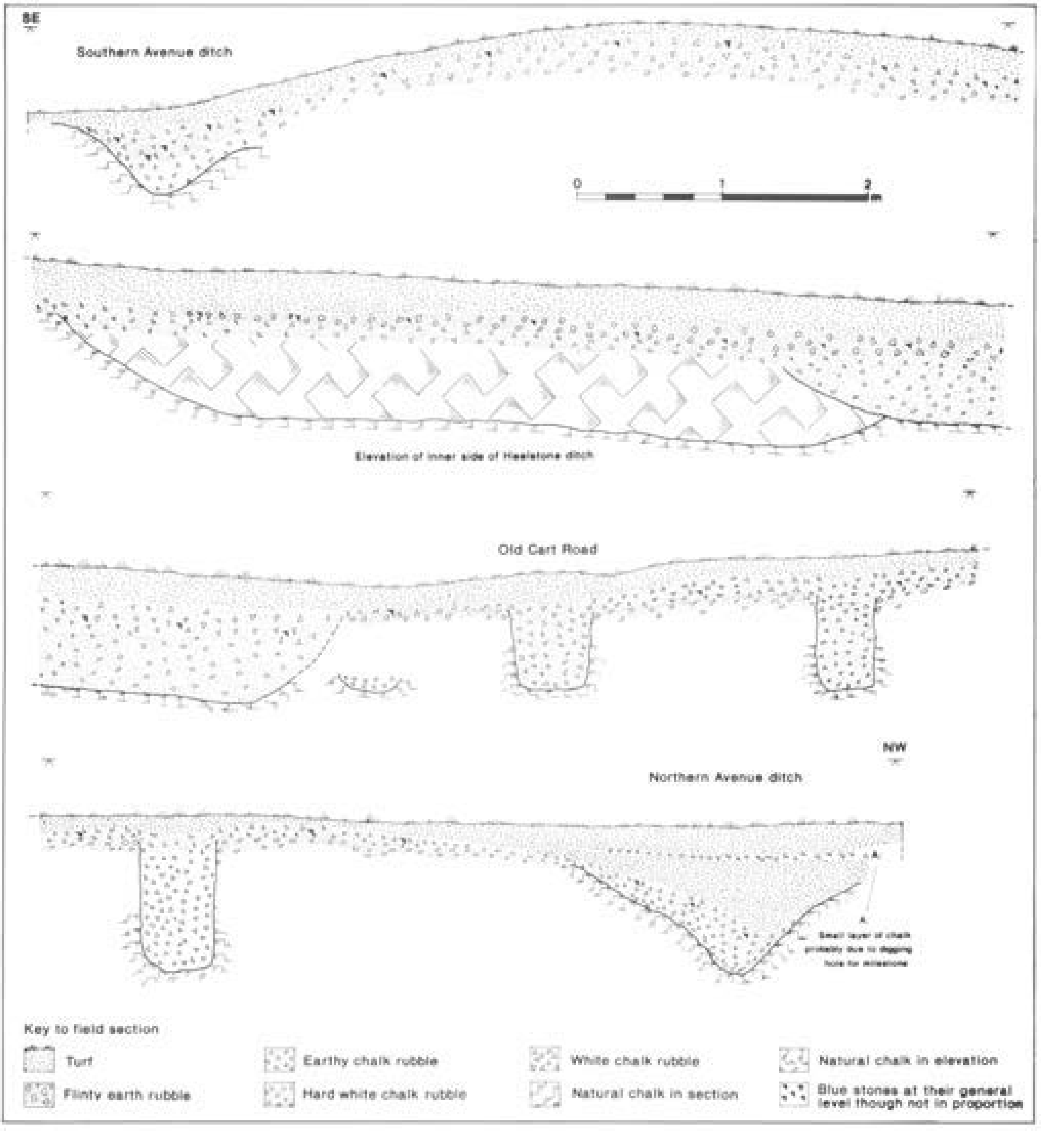
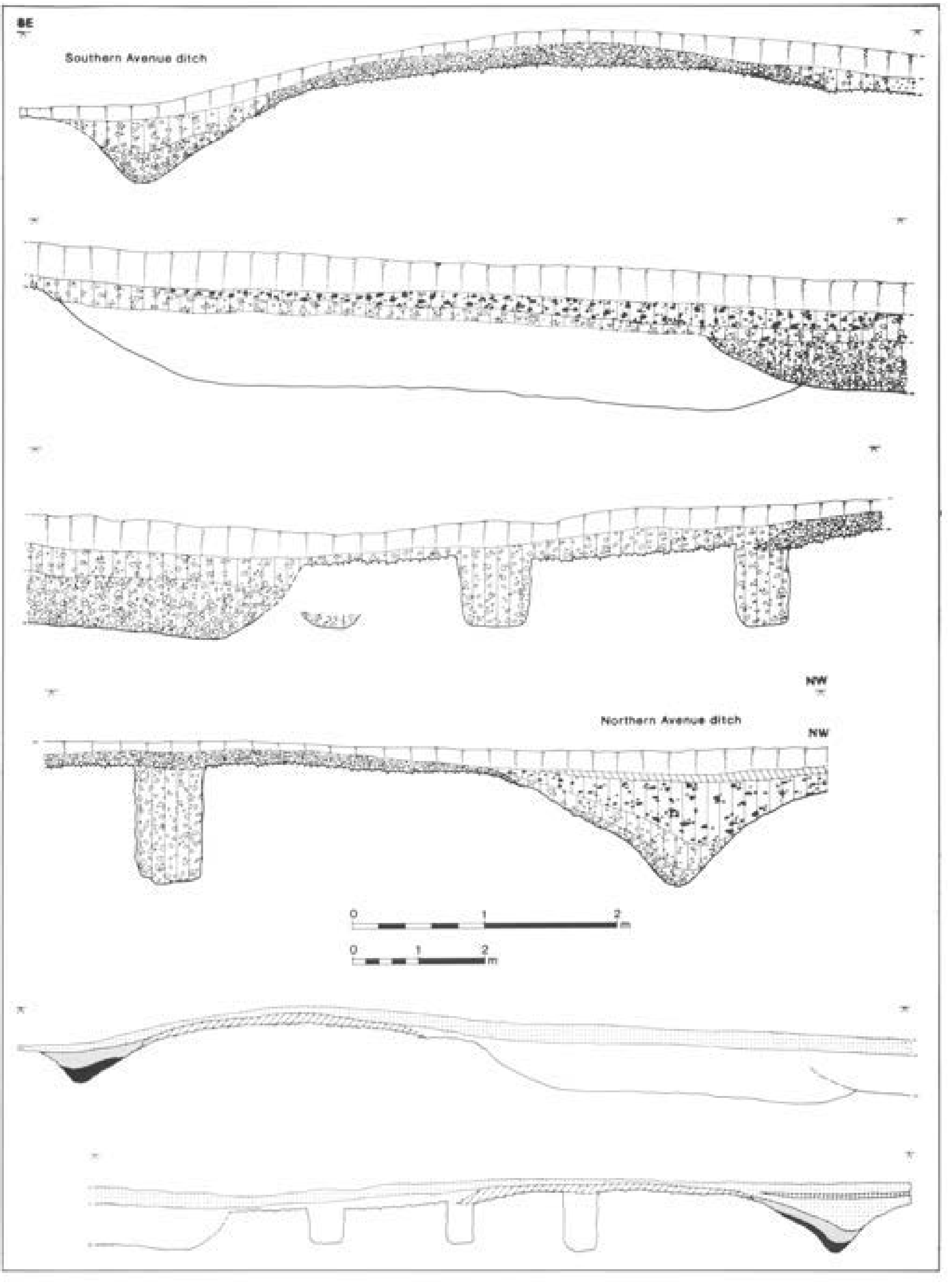



*Fig 183 The Avenue, C6, Hawley 1923: ditch sections*



SE
Southern Avenue ditch
NW
Northern Avenue ditch
NW
0
1
2
m
0
1
2
m


*Fig 183 (cont)*

excavation). Two of these dates (BM–1079 and I–3216) have now been rejected on technical grounds (*see Appendix 2*) and two new dates have been obtained. However, because there has been much discussion over the chronology of the Avenue in the past, the 'old' dates will be considered in detail before discussing the new ones, so that their implications for interpretation at the time they were obtained can be fully understood. Full consideration of the dates together with the reasons for their acceptance or rejection can be found in Appendix 2 where all the dates are listed.

Between 1967 and 1976 four radiocarbon determination samples from material from the Avenue ditches were submitted for assessment. These are briefly listed below followed by a discussion of the rationale behind, their submissions. It should be noted here (*see also Appendix 2*) that the 'calibrated' date ranges are those cited by Atkinson and it is not certain how he calibrated these dates.

**Zone A, eastern (river Avon) end, C87. BM–1079:** In 1973 or 1974 George Smith submitted a piece of antler with two tines from layer 55C (5) (not from 55D (5) as stated in Smith 1973, 48) to the British Museum for radiocarbon analysis (Smith 1973, 50; Burleigh and Hewson 1979, 341). The resulting determination was 3020±180 BP ('1690–820 BC').

**Zone C, eastern area, C86. I–3216:** In the summer of 1967 the Vatchers excavated a stretch of both Avenue ditches, prior to the construction of the A303. Later that year they submitted three separate items to Isotopes Incorporated of New Jersey, USA, as a bulked sample: 'It is hoped that items 1–3 will provide sufficient carbon for the test and that a date can be obtained satisfactorily from these three bones only' (submission letter from the Vatchers to Isotopes Inc, no date).

The three bones comprised:

> an ox scapula ... complete ... [from the] primary silt of ditch and leaning against the side of ditch remains of an ox scapula ... [from the] primary silt of ditch near bottom of ditch and an antler tine ... [from the] primary silt of ditch near bottom of ditch.

and another note states that the antler and one of the scapulae come from the 'east' ditch (here, the northern ditch), the other from the 'west' (southern) ditch (Vatcher, archive). A later article states that: 'the specimens submitted were an antler tine and two bovine scapulae, found in the primary chalk silt of both ditches' (Atkinson *et al* 1976, 240). Using the photographic archive, the post-excavation plan, and notes on the original finds bags it has proved possible to identify the location of these samples within the excavation area (Plan 4, Zone C). The determination obtained was 2750±100 BP ('1250–790 BC').

**Zone G, Stonehenge terminal, C83. HAR–2013, 3720±70 BP, 2350–1930 cal BC:** This sample, an antler, was recovered from the southern Avenue ditch during the 1968 excavation. It was submitted for dating to the laboratories at Harwell in November 1976 and the submission note states that the antler, with the Vatchers' reference STAV 1968, was excavated from 'near the base of ditch'. It is shown on the section drawing within the primary fill (Fig 180). It is perhaps worth noting the proximity of the antler to the posited recut of the southern ditch at this point (*see above*).

**Zone G, Stonehenge terminal C6. BM–1164, 3678±68 BP, 2290–1890 cal BC:** The antler submitted to the Research Laboratory at the British Museum for sampling in 1974 came from Colonel Hawley's excavation (C6) in 1923. It bore the catalogue number 4765, and was excavated from the northern Avenue ditch. The relevant diary entry for 25/3/1923 reads: 'Dug out the N.W. trench of Avenue on edge of Causeway as far as the end of the 20 feet cut getting a section of it there. 4675: Came upon another Pick 12 feet [3.7m] from beginning end' and the antler is also listed amongst the finds for that day: '4765: Pick in N.W.

*Fig 183 (opposite)*

This section is published here reversed.

***Field section***

This section is at a slightly oblique angle. It shows the Heelstone ditch elevation after excavation and a later feature cutting the Heelstone ditch to the north-west. It also shows four postholes. In this section bluestone pieces are shown in the upper part of the 'earthy chalk rubble', interpreted as a secondary fill (note that these are not shown, as stated by Smith, 'in the upper part of the 'yellow chalk rubble' of the primary silts' (Smith 1973, 54)). Hawley describes how 'the upper layer above [the Avenue ditches] contained Roman period pottery and masons' chips, the latter reaching farther down and ending upon pasty chalk mud or silt about 12 in. thick, upon the bottom ... the layer of silt in the ditches was a thick one and contained no masons' chips' (Hawley 1925, 23).

***Rationalised and schematic sections***

The two postholes shown to the south-east of the northern Avenue ditch were observed by Hawley to pre-date the Avenue as 'the Avenue bank passed over the first and partly over the second, showing existence previous to the Avenue' (Hawley 1925, 24). This relationship is not clearly shown on the section drawing and so has been added on the rationalised and schematic sections. Similarly, the extent of the southern bank is unclear and has been estimated. In the schematic section the four postholes, the Heelstone ditch, and the later feature cutting the Heelstone ditch have all been left blank, as they are discussed in detail elsewhere in this report (*Chapter 7*). It is assumed that what is keyed as hard white chalk rubble in the bank areas on the field section is, in fact, weathered and rotted chalk natural as it is cut by the postholes.

*Fig 184 The Avenue: oblique shot of the Avenue and Heelstone ditch during excavation of the first part of C6 in 1923. Note the three postholes on the left-hand side of the trench.* © *Society of Antiquaries of London*

trench 12 feet from end. 1'9" B.G.L. (bottom)'. In both cases the catalogue number has been added to the transcript of the diary by R S Newall.

Of these four radiocarbon dates, the first to be submitted, in 1967, was that from C86. This was a bulked sample (I-3216, *see Plan 4, Zone C*) of two bovid scapulae and one antler from the primary fills of *both* Avenue ditches, even at that time a questionable mixing of material from different contexts, and unsurprisingly it produced a date which

> was much more recent than expected and so was rejected as due to contamination (Mrs L Vatcher, personal communication).
>
> (Smith, 1973, 46)

and

> was then and probably still is 'archaeologically unacceptable' in Stuart's [Piggott] immortal phrase, and has in consequence never been published.
>
> (letter from Atkinson to Hugh Shortt, Curator of Salisbury Museum, 9/6/1974)

In a note published in *Antiquity*, the bulked nature of the sample had been made explicit: 'The specimens submitted were an antler tine and two bovine scapulae, found in the primary chalk silt of both ditches' (Atkinson *et al* 1976, 240). One of the cattle scapulae submitted (Fig 240) lay 185mm above an ox pelvis which lay just above the floor of the southern ditch. It is intriguing that the scapula was selected in preference to the pelvis which was more securely from a primary context (Fig 185).

The next sample to be submitted was from George Smith's excavation (C87) at the Avon end of the Avenue, in 1973 or early 1974. It was doubted at the time whether this antler, from primary fill, would provide a good sample

> Smith ... has written to me to say that the radiocarbon date from antler from his own dig will almost certainly be a failure, owing to the small size of his sample.
>
> (letter from Atkinson to Hugh Shortt, 9/6/1974)

> George Smith's sample ... was rather a poor specimen and yielded little collagen and I think may have been contaminated by humic material to some extent though we have, of course, tried to remove this. The sample is being measured now but I am not hopeful about getting a good date.
>
> (letter from Richard Burleigh to Atkinson, 20/6/1974)

> In the summer of 1974 Mr George Smith .... wrote to one of us (RJCA) that the antler fragments from (the) excavation were almost certainly insufficient to provide a reliable radiocarbon date.
>
> (Atkinson *et al* 1976, 239)

In the light of the suspect date from the C86 sample (I–3216) and the expected failure of the C87 one, Atkinson wrote to Hugh Shortt on 9 June 1974 proposing that an antler from Hawley's excavation of the Avenue (C6) should be submitted and a selection of antlers from this excavation was sent to Richard Burleigh at the British Museum Research laboratory by Hugh Shortt on 8 July 1974. Nearly two years later, on 14 April 1976, Atkinson was informed of the new date for one of the C6 antlers (BM–1164). Four months later Atkinson heard the results of George Smith's C87 date (BM–1079):

> I have just heard from George Smith ... that he has had a radiocarbon date from the BM laboratory for his antler fragments of 1070±180 b.c. When corrected, this is about 1345 B.C. This is wildly different from the date of 1728±68 b.c. (about 2130 B.C.) which the BM gave recently for one of Hawley's antlers from the bottom of the Avenue ditch near the Heel Stone. It is closer to the date of 800±100 b.c. (about 975 B.C.) which the Vatchers got from their dig ... Up to now I had assumed that the Vatcher's date was a rogue one, to be disregarded; but now I am far from sure. It is beginning to look as if the Avenue may be of more than one date of construction .... Lance Vatcher tells me that he has another antler, found on the bottom of the Avenue ditch where it was cut through by a pipe-trench somewhere near the King Barrows. I am urging him to get this radiocarbon dated as well.
>
> (letter from Atkinson to R S Newall, 30/8/1976)

This antler, from the SEB cable trench excavation (C83), was submitted to the laboratory at Harwell in November 1976. An erroneous preliminary date was first released:

> The preliminary radiocarbon date of [the] antler specimen ... is HAR–2013 2990±90 b.p. = 1040±90 b.c. This is subject to the usual month or six week check, and cannot be regarded as absolutely final till then; but it is most unlikely that it will alter appreciably ... We now have a very odd situation, with four dates from the Avenue, three of which are consistent with each other, but none of them consistent with the fourth, though the latter is consistent with the two dates we have for the Stonehenge II/IIIa transition, as follows:

| | | Radiocarbon date | Corrected date |
|---|---|---|---|
| 1 | I–3216 | 800±100 b.c. | 975±115 B.C |
| 2 | HAR–2013 | 1040±90 b.c. | 1310±110 B.C. |
| 3 | BM–1079 | 1070±180 b.c. | 1335±190 B.C. |
| Best combined estimate (1, 2, 3) | | | 1180±75 B.C. |
| 4 | BM–1164 | 1728±68 b.c. | 2135±110B.C. |
| 5 | BM–46 | 1720±150 b.c. | 2120±160 B.C. |
| 6 | I–2384 | 1620±110 b.c. | 2000±125 B.C. |
| Best combined estimate (5, 6) | | | 2145±100 B.C. |
| Best combined estimate 4, 5, 6) | | | 2085±75 B.C. |

> At the moment I can see only one way to explain all this, as follows. At or close to the date of construction of the double circle of bluestones of period II, the first straight stretch of the Avenue, from Stonehenge to Stonehenge Bottom, was built. Much later, and after the final arrangement of the bluestones in their present form in period IIIc, the Avenue was extended from Stonehenge Bottom to West Amesbury. By this time the original part of the Avenue would have been much eroded and silted, and was accordingly re-cut, by digging accumulated silt out of the ditch and throwing it on the bank, to give a uniform appearance throughout. At the end of this re-cutting the antler picks used were discarded; but in places not all the silt was removed, and some (or at least one) of the antler picks discarded during the initial construction remained in situ (ie no. 4 in the list).
>
> This is a distinctly shaky story, and needs to be tested as far as the available evidence allows. Two things seem to be desirable. First, a comparison ought to be made of all the available sections of the Avenue ditches, to see if there is any evidence that some show more weathering than others, because of different (hypothetical) dates of construction ... Secondly, it seems to me that we now need to have at least one additional radiocarbon date from the antlers excavated by Hawley from the Avenue W. ditch between its beginning and the road.
>
> (letter from Atkinson to the Vatchers, 27/1/1978)

In Atkinson's opinion, the best antler to be submitted from Hawley's C6 excavation was cat no 4763 (letter from Atkinson to Peter Saunders, Curator of Salisbury Museum after Hugh Shortt's death, 10/2/1978). In early March 1978 the corrected date for HAR-2013 was released:

> We have now heard from Harwell that the previous date given us was incorrect and the revised date is so close to what one had expected, that there is now no longer a need to carbonize a third antler to decide the issue.
>
> (letter from Peter Saunders to Carole Keepax, 8/3/1978)

As the result from the C83 antler (HAR-2013, 3720±70 BP) was so close to that of the C6 antler (BM-1164, 3678±68 BP), it was decided not to submit any further radiocarbon samples.

Commenting on the proposed entry in *Radiocarbon* for the sample from C87 (BM-1079, 3020±180 BP), Atkinson wrote:

> ... this date is much later than expected only if it is assumed that the Stonehenge Avenue is of a single period of construction. If this date is taken together with I-3216, 2750±100, there is a case for supposing that the Avenue is of two periods of construction. If there is no evidence for contamination other than the apparent lateness of this date, I suggest that it be taken at its face value.
>
> (letter to Richard Burleigh, 30/9/1978)

In summary, despite his diligence in obtaining as many radiocarbon dates for the Avenue as possible as well as in urging a comparison of the excavated sections of the Avenue ditches and retaining samples for future radiocarbon determination, it can be seen that Atkinson was aware of some of the shortcomings of both the Vatchers' C86 sample (I-3216) and Smith's C87 sample (BM-1079) and yet accepted them in proposing his two-part development of the Avenue.

In addition, it is interesting that the preliminary, erroneous, date for HAR-2013 (the antler from the Vatchers' C83 excavation), which was not what was expected, was to be tested by a further submission of antler from the Avenue at the Stonehenge end, although it agreed well with the two other above-mentioned late dates for the Avenue. When the correct date for HAR-2013, which was an earlier date and conformed with expectations, was released, it was decided that no further dates were needed, as the tally was then two early dates for the Stonehenge end and two late dates for the Avon end. One wonders whether this was an example of archaeological testing of the data coming to a halt as soon as a result was obtained which agreed with the prevalent theory. Admittedly very few antlers from the Avenue excavations were suitable for submission and the importance of retaining samples for future testing is stated several times in the correspondence.

On purely archaeological grounds, it can be seen from the above survey of the provenances of the material selected for dating and the doubts expressed at the time, that both the dates for the eastern end of the Avenue must be considered unreliable, despite their chronological overlap. Why Atkinson based the dating of his period IV on these dates, even though he had acknowledged the problems associated with them (quoted above), is not clear, since he obviously also understood the problems in radiocarbon as well as archaeological terms. Whatever the reason, accept them he did, and the two-stage construction for the Avenue was committed to print in Appendix II of the 1979 edition of *Stonehenge*. These dates are further discussed in radiocarbon terms in Appendix 2, below.

A two-stage development makes little sense if the Avenue was constructed as a processional way marking the route of the Bluestones from the Avon. It seems very odd that the major part of the Avenue leading from the river Avon towards the monument should, according the Atkinson's chronology, be constructed many hundred years after the first arrival of the Bluestones. It is possible, of course, that the route from Stonehenge Bottom to the river Avon was marked in some other way though there is no evidence of this from any of the excavations, and this would require either that the Avenue continued in use for centuries or that the symbolic import of the route remained ingrained in the folk memory of the people for many generations. The archaeological evidence, most of which was available to Atkinson in 1979, suggests otherwise.

In RCHM(E) 1979 (11) a further argument for the two-fold division of the construction of the Avenue is presented, this time supported by the relationship of the Avenue to round barrows Amesbury 100 and 131 (Plan 3), which would pre-date the Avenue if the radiocarbon dates from the eastern end were accepted. The 'distinct change or kink in its alignment' (*ibid*, 11 and pls 8 and 9) is taken as suggesting that the barrows 'might well have been in existence when this part of the Avenue was built'.

It is arguable whether the change in the alignment of the Avenue at this point can be described as 'distinct'. On the RCHM(E) transcription of aerial photographic evidence the change in alignment appears as a gentle curve over some 400m between two straighter stretches of the Avenue (Plan 3). It is true that the end of one of these straight stretches occurs more or less at the group of barrows in question. However, it could also be argued that the 'kink' came first, as the Avenue would have had to bend somewhere along its course to get from the Avon to Stonehenge, and that the later barrows then respected the line of the Avenue.

*Fig 185 Ox pelvis on the base of the southern Avenue ditch in C86, 1967, submitted for radiocarbon dating in 1994 (Vatcher archive, print no 3/34)*

**Radiocarbon dating: new dates and their implications**

It was decided to submit further samples for radiocarbon dating in order to help resolve these problems. The question to be asked was whether the construction of the entire Avenue could be considered as one event, albeit of possibly lengthy duration, or whether there were good grounds for considering the Stonehenge section to be earlier than most of the length of the monument. As with all other samples from Stonehenge, the material selected from the Avenue was subjected before submission to rigorous scrutiny in terms of suitability for dating and security of context (*see Appendix 2*). In the event, only two further samples were submitted to the Oxford Accelerator.

At the same time as the new samples were being processed, attempts were made to obtain more information on the laboratory preparation and handling of the previous samples in order to assess the validity, on radiocarbon and statistical grounds, of the existing dates. The results of these inquiries are presented in Appendix 2.

**Zone C, eastern area, C86. OxA–4905, 3865±40 BP, 2290–1890 cal BC:** A large bovine pelvis was recovered from the Vatchers' C86 (*see above*). It is well recorded, with photographs showing it resting on the base of the southern Avenue ditch (Fig 185) The post-excavation plan is annotated: 'Shoulder blade shovel at –0.75m over pelvis pusher –0.935m on base of ditch' (Plan 4, Zone C). Analysis of the pelvis by Dale Sarjeantson has shown that the Vatchers' interpretation of it as a tool is probably erroneous, as there are no traces of wear on any of the surfaces of the bone (archive).

**Zone G, Stonehenge terminal, C6. OxA–4884, 3935±50 BP, 2580–2300 cal BC:** An antler from Hawley's 1923 excavation of the Avenue ditches at the Stonehenge end of the Avenue (C6) was submitted for radiocarbon assessment in 1994. The antler (Hawley cat no 4763) was found on the bottom of the northern Avenue ditch, at a depth of 26in (0.7m) and at 8ft 4in (2.5m) from the terminal: 'There was a Staghorn pick at 8'4" [2.54m] from the end it was on the bottom and poor specimen at 26" B.G.L.' (22/3/1923). This was the antler chosen by Atkinson in 1978 as the most suitable for radiocarbon dating out of the surviving antlers but was not used at that time (*see above*).

M J Allen comments on the new dates: Two of the previous dates from the Avenue remain acceptable (BM–1164, 3678±68BP and HAR–2013, 3720±70BP). The two new dates were both from the primary fills. The results are inconclusive. Taken together they cover a period of between *190 and 630 years* and suggest that the Avenue was indeed constructed over a period of several hundred years. Analysis of the dates, however, shows that it is most likely (*c* 75%) that the first dated event comes from the Stonehenge terminal but that it is almost certain (98%) that the last dated event also comes from this zone. Given the span of the dates and the fact that there is only one from the entire length of the Avenue to the east of Stonehenge Bottom, it is very difficult to make any deductions about the order of construction. The radiocarbon evidence does suggest, however, that the Avenue was constructed during phase 3 and there is no evidence for a distinctly later period of construction (*see Appendix 2*).

## Form and function of the Avenue

*by Julie Gardiner*

The Avenue formed an integral part of the overall scheme at Stonehenge during phase 3. As such it finds a number of British parallels in the association of avenues with later Neolithic–Early Bronze Age monuments. A recent review by Burl (1993) lists a minimum of 28 avenues in Britain (excluding the unproved Beckhampton Avenue at Avebury), of which at least 24 are associated with henges, stone circles, and/or cromlechs (*sic*). What distinguishes the Stonehenge Avenue from virtually every other known example is the material used for its construction; it is a simple earthwork monument whereas nearly all the others listed by Burl consist of parallel rows of stones or, more rarely, wooden posts. Burl argues that the choice of material was largely a function of geography and geology; as with the megalithic tombs, the use of stone is largely confined to those areas where suitable rocks were easily available and other materials were used elsewhere. This is not an entirely satisfactory explanation and will be discussed in more detail below.

Whatever the method and materials of construction the Stonehenge Avenue can be regarded as one example of a tradition of monument which has a wide, if sparse, distribution in the British Isles, with a few outliers in

Brittany. Avenues occur from Broomend of Critchie in Aberdeenshire to several examples on Dartmoor though within that distribution there are a number of core areas, notably on Dartmoor (eight examples), in Wessex (five examples), and in Cumbria (five) (*ibid*, fig 7). Although a few locations have more than one avenue in close proximity, it is rare for these monuments to occur in tight clusters and where they do it is not clear that they are sited with any direct reference to one another.

Although avenues are broadly similar in design, consisting of roughly parallel rows of stones, posts, or earthen banks, or, in Aberdeenshire, stone causeways, there is no uniformity in their length, width, orientation, or topographical position (*see* Burl 1993, gazetteer for details). The shortest examples are little more than extensions to portal entrances of stone circles, as at Stanton Drew, Somerset, where two avenues arising from different stone circles are 33m and 50m in length.There is a possibility that these Avenues are now truncated from their original length but this cannot be determined on present evidence. Longer examples range from *c* 80m (Moor Divock, Westmorland) to *c* 2.8km (Stonehenge) though there is great variety between those extremes. The Stonehenge Avenue is the longest known example, followed by the West Kennet Avenue at Avebury. The only other examples known to extend for more than a kilometre are in Milfield Basin, Northumberland (1726m), and on Shap, Westmoreland (1200m). To some extent these extra long examples might be seen as forming a sub-group of avenues since they are all associated with monuments which are themselves complex in design and/or form part of a complex group or landscape of monuments. The width of avenues is also very variable, from as little as 2m to as much as 37m. Again, the long avenues above tend to be wider than most, but not exclusively so, and most vary considerably over their full lengths. The Stonehenge Avenue consists of fairly straight sections with wide gentle curves between them. As such it is rather more regularly laid out than most of the others, which tend towards a rather sinuous course. Indeed, Stukeley, and others after him, believed that the Avebury avenue(s) had been laid out 'as an image of the sacred snake' (*ibid*, 71).

The only other certain example of an earthen avenue is at Milfield Basin (Harding 1981). This apparently discontinuous monument lies at about 60m OD within a broadly D-shaped basin between the rivers Glen and Till (*ibid*, figs 1 and 2). The avenue, which has no clear terminal at either end, runs north-north-west from just south of the Marleyknowe henge (NT 943 323), diverting slightly to skirt the henge to its west, and follows an irregular course passing through the middle of the Coupland henge (ST 940 330) and out through its main, northern, entrance, proceeding past a third henge (Milfield south, ST 939 335), and eventually disappearing beneath cropmarks around the site of the Saxon palace at Melmin. A section across the avenue just north of the Coupland henge showed the ditches, which here were *c* 24m apart, to be irregularly cut, 0.80–1.30m wide at the top and *c* 0.60m wide at the bottom. They were very shallow, only 0.20–0.30m deep below the subsoil, with dark loamy fills showing little indication of the presence of bank material (*ibid*, 91–3); indeed there was no sign of any banks. No finds were recovered. A further section across the eastern ditch to the north of the Milfield South henge again showed it to be a very slight feature, 0.76m wide and *c* 0.31m deep below the subsoil (*ibid*, 101–2).

A possible earthen or even rock-cut avenue at Arbor Low, Derbyshire, was represented by a single bank extending from one side of the henge entrance. Rocks and earth had been apparently piled up to form the bank, which survived in 1902 to a height of *c* 0.45m (Burl 1993, 20 and gazetteer). Burl is not convinced by this feature.

There is no clear evidence that the Stonehenge Avenue ever had a stone setting. Both Inigo Jones and John Aubrey were of the opinion that such a setting had existed (Burl 1987, 77–8). It is possible that some of the stoneholes and postholes between the Heelstone and the main entranceway of Stonehenge itself (Hawley's C6) could have been related to the Avenue though there is no convincing evidence for any direct relationship and all the major features in this area are considered to pre-date the Avenue (*see Chapters 6 and 7 above*). In that respect we might consider them to consititute a precursor to the Avenue, but the sequence of features at the north-eastern entrance remains ambiguous. None of the excavations along the Avenue north of the Heelstone recovered any evidence to suggest that there was a stone setting. Geophysical survey of 225m of the Avenue was undertaken following suggestions by Pitts (David and Bartlett in Pitts 1982, 90–3) that there might have been a setting of paired stones at the Stonehenge terminal, north of the A344 (Fig 264). This revealed some small anomalies but without excavation there is again no clear indication that these represent stoneholes (*see Appendix I*).

The only radiocarbon dates available for any of the avenues are those from the Stonehenge Avenue discussed here. On the basis of dates obtained from other monuments directly associated with avenues and their assemblages, Burl suggests a date range of *c* 2600–2000 calendar years bc (note that Burl states that his use of dates is based on the 'approximate converted B.C. date' (*ibid*, xii)). Only a limited number of avenues have been subject to excavation; the West Kennet avenue produced Beaker pottery as did those at Callanish (Isle of Lewis) and Broomend of Critchie, and, of course, many of the henge monuments in their later or stone phases, including Stonehenge itself.

The interior of the Avenue has produced no evidence for contemporaneous features in any of the cuttings and both it and the ditches were remarkably clean of artefacts. This lack of 'litter' is certainly not a common feature of some classes of Neolithic monuments, where the debris in the ditches of both causewayed enclosures and henges has, in the past, led various authors to the unlikely suggestion that people were living in them. Nor was it a feature of the West Kennet Avenue, Avebury, one of few other avenues to have been systematically excavated. Here structured deposits including human and animal bone, flint arrowheads, and later Neolithic and Beaker pottery were placed in the stoneholes and at least one area within the Avenue produced large quantities of flint and pottery, together with a number of pits and postholes (Smith 1965, 211–4). Most of these contained Peterborough- or Grooved Ware-associated assemblages and probably therefore pre-date the stone setting of the Avenue itself. The cleanliness of the Stonehenge Avenue has more in common with cursus monuments, where excavations have generally produced few finds (*cf* Richards 1990, 93–6), though modern excavations of cursus monuments have generally been small-scale. Excavation of a 20m wide transect across the Dorset Cursus at Down Farm, Woodcutts, revealed the presence of knapping debris *in situ* in the primary silts of one of the ditches, exploiting flint nodules exposed during its construction, as well as evidence of secondary use of the most sheltered area inside the cursus close to the eastern ditch, but the interior of the monument was very clean of artefacts, with only small and broken flint flakes present (Gardiner 1991). Limited trenching across the cursus at Sarn-y-bryn-caled, Powys (Gibson 1994), produced no artefacts.

Whether or not avenues are in any way developed from cursus monuments is open to speculation, but the purpose and function of both classes of monument remain enigmatic. Atkinson, as discussed above, viewed the Stonehenge Avenue as a processional way for the Bluestones and certainly the concept of a processional or display function seems reasonable for many examples, though it cannot be proved. The elaboration of formal entrances to a variety of monuments of the Neolithic and Bronze Ages is well documented and the extension of many avenues from the entrances of stone circles and henges may have served merely to emphasise the entrance, to funnel people into the monument, or even to *exclude* visitors. Not all avenues lead to entrances, however, and some, like Milfield, pass through earlier henge monuments or were diverted round them. There are also incidences of 'detached' avenues which lie tangential to stone circles, as at The Kirk, Lancashire, and Rhos y Beddau, Powys (Burl 1993, gazetteer). The alignments of some of the avenues listed by Burl can be shown to have astronomical significance, though in many cases this may be more a product of the previously established alignment of the monument to which it is attached than specific to the avenue itself.

The question of emphasis may perhaps be raised again here. Burl considers some of the longer avenues, including West Kennet, Broomend of Critchie, and Stonehenge itself, to have been extended, perhaps several times, over a lengthy period of time. He suggests that these extensions served not 'merely to make them more distinguished' (*ibid*, 72) but '... with the intention of connecting once-separate places, linking major ritual centres with lesser but vital elements such as rivers or mortality'. One aspect of the siting of avenues which probably deserves more attention is the physical connection which they make between stone circles and water (*ibid*, 72). Burl cites at least seven examples where this is the case. A number of examples physically link stone circles and funerary monuments, *eg* Nether Balfour, Aberdeenshire (*ibid*, gazetteer), and others are attached to stone circles containing human burials, such as Callanish, and Merrivale and Shovel Down on Dartmoor. Burl considers that these avenues came later in the period of construction and that the tradition was then developed into one of stone rows which led directly to cairns of one form or another but were not attached to stone circles.

Within this tradition, and somewhere near its beginning, lies the Stonehenge Avenue. Despite the number of excavations carried out along its course, its original purpose has not been fully defined, though some of the myths about it have been dispelled. Like the monument to which it is attached, it shares many elements in common with others of its type while remaining essentially unique. Like Stonehenge itself, its sum remains greater than its parts.

## Discussion

Only a brief summary of main points is presented here, as each sub-phase has been discussed at some length above. Wider aspects are discussed in Chapter 10, below.

Phase 3, because it comprises the most impressive and monumental elements of the extant monument, is the period of the site's history which has attracted most speculation in the past. It would be satisfying to be able to present here a definitive account of the development of the monument in this phase, with reasonable confidence that that single sequence was a close approximation to the truth, but that unfortunately is not the case.

There are two main reasons for this. The greatest constraint is undoubtedly the nature of the site itself. The monument is made up largely of concentric elements, themselves composed of discrete features. There are therefore very few points at which the concentric elements have relationships with each other, and in some cases the integrity of those elements can also be questioned, as discussed under the individual sub-phases, above. It seems reasonable, for example, to assume that the Sarsen Circle stoneholes belong together on the grounds that they are, or were, linked by lintels (although the possibility of the setting being unfinished could also be argued), but the reality of the Q and R Holes as a single setting is much more open to doubt.

To add to this unavoidable problem is the much more regrettable one of lack of recording of the archaeology during the various episodes of excavation. This is to be expected in the pre-twentieth century 'diggings' but it is particularly regrettable in more recent times. As the material made available to the authors (and largely reproduced here) must be accepted as the total archive for the site, the reader can reach her/his own judgement concerning how the site was recorded. In general the information recorded about the deposits excavated must be regarded as minimal, even by the standards operating some decades ago.

The periphery has been discussed at length above, and it is the detail of the interior sequence which dominates this phase. The stratigraphic constraints within which the developments of phase 3 have been defined, and the subjective assumptions which have also influenced the interpretation of the sequence can be briefly summarised. Stratigraphic relationships are italicised below. The archaeologically determined sequence in relation to the radiocarbon dates is discussed in Appendix 2.

## The Interior

- *The Q and R Holes are earlier than the Sarsen Circle (fill of Q4 cut by stonehole for Sarsen Stone 3 of the Circle).* The provisos in this case are the weakness of having only one stratigraphic relationship on which to base the sequence, and the probability that not all the features called Q and R Holes belong to a single setting.

- It seems unlikely that the large sarsens of the Trilithon setting could have been erected after the erection of the Sarsen Circle, on the grounds of the practicality of access to the interior.

- The only practical explanation for the erection of Stone 56 from the side and interior is that something was standing on the exterior side of it, making access difficult.

- Both the Bluestone Circle and the Bluestone Horseshoe include stones which have been dressed to particular and elaborate shapes, including two lintels. These stones are clearly not in the positions for which they were originally intended, but they may have stood in their original settings for some time, as the lintels appear to show wear (Atkinson 1979, 53).

- *The Bluestone Horseshoe/Oval must be contemporary with or later than the Sarsen Trilithons (Bluestone 68 stands within the hole for Sarsen 56, with a cut either not present or not recorded).*

- *Bluestones of the Bluestone Horseshoe/Oval cut other discrete features, some of which appear to be stoneholes, and at least one of which almost certainly held a Bluestone (WA 3402).*

- The Bluestone Circle is later than the Q and R Holes (several individual relationships, see sub-phases 3i and 3iv; these recorded relationships, taken with the fact that the two circuits partly coincide, suggest that Bluestone Circle holes generally cut Q and R Holes in the other, unrecorded or disturbed relationships).

- *A feature almost certainly of the Bluestone Circle (filled with WA 2445) cut the erection ramp for Stone 56 of the Sarsen Trilithons.*

- *The Z Holes are later than the Sarsen Circle (Z Hole 7 cuts the erection ramp for Sarsen 7 and spoil from the digging of Z2 could be seen to overlie the fill of Stonehole 29; Hawley 1925, 29).*

If the radiocarbon dates are also included amongst the constraints to interpretation the following apply:

- The Sarsen Circle is very early in the sequence, and is the earliest dated element.

- The Y Holes are the latest dated element, and the Z Holes are also likely to be late in the sequence

The sequence described in this chapter has been developed as a best fit for these constraints, as well as to accommodate those few short stratigraphical sequences involving individual features which cannot be assigned to major elements of the monument. It is illustrated in Appendix 2 (eg Fig 268), but it is obvious that such a sequence, reliant on such meagre evidence, must involve a considerable amount of supposition. In particular it is difficult to establish with any certainty which of the destroyed elements stood together or stood with elements of the monument which still survive. This cannot be resolved in the case of completely isolated features, and can be resolved only imperfectly in the case of single features which form part of a stratigraphic sequence in which the most recent end is fixed (as is the case with the features cut by Bluestone holes).

As described more fully in Chapter 6, the appearance of the Bluestones and the move to replace a timber monument with stone have been taken as signifying the shift of practice which marks the beginning of phase 3. Some sort of setting including the Q and R Holes is accepted as the earliest stone setting, but it seems likely that it included elements other than these stones. The extent of later activity is such that much of this may have been destroyed, and it is in any case impossible to assign confidently individual isolated features to this setting, except in a few rare cases, and then only tentatively.

The Crescentic Feature (C35), representing at least three standing stones and possibly more, was clearly early in the sequence and it is tempting to place it with the Q/R setting as it lies in the area of the site where there appear to have been few other early features. It could be argued (assuming that there are Q and R Holes in the unexcavated parts of the southern sector) that the setting was focused towards the western, open side, where the Crescentic Feature stones lay. It is perhaps too fanciful to suggest that the Crescentic Feature stones formed a 'cove'-like structure, particularly as the 'open' side would appear to have faced the wrong way (ie outwards rather than inwards), but it is nonetheless a possibility that this feature represents an important element in the early stone monument.

The erection of the Sarsen Circle and Trilithons seems to be a coherent activity in that they utilise the same methods of construction. It would have been highly impractical, indeed virtually impossible, to erect the Trilithons after the Circle was in place. Although the radiocarbon dates seem to present something of a problem in this respect (Appendix 2), and it was possible to obtain only one determination for the Sarsen Circle, it seems reasonable to view them as being broadly contemporaneous and probably early. The question of what was standing with them is difficult to resolve, but it is possible that it was a setting of Bluestones, as to suppose otherwise is to necessitate a non-Bluestone phase when the Bluestones 'went into store' at some unknown location. Although this is not impossible it hints at special pleading, and there is an appealing simplicity in the concept of putting together a phase without Bluestones with the missing 'dressed Bluestone' setting, and so solving two problems in one. The only problem with this is the identification of stoneholes for this putative setting, as discussed at length above (sub-phase 3iii).

The welding together of two major elements is not enough, however, to account successfully for the depth of stratigraphy in the one or two places where it survives, nor for the number of isolated features occurring at various locations. Because of this, and because the existence of the 'dressed Bluestone' setting within the monument is in itself open to considerable doubt, that setting and some of the individual features have been assigned to a sub-phase (3iii) which, as described above (and in Chapter 10), is almost certainly not a single sub-phase at all. Although it is not ideal to create such a 'dustbin' sub-phase, it was felt to be necessary on the grounds that the position of these features in the sequence was known in broad terms (ie pre-Bluestone Horseshoe and Circle), but their exact part (or parts) in it was not.

A similar ambiguity exists in the case of sub-phases 3iv and 3v, in that it could be argued that the standing Bluestone Horseshoe and Circle were originally intended to stand as they do now, and that the ascribtion of the northern arc of stones to the same setting is mistaken. Indeed, it could be argued that the northern arc is itself not a coherent complete setting, but a number of unrelated features joined by the eager pencil of the archaeologist searching for regularity of pattern. As there is no dating evidence to establish the construction date of any of the features, and no recorded stratigraphic relationships with other elements of the monument, it must be regarded as being only weakly ascribed to this sub-phase. It is apparent, however, in terms of plan, that the proposed Oval is in fact a 'double horseshoe', that is, that the 'northern arc' end reflects the rather flat curve of the south-western end of the Horsehoe, which strengthens the impression that they were at some point part of a single setting.

It seems incontrovertible that the final stage of the monument was the construction of the Y and Z Holes, and it seems reasonable to assume that these were intended to hold Bluestones. It cannot be assumed, however, that they were intended to hold any of the Bluestones already at the monument; the interpretation favoured here, unlike that proposed by Professor Atkinson, does not assume that all the Bluestones now on the site arrived in one operation. It has been suggested here that there were fewer Bluestones in the 3i setting than are now on site, that these were reused in the 3iii settings, but that many more were brought in to create the 3iv Oval and Circle. Subsequently at least four, probably small, stones (of the northern 'arc') were removed and may not have featured it the settings of 3iv and 3v. It is even possible that they were broken up for the production of implements. It is not necessary to invoke the proposed destruction of the Circle and Horseshoe to account for the construction of the Y and Z Holes, and it may have been the eventual impossibility of acquiring enough new Bluestones which caused the abandonment of the scheme. As the Y and Z Holes were clearly constructed many generations after the original Bluestones were acquired it might be expected that the original circumstances of the stones' acquisition could not be reproduced and the stones obtained. The undertaking was obviously not a minor one, however, and the scale of the remodelling, so late in the monument's history and well into the Early Bronze Age, is in striking contrast to the majority of communal acts of the time which largely commemorate individuals, in the form of barrow building. Stonehenge even at this late stage still appears to have acted as a focus for large-scale monument-related activity of a sort which had largely disappeared some generations before.

# 8 The assimilation of the monument and post-Bronze Age use and abuse

*by Julie Gardiner*

## Summary: landscape and monument


The use of the monument from the later Bronze Age to the present day seems to have been essentially superficial: very few datable features are identifiable and the intent and purpose of those that exist remain ambiguous. The majority of finds which post-date the primary use of the monument can be accounted for in terms of casual visits by tourists, passing traffic, and occasional activities held within its bounds, such as fairs. At some stage, or at several stages, in its later history, major parts of the stone settings were dismantled, broken up, or removed, and other stones have fallen, some to be re-erected. The post-Bronze Age story of Stonehenge is therefore essentially one of dilapidation, vandalism, occasional use, and restoration, its main role being as a tourist attraction.

That said, however, the monument is certainly likely to have remained a place of importance within folk memory for many generations after its main period of use and there is no reason to suppose that later prehistoric communities in the area viewed it with any less interest (or superstition) than we do now. Even though the purpose of the monument may have been long forgotten, its extraordinary structure, its obvious importance as a focus for the construction and use of other, lesser monuments, and its very strangeness may have exerted considerable influence over the use of land around it. It did not become invisible because it ceased to be used for its original purpose(s), nor was the development of the human landscape around it halted. In this chapter evidence for activity at the monument itself after the stone settings had gone out of use down to the present day is briefly considered alongside evidence for the later development of the study area as a whole.


## Landscape and landuse

*by Michael J Allen*

Unlike previous chapters in which a relatively limited timespan was discussed, some two and a half millennia (1600 cal BC to AD 1995) of environmental data are summarised here. As a result, this discussion confines itself to broader, more general statements concerning the development of the downland around Stonehenge, rather than providing specific details for each archaeological and historic period. After the main use of the monument was over, from the later Bronze Age, it is evident that much of the landscape around Stonehenge, like most of the chalkland of southern England, was cleared and farmed (*cf* Bradley 1978; Allen *et al* 1990; Allen 1994). The emphasis here must lie upon reviewing the use and economy of the largely open farmed land, rather than the physical nature of that landscape.

The development of formalised and regular bounded field systems in the form of preserved 'Celtic' fields can be seen on Stonehenge Down, Fargo Wood, Durrington Down, Wilsford Down, Lake, and the gentle slopes of Rox Hill. Evidence from Wilsford Shaft (Bell *et al* 1989) indicates the presence of arable fields, recently abandoned arable fields, and grazed downland pasture. During the later Bronze Age, therefore, significant areas of arable land existed and the downlands were a seasonally changing mosaic of tilled and pastured fields. The evidence of the field systems, of sites such as Wilsford Shaft, and of emmer wheat at the settlement near Fargo Wood (Richards 1990, 194–208), support this picture, which is corroborated by mollusc and sediment evidence from many earlier ditches which were silting up at this time. There is a widespread occurrence of predominantly silty deposits (silty clays and silty loams) in a large number of ditches in the later Bronze Age. For instance, at Stonehenge itself the secondary fills have a relatively high silt component (Evans 1984; *see Chapter 6*). This can also be seen in the ditches of the Neolithic causewayed enclosure at Robin Hood's Ball (Richards pers comm), the Stonehenge Cursus (Allen pers obs), and the Bronze Age barrows on King Barrow Ridge (Cleal and Allen 1994), and was notably recorded by Cornwall (1953) from the Y Holes at Stonehenge. The silty nature of these deposits is a result of wind-blown material, but need not imply a drier climate as Cornwall postulated (*ibid*) but rather expanses of tilled land and open dry fields. The silty loessic soils are highly susceptible to wind erosion when they are dry and exposed after the summer harvest of both the ear and the straw.

Despite continued evidence for tillage there is little colluvium corresponding to this activity in the local dry valleys. It has been noted elsewhere that this lack of colluvium is surprising in view of the demonstrable intensity of arable activity in this area (Allen 1988; 1991; 1992; Bell 1986). Several auger transects across Stonehenge Bottom, and also across Normanton Bottom and Cursus Valley, as well as small valleys at Winterbourne Stoke Crossroads, the Diamond on Wilsford Down, and Greenland Farm (Richards 1990, 210–11; Allen 1994, 268–71, fig 56) that would normally have been expected to produce colluvium, revealed none. Recently, shallow deposits of colluvium were recorded high up in an eastern 'tributary' of Stonehenge Bottom south of the barrows on King Barrow Ridge (Wessex 1993b), but within the Avon Valley at Fighledean, Bronze Age colluvium is present (Allen and Wyles 1993). Nevertheless, the presence of the fields themselves, the silty nature of the ditch fills, and molluscan evidence in the main Ditch fills from Stonehenge (Evans 1984), Stonehenge Cursus (Allen unpublished data), and Amesbury 42 (Entwistle 1990) all indicate tillage.

Despite this evidence for tillage, a large component of the landscape seems to have remained as short-grazed grassland. In broader terms, the complex pattern of arable fields, grazed pasture, and rough pasture produced a fine-grained mosaic of landuse in the earlier Neolithic (*Chapter 4*), but by the later Bronze Age this pattern may have been much more coarse-grained. This is highlighted by recent mollusc analysis of two Late Bronze Age ditches on Earl's Down Farm to the east of Amesbury (Allen and Wyles forthcoming), which indicated that these 'ranch boundaries' (*cf* Bradley 1978, 47; Bowen 1978; Bowen and Fowler 1978) were set in short-grazed pasture. This type of land division is emphasised by the Wessex Linear Ditch Project where molluscan evidence indicates that most of the boundaries are adjacent to cultivated fields, possibly with intermittent episodes of pasture (Entwistle in Bradley *et al* 1994). These larger linear boundaries may suggest the closer integration of arable and pasture and may have been specifically designed to segregate livestock from cultivated crops. Indeed, if the interpretation of the features excavated by the Vatchers at Winterbourne Stoke Crossroads is accepted (Vatcher and Vatcher 1968), there is archaeological evidence for a 'stockade' enclosure. Certainly an emphasis upon sheep/goat with cattle is shown by the limited faunal evidence for the later Bronze Age. Few pigs or even horses are recorded.

From the Iron Age onwards there is a decreasing quantity of environmental data for the nature of the downland economy. In the Avon Valley a mixture of both tillage and pasture is indicated from the analysis of the colluvium at Fighledean (Allen and Wyles 1993) and at Vespasian's Camp molluscan evidence suggests the presence of pasture, or at least short-trampled grassland, which might be the result of stock grazing or human trampling (Allen unpublished).

Undoubtedly the most significant contribution to the later Bronze Age and Iron Age landscape is the detailed survey and analysis from the Wessex Linear Ditch Project (Bradley *et al* 1994) to the east of the Stonehenge area as defined in Figure 1. Entwistle's major programme of molluscan analysis produced detailed sequences from seven of the linear ditches (Entwistle in Bradley *et al* 1994). Most of these sequences are predominantly arable, but episodes of pasture regularly occur especially in the later (usually medieval) periods. It is argued that these boundaries were developed both for territorial demarcation and for agricultural division, but that they cannot be seen to indicate major changes in the overall farming economy and landuse regime (*op cit*, 138). This is supported by the molluscan sequences detailed both within the Wessex Linear Ditch Project and those from Earl's Down Farm. Indeed, the examination of ditches of most other prehistoric sites and monuments whose fills accumulated through the Iron Age do not show any major changes in landuse.

Evidence for the Roman and post-Roman landscape is both scant and imprecise. Most earlier ditches continued to fill up with sediments through time, but it is difficult to isolate either specific epochs or any significant changes within the enviornmental sequences from these deposit, perhaps because there *are* no significant changes. A general trend of less silty, aeolian fills in the upper (Roman and post-Roman) ditch fills can be detected. In part this could be a result of the changing nature of the downland soils (Limbrey 1978; Allen 1994), but this trend is consistently accompanied by evidence from molluscan assemblages of grazed grassland pasture rather than broken arable ground.

Within the molluscan assemblages from the upper fills of these ditches, although we must take care not to confuse localised stabilisation confined to the ditch with evidence of pasture around, it is perhaps significant that Allen (in Cleal *et al* forthcoming), Entwistle (in Bradley *et al* 1994), and Evans (1984) have independently recorded this phenomenon of the re-establishment of pasture from a large of number linear ditches, barrow ditches, and the enclosure Ditch of the monument itself. This tends to suggest general changes in the coarse-grained mosaic pattern of landuse towards a more uniform landscape with the proportion of pasture increasing, to the detriment of cultivated fields.

Little is known of Saxon agricultural activity in the area. The first documentary record of Amesbury in the late tenth century is as a royal estate and it is likely that the estate had already been a royal possession for some considerable time. In the medieval period much of the area was under cultivation, in the open fields of the manors of Amesbury Countess and West Amesbury (RCHM(E), 395–6, fig H1).

In the post-medieval period much of the Stonehenge landscape, as elsewhere on the southern chalklands, was largely laid to pasture, predominantly for sheep. Although much of Salisbury Plain remains protected from the ravages of tillage by being within the ownership of the Ministry of Defence, arable farming certainly expanded in the post-war years with the advent of both mechanisation and chemical fertilisers. When the Royal Commission published their maps of the Salisbury Plain (RCHM(E) 1979) over 70% of 'Stonehenge and its environs' was under cultivation and only 3% existed as old grassland (*cf* Richards 1986). Since then further areas have been cultivated and some of the reintroduced grassland has reverted to cultivation. Although the Stonehenge Triangle is under grass, most of the land to the south of the monument is under cultivation.

# The monument

## Later Bronze Age features

### Ditch circuit

Sherds of Deverel-Rimbury, later Bronze Age, and indeterminate pottery occur at Stonehenge but no significant concentrations are apparent. Some occur scattered in the latest Ditch silts but there are no clear indications of any cut features of this period within the Ditch. In view of the presence of both earlier and later deposits of cremated and inhumed bone the possibility of sporadic burial activity during the later Bronze Age cannot be discounted, but neither can it be proved.

### Interior of the monument

A number of features for which no direct dating evidence is available were excavated in the interior. Those which probably relate to the main period of use of the monument are discussed in Chapter 7, above. Other features can be dated to the historic period, and especially to recent centuries, as discussed below, but there is virtually no information to suggest that any date to the prehistoric period after the main use of the monument had come to an end. There are no cut features which can be securely dated to this time but that some activity occurred at the site in the later Bronze Age is indicated by the presence of pottery and by an unusual bone point (WA obj no 24) from the disturbed upper fill of Stonehole 8 (C13). This object finds its closest parallel in an example from Hockwold, Norfolk, where it was associated with a predominantly Middle Bronze Age assemblage (J Davies and S Margeson pers comm). The Stonehenge point produced a radiocarbon date of 1260–840 cal BC (OxA–4885; 2840±60 BP).

In C13, a complex of features around Q and R Hole 10, on the inner side of Stone 8, included a trench which linked the Q and R Hole (WA 2792; Plan 2). Hawley comments:

> Began by digging at the North end of the small hole [Q10]. Soft soil passes out from it apparently into another cavity beyond [WA 2792]. The first hole appears to be older than the one which follows it northwards ... The first small hole may have been made for a stone but it is impossible to say what the continuation beyond was, it was probably later and 1 piece of Rhyolite was found in the upper part of it at 27 [0.69m] BGL (J–K in Plan).
>
> (20/8/1924)

## The Stonehenge Layer

The 'Stonehenge Layer' (phase 88) was encountered in excavations within the monument by Hawley and Atkinson *et al*. It occurred over all types of cut features including the Ditch. Though it seems to have been more or less ubiquitous in the excavation trenches, its full extent has not been determined. Atkinson commented that it seemed to extend across the Bank and Ditch and a little beyond (1979, 53).

The Stonehenge Layer, so christened by Hawley, was described by him thus:

> The top surface is one that is distributed more or less evenly over the whole surface at Stonehenge, including the ditch outside the rampart, but it is absent in places eroded by traffic. It varies in thickness from an inch to 15 in., [*c* 2.5–38cm] rarely deeper. It seems to have originated at the time Stonehenge was built, as the mason's chips occur in it but not below it. Unfortunately it is not stratified and is a jumble, beginning with neolithic flint implements, passing to small fragments of Bronze Age and Roman pottery, and thence onward to objects of every successive age down to the present time, but as it gives a limit to the mason's chips and incidentally to the building of Stonehenge, I have taken it as a guide for dividing that period from any other which preceded it.
>
> (1925, 21–2)

Atkinson agreed that this layer occurred almost everywhere and he records everything from Neolithic pottery to beer bottles (1956, 53–5). He further confirmed Hawley's frequent Diary comments that it lay immediately under the turf and rested directly on the chalk where no features occurred, slumped into soil-filled features such as the Y and Z Holes, but was otherwise fairly level.

Unlike Hawley, however, Atkinson considered this layer to be considerably later in date than the stone settings. He was not convinced that the presence of sarsen and bluestone within it was the result of the dressing of the stones. He was of the opinion that the final dressing of the Sarsens on the site would have been undertaken by pounding rather than flaking, so that the resulting debitage would have consisted largely of sand rather than flakes. The distribution of bluestone fragments was very wide and 'remarkably uniform' (*ibid*, 54) rather than showing any obvious concentrations such as might have been expected around the site of the dressing of individual stones, and he disputed the dressing of the Bluestones within the monument (though Hawley noted some small concentrations, for instance close to the stump of Stone 33e (*see caption to Fig 134, above*).

Atkinson concludes that the Stonehenge Layer was 'nothing more than the accumulation of all the objects dropped on the surface of the ground, which have travelled slowly downwards ...' and that it 'therefore cannot be used as a chronological index, since its formation has been continuous and is still continuing today' (1956, 55). Of the uniform horizontal distribution of bluestone chips he concluded that it was 'difficult to explain except in terms of the deliberate scattering of fragments broadcast, perhaps as a means of emphasizing the purposefulness of a partial destruction of the monument' (*ibid*, 93, Atkinson's emphasis). He argued that the chipping-off and subsequent loss of fragments by casual visitors would not have been sufficient to produce the distribution and would, in any case, be expected to show a fall-off with distance from the stone settings.

Hawley thus regarded the origin of the Stonehenge Layer as marking the level at which the dressing of the stone monuments began, with a gradual accumulation of material of later periods, and Atkinson, in contrast, believed it to be much later in origin, beginning with destruction of the stones rather than their erection.

In the early editions of *Stonehenge* this was Atkinson's final word on the subject. However, in Appendix 2 of the 1979 edition, following work in 1964 occasioned by the collapse of Stone 23 (C56–8), he changed his mind:

> A sample of the 'Stonehenge layer' ... yielded at its base a clay pipe-bowl made by Jeffry Hunt in Bristol between about 1650 and 1670. This find makes it certain that the layer was laid down, presumably as a deliberate metalling of flints collected from nearby ploughed fields, not later than A.D. 1700 ... The numerous fragments in its upper levels are almost certainly the product of the increasing demand during the eighteenth century for keepsakes broken off with a hammer
>
> (1979, 213).

This statement not only directly contradicts his earlier intepretation but also his well rehearsed discussion, both in *Stonehenge* and in a then quite revolutionary article in *Antiquity* (1957), on the extent and depth to which earthworms can move material downwards in the soil.

The true nature of the Stonehenge Layer is difficult to assess because no details are available of its composition at specific points or within specific features and its full extent remains unknown. Hawley's identification of the pottery found within the layer (sometimes referred to specifically as the Stonehenge Layer and sometimes included under 'humus') was not sufficiently accurate to enable us to distinguish the true identity of many of the individual sherds he termed 'Bronze Age', so that it is impossible to determine any stratigraphic information regarding the distribution of ceramics (or other objects) within the layer. There are, however, very slight hints of some stratigraphy in parts of the Ditch. For instance, Hawley describes how, in C26 (Segment 21), the 'humus' was 'deeper than usual, 17 inches [0.4m] at the centre and the chips did not reach to the bottom of it' (18/7/1924); and further along in that cutting 'humus in second crater is 20" [0.5m] then merges gradually to a more chalky humus and eventually into typical fine ditch silt ... A chip of dolerite was found at 23" [0.6m], in the lighter coloured humus the lowest yet found in the ditch' (21/7/1924).

There can be no doubt that the layer formed over a very considerable period of time, but how and to what extent distinct episodes of activity have contributed to it remains unclear. Stone dressing, destruction, souvenir hunting, dumping, worm sorting, rabbit and other disturbance, to say nothing of general trampling and wear and tear, may all have played a part. It is no longer possible to reassess quantitatively the distribution of either bluestone or sarsen fragments across the site because so little of the original assemblages survives (*see Chapter 9*). There seems to have been little packing in the stoneholes of the Bluestones which might have provided an explanation for the lack of fragments from stone dressing concentrated near individual stones (ie material resulting from stone dressing that was cleared from the surface and dumped in the stoneholes to help keep them upright), whereas the Sarsen stones were partly supported by a packing of sarsen fragments, some of which were clearly flaked from larger blocks, though whether during dressing or later wrecking cannot be determined. It is certainly difficult to argue that the bluestone chips are the result of on-site dressing of the stones unless large fragments were deliberately removed from the area within the stone settings leaving only the smaller pieces. On balance, it seems most likely that the bluestone fragments which are spread throughout the Stonehenge Layer are the result of the destruction of the stones rather than their dressing.

Does this also imply, then, that the bluestone objects (edge ground artefacts, discs, hammerstones, axe fragments, etc, *see Chapter 9*) are later than the main use of the Bluestone settings or that these were brought on to the site along with the dressed stones? And what of the sarsen fragments and objects which seem to be so similar to the bluestone assemblage with the addition only of the mauls, which it has long been assumed were used in dressing the stones? It is possible that the Sarsens were dressed on site whereas the Bluestones were not, though the distribution of sarsen fragments away from the settings does not seem to be notably different from that of the bluestone fragments, though the quantities involved may be less. Even Hawley was of the opinion that some of the concentrations of sarsen he found close to the stones were the result of wrecking rather than dressing.

The argument that the Stonehenge Layer was deliberately dumped metalling derived from local fields as late as the seventeenth century is unconvincing. First, there seems no logical explanation for the dumping, except perhaps along the trackways, and secondly dumping along the trackways would not explain the presence of the stone fragments (apparently) all across the site. If there was any suggestion that the stones occurred towards the base of the Stonehenge Layer, that is with later material having been dumped over the top, such an argument might hold, but it would still not solve the problem of how they got there in the first place.

Overall, it seems best to view the Stonehenge Layer as the result of at least 3500 years of general activity and disturbance in and around the monument. There are areas within the settings which are known to have been extensively disturbed (*see below*), even before archaeological excavation, and many centuries of human feet, worms, horses, carts, rabbits, sheep, and military vehicles are bound to have churned the surface to a considerable depth. The lack of detailed description of the layer gives the impression that it was fairly uniform, but there may well have been considerable variation across the site which is simply not apparent in the records, or may not have been apparent to the excavators given the lengthy timespan and piecemeal nature of the excavations. In addition, as discussed in Chapter 2 above, it is very likely the original ground surface within and around the monument was considerably higher than it is today, so that any stratigraphy may already have been lost long before any excavations took place.

The time at which the initial formation of the base of this layer began remains uncertain. Cleal's re-analysis of the pottery (*Chapter 9*) confirms the presence of Beaker sherds within it and some of Hawley's descriptions of cremation deposits in the Ditch silts imply that they were inserted from a high level and lay either well down within the Stonehenge Layer, or at its base above the Ditch silts proper. It has been argued (*Chapters 6 and 7*) that the presence of these deposits so high in the Ditch indicates continued, if sporadic, use of the feature as a place of burial at least into the early part of phase 3 and possibly beyond. It is possible that they continued to be deposited after the main period of use of the monument had ended; they are essentially undatable but are probably Bronze Age rather than later.

The layer may therefore have begun to form almost as soon as the final stone was erected, but the presence, nature, and distribution of the stone chips suggest that the bulk of the material incorporated within it belongs to a period considerably later than this, from a time when stones were being wrecked up to the present century. When the wrecking of the stones began, and to what degree they were destroyed in any one episode or at any given point in time, is a matter for debate.

## Further excavations in the car park

*by K E Walker*

The main episodes of work in the car park and the principal features and finds from them have been described (*Chapters 4 and 9*). For the sake of completeness the following summarises the results of several minor pieces of work in which the archaeological features identified produced no diagnostic or datable material.

At least one other feature besides the Palisade Ditch was recorded on the plan of the Vatchers' 1967 excavation (C81, see Fig 24). It is annotated as 'possible post at –0.30m from weathered chalk' and was approximately 1.2m in diameter (WA 9780). No other details of this feature are known, though it can be seen on an aerial photograph of the excavation (RCHM(E) SU 1242/38). The date of this feature cannot be established, nor any possible relationship with the Palisade Ditch. It is, however, of similar diameter to the Mesolithic pits uncovered in the car park (*see Chapter 4*). The aerial photograph also appears to show other features visible as dark patches on the stripped chalk surface but these are not shown on any available plans and no details survive.

Fragments of both bluestone and sarsen were recovered in W E V Young's excavations in the car park in 1935 (discussed further in Chapter 9). An area of 226 x 60ft (*c* 69 x 18m) and two smaller areas each of *c* 9 x 5ft (2.7 x 1.5m) were stripped to the chalk surface between 2 and 22 January 1935 by Young and a gang of 12 men. The site was visited frequently by Newall, who identified the foreign stone, and on the 25 January by Stuart Piggott. The work is unpublished, but an extract from Young's diary deposited in Salisbury Museum by J F S Stone with the consent of Mr Young provides details. No features, archaeological or otherwise, were recorded. The finds are housed at Salisbury Museum and included worked flints, in addition to the bluestone and sarsen. Young described the finds as 'all of an entirely superficial character, were remarkably few...'.

In 1979 the Central Excavation Unit excavated an area of 70m$^2$ in the north-west corner of the car park in advance of construction work. The work was published as a note:

> The only archaeological features were thirty-eight stakeholes, randomly scattered, with typical dimensions of 5cm diameter and 10–12cm depth. No dating evidence was found in their fill but they are closely similar to others used in construction of round houses of Iron Age date elsewhere on the chalkland, eg at Danebury.
>
> (Smith, 1981, 181)

A line of five regular sub-square postholes was also recorded. These were interpreted by the excavator as 'probably modern'.

Prior to the construction of new visitor facilities in 1988–9, Wessex Archaeology examined an area 22 x 5m immediately north of the original visitor complex, which was to be quarried away to allow for an access ramp and ticket office (C99). A sewage pipe laid in 1984 crossed the the area diagonally. Monitoring the laying of this pipe had revealed no archaeological features (C98). A further strip of *c* 80 x 4m of the chalk surface of the developer's compound and access road (C100) was examined.

In 1993 additional visitor facilities necessitated further archaeological monitoring in the north-west corner of the car park (C101). Some natural soil horizons remained despite extensive modern disturbance, but no archaeological features were recorded. Small quantities of undiagnostic struck flint were recovered from the remnant subsoil areas (Wessex Archaeology 1993c).

## Iron Age and later

No clear picture emerges of Iron Age activity at Stonehenge; the indication is of sporadic, possibly 'tourist' visits. Apart from a small amount of pottery in Early, Middle, Late, and various intermediate Iron Age fabrics no artefacts which are certainly of the period survive in the collections. The presence of Iron Age pottery in a number of the Y and Z Holes was responsible for their initial dating to this period (*see Chapter 7*) but all the Iron Age (and later) pottery is from the upper layers. The largest collection, from the top of Z Hole 12, is from a single pot. Hawley (1928, 175) commented that ZH 4 had been disturbed in the 'Early Iron Age' to about two-thirds of its depth by a fire and a hearth with at least 42 sherds. Surviving sherds from this feature are nearly all from a single vessel of indeterminate late prehistoric date.

The one hint at more formalised activity in the immediate area is the presence of at least one human burial. This, the body of a young adult male (*see Chapters 6 and 9*), was inserted into the terminal of the Palisade Ditch and provided a radiocarbon date of 780–410 cal BC (UB–3820; 2468±27 BP). The burial occurred at a time when the palisade posts had completely rotted away and the ditch had almost silted up; there is no question that the ditch itself was of Iron Age construction (Fig 186). An isolated burial of this kind can occur at any period but it raises the possibility that some of the fragments of inhumed bone (and just possibly some of the cremated material) found high up in the Ditch could be of this period, though it would be unusual for the area (A P Fitzpatrick, pers comm). It must be stressed that this evidence is entirely circumstantial and the idea of possible Iron Age burials at the monument might not have occurred to the authors had the Palisade Ditch skeleton proved to be of Bronze Age date as had been expected.

A larger quantity and variety of Roman pottery survives, as well as a number of coins and small, mostly personal items of metal, and a broken bone hairpin. The metal objects include brooches, pins, and toilet implements, again all items that could have been lost by casual visitors. The surviving material shows no particular concentration in any part of the site except possibly in the area around Stone 7; here one fairly coherent group of material was recovered by Hawley in 1920 immediately south of Stone 7 (C1).

> The shallow area along the south side of the frame contained a number of objects of the Romano-British period, and produced 92 sherds of that date, an iron awl, a small long hammer-head of iron resembling those used by jewellers or clockmakers at the present day, a turned bronze ring, part of a shale bangle, and part of an iron knife and of a sickle.
>
> (1921, 29)

Of these only the ring (WA obj no 71) and the shale bracelet (WA obj 470) have been identified in the collection.

The monument may have been used occasionally for burial. Hawley encountered human bone in a shallow grave (context 1399; see Table 57) cut into the Ditch in C22 (Segment 2). The grave was 'only 22 inches B.G.L [0.56m]', and the 'depth of soil over [ditch] silt ... is in the middle 22" [0.56m]'. Roman and 'Bronze Age' pottery and stone chips were encountered at the same level and it therefore seems that the grave lay above the Ditch silts proper. The (inhumed) bone was only partially preserved with many bones missing. Unfortunately Hawley discarded the bone 'as the interment was evidently quite a late one' and he comments:

> The absence of so many bones suggests the body having been that of a felon hung in chains or certainly decomposed from long

*Fig 186 Iron Age skeleton 9470 in the terminal of the Palisade Ditch (Vatcher archive V6/20A)*

> exposure before burial ... There was a small piece of iron near the Bones resembling the lever inside a padlock.
>
> (28/3/1922)

This object (WA obj no 61) survives and, though corroded, does seem to be part of a lock or padlock. In terms of dating it is undiagnostic and not certainly associated with the burial, but, on balance, the burial seems most likely to be of Roman or later date.

The burial encountered in C12 (WA 2724) is not clearly dated. It probably belongs in phase 3 (*see Chapter 7*) but considerable quantities of Roman and later material were in the area around it and in the grave fill, so that a later date cannot be entirely excluded.

Atkinson was of the opinion (1956, 77–8) that some of the wrecking of the stone monument could have taken place in the Romano-British period when it is conceivable that

> Stonehenge was regarded by the occupying power as a dangerous focus for resurgent nationalism, particularly perhaps during the early years of the occupation, when the flourishing cult of Druidism was stamped out with unusual ferocity. [He was at pains to point out, however, that there is no demonstrable connection between the monument and the Druids.]

As evidence for the possible date of this wrecking Atkinson cites the grave close to Y Hole 9 (considered here to belong in phase 3 and described in Chapter 7), and the presence of Roman pottery mixed with bluestone chips in the fills of the Y and Z Holes:

> the vertical distribution of these chips is very closely and strikingly matched by the vertical distribution of fragments of Roman pottery in the same holes. And since both chips and potsherds are of the same order of size, and will therefore have been buried by earthworms at the same rate, it follows that they must have been dropped on the surface at the same time.
>
> (Atkinson 1979, 92–3)

It is quite possible that some wrecking of the site took place at this time but there is no conclusive evidence. The presence of a grave does not imply activity of this sort, and no finds of any kind are reported from it. The Romano-British material within the Y and Z Holes is as thoroughly mixed with pottery of other periods as it is with bluestone chips.

There seems no reason to doubt that Stonehenge would have been an antiquity of interest throughout the medieval and post-medieval periods, and much of the post-Roman material recovered from the site is again likely to relate to tourism. The first known description of the monument is that of Henry of Huntingdon in the early twelfth century (Arnold 1879). The presence in later centuries of cart-tracks and roads across and beside the monument probably led to a steady increase in both general traffic and visitors and there are numerous finds relating to horses and horse-drawn vehicles. For the most part concentrations of finds, particularly those of post-medieval date consisting of pottery, glass, and clay pipes, may be interpreted as no more than the remains of picnics or, perhaps, brief stays by shepherds and other itinerants.

The fairs held at Stonehenge from the sixteenth century are likely to have been one source of material and it is possible that some of the postholes and other undatable features of the monument could relate to these activites; Chippindale (1983) gives a comprehensive account of the use and abuse of the monument over recent centuries with many excellent plates.

Some features within the stone settings may relate to post-Bronze Age activity though it is difficult to be certain of this. Hawley excavated a large semi-circular pit to the west of Stone 15 (WA 2425/3639) against the eastern edge of his excavation of C17. Hawley describes it thus:

> a large excavation was found to have been made in the row of Foreign Stones [*ie* the Bluestone Circle] ... The filling of soil was comparatively recent, most of it being humus, and a more convincing proof of this being recent work was afforded by finding, on the bottom, the neck and upper part of a seventeenth–century glass flagon, which incidentally gave a comparative date for the robbery. It is more than likely that other stones had been taken from the row as the place extended eastward, passing under a large Sarsen boulder on the surface which had been broken off no. 15, and under this we could not dig as the fragment would have fallen in.
>
> (1926, 11)

Hawley thus believed that this feature represented post-medieval wrecking of part of the settings.

Peter Berridge notes (archive) that Atkinson's interpretation was that Hawley had not reached the bottom of the feature. He (Atkinson) excavated a layer of chalk rubble (context 3638) apparently below the base of Hawley's excavation, which contained loose earthy fill and was therefore probably the original primary fill of the hole. He therefore argued that the hole was actually part of one of the stone settings but had been disturbed, first in the seventeenth century and then by Hawley. One piece of eighteenth-century bottle glass survives from Hawley's excavation but no flagon; whereas the primary fill produced part of a Group 1 stone axe (WA obj no

489; Fig 89). Clearly some major disturbance had occurred here in the post-medieval period but the feature is here assigned to phase 3i (*Chapter 7*).

The question of post-Roman wrecking of the monument is raised by this feature and by the lack of conclusive evidence for such activities in the Roman period. Atkinson was unable to put forward any definite evidence for medieval wrecking 'though individual acts of vandalism were common well into the nineteenth century' (1956, 93; *see also Chippindale 1983*). In some cases the 'vandalism' may have been unintentional. Chippindale, quoting an eighteenth-century source, describes the collapse of Trilithon Stones 57, 58, and Lintel 158 in January 1797.

> The trilithon had long been leaning. The immediate cause of its collapse was a sudden and very rapid thaw after very deep snow. Gypsies were in the habit of camping at Stonehenge before the Wiltshire fairs and it was said that they dug a hole in 1796 the better to shelter beside the trilithon. Water gathering in the scoop had done the rest.
>
> (1983, 113)

A large hole under Stone 58 is annotated on the section drawing (Fig 142, Sc 52.2) as 'modern gypsy howk'.

Sarsen stones occur scattered naturally across the chalk downland with some (generally minor) concentrations, including in the Amesbury area (*cf* Bowen and Smith 1977). The presence of sarsen in buildings in the Amesbury area may be the result of plundering of the monument, or it may not, but the use or reuse of Bluestones as building material seems not to have been the subject of any study to date and thus it is not clear where any such material removed from the site may have gone. It is known that fragments were broken off in recent centuries: 'a practice ascribed to the belief that the stones were factitious and were possessed of unusual powers of healing' (Atkinson 1956, 191). They were also removed as souvenirs, but it is hard to believe that the wholesale destruction or removal of stones from at least the early sixteenth century onwards would have gone unremarked somewhere in the literature, given the obvious interest in the stones from that time (see Chippindale 1983, 90–92 for some recorded examples of souvenir hunting).

There are many depictions of Stonehenge from this period onwards, particularly from the eighteenth and nineteenth centuries, but one cannot reliably assess the decay of the monument by attempting to reconcile artistic impressions of the site in various states of romantic ruination and the surviving stones – stones which are present in any one painting or etching but not in a later one may have fallen, been removed, or simply fallen prey to artistic licence.

One possibility, again without proof, is that wrecking occurred in the early Christian period. There is a small quantity of Saxon pottery and nearly half the medieval pottery is of tenth to eleventh century date; it might be that the destruction of what could easily be considered a heathen 'temple' was the result of religious fervour or pure superstition. At Avebury a number of stones appear to have been deliberately felled and buried during the medieval period (Smith 1965 176–7), albeit somewhat later (thirteenth–fourteenth century). Indeed, stone 9 of the south-west sector at Avebury fell during operations to bury it, crushing one of the men taking part in the work (the 'barber-surgeon'), who seems to have lost from his purse at the time three coins of the reign of Edward I which date the accident to the period *c* 1320–1325 (*ibid*, 178–9). Smith argues that the burial of the stones was unlikely to be for land clearance, breakage and removal being a much more logical method. She favours an explanation of the practice as the result of superstition.

One other 'feature' is of some antiquarian interest. Hawley records encountering the results of earlier archaeological exploration during work close to the Slaughter Stone:

> ... we already knew that Cunnington had examined it in 1801 ... we found a cavity for about 3ft. or 4 ft. [0.9–1.2m] around the stone, evidently his work, but one could see that the stone had been buried earlier in a pit very roughly dug in the solid chalk ... the top and bottom rest on sloping chalk and cause a void of about 10 in. [0.25m] under it. This void was filled with dirty rubble containing much modern rubbish, evidently returned by Cunnington. There could be little doubt about this, as we found a bottle of port wine left under the stone, presumably by him out of consideration for future excavators. The seal was intact, but the cork had decayed and let out nearly all the contents.
>
> (1921, 34)

## Discussion

### Later Bronze Age

The block of downland between the rivers Avon and Till bears extensive field systems of the later Bronze Age. The area immediately around Stonehenge may well have continued to be held in some esteem, since comparatively little material was recovered during the Stonehenge Environs Project (Richards 1990) and no 'Celtic' field systems are known immediately to the north, east, or south of the monument: 'These areas have not been heavily ploughed and, had fields once existed here, some evidence of their former presence might be expected to have survived' (RCHM(E) 1979, xiii). Only to the west, on Stonehenge Down, in the triangle between Stonehenge, the A360, and the Winterbourne

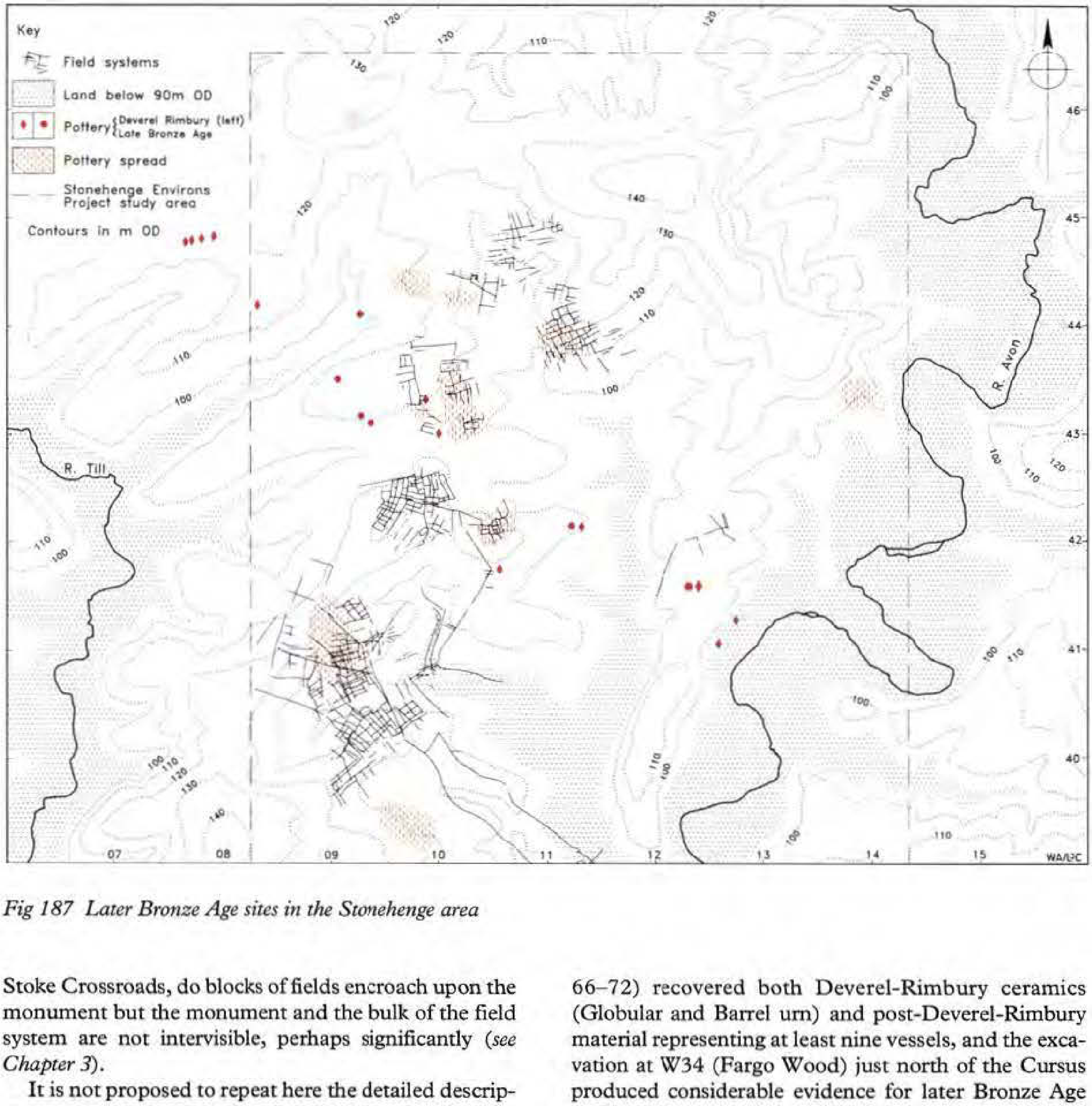



*Fig 187 Later Bronze Age sites in the Stonehenge area*

Stoke Crossroads, do blocks of fields encroach upon the monument but the monument and the bulk of the field system are not intervisible, perhaps significantly (*see Chapter 3*).

It is not proposed to repeat here the detailed descriptions of the Bronze Age landscape provided by RCHM(E) (1979) or the Stonehenge Environs Project (Richards 1990) but rather to summarise the most relevant points. The major field systems of the area run in a gentle arc from south to north to the west of Stonehenge where they presumably indicate the main focus of settlement and farming activity. The bulk of the later Bronze Age pottery and flintwork recovered during the Stonehenge Environs Project is associated with these extensive field systems.

Richards divided the blocks of fields into several main groups. The first of these lies to the north of the Cursus and around Fargo Wood (Fig 187; Richards 1990, fig 160). The overall number of sherds from fieldwalking is very small (23; 196.6g) but excavation of site W32 (*ibid*, 66–72) recovered both Deverel-Rimbury ceramics (Globular and Barrel urn) and post-Deverel-Rimbury material representing at least nine vessels, and the excavation at W34 (Fargo Wood) just north of the Cursus produced considerable evidence for later Bronze Age settlement activity (*ibid*, 194–208). Recent work Wessex Archaeology 1991) has confirmed a Middle Bronze Age date for an enclosure just north of Fargo Wood.

Surface collection produced pottery not only of later Bronze Age type but also of Peterborough Ware and Beaker. Several concentrations of burnt flint were identified. Excavation revealed a possible pit, a posthole which produced one grain of emmer wheat, and the terminal of a gully. Fragments of querns/rubbers and a complete saddle quern, mostly of sarsen, were recovered, together with worked flint and quantities of animal bone. All the bone identified was from domestic species, predominantly sheep/goat and cattle with a few pig bones, five horse fragments, and one dog bone. In addition to small quantities of earlier pottery, 21 sherds

(336.6g) of Deverel-Rimbury, 1325 (3855.3g) of post-Deverel-Rimbury, and 2645 (3606.5g) of plain Late Bronze Age pottery in 12 fabrics were recovered.

Fieldwalking in 1991 as part of the assessment of the proposed site for the new Stonehenge Visitor Centre to the north of the Cursus also produced further evidence of later Bronze Age activity including pottery and flintwork (Wessex Archaeology 1991) which suggested both domestic and industrial acivity.

The fields on Stonehenge Down have also produced both Deverel-Rimbury and plain Late Bronze Age pottery, again in small quantities. Interestingly, it is this block of fields that appears to be crossed unconformably by the Palisade Ditch (*see Chapter 6*), and 21 sherds of Peterborough Ware and one of Grooved Ware were recovered by Richards (*see Chapter 10*).

A concentration of Late Bronze Age pottery (48 sherds; 280.2g) occurred in association with fields at Winterbourne Stoke Crossroads. Later Bronze Age settlement features were recorded here by the Vatchers in 1967 during road improvements (Vatcher and Vatcher 1968), when four circular structures, some shallow pits, and two 'stockade' trenches were recorded. Richards re-examined this material (Richards, *op cit*, 208–10, fig 148) and suggested the presence of at least three circular post-built structures with south-facing porches, one of which contained a small area of burnt flint, possibly a hearth and possibly associated with some sort of working floor, suggesting that this was not a domestic structure. At least one of the stockade trenches seems to be a linear ditch but it produced no dating evidence. The small amount of pottery includes both Deverel-Rimbury and Late Bronze Age fabrics.

Excavation by Mrs Cunnington (1929) of the enclosure close to Woodhenge known as the Egg revealed a number of pits and postholes but few finds. The limited amount of pottery included fragments of Barrel Urn and some rusticated sherds. Nearby, a pit containing part of a Barrel Urn and fragments of Barrel and Globular Urn and animal bone was recorded during the laying of a pipe trench (Stone *et al* 1954). A small scatter of Late Bronze Age pottery was also collected by Richards close to Woodhenge and the Egg, which lies within a complex of ditches forming rectangular enclosures of more than one phase. To the north of Durrington Walls, a linear ditch producing Late Neolithic, Middle, and Late Bronze Age pottery converges on the south-east corner of the Packway Enclosure (*see also below*).

Excluding the Palisade Ditch, linear ditches in the area generally occur in the south-west. There is little direct dating evidence for any of these but most appear either to be integrated with field systems or to overlie them (RCHM(E), *op cit*, xii–xiii). A recent small-scale watching brief on the slope between Stonehenge Bottom and King Barrow Ridge, approximately level with barrow G39, recorded short lengths of three shallow ditches. One had a square profile and was 2m wide by 0.46m deep and the other two narrower and shallower. no dating evidence was recovered but these could be part of a later Bronze Age field system (Wessex Archaeology 1994c). There are a number of essentially undated enclosures in the area which seem most likely to be of later Bronze Age date, for instance those apparently associated with linear ditches and fields on Rox Hill and south-west of Fargo Plantation. In addition, there are a number of comparatively late barrows in the area, mostly lying on the periphery of the main groups, as at Lake and Winterbourne Stoke Crossroads (Grinsell 1964). Just to the north-east of Boscombe, east of the area studied here, sampling of a linear ditch at Earl's Down Farm (Cleal *et al* forthcoming) produced only Romano-British pottery from its upper fill but an apparently associated ditch contained small amounts of animal bone and one sherd of Late Bronze Age pottery.

A recent survey of linear ditches on Salisbury Plain, east and north-east of the river Avon (Bradley *et al* 1994) confirmed the presence of similar blocks of fields to those in the Stonehenge area but concluded that most of these were later than the linear ditches. Detailed study of the pottery in this area by Frances Raymond (*ibid*, 69–90) indicated the presence of both Deverel-Rimbury finewares and coarsewares associated with both open and small enclosed settlements. The former occurred on a number of sites but the coarsewares, which are essentially of two distinct traditions, had very confined distributions. In this respect the area is closely comparable with Cranborne Chase on the Wiltshire/Dorset border (Barrett *et al* 1991) but contrasts with the Stonehenge area where Deverel-Rimbury pottery is widely and sparsely scattered with little unequivocal evidence for the presence of individual settlements. There is no evidence from the Linear Ditch Survey area that linear ditches there originated in the Middle Bronze Age; the main linear ditch systems developed in the later Bronze Age. On the few occasions where excavation of ditch sections produced pottery, it was clear that plain Late Bronze Age ceramics had been in use for some time prior to the development of the core areas of field systems and associated settlements. A much wider range of pottery forms was apparent amongst the Late Bronze Age pottery with evidence for the sharing of traits across the whole area, in contrast to the earlier pottery. In addition, however, some characteristics showed more restricted distributions, so that the various major blocks of linear ditches and their associated settlements seemed to fall into several small teritorial units.

Settlement locations seem to have continued in use though the small enclosures with Deverel-Rimbury pottery seem to have gone out of use, to be replaced by larger, open sites suggesting more extensive but nucleated settlement (*ibid*, 139). Large areas of potentially productive land remained outside the linear ditch systems, however. This pattern seems to be reflected in the Stonehenge area where some Deverel-Rimbury concentrations, such as they are, coincide with concentrations of Late Bronze Age material, suggesting both the presence of settlement activity and its continuation. In contrast to the Linear Ditch Survey area, on the other hand, the available evidence is not sufficient to distinguish the sequence of, or relationship between, the linear ditches, the field systems, and the later Bronze Age settlement evidence, the last being considerably slighter and more diffuse than in the Linear Ditch Survey area. The linear ditches to the south-west of Stonehenge are most likely to be of Late Bronze Age date (Richards 1990; *cf* Bradley in Bradley *et al* 1994, 141) but they do not appear to represent the same level of organisation of the landscape as do those in the Linear Ditch Survey area.

## Iron Age to Roman

Iron Age material is not present in any quantity at the monument itself and this is entirely in keeping with the evidence from the surrounding landscape. Few Iron Age sites are recorded in the area and those that are known lie on the periphery of our main area of interest. Vespasian's Camp, a univallate hillfort in a dominant position overlooking the Avon on the outskirts of Amesbury, covers an area of some 15ha. The hillfort has seen little archaeological intervention. Clearance in advance of road-widening revealed two phases of contruction for the main rampart on the western side (RCHM(E) 1979, 20–1) and recovered a small amount of 'early' Iron Age pottery.

The Packway Enclosure at Durrington (Wainwright and Longworth 1971, 307–28; RCHM(E) 1979, 24) also overlooks the Avon. It is a kite-shaped enclosure on an east facing spur with straight sides of unequal length (42–70m) consisting of V-shaped ditches 3.6m wide at the top and 2.1m deep from the surface of the chalk. There is a narrow entrance in the shortest (southern) side. The enclosure has suffered badly from ploughing and only two shallow pits were recorded in the interior, one of which included a few sherds of Late Iron Age pottery, fragments of three rotary querns, and a stone spindlewhorl (Wainwright and Longworth 1971, 310).

The Durrington Walls excavations (*ibid*) recorded a number of pits of Iron Age date including one probable storage pit 2.1m deep, indicating the presence of a small settlement. Five pits and four postholes, crossed by a linear ditch, were recorded north of the Northern Circle of the Neolithic monument. These had all been badly plough-damaged but some late pre-Roman Iron Age pottery was recovered, together with some loom or thatch weights, simple bone objects, and a decorated copper alloy ring (*ibid*, 322–4). A narrow palisade trench crossed the Southern Circle of the great henge and also seems to be of Iron Age date. Pottery and a brooch of late pre-Roman Iron Age date were recovered. Two shallow pits containing Early Iron Age pottery were recorded during excavation of a Romano-British settlement south-west of Durrington walls in 1970 (Wainwright *et al* 1971).

Excavations conducted in advance of the laying of a gas pipeline in the Avon Valley north of Durrington cut through one of the ditches of the Packway Enclosure and several lynchets to the north (Graham and Newman 1993). A few stakeholes, a pit, and a posthole were encountered inside the enclosure but only three sherds of pottery, probably of Late Bronze Age/Early Iron Age date, were recovered. A Romano-British rural site (*see below*) at Figheldean, excavated as part of the same project, revealed an earlier, Iron Age enclosure associated with a range of Late Iron Age–early Roman pottery.

Surprisingly, the extensive surface collection strategy and excavation programme of the Stonehenge Environs Project (Richards 1990) produced no Iron Age pottery, and as Allen has pointed out (*above*) there was no colluvium datable to this period in Stonehenge Bottom. This evidence suggests that any focus of settlement lay within or to the east of the Avon valley.

The only other known finds of Iron Age date in the area come from the pond barrow and upper levels of the Wilsford Shaft (Ashbee *et al* 1991) and include fragments of an almost complete Early Iron Age jar and other sherds, representing a total of four vessels, with disarticulated human and animal bone fragments. Four radiocarbon dates obtained from the human and animal bone in the top of the shaft provided radiocarbon results from which Housely and Hedges calculated a calibrated mean of 760–400 cal BC (OxA-1210–1213; 2450±60 BP; 2320±80 BP; 2360±60 BP; 2480±60 BP; *ibid*, 69, table 4).

Within the area covered by the Linear Ditch Survey (Bradley *et al* 1994), a major change in land division (and presumably territorial organisation) occurred during the eighth century BC, at a time when Early All Canning's Cross pottery appeared. Shortly after the appearance of this ceramic style the Late Bronze Age settlements were abandoned, there was a shift in the location of principal settlements towards hilltop positions overlooking the Avon Valley and around Sidbury Hill, and these locations were emphasised by the reconstruction of linear boundaries running up to them. The earliest hillforts and associated enclosures emerged during the same period. By the Middle Iron Age hillforts changed their character and distribution and extensive 'Celtic' field systems were laid out with associated enclosed settlements, a development which, combined with environmental data, points to a general expansion in and increased organisation of farming.

Around Stonehenge the sequence is less clear, as virtually no Iron Age material has been recorded from the areas covered by field systems (Fig 187). As Bradley points out (*ibid*, 145), the ceramic sequence here is also truncated at the very end of the Bronze Age. There appears to be a similar shift in settlement location and in the position of defensive sites such as Vespasian's Camp, though dating evidence is too slight to provide any sequence.

Roman material is more widespread, though again the focus of actual settlement evidence is towards the periphery of our area of interest. Finds of Roman pottery including samian were reported in the 1930s from both sides of the Fargo road on Durrington Down (RCHM(E), *op cit*, 24) and part of a small Romano-British settlement was excavated just south-west of Durrington Walls in 1970 (Wainwright *et al* 1971). The main focus of the settlement seems to have been on slightly higher ground to the west of the excavated area, and although no house structures were recorded their presence nearby was indicated by building tile and dressed stone in rubbish pits. An extensive spread of pits, gullies, and postholes was recorded together with the nearby remains of two small ditched enclosures, one containing a corndrying kiln; two infant burials were also found. Most of the pottery recovered was of third–fourth century date, predominantly of Oxfordshire, New Forest, and local origin.

North of Durrington, excavations at Figheldean uncovered substantial evidence of an enclosed Romano-British rural settlement on the edge of a ridge overlooking the river Avon. Enclosures, pits, ditches, two kilns (one of them a corndrying kiln), and at least five structures were recorded together with part of a cemetery with at least seven graves (Graham and Newman 1993). Pottery from the site covered the whole Romano-British period.

Another Romano-British site in the area on the outskirts of Amesbury at Butterfield Down appears to be a small town (Rawlings and Fitzpatrick forthcoming), parts of which were recently excavated in advance of housing development. Here, though few early features were recorded, glass and pottery from the first and second centuries AD were recovered from a variety of contexts.

The late Roman, apparently unenclosed, settlement covered at least six hectares but a single, shallow, right-angled wall-footing and a ring gully were the only certain traces of the foundations of buildings and no clearly defined buildings or residential compounds were identified (timber framed buildings may have rested on sill beams). Environmental evidence indicated crop cultivation nearby and processing on site – corndrying kilns, a millstone, and querns were recovered – as well as the raising of cattle, sheep, and pigs. The occurrence of a sceptre head may indicate the presence also of a rural shrine.

Several undated enclosures, such as the rectangular enclosure south-west of Fargo Plantation close to where the Roman pottery was recovered and curvilinear examples north and east of Druid's Lodge and Woodford, are considered by RCHM(E) (1979, xii) as being most probably of Romano-British date.

Just outside the study area to the north-west, recent work at Maddington Farm, Shrewton, clipped the edge of a Romano-British farmstead of probable third–fourth-century date with evidence for a small hut with associated hearths, crop production, and animal husbandry. A field boundary was marked by a series of ditches and the development of a negative lynchet. The edges of the fields thus delimited had been used for the burial of a series of inhumations and were also the site of a number of marling pits (McKinley and Heaton forthcoming). The site lies beside what it believed to be the line of the Roman road from Devizes to Salisbury.

If much of the area was not used for actual settlement, the probability of agricultural use remains. A buried soil sampled during excavation of one of the ditches of Amesbury 42 long barrow contained quantities of Roman pottery and the molluscan sequence here included *Helix aspersa*, thought to have been introduced in the first century AD (Entwhistle in Richards 1990, 109), at the base of a ploughsoil. The Stonehenge Environs Project (Richards 1990) recorded various scatters of Roman pottery (*ibid*, fig 17), mostly in relatively small amounts. The distribution is widespread but only in the Winterbourne Stoke area does any concentration of material coincide with field systems or linear ditches. Here we can demonstrate Middle–Late Bronze Age settlement associated with at least one linear ditch and probably with the field systems. The field ditch at Earl's Down Farm (Cleal *et al* forthcoming) marked a boundary between arable and pasture. The possible expansion of existing field systems at this period cannot be discounted but it seems unlikely on present evidence that the main blocks of fields are post-Bronze Age in origin.

## Medieval and post-medieval

The wider medieval landscape around Stonehenge will not be discussed in any detail here. It was recently the subject of investigation by James Bond during assessment work for the proposed new visitor centre for Stonehenge (Bond 1991). Landuse during the medieval and post-medieval period and its direct effects on the Avenue have already been discussed by Montague (*Chapter 7*).

In terms of the study area as defined in Chapter 2 medieval settlement on any scale is again distributed towards the periphery, along the river valleys. Documentary evidence shows that much of the area around Stonehenge itself was under the open arable fields belonging to the settlement of Amesbury Countess in the northern area, and Amesbury west in the south (*ibid*, RCHM(E) 1979, xvi–xviii), with open dowland in the higher parts. Coneybury Hill was the site of a rabbit warren, a name recorded as early as 1382 (Bond 1991, 398).

It was suggested above that some of the wrecking of the monument could have occurred in the early Christian period. This is conjecture, but Amesbury is mentioned in pre-Conquest sources and became a royal estate in the tenth century (*ibid*, 385–6; cf Chandler and Goodhugh 1989). There is some suggestion of an early minster church here, superseded in AD 979 by an abbey founded by Queen Aelfthryth. This in turn was replaced in 1177 by a priory of nuns of the Order of Fontavrault. However, from the eleventh century Amesbury seems to have lost much of its importance and it is interesting to note the proportionately large amount of pottery of the

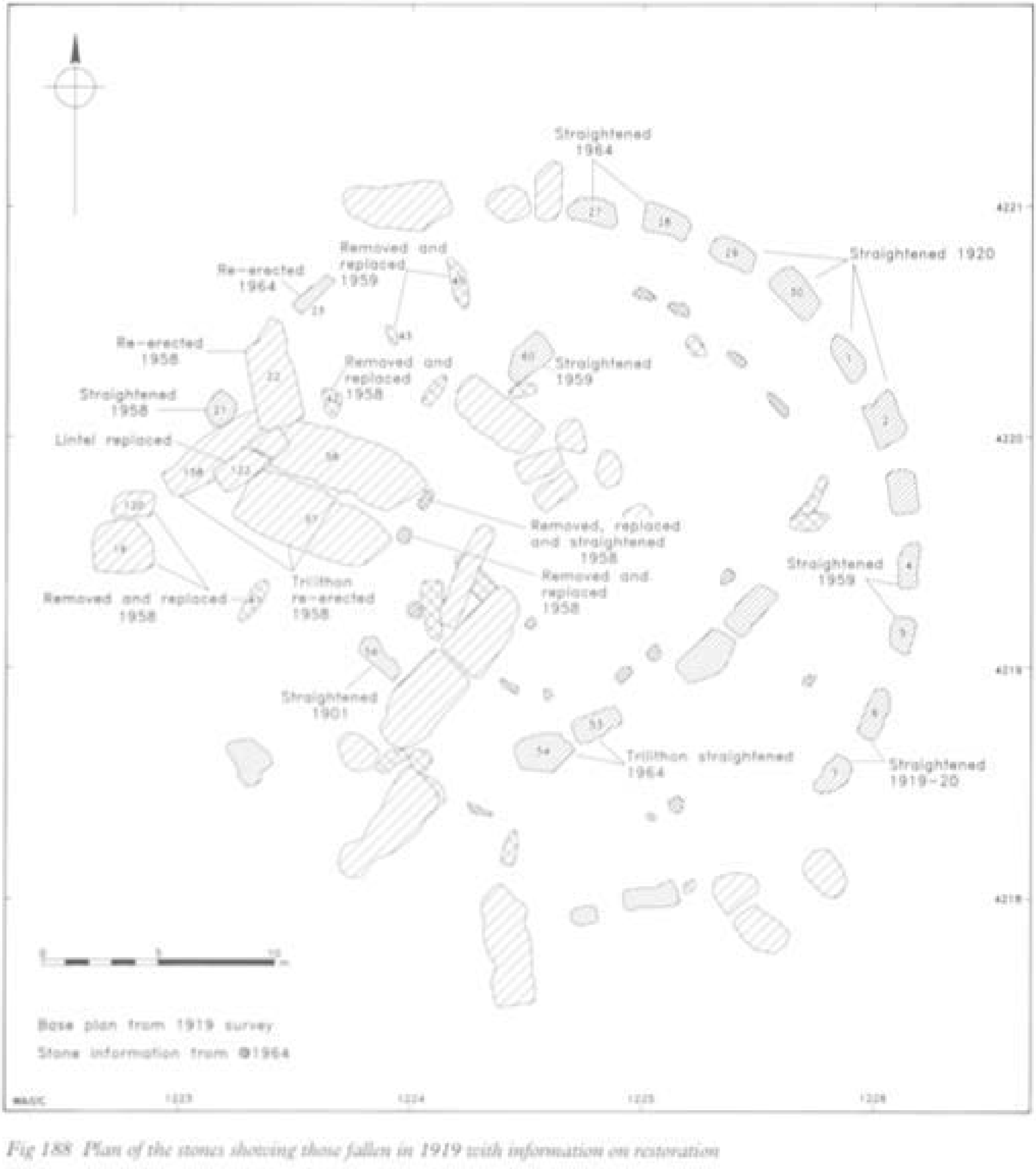



*Fig 188 Plan of the stones showing those fallen in 1919 with information on restoration*

tenth- to eleventh-centuries from Stonehenge in comparison with later medieval pottery. The presence of the religious house nearby may have been influential in bringing about the destruction of parts of the monument but no more can be made of this on present evidence.

By the early eighteenth century the downland landscape surrounding Stonehenge was largely open pasture for the maintenance of enormous flocks of sheep. However, by the time of Stukeley's visit in the early 1720s temporary ploughing already encroached on the prehistoric monuments. From 1812 the local parishes began to employ Parliamentary procedures to enclose their fields so that, for example, by 1824 more than half the land in Amesbury was under arable agriculture. The appearance of isolated farmsteads and field barns away from village nuclei followed the process of enclosure. Fargo Cottages, for instance, were built in 1847 some 550m west of Stonehenge. This process continued until by 1971 the only area of remaining old grassland was that immediately around Stonehenge (RCHM(E) 1979, xv–xix; Chandler and Goodhugh 1989; Bond 1991, 425).

The nineteenth century also witnessed the planting of trees as shelter belts or ornamental clumps: Fargo plantation was established in 1846 and the beeches of King Barrow Ridge were planted some time before the first edition of the 1 inch to 1 mile Ordnance Survey map of 1879.

Similarly, although in the eighteenth century tracks and coach roads crossed the downs, it was not until the establishment of the Amesbury Turnpike Trust in 1762 that the road south of Stonehenge (A303) was formalised and an entirely new road constructed to the north (A344) cutting across the Avenue (Bond 1991, H4).

## The twentieth century

*by Andrew J Lawson*

The two principal human activities at Stonehenge during the twentieth century have been the archaeological excavations with which this volume is principally concerned and tourism and associated attempts at mitigation. Alongside these there have been major episodes of consolidation and reconstruction of the monument, which are inextricably linked with the excavations. Early surveys, for example by Inigo Jones (1655), John Aubrey (1666), William Stukeley (1740), John Wood (1747), and Flinders Petrie (1880), are important in establishing the fact that since the middle of the eighteenth century at least no stone is known to have been removed from the site.

### Dilapidation

It is not known when the monument began to fall into ruin or when the missing stones were removed. However, of the stones that remain on site it can be said that the tallest Trilithon (Stones 55, 56, and 156) had already fallen by *c* 1574 when Lucas de Heere made a watercolour sketch, despite Sir Richard Colt Hoare's claim that it fell in 1620 (Colt Hoare 1812, 154; Chippindale 1983, 33, fig 21). Stones 8, 9, 12, 25, and 127 of the Sarsen Circle and Stones 59 and 160 of one of the Sarsen Trilithons had probably fallen much earlier, certainly before John Wood's 1740 survey. A third Trilithon (Stones 57, 58, and 158) fell on 3rd January 1797 (Mayton 1800; *see above*). Stone 14 appears to have finally collapsed to a virtually horizontal state after 1837 (the date of a painting by Richard Tongue; Chippindale 1990, fig 5), having previously been supported since at least the end of the seventeenth century by Stones 38 and 39. Stone 22 in the Sarsen Circle and a lintel (122) collapsed on 31 December 1900, and the neighbouring Stone 23 in March 1963.

Because most of this dilapidation has occurred in the south-western half of the monument, the direction of the prevailing wind, it is likely that natural weathering has had the greatest effect here (Atkinson 1957, 2). The dissolution of the chalk bedrock, exacerbated by rainfall, has effectively lessened the depth of the foundation sockets of the monument leading to the eventual collapse of the stones. The continued deterioration of the monument has been arrested through remedial action by the site's owners in the twentieth century.

### Consolidation and re-erection

By the 1820s the growing pressure from visitors was such that a guardian was appointed. A later owner of Stonehenge, Sir Edmund Antrobus, issued clear instructions to the guardian to prevent damage to the monument and to attempt to avert littering of the site. Following the collapse of Stone 22 Sir Edmund restricted access to the previously open site and in May 1901 a surrounding fence was erected and a charge levied on visitors. Stone 56, the tallest of all the stones, was leaning dangerously and Sir Edmund, anxious that it might break or collapse onto a visitor, organised its re-erection preceded in September 1901 by Professor Gowland's excavation (C64).

Sir Edmund Antrobus died in 1915 and Stonehenge was bought at auction by Mr Cecil H E Chubb, who lived at Bapton Manor near Salisbury and who later gave it, and some 30 acres (12ha) of surrounding land, to the nation; as a consequence he was knighted (Baker, nd). By this time many of the stones were being propped up (*see Fig 5*) and the site was not only a mess but a dangerous mess. Figure 188 shows the stone settings in 1919 with the then positions of fallen stones. The Office of Works embarked on a programme of minimal restoration (Fig 189) and looked to the Society of Antiquaries of London for the supervision of any necessary groundworks so that any archaeological evidence would be recorded. The Society saw this approach as an opportunity for the exploration of the entire monument. Under their aegis Lt Col William Hawley embarked on the first of his eight seasons of work, around the base of stones on the eastern side of the circle (Chapter 1).

By 1954, during the campaign of Atkinson *et al*, fear that visitors climbing on the stones would erode some of the newly discovered carvings prompted new recommendations for the re-erection of the stones known to have fallen since the eighteenth century (R Atkinson pers

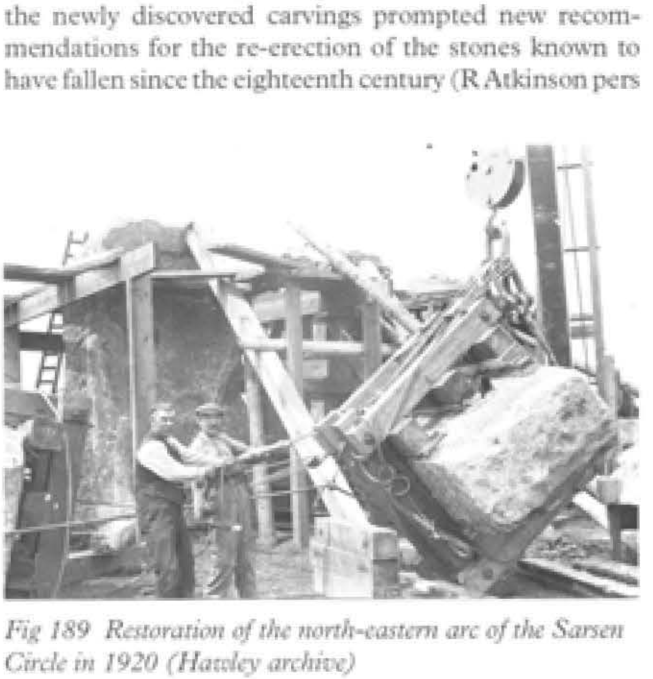


*Fig 189 Restoration of the north-eastern arc of the Sarsen Circle in 1920 (Hawley archive)*

comm). Six stones were to be repositioned, and those that had fallen earlier were to be left 'as a survival of damage in ancient times' (Piggott 1959, 50). Following a debate in the House of Commons, the work was undertaken between March and June 1958. As with the earlier work supervised by Gowland and Hawley, it was necessary to excavate the original sockets of the stones to be repositioned before the stones were set in concrete. The work necessitated the temporary removal of additional stones which were later replaced (*Archaeol Newslet*, 6(6) (1958), 143 and 6(7) (1958), 167).

According to Atkinson, two cranes were used during the operation (Fig 190). The larger device known as the 'Brabazon Crane' (because it had been built to lift the prototype Brabazon aircraft in the event of a crash) had been borrowed from the nearby RAF airfield at Boscombe Down. Its driver had not operated it before and at one point in the lowering of a stone Atkinson was spared, by a whisker, from being crushed. The driver, not knowing the correct operation, arrested the descending stone by thrusting a metal object into the mechanism only seconds before the archaeologist would have been squashed (R Atkinson pers comm).

The following year it was decided to straighten Stones 4, 5, and 60 and to set them in concrete. Following the collapse of Stone 23 in 1963, it too was re-erected, together with Stones 28, 53, and 54, and many former excavation trenches were emptied and refilled with clinker. On each occasion the work of re-erection was preceded by archaeological excavation (Atkinson 1979, 213) and the infilling of trenches was supervised (R Atkinson pers comm).

Since that episode, changes at the monument itself have been largely cosmetic: gravel was laid in some areas of the stone settings in 1963 to prevent further erosion, and following the closure of the stones themselves to the public in the 1970s the interior was grassed over. Areas of imported turf have been laid in the southern part of the site beyond the Ditch and new pathways have been created for the visitors. The minor excavations occuring post-1963 and discussed elsewhere in this volume have all been on the periphery of the monument, as were the excavations in the car park and underpass.

*Fig 190 Re-erection of lintel 158 by the 'Brabazon Crane' in 1958 (P50216)*

**The setting of the monument: encroachment and clearance**

In considering the recent history of Stonehenge we should also consider the wider landscape just as we have done for earlier periods. Contemporary features are the archaeological remains of the future.

Between 1897 and 1902 a War Office Committee negotiated the purchase of 43,000 acres (*c* 17,200ha) of Salisbury Plain to the north of Stonehenge for infantry training. Subsequent purchases have brought the size of this range to 91,000 acres (*c* 36,400ha). The immediate consequence was a considerable increase in military traffic which continued to use the available tracks across the unfenced part of the monument *en route* for newly established camps at Larkhill and Durrington to the north (see Chippindale 1983, 176, illus 144).

In 1917 a training aerodrome was established for the Royal Flying Corps. This new development, on a rectangular area of 360 acres (148ha) west of Stonehenge (Fig 8.6), necessitated the demolition of Fargo Cottages. The principal hangars and technical facilities straddled the road to the south (A303) and encroached within 400m of the stones (Quarrie 1987).

By the First War the paying visitor to Stonehenge witnessed a sad scene: a fenced, propped-up monument degraded by traffic traversing the earthworks, its setting impaired by a nearby aerodrome as well as by the roads on either side. After the First War flying was reorganised and the aerodrome was no longer needed. The final flight of aircraft left in October 1920 and the buildings began to be demolished shortly afterwards (RCHM(E) 1979, pl 1); some were reused as a pedigree stock farm (eg Ordnance Survey 1926). The largest hangars near Fargo Plantation were dismantled in the 1930s (Ashworth *et al* 1987, 104) and the nearby buildings bulldozed into the western terminal of the Cursus in the late 1950s (Christie 1963).

At the same time that the aerodrome was being decommissioned Hawley noted (1921, 1) that the nation's acquisition of the monument and adjacent land 'made it possible to set back an unsightly fence and divert a cart track some distance from the monument'. Initially, the track to Larkhill was moved just beyond the Ditch but in the 1960s it was moved further west, thus overlapping the site of the earlier aerodrome buildings so that the sites of round barrows could be included within the triangle of land which contained Stonehenge.

In 1920 a pair of custodians' cottages had been built at the eastern apex of the triangle and before the end of that decade a café was built opposite them on the A344 (Fig 191). In 1929, following a public appeal, 1500 acres (600ha) surrounding Stonehenge were bought and placed in the hands of the National Trust. Since the object of the national appeal had been to restore open

# Plate 1: The Monument

*Plate 1.1. View through the monument along the axis, from the south-west, Stone 56 to left-centre*

*Plate 1.2. View through the monument from the west, Trilithon 57/58 in centre*

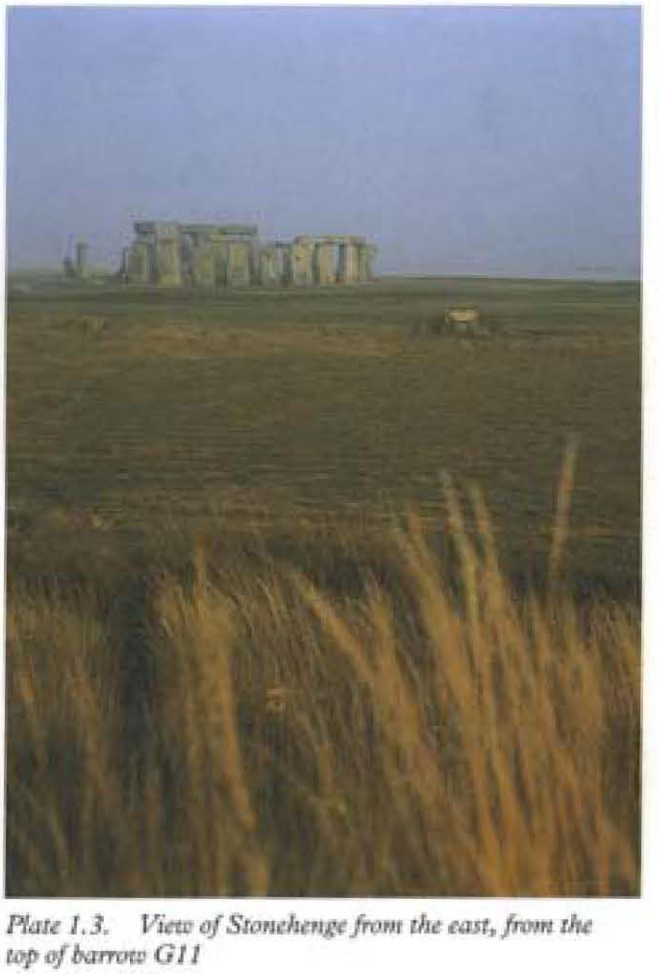


*Plate 1.3. View of Stonehenge from the east, from the top of barrow G11*

*All colour plates by Elaine Wakefield*

# Plate 2: The View Out

*Plate 2.1. Looking north-east along the axis from the centre of the monument, through the Sarsen Circle to the Heelstone. In the background to the right is King Barrow Ridge (see Figs 22)*

*Plate 2.2. Looking north-west from the centre of the monument, Trilithon 57/58 to the left with Stones 21 and 22 beyond. Notice the barrows of the Cursus group on the near horizon (see Figs 21 and 22)*

*Plate 2.3. Looking south across fallen Stone 12 and through the southern entrance. The South Barrow is to the left with the Normanton barrows on the near horizon to the right of the entrance (see Figs 21 and 23)*

*Plate 2.4. Looking south-east across fallen Trilithon Stone 59 with Trilithon 51/52 beyond. On the horizon is Luxenborough Plantation*

# Plate 3: The View In

*Plate 3.1. View from the southern entrance, South Barrow beyond entrance to the right*

*Plate 3.2. View from the east near Coneybury henge*

*Plate 3.3. View from the north-west, through the entranceway, from beside the Heelstone*

# Plate 4: Techniques of Construction

*Plate 4.1. The Sarsen Circle (Stone 2 far left): the vertical stones taper upwards, the lintels are curved to form the circle. Notice how closely they fit together*

*Plate 4.2. Bluestone lintel 150 with mortise hole underlying Stone 32 of the Bluestone Circle*

*Plate 4.3. Trilithon 53/54 showing tapering of the uprights and shaping and fitting of the lintel*

# Plate 5: Techniques of Construction

*Plate 5.1. Stone 68 of the Bluestone Horseshoe in front of Stone 56 of the Great Trilithon. Stone 68 is grooved and was probably reused from an earlier setting. Stone 56 shows the tenon for fallen lintel 156*

*Plate 5.2. Fallen lintel 156 showing mortise holes, Stone 56 with corresponding tenon beyond*

*Plate 5.3. The 'foot' (see text) of fallen Sarsen Trilithon Stone 55*

# Plate 6: Old Excavation Trenches Revealed by Parchmarks, August 1994

*Plate 6.1. The 'crenellated' pattern of Gowland's 1901 excavations at the foot of Stone 56 (C64); compare with Fig 149 and Plan 1*

*Plate 6.2. Cutting 12 looking approximately north-west (Trilithon Stone 60 standing centre-left) showed up with could be accurately measured off*

*Plate 6.3. Parchmarks in the centre of the monument, looking south-east. The only excavation known to have taken place in the centre was by the Duke of Buckingham in the seventeenth century. The area beneath the amorphous parchmark under the ranging rods was augered in 1994 and produced loose soil similar to the backfill of the excavation trenches on the site*

# Plate 7: Tooling and Carving

*Plate 7.1. Fine tooling on Sarsen Stone 16*

*Plate 7.2. The dagger carvings and graffiti on Stone 53*

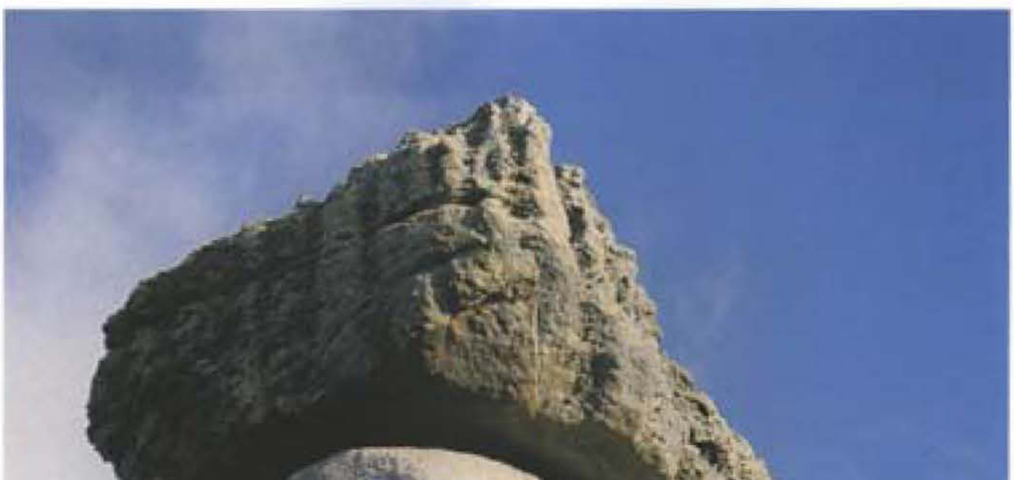


*Plate 7.3. Detail of lintel 152 showing tooling and weathering*

# Plate 8: Artefacts

*Plate 8.1. Late Neolithic/Early Bronze Age objects from Stonehenge (see Chapter 9 for dimensions and descriptions). Notice the burnt upper surface of the ceramic object*

*Plate 8.3. Bifacially worked Bluestone object (WA obj no. 287)*

*Plate 8.2. The ceramic object (lower surface uppermost) showing in cised decoration and lug*

*Plate 8.4. Bone 'chisel' (WA obj no. 23)*

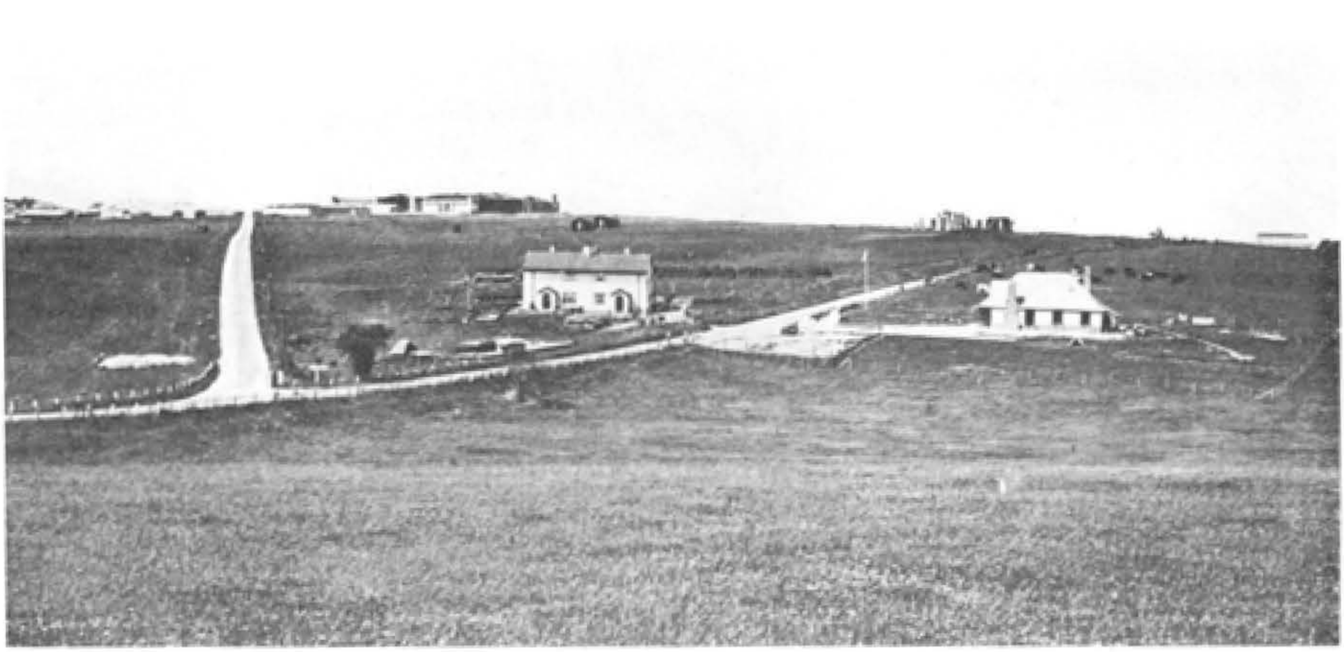


*Fig 191 View of Stonehenge from the east, probably in the 1920s, with the aircraft hangars on the skyline, custodians' cottages in the centre, and the café to the right (source unknown)*

surroundings to Stonehenge these buildings were removed and the cottages were replaced by 1939 with new ones on King Barrow Ridge to the east.

Stonehenge now lies in open country with few modern buildings visible and large areas of pasture in the immediate vicinity. Much of the wider area is under arable and is still part of the continuing wider system of human agricultural activity which has been a feature of the landscape of Stonehenge for millennia. Military activity on Salisbury Plain continues to be widespread and intensive but the area around the monument itself is no longer subject to troop movements, except along the roads and through the airspace above it. The roads themselves are still the most obvious intrusion on the landscape. Whatever the outcome of the current debates concerning the rerouting or otherwise of the roads and the siting of the visitor facilities may be, the early years of the third millennium AD are likely to see another period of intensive human activity in the area of the monument. Let us hope that this will be the last for many years and that Stonehenge will be allowed to retire gracefully into its landscape.

# Part 3: Artefacts and ecofacts: the finds assemblages

## 9 Finds assemblages

### The collections

*by Julie Gardiner*

Although a large number of artefacts from the excavations at Stonehenge remain in museum collections, those that survive for examination represent only a fraction of the total recovered. It is now almost impossible to quantify what proportion of the total is extant, since material was discarded at several stages by the principal excavators and some pieces known to have been kept by them can no longer be traced. It is known, for instance, that Hawley reburied a considerable quantity of finds in a series of pits located to the south-east of the monument. The position of these 'Graves', as he termed them, is known and they are visible on some aerial photographs taken at the time (*see Fig 11, above*). Precisely what went into these pits is not known, nor how the material was redeposited, but here it presumably remains. The other positive identification of redeposited material relates to the majority of the cremations from Hawley's excavations, principally from the Aubrey Holes, which were reinterred in Aubrey Hole 7 in 1935. Again, it is not known under what circumstances they were reburied, though re-excavation might allow a full analysis of the burials to be carried out should they prove to have been redeposited in individual bags or other containers.

The majority of finds that are extant are housed in the Salisbury and South Wiltshire Museum under various accession numbers (*see Appendix 9*). Prior to this project, these collections included material from all the main series of excavations, including, so far as it has been possible to ascertain, all remaining artefacts from excavations by Atkinson *et al* and the bulk of material from Hawley's and Gowland's work, as well as some of the smaller interventions. Recent work was represented by archives of excavations carried out by, for instance, by George Smith for the Central Excavation Unit (CEU; 1973, C87, 109; Intervention nos 6301, 6302), Evans and Atkinson (1978; C61, 62, 96, 97; Intervention nos 6351–4), Pitts (1979–80; C91; Intervention no 6501), and Wessex Archaeology (various 1988–93; C99–102, 110; Intervention nos 6602–6).

Small groups of artefacts from Stonehenge have been widely distributed to other museums, including the British Museum, the Museum of Anthropology and Archaeology, Cambridge, the Ashmolean Museum, Oxford, the National Museum of Wales, Cardiff, and university teaching collections, notably at Edinburgh (*see Appendix 9*). Some of this material was traced, checked against the catalogue of Hawley's finds (prepared by Newall), and partially studied, by Peter Berridge and/or Margaret Ehrenberg. For the most part these collections consist of fragments of bluestone and sarsen, sarsen mauls, antler picks, miscellaneous post-Bronze Age pieces, and small amounts of pottery and flint. In some cases contextual information is no longer available and with the possible exception of the antler picks and pottery the assemblages in all these categories are known to survive as only a small fraction of the original total and are amply represented by the Salisbury collections. For these reasons, and in view of the work undertaken by Berridge (*see below and Chapter 2*), it was decided not to examine collections other than those at Salisbury, with the exception of finds from the Vatcher's excavations along the Avenue which are currently held by Wessex Archaeology but will be deposited with the main archive. (It should also be noted that a small collection of pottery from the Vatcher's excavation of the Palisade Ditch (1967) was supplied for examination by John Barrett, Glasgow University.)

The National Museum of Wales (Acc no 33.561) holds a collection of rather more diagnostic pieces, including stone axes and chalk balls. These have not been examined by the present authors but were studied by Peter Berridge and information from him is included in the relevant sections below.

Recently excavated artefacts from excavations which have already been adequately published have not been re-examined except where specific questions remained (eg flint from George Smith's Avenue excavation).

#### Databases

All artefacts have been fully and individually recorded using specially designed forms based on Wessex Archaeology's standard recording system for finds, modified to accommodate the various numbering systems adopted by the different excavators and previous workers. All finds were catalogued according to their original contexts and finds numbers, the former then being converted to the new Wessex Archaeology context number. A series of numerical finds codes was assigned to each class of artefact by material category, together with object numbers for individual artefacts (as opposed to undiagnostic pieces of bluestone, sarsen, flint flakes, glass, etc) and pottery record numbers for featured sherds. Full details of the codes used are in archive. Thus, each find's record includes all the various context and finds numbers assigned to the individual pieces since they were excavated. Recording of animal bone and antler picks/rakes was carried out in accordance with the standard practices of the Faunal Remains Unit of Southampton University as detailed in the relevant sections below. All finds, including environmental data, are entered into one of several databases held in both paper and disk form with the archive. A list of the databases and their contents is given in Appendix 9.

It had originally been intended that this volume should not include a traditional chapter of finds descriptions and catalogues but that all the data should be incorporated into the relevant phase discussions presented in foregoing chapters. In the event, such a large proportion of the artefacts proved to have come from poorly stratified contexts that this would have effectively excluded most of the database. As already stated, the extant collections are very incomplete and this further complicates the presentation of the artefact assemblages in a coherent and quantified form. To exclude discussion of all finds not personally examined during the course of this research would be to bias the information unacceptably, since whole categories of finds, notably the human remains and much of the flint assemblage, would be effectively lost.

Peter Berridge's work on the archives included re-cataloguing all Hawley's finds from the lists presented in the excavator's Diaries and Newall's catalogue and checking the Diary entries against the artefacts themselves as far as possible. He also provided a card index of finds from the excavations of Atkinson *et al.* Berridge's files are available in the archive and include information on where finds other than those at Salisbury are curated. There is a database of all finds recorded by Hawley from contexts which can be assigned to phases 1–3, for comparison with the separate databases of all extant finds recorded by Wessex Archaeology. In the sections that follow, all artefacts personally examined are described and discussed, those diagnostic pieces present in other collections which were examined and recorded in detail by Berridge are included in the catalogues, and reference is made to the wider assemblage of material where the information could be adequately drawn from Berridge's archive. Information relating to the discard of individual categories is included where possible.

## Presentation

The sections below follow a similar format. The prehistoric artefacts relevant to the construction and use of the monument are presented first. In each case the nature and current location of the artefacts are described together with any available information on the completeness or otherwise of the assemblage, and any evidence for systematic discard or curation. The identification and distribution of artefacts from phased contexts are then described. This is followed by a description of individual artefact/ware categories, their affinities, and distribution across the monument as a whole, accompanied by summary tables and distribution plans where relevant. Each section concludes with a brief discussion and a catalogue, either of all known artefacts – in the case of the smaller groups such as chalk, antler, and bone objects – or illustrated examples for larger groups such as pottery, flint, bluestone, and sarsen. The only exception to this rule (apart from pottery, *see below*) is the flint, which is discussed by individual phase. For the small groups of Neolithic and Bronze Age objects other than pottery, all those in Salisbury Museum are illustrated, with representative examples from the larger groups and featured sherds of pottery. Antler picks/rakes are illustrated by a selection of photographs only.

Because such a small proportion of the earlier prehistoric pottery is from phased contexts the treatment of this artefact category differs in detail from the other categories. The collection is treated by ceramic style, with each style discussed under the following headings: Fabric; Phased Context; Distribution; Discussion. A selection of featured sherds is illustrated and a catalogue of illustrated sherds provided in extended captions.

The post-Bronze Age artefacts are dealt with in summary only. All finds are entered onto the archive database but the text here includes only brief discussions. Summary catalogues are presented for coins and metalwork.

The environmental data are presented in as much detail as possible with emphasis on the major categories of human remains and animal bone. The format of these reports follows that of the artefacts as appropriate though the discussion of the animal bone is by individual phase. This section does not include details of the the molluscan and pollen analyses of the Mesolithic pits in the car park, which are presented in Chapter 4, above.

## Conventions

In all sections below, individual objects are referred to by their Wessex Archaeology object number (or Pottery Reference no (PRN)) where one has been assigned. Otherwise they are referred to by their original catalogue number (eg Hawley cat no 4321a; Atkinson cat no S54.123), and both numbers are recorded in the finds database. If neither is available (for instance in the human remains and animal bone sections) the principal reference is by WA context no, cross-referenced to Berridge's Catalogue numbers where these are available. The catalogues include details of Wessex Archaeology context and object/PRN number, original catalogue number, cutting, phase, and group.

All measurements are in millimetres unless otherwise stated. L = length, W = width, T = thickness, Wt = Weight (in grams).

# Earlier prehistoric pottery

*by Rosamund M J Cleal*

This section concentrates chiefly on the pottery not assignable to a site phase, and will be dealt with by ceramic style. All the pottery was recorded using the standard Wessex Archaeology recording system (Morris 1992). Fabrics were defined on the basis of inclusion type and frequency; type sherds were examined and described at x20 magnification with a binocular microscope. Sherds were generally assigned to fabrics by eye, but examination at x20 magnification was used where necessary. Terms used consistently are 'hard' for not easily scratched with the fingernail, and 'soft', easily scratched with the fingernail, and 'fe' is used as an abbreviation for iron oxides.

A selection of featured sherds is illustrated. Counts and weights of all sherds are given in Tables 25–9. Totals given in the text are for the monument only (ie the Ditch and Bank and the area around it) but the tables include sherds from elsewhere (ie the Palisade and the Avenue).

## Earlier Neolithic

Only one sherd (broken in two along a probably post-depositional break) (Fig 193, P1), can be confidently assigned to this period. It is a decorated rim sherd in a fabric with flint and sand (F1), and it carries a pre-firing perforation and incision. A cereal grain impression is visible on the exterior surface. The sherd is noted in the Catalogue as the only pottery 'actually found on the bank'. There is no mention of context in the Diaries, but it seems likely, in view of the note in the catalogue, that it had weathered out of bank material.

### Fabric

The single fabric of this date is F1, a hard fabric with a rough, slightly sandy feel and a hackly fracture. It contains sparse flint (*c* 5%) of moderate size (<5mm) and moderate quartz sand (*c* 15%, <0.5mm).

### Discussion

Stylistically the vessel represented by this sherd seems to have had close parallels in the local area. At King Barrow Ridge, 1km to the east, between a quarter and a third of a small carinated bowl was recovered from a possible posthole (Cleal and Allen 1994, fig 5, feature B; fig 8, P42). This vessel was in a hard fabric with flint and sand, not unlike that of P1, and also carried oblique incised slashes across the top of the rim. Around the neck are two rows of very deep round impressions, similar in diameter to the hole in P1, but not completely penetrating the vessel wall. The King Barrow Ridge vessel in turn shows affinities with a small group of vessels at Windmill Hill causewayed enclosure, 30km to the north (Smith 1965, fig 26, P176–P178, and fig 27, P179), and to vessel W7 at Fussell's Lodge long barrow, less than 10km to the south-east (Smith 1966, fig 6).

Because of the nature of the context there is no unequivocal association between the construction and early use of the monument and this sherd, although it is likely that some pottery of this type was still in use at this time. The vessel represented is unusual, but not unknown in the local area.

A single plain body sherd (4g) recovered from the base of one of the Avenue ditches in C86 may also be earlier Neolithic on the grounds of its hard sandy fabric containing some flint (recorded in archive as Q7). The sherd is very weathered and likely to be residual, probably derived from the known earlier Neolithic activity on King Barrow Ridge (*see Chapter 5*).

## Grooved Ware

Only eleven sherds (56g) from the site could be confidently identified as Grooved Ware (Table 25), and these represent a likely total of no more than three vessels on the basis of rim count, and only one or perhaps two more on the basis of all sherds.

### Fabric

Two fabrics occurred in the Grooved Ware:

**S1** Soft, smooth fabric with a hackly fracture, containing moderate to common (15–20%) shell, well sorted (<5mm, most <2mm) but unevenly distributed. Flint, dark black reddish brown grains (probably glauconite or iron oxides), and quartz sand are also usually present, although flint is not present in every sherd, and is likely to be a natural inclusion in the clay. Both the quartz sand and glauconite or iron oxides are rare to sparse.

**G11** Soft fabric with a rough feel and hackly fracture, containing grog which is difficult to distinguish from the clay matrix, but probably sparse (*c* 5%), and rare to sparse (1–3%) flint, which is angular, small (<2mm), and may be a natural inclusion in the clay. Some fine quartz sand and dark grains (iron oxides or glauconite) are also present.

Both shelly fabrics and grog-tempered fabrics are common in Grooved Ware, both locally and in central southern and eastern England as a whole. At Durrington Walls thin-sectioning demonstrated that some at least of the shell present was fossil (Finch 1971), but there is certainly recent marine shell in some of the Grooved Ware from Ratfyn, Woodlands, and Chalk Plaque Pit (Cleal *et al* 1994), which suggests that Grooved Ware vessels and/or the materials used to make them were entering the area from a variety of sources. The identification of the shell in the Stonehenge Grooved Ware has not been attempted, primarily because the amount of material is so small and the sherds so fragile that any possibly destructive examination of them should not be attempted. Although non-destructive analysis of sherds

**Table 25 Grooved Ware counts and weights**

| *Cutting* | *Phase/group* | *Fabric* | |
|---|---|---|---|
| | | *G11* | *S1* |
| *Ditch* | | | |
| C21 | 89/00 | 1/3g | – |
| C26.5 | 2b/24 (context 2471) | – | 4/32g |
| C28.8 | 2a/17 (context 2554) | – | 4/4g |
| C28.15 | 89/00 | – | 2/17g |

*Listed by phase or unphased category, group number (context number for phased contexts only)* can produce informative results, it was felt that as both marine and fossil shell are already known from the local area, the amount of extra information derived from such an examination was not likely to be sufficient to justify any additional risk to the material.

**Phased sherds**

The only occurrences of Grooved Ware in phased contexts are from the Ditch, and unfortunately there is some uncertainty about their location.

The rim sherd P2 and three other small fragments associated with it are recorded as finds 1616 and 1617 in the catalogue prepared by Newall of the Hawley excavation finds, although it should also be noted that the labels with the sherds are recent ones, presumably repeating older originals, since the numbers could not have been marked on the sherds because of their condition. These are listed as:

> These are small fragments both of one pot and show evidence of raised ornament. This was found in the ditch on 23rd July 1924 10" [0.25m] above the bottom in loose white chalk on rampart side and 15" [0.38m] from the side. This does not appear to be especially mentioned in the diary.

A handwritten note appended to this entry reads *but see Diary 1925, p8.*

The Diary entry for the 23/7/1924 is for Segment 17, the eastern terminal of the ditch at the southern entrance, which mentions 'Two pieces of very black soft pottery slightly red on outside same as small fragments found yesterday at 32" [0.81m] B.G. L.' These sherds are almost certainly the two joining sherds of P4, as they are described as grooved in the catalogue; they are marked 1610 and 1611, and those numbers are appended to the Diary description. From descriptions elsewhere (eg 21/7/1924) it seems that this terminal may have been cut by a feature in which the Grooved Ware may have lain. Four other fragments are also noted, of which P3 is one.

It certainly appears from this that there was Grooved Ware in Segment 17, at a low level in the Ditch, but it seems likely that the segment was disturbed and the Grooved Ware deposited within a feature. The other occurrence, that of the sherds labelled 1616 and 1617, is more problematic. The other Diary entry (ie the handwritten note) draws attention to an entry in the following year, for the eighth section of C28 (which falls within segment 7). This entry describes the finding of

> a very small piece of pottery in loose chalk 15" [0.38m] from rampart side and 10 inches [0.25m] above the actual bottom of the ditch. It was whitened by the chalk and was only detected by a small piece having been broken off. It is of soft fine black gritty ware surface brown. It would have been much more satisfactory if it had been found actually on the bottom. It might have slipped down the side amongst falling chalk quite a long time after the ditch was deserted and is certainly a little newer than the things on the ditch bottom. Again the silting here is shallow, the ditch depth being only 4′ [1.2m].
>
> (17–19/6/1925)

The physical description matches the rim sherd P2, as it is largely covered by a white deposit from having been buried in chalk, is soft, black, and gritty, and was probably found in one piece although it now consists of tiny fragments. It is unlike the pieces numbered 1610–15, which could have belonged to a single vessel, and it also matches the catalogue description of it as showing evidence of raised ornament: P2 appears to have a cordon (it should be noted that the catalogue descriptions of pottery are generally of a very high standard for the period). The description of the depth also matches that given in the 1925 Diary entry.

The fact that in the catalogue numbering system this sherd follows the sherds from Segment 17 has no bearing on the likelihood or otherwise of their findspots being close to one another, as the catalogue appears to have been compiled at a later date, and material from different episodes of excavation is often juxtaposed. It has therefore been concluded that there are at least two Grooved Ware vessels represented *in situ* in the Ditch: one from Segment 17 (C26: P3 and P4) and probably from a disturbance phased as of phase 2b; and one from Segment 7 (P2), in a context for which there is no positive evidence of disturbance.

It is tempting to assign this sherd to the primary filling of the Ditch, but Hawley's reluctance was well founded, and the size of the fragments means that they could have reached a low position in the ditch by post-depositional processes. The fact that they are chalk-stained may well only reflect the chalky nature of even the upper filling of the Ditch.

**Distribution**

There is no concentration of Grooved Ware around the site. The two occurrences in the Ditch are in different areas. The rim P2 and the fragments associated with it were found in the eastern length (C28) and P3 from close to the southern entrance.

**Discussion**

The Grooved Ware assemblage is small, and the individual sherds very fragmentary (mean weight 5.1g; mean area 309 $mm^2$; maximum area 700 $mm^2$). None of the sherds shows any features diagnostic of the three major sub-styles of this tradition as defined in Wainwright and Longworth 1971 (236–42), although the bevelled rim of

**Table 26 Beaker pottery counts and weights**

| | | | | *Fabric* | | | | |
|---|---|---|---|---|---|---|---|---|
| *Cutting* | *Phase/group* | *C1* | *G1* | *G2* | *G3* | *G4* | *G5* | *G99* |
| *Interior* | | | | | | | | |
| C1 | 87/00 | – | 2/23g | – | – | – | – | – |
| | 88/00 | - | 7/30g | – | – | – | – | – |
| | 89/00 | - | 3/19g | – | – | 2/9g | – | – |
| C2 | 87/00 | – | – | – | – | 2/5g | – | – |
| | 88/00 | – | – | 1/11g | – | 21/104g | – | – |
| | 89/00 | – | – | – | – | 1/4g | – | – |
| C7 | 87/00 | – | 1/2g | – | – | – | – | – |
| | 88/00 | – | 2/10g | – | – | – | – | – |
| C10 | 89/00 | – | 2/8g | – | – | – | – | – |
| C12.1 | 81/00 | – | 2/8g | – | – | – | – | – |
| | 88/00 | – | – | – | – | 3/13g | 1/2g | – |
| C12.4 | 87/00 | – | – | | – | – | – | – |
| C12.6 | 88/00 | – | 3/30g | – | – | – | – | – |
| C12.8 | 87/00 | – | 11/91g | – | – | – | – | – |
| | 88/00 | – | 18/151g | – | – | – | – | – |
| C8, C13, C14 | 60/32 | – | 2/8g | – | – | – | – | – |
| | 81/00 | – | 3/9g | – | – | 1/3g | – | – |
| | 89/00 | – | 16/58g | – | – | 1/1g | – | – |
| C16.1 | 89/00 | – | – | – | – | 2/9g | – | – |
| C35 | 89/00 | – | – | – | – | 1/2g | – | – |
| C45A | 88/00 | – | 4/18g | – | – | – | – | – |
| C45B | 3ii/05 (context 3171) | – | 1/3g | – | – | – | – | – |
| C45C | 88/00 | – | 3/13g | – | – | – | – | – |
| C45D | 3i/09 (context 3167) | – | – | – | – | 2/2g | – | – |
| C56 | 3ii/06 (context 3523) | – | 1/3g | – | – | – | – | – |
| | 90/00 | – | 1/2g | – | – | – | – | – |
| C58 | 88/00 | – | – | – | – | – | – | 1/1g |
| | 89/00 | – | 1/3g | – | – | – | – | – |
| C33.4 | 60/43 | – | 2/8g | – | – | – | – | – |
| C33.10 | 89/00 | – | 1/5g | – | – | – | – | – |
| C33.16 | 3vi+ | – | 1/3g | – | – | – | – | – |
| C34.1 | 60/42 | – | 1/4g | – | – | – | – | – |
| C34.11 | 89/00 | – | 1/6g | – | – | – | – | – |
| *Periphery* | | | | | | | | |
| C4.2F | 89/00 | – | 1/12g | – | – | – | – | – |
| C36 | 87/00 | – | – | 5/22g | – | 1/28g | – | – |
| | 89/00 | – | 1/3g | – | – | – | – | – |
| Ditch | | | | | | | | |
| C22 | 3+ | – | 1/3g | – | – | – | – | – |

**Table 26 (cont)**

| *Cutting* | *Phase/group* | *C1* | *G1* | *Fabric* *G2* | *G3* | *G4* | *G5* | *G99* |
|---|---|---|---|---|---|---|---|---|
| C23 | 89/00 | – | 1/3g | – | – | – | – | – |
| C24 | 89/00 | – | – | – | – | 3/13g | – | – |
| C28.1 | 89/00 | – | 1/1g | 19/42g | – | – | – | – |
| C28.4 | 89/00 | – | – | – | 1/1g | – | – | – |
| C28.6 | 89/00 | – | – | – | 25/44g | – | – | – |
| C28.16 | 89/00 | 1/9g | 2/9g | – | – | – | – | – |
| C28.14 | 89/00 | – | 1/4g | – | – | – | – | – |
| C28.16 | 89/00 | – | 1/5g | – | – | – | – | – |
| C29 | 89/00 | – | 1/2g | – | – | 1/2g | – | 3/6g |
| C41 | 88/00 | – | 1/5g | – | – | – | – | – |
| *Unprovenanced* | | – | 3/13g | – | 1/2g | 2/10g | – | – |

P5 is close to that of form 24 at Durrington Walls (Wainwright and Longworth 1971, 57, fig 20), which is a diagnostic feature for the Durrington Walls sub-style (*ibid*, 242).

The vessel represented by the small sherds of P2 may, however, be tentatively identified as of the Woodlands sub-style. The only featured sherd, the rim sherd, shows some sign of having a worked-up horizontal cordon on the exterior, which would be diagnostic of that sub-style. An additional factor in support of this identification is that very small, thin-walled vessels occur almost exclusively in the Woodlands sub-style, or where not directly assignable to that tradition, occur in association with it (eg some published vessels from the type site (Stone 1949, 123–5, fig 1), and unpublished vessels from Barrow Hills, Radley, Oxfordshire, Cleal forthcoming).

## Beaker

A total of 229 sherds, weighing 1019g, was recovered from the site (Table 26), the majority being from contexts not associated with the construction and use of the monument. The occurrence of sherds associated with the monument is discussed in Chapter 7. On rim count alone as few as six vessels are represented, and even taking into account decoration, fabric, and distribution it is difficult to find reliable grounds for suggesting more than 10–15.

### Fabric

Seven fabrics are represented among the Beaker material, most of which are grog-tempered.

**C1/Bkr; LNEBA** Hard, smooth fabric with a hackly fracture. It contains sparse to moderate angular voids (*c* 5–10%; <5mm, most <2mm), unevenly distributed. In a single example the surviving inclusion is calcite, and it seems likely that all the voids represent calcite. Probably grog is also present (*c* 10%) but it is difficult to distinguish from the clay matrix. Dark reddish to black grains (fe or glauconite) are rare.

**G1/Bkr; LNEBA** Hard fabric with sparse to moderate small grog (10–15%; <2mm), sparse quartz sand (<5%), rare dark grains (some magnetic (fe) and possibly some glauconite) occasional flint, and occasional calcareous inclusions represented by voids. The grog is difficult to distinguish from the clay matrix. The majority of sherds are unequivocally Beaker and show a typical firing of reddish exterior, reddish exterior margin, black core, and brownish interior surface. Firing of some of the plain sherds is not of this pattern, and they have been recorded as Late Neolithic/Early Bronze Age (LNEBA).

**G2/Bkr** Soft, smooth fabric with a hackly fracture. It contains moderate to common grog (15–20%); <3mm; sub-angular to sub-rounded) which is generally easily visible against the matrix and contains quartz sand. Other inclusions include sparse (<5%), poorly sorted (<2.5mm, most <1mm) quartz sand and occasional flint and limestone (probably chalk), both rounded.

**G3/Bkr** Hard, smooth fabric with a hackly fracture. It contains moderate to common (15–20%) small (<1mm) grog, rare to sparse quartz sand (<3%; <1mm), and some dark reddish to black grains, at least some of which are fe but which may also include glauconite. The fabric is distinctive, generally with a fine finish and well fired.

**G4/Bkr; LNEBA** Hard fabric with a soapy feel and hackly fracture, with virtually no inclusions other than grog which is difficult to distinguish from the clay matrix. Dark grains which are probably fe or glauconite are occasionally present, as are voids which probably represent a leached-out inclusion type. This code was only used for plain sherds if they were of less than 10mm thickness and had a Beaker-like firing.

**I1/Bkr/LNEBA** Hard, smooth fabric with a hackly fracture. There are few obvious inclusions in this fine fabric, the most obvious being dark soft reddish brown to black grains which here as elsewhere are considered likely to be iron oxides (fe) or glauconite altered by firing. They are probably a natural inclusion in the clay. Other inclusions present are quartz sand, flint, and angular quartz(ite) and mica, all rare or occasional. Grog is also almost certainly present, but is impossible to identify it with confidence; it is likely, therefore, to be finely crushed. The fabric is slightly micaceous, the mica showing as very small white metallic flakes.

**Q6/Bkr** Hard, sandy fabric with moderate quartz sand (10–15%; <1.0mm, most <0.5mm). Glauconite or fe also present, and grog may be present but is difficult to distinguish from the clay matrix.

The presence of iron oxides and possibly glauconite in the Beaker fabrics is consistent with the evidence from the Stonehenge Environs Project, where clays with iron oxides and/or glauconite appear to have been preferred (Cleal with Raymond 1991, 237–8; note, however, that at that time the likelihood that glauconite was represented among the dark reddish to black grains was not appreciated by the authors and their 'fe' category of inclusion almost certainly includes glauconite).

### Phased sherds

Only four Beaker sherds were found securely stratified in features which can be assigned to a phase, and a further sherd is probably assignable to the primary filling of a Z Hole. The sherds in the earlier context are the two small body sherds found in Q Hole 5 (P7 and P8). One is certainly comb-impressed (P7) and the other seems to have some comb impression barely surviving next to a break; both sherds are clearly Beakers, judged on their wall thickness, colour, and fabric. Although they are from relatively high in the feature they must be assumed to have entered the feature with deliberate backfill which followed the removal of the stone, and are therefore contemporary with or earlier than the dismantling of the Q and R Setting (ie phase 3i). Two other sherds, from C45 and G56 respectively, were recovered from Sarsen stoneholes, one each from Stone 3 of the Sarsen Circle (P9) and around 53 or 54 (it is not clear from which) of the Sarsen Trilithons (P10). The sherd from Z Hole 16 is almost certainly to be regarded as coming from the primary fill, and therefore belonging to phase 3vi.

### Distribution

If calculated by sherds per square metre the distribution of Beaker sherds does not vary markedly across the site. In absolute terms there is some hint of a concentration towards the northern part of the site, with sherds of the same vessels occurring in C12 and C45. The exact location of sherds within cuttings is difficult to establish in most cases, but there is a possibility that most of the sherds of an exceptionally thin-walled and fine Beaker (P22/3) came from the general area around the disturbed grave, WA 1399. It is very tempting to see this as a disturbed grave good, but it is now impossible to establish whether or not this was the case.

**Table 27 Beaker decorative techniques**

| *Technique* | *No* | *% of total decorated* |
|---|---|---|
| **Comb** *(N = 105)* | | |
| *Indeterminate* | 2 | |
| *Rectangular-toothed* | 76 | |
| *Square-toothed* | 27 | 63.3 |
| **Fingernail** *(N = 40)* | | |
| *Non-plastic* | 11 | |
| *Plastic* | 29 | 24.1 |
| **Grooves/incision** *(N = 9)* | | |
| *Groves* | 4 | |
| *Incision* | 5 | 5.4 |
| *Impression* | 4 | 2.4 |
| *Plastic (cordons, bosses, etc)* | 7 | 4.2 |
| *Twisted cord* | 1 | 0.6 |
| *Total decorated* | 166 | |

Decorated as % of Total Beaker (N = 229) = 72.5%

It is interesting to note the occurrence of considerable quantities of Beaker material in the Ditch cuttings. Some of this seems to have been *'in situ'*, almost directly on top of the secondary ditch fill, and occasionally associated with hearths and other features. It is very difficult to separate out distinct Bronze Age layers in the Ditch cuttings excavated by Lt-Col Hawley, but the evidence does at least clearly indicate that the Beaker-associated use of the enclosure post-dated the filling of the Ditch to the top of its cut. In at least one case (in Segment 9) Beaker sherds were associated with a hearth and with a bluestone implement.

### Discussion

The Beaker assemblage as a whole is small and composed largely of small sherds (mean weight 4.5g; mean area 438 $mm^2$; maximum area 1000 $mm^2$). Although any calculation of vessel numbers is difficult with such fragmentary material, the subjective impression gained from the assemblage is that there are relatively few vessels represented by several sherds each. This is particularly the case with the vessels represented by P24 and P29. It seems likely that in these cases the vessels were broken within the monument, rather than entering it as sherds.

In view of the lack of support from radiocarbon dating for any of the established typologies of Beakers (Kinnes *et al* 1991), it does not seem justifiable to attempt to classify the very fragmentary material from the monument. It may be noted, however, that there is only a single cord-impressed sherd (P31; from the base of the Stonehenge Layer around Stone 27, C58), which could

**Table 28 Indeterminate later Neolithic/Early Bronze Age pottery counts and weights**

| | | | | *Fabric* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Cutting* | *Phase/group* | *C1* | *F99* | *G1* | *G4* | *G5* | *G6* | *G99* | *I1* | *Q99* | *S1* |
| *Interior* | | | | | | | | | | | |
| C1 | 88/00 | – | – | 1/16g | – | – | – | – | – | – | – |
| | 89/00 | – | – | – | – | 2/18g | 3/14g | – | 1/6g | – | – |
| C2 | 87/00 | – | – | – | 3/21g | 25/123g | – | – | – | – | – |
| | 88/00 | – | – | – | – | 10/74g | 1/7g | – | – | – | – |
| | 89/00 | – | – | 1/20g | – | – | – | – | – | – | – |
| C7 | 80/00 | – | – | – | – | 1/7g | – | – | – | – | – |
| | 88/00 | – | – | – | – | 2/9g | – | – | – | – | – |
| | 89/00 | – | – | 2/15g | – | – | – | – | – | – | – |
| | 91/103 (context 1705) | – | – | 1/10g | – | – | – | – | – | – | – |
| C10 | 89/00 | – | – | 2/14g | – | – | 15/86g | – | – | – | – |
| C12.4 | 87/00 | – | – | 1/4g | – | – | – | – | – | – | – |
| C8, C13, C14 | 3iv/07 (context 2342) | – | – | – | – | – | 1/5g | – | – | – | – |
| | 81/00 | – | – | – | – | – | 1/3g | – | – | – | – |
| | 89/00 | – | – | – | – | 8/42g | 2/7g | – | – | – | – |
| C45C | 88/00 | – | – | 1/10g | – | – | – | – | – | – | – |
| C45H | 89/00 | – | – | 1/4g | – | – | – | – | – | – | – |
| C78 | 89/00 | – | – | – | – | – | 3/16g | – | – | – | – |
| C92 | 87/00 | – | – | – | – | – | – | 9/16g | – | – | – |
| C32.4 | 89/00 | – | – | 1/14g | – | – | – | – | – | – | – |
| C32.9 | 89/00 | – | – | 1/9g | – | – | – | – | – | – | – |
| C32.10 | 3+ (context 1183) | – | – | 1/4g | – | – | – | – | – | – | – |
| | 89/00 | – | – | 1/8g | – | – | – | – | – | – | – |
| C32.16 | 89/00 | – | – | 1/4g | – | – | – | – | – | – | – |
| C32.24 | 89/00 | – | – | – | – | – | 1/21g | – | – | – | – |
| C32.29 | 89/00 | – | – | 1/53g | – | – | – | – | – | – | – |
| C33.2 | 60/43 | – | – | 1/7g | – | – | – | – | – | – | – |
| C33.4 | 60/43 | – | – | 1/3g | – | – | – | – | – | – | – |
| C33.9 | 89/00 | – | – | – | – | – | 1/4g | – | – | – | – |
| C33.12 | 89/00 | – | – | – | – | – | 1/4g | – | – | – | – |
| C33.14 | 89/00 | – | – | – | – | 1/3g | – | – | – | – | – |
| C33.15 | 89/00 | – | – | – | – | – | 1/4g | – | – | – | – |
| C34.4 | 82/00 | – | – | 1/10g | – | – | – | – | – | – | – |
| C34.8 | 89/00 | – | – | – | – | 1/5g | – | – | – | – | – |
| C34.11 | 89/00 | – | – | – | – | – | 1/26g | – | – | – | – |
| C34.12 | 89/00 | – | – | 1/5g | – | – | – | – | – | – | – |
| *Periphery* | | | | | | | | | | | |
| *Ditch* | | | | | | | | | | | |
| C6 | 89/00 | – | – | – | – | 2/9 | 3/11g | – | – | – | – |
| C18/19 | 89/00 | 2/6g | – | 1/4g | – | – | 5/20g | – | – | – | – |
| C20 | 88/00 | – | – | – | – | 1/7g | 2/11g | – | – | – | – |
| C21 | 89/00 | – | – | – | – | – | – | 2/2g | – | – | – |

**Table 28 (cont)**

| *Cutting* | *Phase/group* | *C1* | *F99* | *Fabric* *G1* | *G4* | *G5* | *G6* | *G99* | *I1* | *Q99* | *S1* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Ditch* | | | | | | | | | | | |
| C23 | 89/00 | – | – | – | – | – | 2/15g | – | – | – | – |
| C24 | 89/00 | – | – | – | – | 1/6g | – | – | – | – | – |
| C28.4 | 89/00 | – | 2/7g | – | – | – | – | – | – | – | – |
| C28.6 | 89/00 | – | – | 1/4g | – | – | – | – | – | – | – |
| C28.10 | 89/00 | – | – | – | – | 1/6g | – | – | – | – | – |
| C28.18 | 89/00 | – | – | – | – | 2/14g | – | – | – | – | – |
| *Bank* | | | | | | | | | | | |
| C43.1 | 1/23 (context 3104) | – | – | 1/2g | – | – | – | – | – | – | – |
| *Unprovenanced* | 90/00 | – | – | 2/14g | – | 1/7g | 9/15g | – | – | – | – |
| *Avenue* | | | | | | | | | | | |
| C86 | 3+/59 (context 9724) | – | – | – | – | – | – | – | – | – | 1/4g |
| | 3+/60 (context 9729) | – | 1/1g | – | – | – | – | – | – | – | – |
| *Palisade Ditch* | | | | | | | | | | | |
| C81 | 00/78 | – | 2/2g | – | – | – | – | – | – | 1/1g | – |

belong to an All-Over-Cord (AOC) Beaker in Clarke's terms (1970). A fairly restricted range of Clarke motifs is present on the remaining material, mainly simple motifs of his Basic European Motif Group 1, such as P22 (Motif 5), P36 (Motif 2), and P37 (Motif 1) (Clarke 1970, 424–5). Beakers with more complex decoration are also present, such as that represented by P35 and P16, but so little of most of these vessels is represented by the surviving sherds that it is impossible to reconstruct their decorative schemes (Table 27).

One noticeable feature of the collection is the reasonably high proportion of fingernail-decorated rusticated sherds. Of the total of 229 Beaker sherds 166 or 72.5% are fingernail-decorated. The number of vessels represented is very low, however, and it is likely that this high proportion could have been created by perhaps as few as two or three large rusticated vessels having been broken within the monument. Two such vessels are P24 and P29, from C12 and C45.

The overall impression gained from the material is that it derives from a small number of vessels, not particularly fine or highly decorated examples, and includes large rusticated vessels. As the earliest occurrence of Beakers is in a Q Hole, early in phase 3, and it is reasonable to envisage Beakers as still circulating in the area by the later stages of phase 3, although probably not to the end. The time period over which these few vessels were deposited was perhaps as much as eight hundred years (ie ?2600–?1800 BC, as suggested by the British Museum Beaker dating programme, Kinnes *et al* 1991). With this in mind it is suggested that the deposition of Beakers was a very minimal part of the monument's history, and perhaps more or less incidental. Although the radiocarbon evidence suggests that the stone phase of Stonehenge and the currency of Beakers were contemporaneous, it is difficult to see this phase of the monument as essentially Beaker-associated when so little of that ceramic and none of the artefacts traditionally associated with it were found there.

## Indeterminate later Neolithic/ Early Bronze Age pottery

Within the obviously earlier prehistoric pottery from Stonehenge there is an element of mainly grog-tempered sherds which are not assignable to any of the major traditions. From the use of grog and their general appearance they seem most likely to belong in the Late Neolithic or Early Bronze Age, when soft, grog-tempered fabrics occur in the Grooved Ware, Beaker, Food Vessel, and Collared Urn traditions.

There is a total of 154 sherds assignable to this category, weighing 891g.

### Fabric

**C1/Bkr; LNEBA** (2/6g) *See fabric description above.* This is mainly a fabric occurring in Beakers.

**F99** (3/3g) Code used for small fragments likely to be of LNEBA date with flint as the most obvious inclusion type.

**G1/Bkr; LNEBA** (27/241g) *See above for fabric description.*

**G4/Bkr; LNEBA** (3/21g) *See above for fabric description*

**G5/LNEBA** (58/330g) Hard fabric with a smooth, soapy feel and hackly fracture. It contains grog, whch is difficult to distinguish from the matrix but may be in the region of *c* 5%. The other major inclusion is quartz sand (<1mm), with a frequency of *c* 10%. Dark grains occur, some of which are certainly iron oxides (they react with a magnet) and others may be glauconite, and there is occasional flint. The fabric is similar to G1, but has a higher frequency of sand. Both oxidised and unoxidised surfaces occur.

**G6/LNEBA** (52/269g) Soft fabric with a smooth, soapy feel and hackly fracture. The main inclusion is grog (*c* 10%; <5mm, most <2mm), with occasional flint. The grog can generally be distinguished from the matrix by eye. The fabric is similar to G5, but has virtually no sand. Both oxidised and unoxidised surfaces occur.

**G99** (11/18g) Code used for small sherds likely to be of LNEBA date in which the only or most obvious inclusion is grog.
**I1/Bkr; LNEBA** (1/6g) *See above for description.*

**Q99** (1/1g from Palisade) Code for sherds likely to be of LNEBA date in which the only or most likely inclusion is quartz sand.

**S1** One sherd (4g) from the Avenue (context 9724) is in this fabric, which at the monument occurs in Grooved Ware. The sherd is featureless, and as there is no other certain Grooved Ware from the Avenue this single instance cannot be certainly identified as Grooved Ware.

It is probable that some of the sherds in the fabrics which are otherwise confined to Beakers may themselves be Beaker, but in the case of featureless sherds, especially those thicker than is normal among Beakers, caution has been exercised in classifying them as such. The most common fabrics are the two grog-tempered fabrics G5 and G6, and these are quite distinctive and not represented among the clearly identifiable Beaker sherds.

### Phased sherds

A single plain sherd in fabric G6 was found by Atkinson *et al* in their re-excavation of cutting C13. It was found in 'clean chalk packing on inner side of stone 33f' of the Bluestone Circle, which places it in sub-phase 3iv, or possibly 3v, as it is Stone 33f which may have been turned at some point (*see Chapter 7*). As the Bluestone Circle has produced radiocarbon dates of 2480–2140 cal BC (OxA–4900; 3865±50 BP), and 2290–2030 cal BC (OxA–4878; 3740±40 BP) the pottery is in accordance with the date.

### Distribution

Sherds of this category occur in a general low-frequency scatter across the eastern and northern parts of the interior, from the interior, and from the Aubrey Holes and Y and Z Holes. The only concentration of sherds identifiable is that of 40 sherds (245g), mainly of fabric G5 (35/197g), in cutting C2, around Stones 29, 30, 1, and 2 of the Sarsen Circle. None of these was in a phased context.

### Discussion

Only two sherds are classifiable in the conventional styles of the Early Bronze Age. The rim sherd (P48) from the western part of the monument (C92) has been published as Food Vessel (Bond 1983). It is in a grog-tempered fabric, and although the rim seems atypical it clearly belongs to that tradition.

The sherd of Collared Urn, P50, from Y Hole 4, has also been published (Gibson 1982, 248, fig STO.1). This sherd is decorated with long oval impressions, and this type of decoration also occurs on at least one other sherd (P52). Other sherds of similar fabric and thickness (ie thicker than typical Beaker sherds) are decorated with rows of oblique fingernail impressions or slashes (P45, P46, P47, and P51). These are almost certainly not all parts of Collared Urns, and perhaps represent the non-funerary vessels which were contemporary with the usually funerary Collared Urns and Food Vessels. There is no evidence that even the single recognisable collar fragment (P50) was from a funerary vessel. The vessel represented by P44 from the the concentration in C2 is reminiscent of Beakers, but its decoration and finish are too crude to allow it to be assigned to that tradition. P49, on the other hand, from C92, in the interior on the western side of the monument, may be Grooved Ware, but it is undiagnostic and was found at a considerable distance from the known occurrences of Grooved Ware at the monument. The vessel P43 is anomalous, but seems more likely to belong to this period than to be earlier or later. The fabric is grog-tempered, fine, and smooth, and not unlike some Beaker fabrics. There is very little curvature around the rim, but it seems that the decoration of twisted cord is probably internal. The rim form is not one found in Beakers, or it would be tempting to place it within that tradition, as some All-Over-Cord Beakers have plain zones on the exterior beneath the rim and lines of twisted cord internally. The markedly concave profile, however, is no more typical of Beakers than the squared-off rim form. The sherd was found in cutting C2 near Stones 29, 30, 1, and 2 and therefore does fit within the known concentration of sherds in G5.

In the local area comparisons may be made between some of the material at the monument and pottery recovered during the Stonehenge Environs Project. At Wilsford Down (site W31), for example, there was at least one sherd probably of Collared Urn (Raymond 1990, P116), in a non-funerary context, and also a vessel similar to P42 at the monument (*ibid*, P117).

## Middle to later Bronze Age pottery

A total of 222 sherds (1073g) is assigned to this category (Table 29). This does not include the clearly Late Bronze Age pottery discussed by Morris (*below*), except

**Table 29 Middle and later Bronze Age pottery counts and weights**

| | | | *Fabric* | | | |
|---|---|---|---|---|---|---|
| *Cutting* | *Phase/group* | *C2* | *F2* | *F3* | *F4* | *F5* |
| ***Deverel-Rimbury*** | | | | | | |
| *Interior* | | | | | | |
| C7 | 88/00 | – | – | 1/44g | – | – |
| C45F | 88/00 | – | – | – | – | 1/23g |
| *Ditch* | | | | | | |
| C23 | 89/00 | – | 1/11g | – | – | – |
| C28.17 | 89/00 | – | – | – | 1/27g | – |
| ***Non-specific Middle–later Bronze Age*** | | | | | | |
| *Interior* | | | | | | |
| C2 | 88/00 | 1/18g | – | 1/12g | – | – |
| | 89/00 | – | – | 1/12g | – | – |
| C7 | 80/00 | – | 1/3g | – | – | – |
| | 87/00 | – | 6/25g | 1/11g | – | – |
| | 88/00 | – | 7/27g | 1/18g | – | – |
| | 89/00 | – | 8/31g | – | – | – |
| C10 | 89/00 | – | 52/176g | – | – | – |
| C8, C13, C14 | 89/00 | – | 17/52g | 1/18g | – | – |
| C45H | 89/00 | – | – | 1/11g | – | – |
| C58 | 88/00 | – | 1/5g | – | – | – |
| C32.9 | AH9 89/00 | – | – | 1/16g | – | – |
| C33.3 | 89/00 | – | – | 1/16g | – | – |
| C33.4 | 60/43 (context 1584) | – | – | 1/22g | – | – |
| C33.5 | 60/43 (context 1587) | – | 1/4g | – | – | – |
| C33.7 | 60/43 (context 1596) | – | 1/5g | – | – | – |
| C33.9 | 89/00 | – | 3/9g | – | – | – |
| C33.10 | 60/43 (context 1604) | – | 1/7g | – | – | – |
| | 89/00 | – | – | 1/18g | – | – |
| C33.12 | 89/00 | – | 4/11g | – | – | – |
| C33.14 | 89/00 | – | 1/3g | – | – | – |
| C34.3 | 60/42 (context 1617) | – | 2/4g | – | – | – |
| C33.30 | 60/43 (context 1611) | – | 1/3g | – | – | – |
| C34.1 | 60/42 (context 1613) | – | – | 1/25g | – | – |
| YH8 | 89/00 | – | 15/59g | – | – | – |
| YH9 | 89/00 | – | 2/10g | – | – | – |
| YH11 | 89/00 | – | 3/8g | – | – | – |
| *Periphery* | | | | | | |
| C6 | 89/00 | – | 3/22g | – | – | – |
| *Ditch* | | | | | | |
| C18/19 | 89/00 | 16/41g | 1/4g | – | – | – |
| C21 | 89/00 | – | 1/3g | – | – | – |
| C22 | 3+ (context 1400) | – | 1/2g | – | – | – |
| | 89/00 | – | 1/2g | 2/28g | – | – |
| C23 | 89/00 | – | 6/15g | – | – | – |
| C24 | 89/00 | – | – | 1/19g | – | – |
| C28.1 | 89/00 | – | 2/10g | – | – | – |
| C28.4 | 89/00 | – | 1/4g | – | – | – |
| C28.6 | 89/00 | – | 2/3g | – | – | – |
| C28.11 | 89/00 | – | 2/6g | – | – | – |
| C28.15 | 89/00 | – | – | 1/40g | – | – |
| C28.16 | 89/00 | 1/1g | – | 1/10g | – | – |
| C29 | 89/00 | 1/4g | 5/23g | – | – | 3/20g |
| C42 | 88/00 | – | 1/4g | – | – | – |
| | 89/00 | – | 1/4g | – | – | – |
| *Unprovenanced* | | | | | | |
| | 90/00 | 2/4g | 24/37g | – | – | – |
| *Palisade Ditch* | | | | | | |
| | 00/79 (context 9833) | – | 1/3g | – | – | – |
| C81 | 00/78 (context 9834) | – | 2/14g | – | – | – |

that a single vessel, P57, which on the grounds of fabric may be assigned to the Late Bronze Age, is also illustrated. A small number of sherds are certainly assignable to the Deverel-Rimbury tradition on the grounds of decoration, and a much larger quantity can be seen as belonging to the Middle to later Bronze Age, but cannot strictly be assigned to that tradition as diagnostic features are lacking.

### Fabric

**C2/MLBA** (21/68g) Hard fabric with a fairly smooth feel and hackly fracture. It contains moderate (*c*10%) calcareous inclusions, unevenly distributed, including some shell, but most are limestone, including chalk; some voids are <1mm, but most 1–2mm, angular to sub-angular. Occasional angular flint (<4mm) is also present and rare quartz sand (<1mm).

**F2/MLBA** (177/588g) Hard fabric with a rough feel and hackly fracture with moderate to common (15–20%) ill-sorted, angular to sub-angular flint (max 5mm, most <3mm, and with a fine component of <0.5mm), unevenly distributed. Sparse quartz sand, evenly distributed, is also present. A high proportion of the sherds have a distinctive firing of mid to dark grey surfaces and red-brown core.

**F3/MLBA** (19/347g) Soft fabric with a rough feel and a hackly to laminated fracture, containing sparse (<7%) ill-sorted, sub-rounded to sub-angular flint (<4mm, most <2mm), unevenly distributed; the flint inclusions have a crushed, rolled appearance. Sparse well rounded grog, unevenly distributed, is also present (<5%; <3mm). Sherds in this fabric are mainly thick-walled (ie >10mm).

**F4/MLBA** (1/27g) Hard fabric, with a granular feel and hackly fracture, containing moderate to common (*c* 15–25%) well sorted, angular flint (<2mm, most <1mm), evenly distributed. Shell is also present, though rare–sparse, small (<2mm) and unevenly distributed.

**F5/MLBA** (4/43g) Hard fabric with a granular feel and hackly fracture, containing moderate to common (15–25%) well sorted, sub-angular to sub-rounded flint (<3mm), evenly distributed. Much of the flint has a crushed and rolled appearance. This fabric is similar to F3 but lacks grog.

### Phased sherds

No pottery of this type was found in contexts associated with the use of the monument assigned to phases 1–3.

### Distribution

It is not possible to identify major concentrations of this material; sherds are scattered widely across the site occurring in the interior (both in the central area and in the general trenching), above the Ditch, and in the Y and Z Holes.

### Discussion

The Deverel-Rimbury element of the assemblage is readily identifiable, and is illustrated by sherds P53-P56, all likely to belong to bucket-shaped vessels. The rim sherds P60, P61, P62 and P64 are probably also from bucket-shaped vessels. The vessel represented by P58 and P59, which is mainly from the upper fill of Y hole 8, may belong to the plain ware tradition of the Late Bronze Age, but the form it is not closely parallelel by plain wares in the local area, for example in sites of the Stonehenge Environs Project (Richards 1990) or the recently published material from the Wessex Linear Ditches Project (Raymond 1994).

Nor is the convex body of P58, and out-turned, slightly enlarged rim, a form typical of the plain ware assemblages of the Thames Valley (Bradley *et al* 1980; Barrett 1980). Its closest parallels would seem to lie in the Burderop Down assemblage, from the Marlborough Downs, where convex bodied jars with everted rims, many of which have a fingertip impressed cordon added below the rim, clearly belong within a later Bronze Age context, but with features – particularly the rims enlarged with applied cordons and cordons applied to the body – which seem likely to be derived from the Deverel-Rimbury tradition.

Raymond treats the Deverel-Rimbury and plain ware traditions as completely separate and easily defined ceramic traditions and is very dismissive in an interim report on the Marlborough Downs Project of the claim that the two may have been contemporary (Raymond 1994; Gingell 1980). Raymond does not, however, cite the later publication of the Marlborough Downs sites, in which the complex composition of the ceramic assemblages is discussed in detail, and from which it is clear that in north Wiltshire at least the situation is not as clear-cut as she suggests (Cleal and Gingell 1992).

## Indeterminate prehistoric pottery

Some sherds cannot confidently be assigned to tradition, and have been classified in this category (Table 30). Two fabrics (F6 and F7) are entirely unassignable to tradition, as they occur only in featureless sherds and on general appearance do not fall readily into the traditions discussed above, or to later or earlier ones. The remainder are generally too small to assign, and often contain inclusions which occur in more than one tradition.

### Fabric

**F6/Indet prehist** (7/34g) Hard fabric, slightly sandy, with a rough feel and hackly fracture, containing sparse to moderate (<10%) ill sorted angular flint (<5mm, most <2mm), unevenly distributed. Sparse fine (<0.5mm) quartz sand, evenly distributed, is also present.

**F7/Indet prehist** (1/5g) Hard fabric with a rough feel and hackly fracture, containing sparse (5%), angular, well sorted flint (<3mm), unevenly distributed.

### Phased sherds

Only a single sherd (in fabric C2) occurs in a phased context, in a stonehole of the Sarsen Circle (in C16). Other sherds of this fabric are considered likely to belong to the Middle or later Bronze Age on general appearance, and there are two featured sherds in this fabric (P53 and P64). As the radiocarbon dating of the stone monument makes clear that the Sarsen Circle cannot be Middle or later Bronze Age in date (*see Chapter 7 and Appendix 2*), either this sherd, whatever the apparent similarities of fabric, is not of Middle to Late Bronze Age date or is not firmly associated with the stonehole despite its apparent provenance (which is from a Hawley excavation).

**Table 30 Indeterminate prehistoric pottery counts and weights**

| | | Fabric | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Cutting* | *Phase/group* | *C2* | *C99* | *F6* | *F7* | *F99* | *G99* | *Q99* |
| *Interior* | | | | | | | | |
| C16.2 | 3ii/05 (context 2400) | 1/4g | – | – | – | – | – | – |
| C32.7 | 89/00 | – | – | – | 1/5g | – | – | – |
| C33.16 | 3vi+/41 (context 3020) | – | – | – | – | – | 1/1g | – |
| C34.16 | 89/00 | – | – | – | – | 1/1g | – | – |
| *Periphery* | | | | | | | | |
| C4.2K | 80/00 | – | – | 7/34g | – | – | – | – |
| C6 | 89/00 | 1/2g | – | – | – | – | – | – |
| C51 | 3a/53 (context 3261) | – | – | – | – | – | 1/8g | – |
| *Ditch* | | | | | | | | |
| C25 | 89/00 | – | 1/5g | – | – | – | – | – |
| C28.8 | 89/00 | 1/3g | – | – | – | – | – | – |
| C28.15 | 89/00 | – | – | – | – | 1/3g | – | – |
| C28.16 | 89/00 | 1/3g | – | – | – | – | – | – |
| C28.18 | 89/00 | 1/3g | – | – | – | – | – | – |
| C29 | 89/00 | 1/3g | – | – | – | – | – | – |
| *Bank* | | | | | | | | |
| C43.1 | 1/23 (context 3104) | – | 1/1g | – | – | – | – | – |
| *Unprovenanced* | 90/00 | – | 1/2g | – | – | – | – | – |
| *Avenue* | 3+/59 (context 9722) | – | – | – | – | – | – | 1/1g |
| *Palisade Ditch* | 3+/58 (context 9721) | – | – | – | – | – | – | 2/2g |

## Ceramic object

Part of a solid ceramic object (Fig 192) was found by Hawley in the upper fill of Aubrey Hole 29. The fabric is hard, with a smooth feel to the surfaces, and it contains rare flint (<1%, <3mm, most <2mm), and sparse fine quartz sand (<3%, <0.5mm); there may be some carbonaceous matter present, and there is almost certainly some grog but it is almost impossible to distinguish it from the matrix. Overall the fabric is within the range of G1, a Beaker and general LNEBA fabric (*see above*). Within the site the fabic is certainly much closer to that of some of the Beakers than it is to anything else, but it could also be accommodated within the general range of Grooved Ware fabrics, which often include grog.

The object is partially oxidised, with generally orange–brown surfaces, and the core shows black where the object is broken. The upper surface (as illustrated) is blackened, either from firing or post-firing burning; there are no visible residues. The three small lugs, of which only one is complete, are horizontally perforated and are applied. There are small slashes around the edge of both upper and lower concave surfaces, and on the lower surface there are also twisted cord impressions around part of the circuit, arranged in a zig-zag design. The exterior body carries horizontal incised lines. Associated with a cremation burial in Aubrey Hole 29. *PRN 10019; Hawley cat no 4562; context 1394; phase 89; group 00.*

### Discussion

This artefact has been classed as an object rather than a vessel because it is quite clearly not a container. Its upper surface (as illustrated) is slightly more dished than the lower surface, but it is nonetheless difficult to envisage this as holding solids, and certainly not liquids, for prolonged periods. The occurrence of some blackening of the upper surface suggests that some combustible material may have been burnt there, perhaps only on one occasion, possibly the occasion of the cremation which it accompanied, but there are no visible carbonised residues. As the object was found with a cremation it is possible that the surface colours are the result of accompanying the body on the cremation pyre, but the restricted nature and location of the blackening suggest that this is not the case. The combination of the perforated lugs, presumably for suspension, the blackened upper surface, and the cord decoration on the lower surface (ie the presumed underside) suggest that the object may have been suspended for the burning of some material. The shallowness of the upper surface seems to indicate that the visibility of the burning material was important, but the decoration on the underside suggests that that surface was also visible to observers, and therefore that it may have been on display above eye level, although the small size of the object would prevent it being seen from a distance.

It is difficult to find close parallels for this object. It was noted by Piggott (1938) in his seminal article on the Wessex Culture, in which he illustrates the Stonehenge object and draws attention to a similar object from Dorchester, Dorset (*ibid*, fig 15, 1 and 2). The latter is similarly divided in two, with more markedly concave upper and lower surfaces than the Stonehenge object, and it is an altogether finer piece. Like the Stonehenge example it is now incomplete. The exterior of the Dorchester object is decorated with horizontal ribs bearing incised chevrons, and it has bridging lugs between the ribs. The interior carries complex geometric decoration, including filled triangles and bands of chevrons. The similarities between these two objects were noted soon after the discovery of that from Stonehenge (correspondence between George Englehart (who was present at the discovery of the Stonehenge object) and Captain Acland at the Dorset County Museum, Dorchester; P Woodward pers comm). There is no provenance for the Dorchester object, other than that it was found in the garden of 'Wareham House' in the town.

Dr Isobel Smith has observed (in an unpublished note in Salisbury and South Wiltshire Museum) that the Dorchester object is strongly reminiscent of Woodlands-style Grooved Ware, both from the type-site, near Amesbury and from Honington, Suffolk (Stone 1949, 124, 126) in having ribs or cordons with incised decoration and small 'bridging lugs'. Furthermore, the decoration on the interior surfaces of the Dorchester object suggests, both in technique and motifs, that used on the internally decorated Grooved Ware bowls at Durrington Walls and Grimes Graves (Wainwright and Longworth 1971, fig 49; Longworth 1981). Smith also notes that the Stonehenge object displays the same kind of thin incisions around the edge as occur on the Dorchester example, that it has a vestigial medial rib, visible as a low rounded ridge around the 'waist' of the object, and lugs. In addition, the cord impressed element of the decoration is not out of place within the Grooved Ware tradition, although in this case the parallels are with the Durrington Walls sub-style rather than the Woodlands. Smith therefore concludes that the Dorchester and

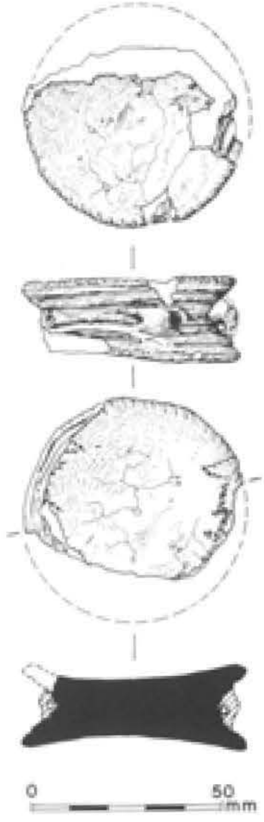



*Fig 192 The ceramic object. Scale 1:4*

Stonehenge examples are the same type of object, although the Stonehenge example is of much the poorer and cruder workmanship, and that both were produced within the Grooved Ware tradition. A possible parallel is also represented by two small vessels from Barrow Hills, Radley, Oxfordshire, where in a Grooved Ware assemblage including Woodlands sub-style vessels there are two rims from miniature vessels or objects, both of which carry incised decoration around the rim similar to that on the Stonehenge object (Cleal forthcoming).

The interpretation of the Stonehenge object as belonging within the Grooved Ware tradition is quite in accord with its likely place in the phasing suggested here for Stonehenge. It is also consistent with the other artefacts associated with cremations from the site, that is, the 'skewer pins' and the macehead. As the cremations appear to belong to the later stages of phase 2 and the earlier part of phase 3, and therefore to the middle part of the third millennium BC, this is also in accord with its presumed relationship with Grooved Ware, and indeed it places it at a time when much Grooved-Ware associated activity was taking place in the local area, particularly at Durrington Walls.

**Catalogue of illustrated pottery**

* indicates sherd or sherds representing an individual vessel for the estimate of number of vessels (ie no other sherd(s) with an asterisk represent the same vessel). Information is given in the order: fabric, description and decorative technique, colour of exterior/core/ interior, condition, context of recovery. Terms used consistently are 'fair' – edges only weathered/worn;


*Fig 193 Pottery: Neolithic bowl, P1. Scale 1:2*

'weathered' – edges and surfaces weathered/worn; 'very weathered' – edges worn and surfaces worn to the extent that the surface is missing in places and decoration and surface finish destroyed; 'soft' – scratched easily with the fingernail; 'hard' – not scratched easily with the fingernail.

### Neolithic Bowl (Fig 193)

P1* Fabric F1; two rim sherds (glued, but apparently joining along a fresh break) of an earlier Neolithic Bowl with a simple out-turned rim decorated with slashes, and a pre-firing perforation; there is a grain impression on exterior; black throughout; fair condition. On Bank, C18. *PRN 10005; Hawley cat nos 1500, 1501; C18; context 1253; phase 89; group 00*

### Grooved Ware (Fig 194)

P2* Fabric S1; one rim sherd and one body sherd of a Grooved Ware vessel decorated with grooves, joining along an ancient break; black to dark brown throughout (surfaces mainly obscured by chalk); condition fair but extremely fragile. The sherd is in fragments, the largest only is illustrated, but they seem to have constituted one sherd before excavation; the fragments do not conjoin, probably because there are pieces which are now missing. In Ditch, C28, probably secondary fill. *PRN 10012; context 2554; phase 2a, group 17*

P3 Fabric S1. A body sherd showing a slight curvature or change in angle. Condition poor and fragile. There are carbonised residues on the interior. In Ditch, C26, probably in a feature within the secondary fill. *PRN 10839; context 2471; Phase 2b; group 24.*

P4 Fabric S1; single sherd (fresh break) decorated with grooves; exterior orange; core black; interior dark grey; weathered. In Ditch, C26, secondary fill. *PRN 10896; Hawley cat no 1610/11; C26; context 2471; phase 2b; group 24.*

P5* Fabric G11; rim, ?Grooved Ware; decorated with grooves and impression; exterior orange-brown, dark grey; core black; weathered. In Ditch, C28, above silts. *PRN 10020; Hawley cat no 1583; C28; context 1383; phase 89; group 00.*

P6 Fabric C1; conjoining rim and body with grooves; exterior pale orange; core obscure; interior pale brown; weathered. In Ditch, in humus. *PRN 10001; Hawley cat no 1890; C21; context 2582; phase 89; group 00.*

### Beaker from phased contexts (Fig 195)

P7, P8 Fabric G4; two body sherds, possibly from the same vessel; one has rows of rectangular-toothed comb impressions, the other possible a row of the same just surviving along the sherd edge; orange-brown throughout; worn. Fill of Q Hole 5. *PRN 10782; Atkinson cat no S.54.1329; context 3167; phase 3i; group 09*

P9 Fabric G1; body sherd with a probably worked-up cordon, and non-plastic fingernail impressions; exterior and exterior half of core orange, interior half of core and interior surface dark grey; worn. Upper fill of Stonehole 3 of the Sarsen Circle. *PRN 10829; Atkinson cat no S.54.1329; context 3171; phase 3ii; group 05*

P10 Fabric G1; body sherd decorated with slightly plastic fingernail impressions; exterior orange-brown; core and interior dark grey; worn. Noted as coming from the 'surface of the chalk' in a section of C56 which is filled almost entirely by the stoneholes and ramps for Stones 53 and 54 of the second Sarsen Trilithon. *PRN 10784; Atkinson cat no S.64.28; C56; context 3523; phase 3ii; group 06*

P11 Fabric G1; Beaker body sherd with rectangular-toothed comb impressions; colour not recorded; worn. Primary chalk silt in Z Hole 16. *PRN 10788; Atkinson cat no S.53.24; C33.16; context 3020; phase 3vi; group 41*

P12 Fabric G99; small sherd with rows of ?comb impression; exterior grey-brown, core and interior dark grey; very worn. Primary chalk silt in Z Hole 16. *PRN 10936; Atkinson cat no S.53.30; C33.16; context 3020; phase 3vi; group 41*

### Beaker from unphased contexts in the interior (Fig 195–6)

P13* Fabric G4; angle of rim uncertain, rectangular-tooth comb impression; pale brown/exterior core as exterior, interior core black/pale brown, weathered. Upper (post-monument) levels around Stones 6 and 7 of the Sarsen Circle. *PRN 10002; Hawley cat no 51; C1; context 1050; phase 89; group 00*

P14 Fabric G1 (includes occasional limestone inclusions, probably chalk); two body sherds joining along ancient break, decorated with cuneiform impressions; surfaces pale brown, core dark grey; weathered. Upper (post-monument) levels around Stones 6 and 7 of the Sarsen Circle. *PRN 10917 and 10918; Hawley cat no 80; C1; contexts 1050 and 1058; phases 89, and 87; group 00*

P15 Fabric G1; body sherd with rectangular-toothed-comb impressions; surfaces orange brown to mid-brown, core black;

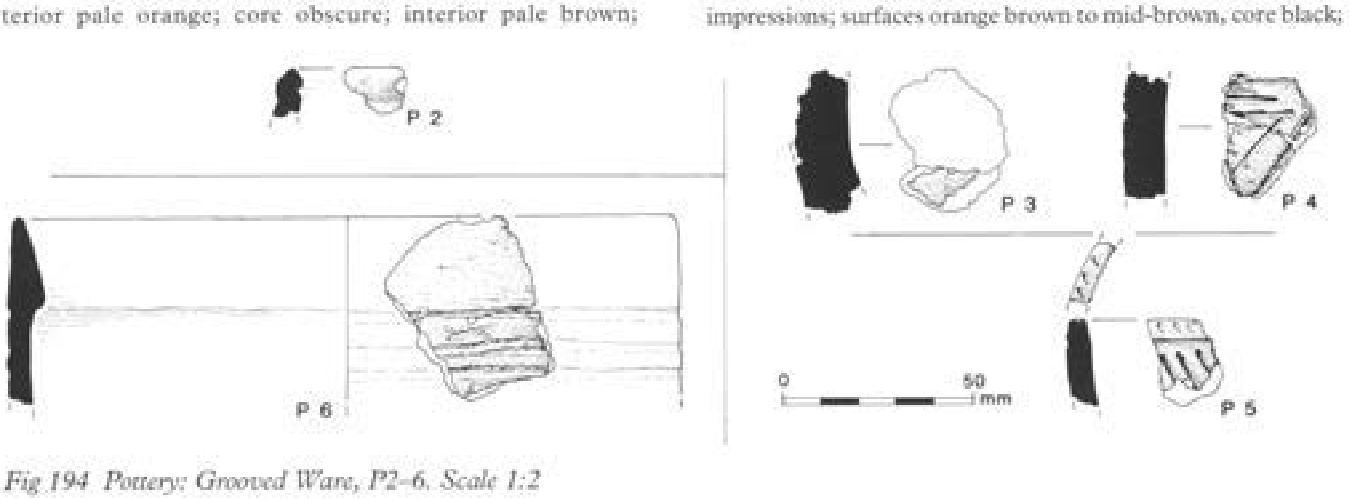



*Fig 194 Pottery: Grooved Ware, P2–6. Scale 1:2*

weathered. Upper (post-monument) levels around Stone 7 of the Sarsen Circle. *PRN 10568; Hawley cat no 9; C1; context 3661; phase 88; group 00*

P16 Fabric G4; body sherd with rectangular-toothed comb impressions; worn. Upper (post-monument) levels immediately to the north (ie the exterior side) of Stone 30 of the Sarsen Circle. *PRN 10589; Hawley cat no 246; C2; context 1073; phase 88; group 00*

P17 Fabric G4; one rim sherd and one body sherd from a Beaker with worked-up or applied bosses and rectangular-toothed comb impressions; exterior pale orange, orange-brown, core black, interior buff, grey-buff; worn to very worn. Post-monument layers on the interior side of Stone 1 and probably between Stones 30 and 1 of the Sarsen Circle. *PRN 10004, 10763; Hawley cat nos 51, 298d; C2; WA context 1050, 1072; phase 88, 89; group 00*

P18* Fabric G1; Beaker rim sherd with fine rectangular-toothed comb impressions, possibly the same vessel as P15; four plain sherds and one decorated sherd (*not illustrated*), possibly also of this vessel; exterior reddish brown, core not visible, interior grey-brown. Post-monument levels around Stones 8 and 9 of the Sarsen Circle (*illustrated sherd*), others from similar level around Stone 6 of the Sarsen Circle. *PRN 10003 (*illustrated*), 10570–74; Hawley cat nos 7, 8, 10–12 and 410; C1 and 14 (*illustrated sherd*); contexts 3196 (*illustrated sherd*), 3661; phase 89 (*illustrated sherd*), 88; group 00*

P19 Fabric G4; Beaker body sherd decorated with rectangular-toothed comb impressions; exterior orange-brown, core dark grey, interior grey-brown; condition fair. Noted as coming from Hawley extension. *PRN 10785; Atkinson cat no S.64.10; C13; context 2313; phase 81; group 00*

P20 Fabric G4; body sherd decorated with rectangular-toothed comb impressions; exterior pale orange-brown; exterior core as surface, core black, interior buff-grey; weathered. Post-monument layer on interior side of Bluestone Circle near entrance. *PRN 10767; Hawley cat no 303; C12; context 2667; phase 88; group 00*

P21* Fabric G4; rim sherd decorated with rectangular-toothed comb impressions and paired non-plastic fingernail impressions; surfaces red-brown, core black; weathered. Post-monument layer on interior side of Bluestone Circle near entrance. *PRN 10009; Hawley cat no 304; C12; context 2667; phase 88; group 00*

P22, P23 Fabric I1; at least three basal sherds and three decorated body sherds of a Beaker with grooved and impressed decoration, in a distinctive fabric and markedly finer than the majority of the vessels from the site; exterior orange-brown, core black, dark grey, interior brown; fair to very weathered. Post-monument layers on interior side of the Bluestone Circle near circle. *PRN 10536–41; Hawley cat nos 300, 326, 33–4a; C12; contexts 2667, 2722; phase 88 and 87; group 00*

P24 Fabric G1; two conjoining sets of body sherds, the two pairs almost certainly belonging to a single vessel and possibly located in approximately the positions indicated on the vessel; the uppermost sherd has an applied plain cordon and the remaining sherds paired plastic fingernail impressions; these sherds may belong to the same vessel as that represented by P29, but this is not certain; exterior and exterior half of core orange-brown, core dark grey, interior dark grey-brown; weathered to very weathered. Post-monument layers on interior side of Bluestone Circle near entrance. Described as 'above Old Turf layer' near the fallen lintel 150, in the Bluestone Circle. *PRN 10897–900; Atkinson cat no S.56.20; C12; context 3835; phase 87; group 00*

P25 Fabric G1; body sherd with an applied cordon and traces of possible fingernail impression; possibly the same vessel as represented by P24; exterior and exterior half of core orange brown, core black, interior grey brown; weathered. On surface of chalk on eastern side of cutting C12, inside Bluestone Circle. *PRN 10621; Atkinson cat no S.56.22; C12; context 2674; phase 88; group 00*

P26 Fabric G1; body sherd decorated with paired plastic fingernail decoration; probably part of the vessel represented by P24; exterior pale orange-brown, core not visible, interior dark grey-brown; weathered. On surface of chalk on eastern side of cutting C12, inside Bluestone Circle. *PRN 10619; Atkinson cat no S.56.22; C12; 2674; phase 88; group 00*

P27 Fabric G1; two conjoining body sherds decorated with paired plastic fingernail impressions; probably part of the same vessel as that represented by P24; fair condition. On surface of chalk on eastern side of cutting C12, inside Bluestone Circle. *PRN 10617–18; Atkinson cat no S.56.22; C12; 2674; phase 88; group 00*

P28 Fabric G1; body sherd decorated with an applied cordon; probably part of the same vessel as that represented by P24; exterior and exterior part of core orange-brown, core black, interior grey brown; weathered. Described as 'above Old Turf layer' near the fallen lintel 150, in the Bluestone Circle. *PRN 10624; Atkinson cat no S.56.20; C12; context 3835; phase 87; group 00*

P29 Fabric G1; at least three conjoining rim sherds and one body sherd, and one other rim sherd of a large rusticated Beaker with horizontal paired plastic finger-pinched decoration; this is probably also represented by P24–27. Although it is difficult to reconstruct a profile, the rim profile varies around the circumference, but is certainly in-turned; exterior orange brown, core black, interior pale orange-brown to orange-brown; weathered . From interior side of Bluestone Circle in area of entrance, and one sherd (S.54.1389) probably from C45 but the finds details are missing for this number. *PRN 10007, 10892–5; Atkinson cat nos S.54.1389, S.56.22; C12, and possibly C45, phase 88, group 00*

P30 Fabric G1; body sherd decorated with paired plastic fingernail decoration; exterior and exterior part of core orange, core black, interior grey-brown; weathered. Post-monument layer near stonehole for Stone 32b of the Bluestone Circle. *PRN 10834; Atkinson cat no S.54.1324; C45; context 3127; phase 88; group 00*

P31 Fabric G1; body sherd with two types of cord impression: two of the rows are Z-twisted impressions (ie made with S-twisted cord) and the two others S-twisted (ie made with Z-twisted cords; exterior pale brown, core not visible, interior grey-brown; weathered. From base of Stonehenge layer in cutting around stone 27 of the Sarsen Circle. *PRN 10920; Atkinson cat no S.64.37; C58; context 3555; phase 89; group 00*

P32–P34 Fabric G2; three body sherds and one base angle sherd decorated with rectangular-toothed-comb impressions; exterior orange to pale orange, core dark grey, interior grey-brown to pale grey-brown; weathered to very weathered. 'Earthy silt over anti-friction stakes', ie replacement material over stakeholes associated with the erection of the Heelstone. *PRN 10776 (P32), 10774, 10901 (P33), and 10775 (P34); Atkinson cat no S.53.96; C36; phase 3+; group 00*

P35 Fabric G2; body sherd decorated with square-toothed comb impressions; 18 other sherds (*not illustrated*), but the vessel was not reconstructable; exterior brown, core black, interior dark grey to black; very weathered. Above the Ditch silt in the first section (Segment 3) of Hawley's Ditch cutting

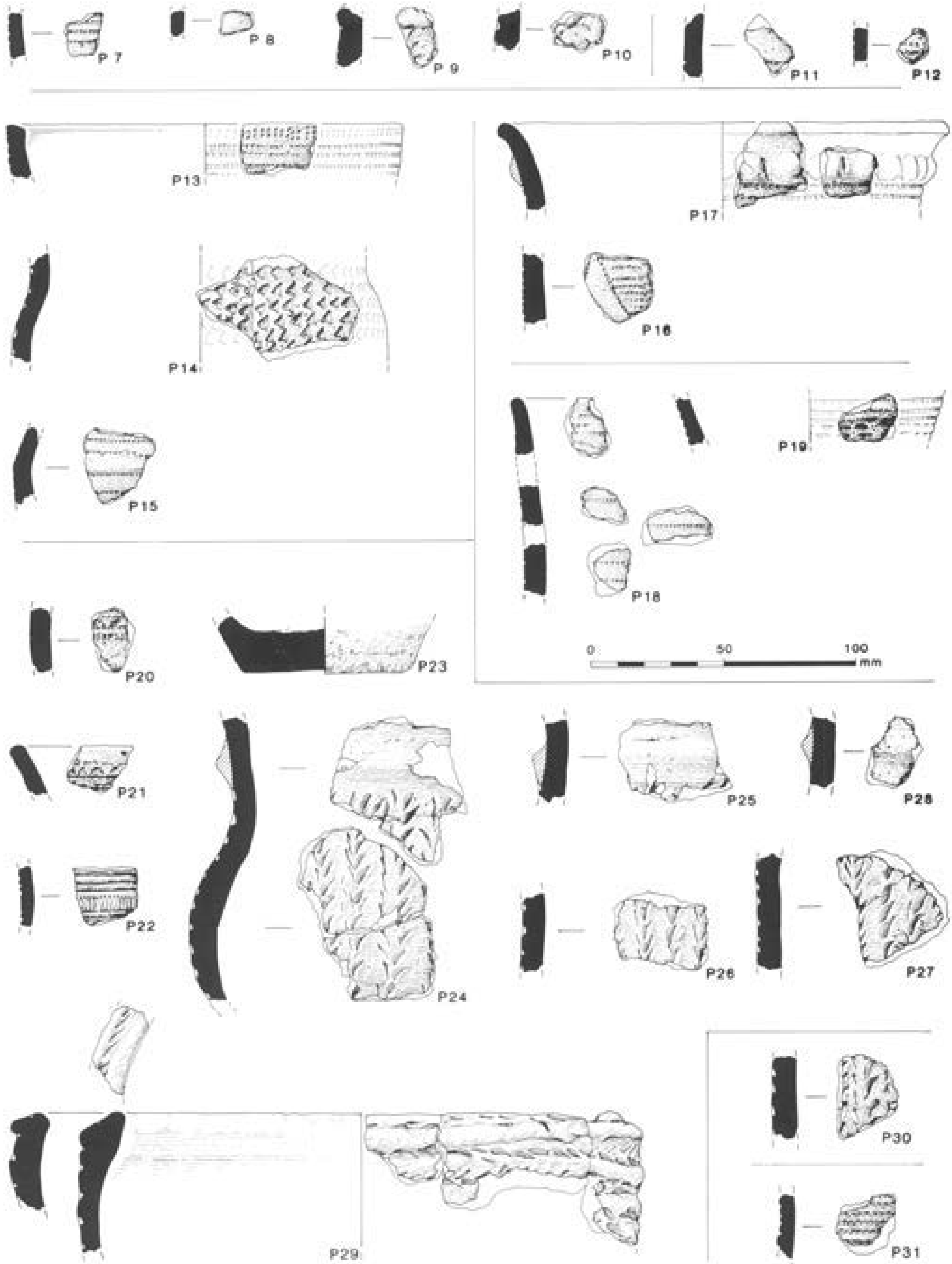



*Fig 195 Pottery: Beaker, P7–31. (Scale 1:2)*

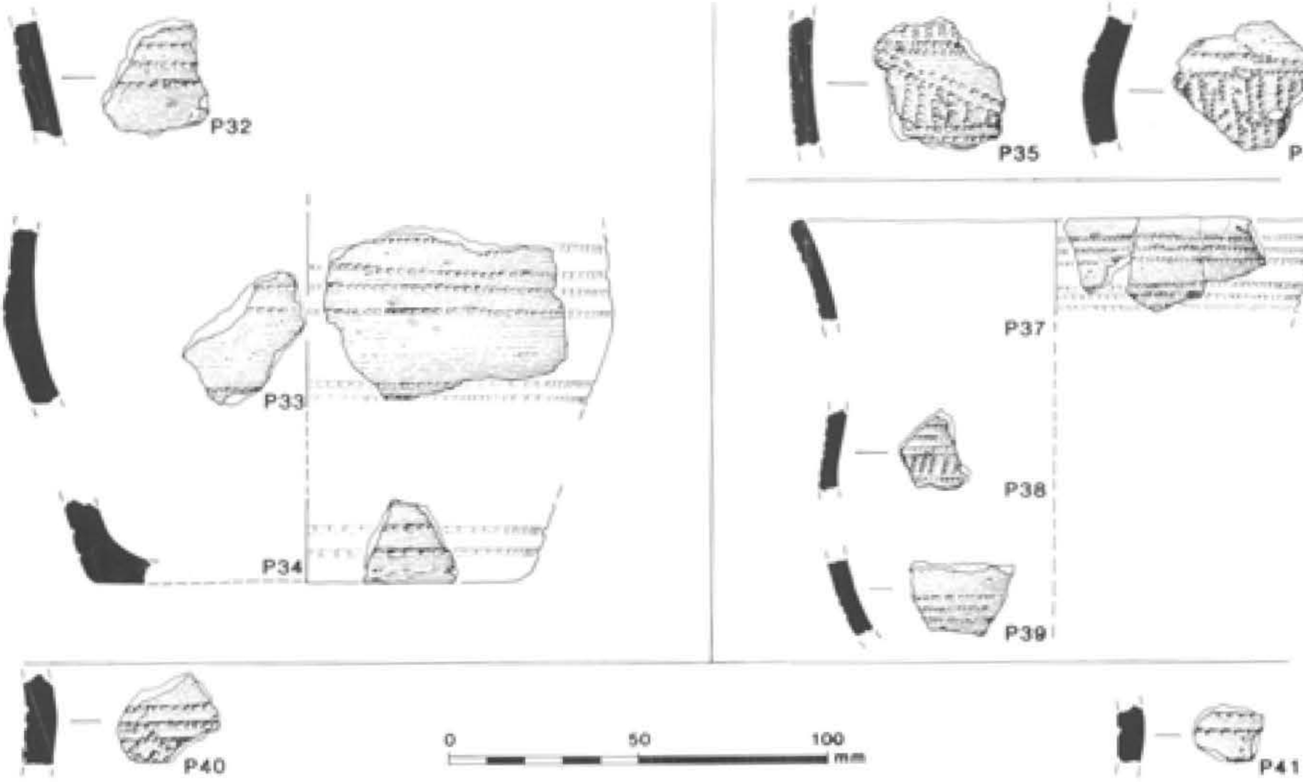



*Fig 196 Pottery: Beaker, P32–41. Scale 1:2*

C28. *PRN 10517–35; Hawley cat nos 1716–1734; C28.1; context 2519; phase 89; group 00*

P36 Fabric C1; body sherd decorated with square-toothed comb impressions; exterior pale brown, core black, interior grey-brown; fair condition. From the turf and humus above section 13 (Segment 8) of Ditch cutting C28). *PRN 10506; Hawley cat no 1856; C28.13; context 2573; phase 89; group 00*

P37*–39 Fabric G3; at least three conjoining rim sherds, and two separate body sherds of a single Beaker decorated with square-toothed comb impressions; 10 other decorated body sherds are not illustrated; exterior orange-red, core black, interior orange red, dark grey, red-brown; weathered. Above silt and in lower humus in section 6 (Segment 5) of Hawley's ditch cutting C28; Hawley notes 24 Beaker sherds, not all of which have been seen by the present author. *PRN 10016, 10902–10915; Hawley cat nos 1752, 1753, 1757, 1758, 1760, 1761, 1764, 1768, 1769, 1771, 1773, 1774, 1783, 1784; C28.6; context 2546; phase 89; group 00*

P40 Fabric G1; body sherd from a Beaker decorated with square-toothed comb impressions; exterior orange-brown, core black, interior grey-brown; very weathered. Above ditch in northern part of circuit. *PRN 10787; Atkinson* cat *no S.54.106.11; C35; context 3892; phase 88; group 00.*

P41 Fabric G4; body sherd with rectangular-toothed comb decoration; surfaces orange–brown, core black; weathered. From disturbed earthy chalk between Stones 70 (Bluestone Horseshoe) and fallen Stone 59 of the Sarsen Trilithons (assigned to turf and topsoil as location not clear). *PRN 10786; Atkinson* cat *no S.56.111; C35; context 3262; phase 89; group 00*

### Late Neolithic/Early Bronze Age from unphased contexts (Fig 197)

P42* Fabric G1; rim sherd with cordon, probably applied, probably from a coarse Beaker; surfaces pale orange-brown, core black; very weathered. Post-monument layer on interior side of Stone 6 of Sarsen Circle. *PRN 10017; Hawley cat no 126; C1; context 3661; phase 88; group 00*

P43* Fabric I1; rim sherd of a vessel with twisted cord decoration probably on the interior (there is little curvature visible in the sherd); surfaces pale orange-brown, core not visible; very weathered. Post-monument layer near Stone 7 of the Sarsen Circle. *PRN 10018; Hawley cat no 47; C1; context 3661; phase 88; group 00*

P44 Fabric G4; body sherd with incised decoration; may be Beaker, but general appearance not typical; exterior orange-brown, core black, interior pale brown; weathered. Post-monument layer on interior side of Stone 1 of the Sarsen Circle. *PRN 10916; Hawley cat no 250; C2; context 1074; phase 87; group 00*

P45 Fabric G1; sherd probably from just below the rim of a vessel with fingernail or other impressions; it may belong to the same vessel as P52, although if so the rim varies considerably around the circumference; exterior red-brown, core black, interior grey brown; weathered. Post-monument layer on interior side of Stone 1 of Sarsen Circle. *PRN 10771; Hawley cat no 200; C2; context1072; phase 89; group 00*

P46 Fabric G1; rim sherd decorated with fingernail or other impressions; may be part of same vessel as P52; surfaces red-brown, core black; weathered. General trenching in interior. *PRN 10769; Hawley cat no 536; C7; context 1705, phase 91, group 103*

P47 Fabric G1; body sherd with impressed decoration, probably fingernail; exterior red-brown, core black interior dark grey; possibly part of same vessel as P52; weathered. General trenching in interior. *PRN 10773; Hawley cat no 812; C7; context 3841; phase 89; group 00*

P48* Fabric G99; rim sherd of a Food Vessel decorated with twisted cord impressions. From general layer on western side of the monument. *PRN 10024; C92; context 4139; phase 87; group 00*

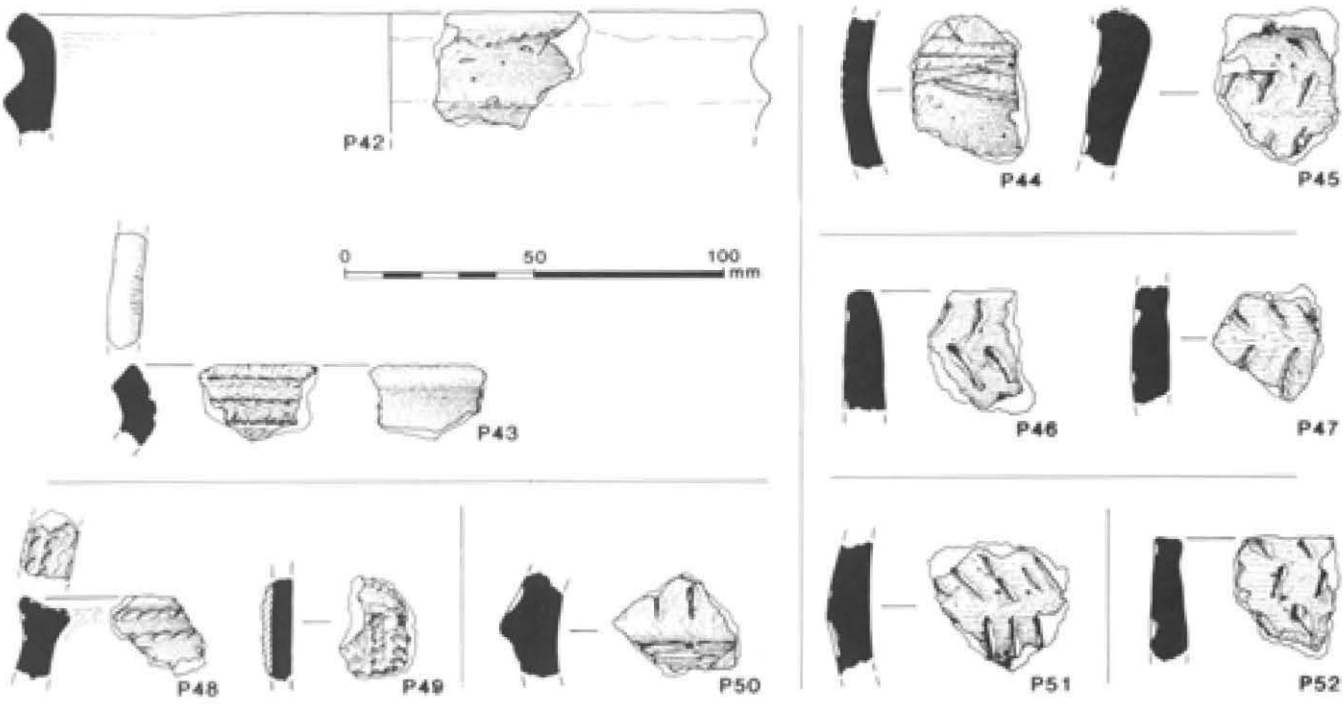



*Fig 197 Pottery: Late Neolithic/Early Bronze Age, P42–52. scale 1:2*

P49 Fabric G99; badly weathered body sherd with either vertical or horizontal ridges with distinct 'troughs' between, there is no curvature visible to suggest orientation; this sherd is probably Grooved Ware, but it lacks diagnostic features, is in poor condition, and is in a fabric very different to the other Grooved Ware from the site. Very weathered. General layer in interior in western half of monument. *PRN 11006; C92; context 4139; phase 87; group 00*

P50 Fabric G1; angled body sherd, could be either way up. It could be from the base of a collar, or from a carinated vessel; possibly part of the same vessel as P52, which it resembles in fabric, wall thickness and colour; exterior red-brown, core black, interior grey-brown; weathered. Y Hole 4. *PRN 10772; Hawley cat no 3163; C34.4; context 1619; phase 82; group 00*

P51 Fabric G1; angled body sherd, possibly same vessel as P52; exterior red-brown, core black, interior dark grey-brown; weathered. Aubrey Hole 4. *PRN 10770; Hawley cat no 4501; C32.4; context 1164; phase 89; group 00*

P52* Fabric G1; rim sherd with cuneiform impressions, slightly rounded; exterior red-brown, core black, interior pale brown; weathered. Aubrey Hole 9. *PRN 10010; Hawley cat no 4520; C32.9; context 3839; phase 89; group 00*

### Middle to Later Bronze Age (Fig 198)

P53 Fabric C2; body sherd with paired slightly plastic fingernail impressions; exterior pale brown, core not visible, interior yellow-brown; very weathered. From post-monument layers on the exterior side of Stone 30 of the Sarsen Circle, or between it and Stone 1. *PRN 10871; Hawley cat no 245; C2; context 1073; phase 88; group 00*

P54 Fabric F3; body sherd with an applied cordon, part of which is missing where it has become detached, decorated with fingernail impressions; exterior red-brown core and interior black; weathered. Trench 41 of the general trenching in C7. *PRN 10867; Hawley cat no 750; C7; context 1752; phase 88; group 00*

P55 Fabric F2; a completely detached handle or lug, with no body wall attached; exterior surface pale brown; fair condition. General trenching, trench 61, C7, near Stone 6 of the Sarsen Circle. *PRN 10868; Hawley cat no 794; C7; context 1752; phase 88; group 00*

P56 Fabric F5; body sherd with an applied cordon with fingertip and fingernail plastic decoration; exterior and core black, interior brown. Stonehenge layer near Stones 32c and d of the Bluestone Circle. *PRN 10877; Atkinson cat no S.54.1337; C45; context 3133; phase 88; group 00*

P57 Fabric Q1; five plain body sherds, some joining; of a vessel with a body diameter determinable from sherd curvature; one coil join is visible; exterior brown to yellow-brown, core and interior black, the latter with carbonised residues adhering. Y Hole 3 and Y hole 4. *PRN 10862–10865; Hawley cat nos 3124, 3125, 3145, 3146, 3150, 3151, 3155; C34.3; context 1617; phase 60; group 42*

P58/59* Fabric F2; at least four conjoining sherds from the rim of a vessel with out-turned rim; the base P59 almost certainly belongs to this vessel, and it is likely that many of the F2 sherds body sherds also belong to it. Y Hole 8. *PRN 10011, 10798, 10799, 10800; Hawley cat nos 3212, 3217, 3210, 3214; C34.8; context 1635; phase 89; group 00*

P60* Fabric F2. Plain rim sherd, angle of rim uncertain; exterior orange-brown, core black, interior brown; very weathered. From Avenue excavation of 1923, post-Avenue layer. *PRN10015; Hawley cat no 4804, 4805; C6; context 1911; phase 89; group 00*

P61* Fabric F2; rim sherd, probably with some rim-top finger-impressed decoration, very abraded; angle of lie of rim uncertain; grey brown throughout; very weathered. From above ditch in east of circuit. *PRN 10006; Hawley cat no 4642; C23; context 1416; phase 89; group 00*

P62* Fabric F3; rim sherd, althought the rim top is almost entirely abraded; exterior pale brown, core black, dark grey; weathered. From above ditch in eastern part of circuit. *PRN*

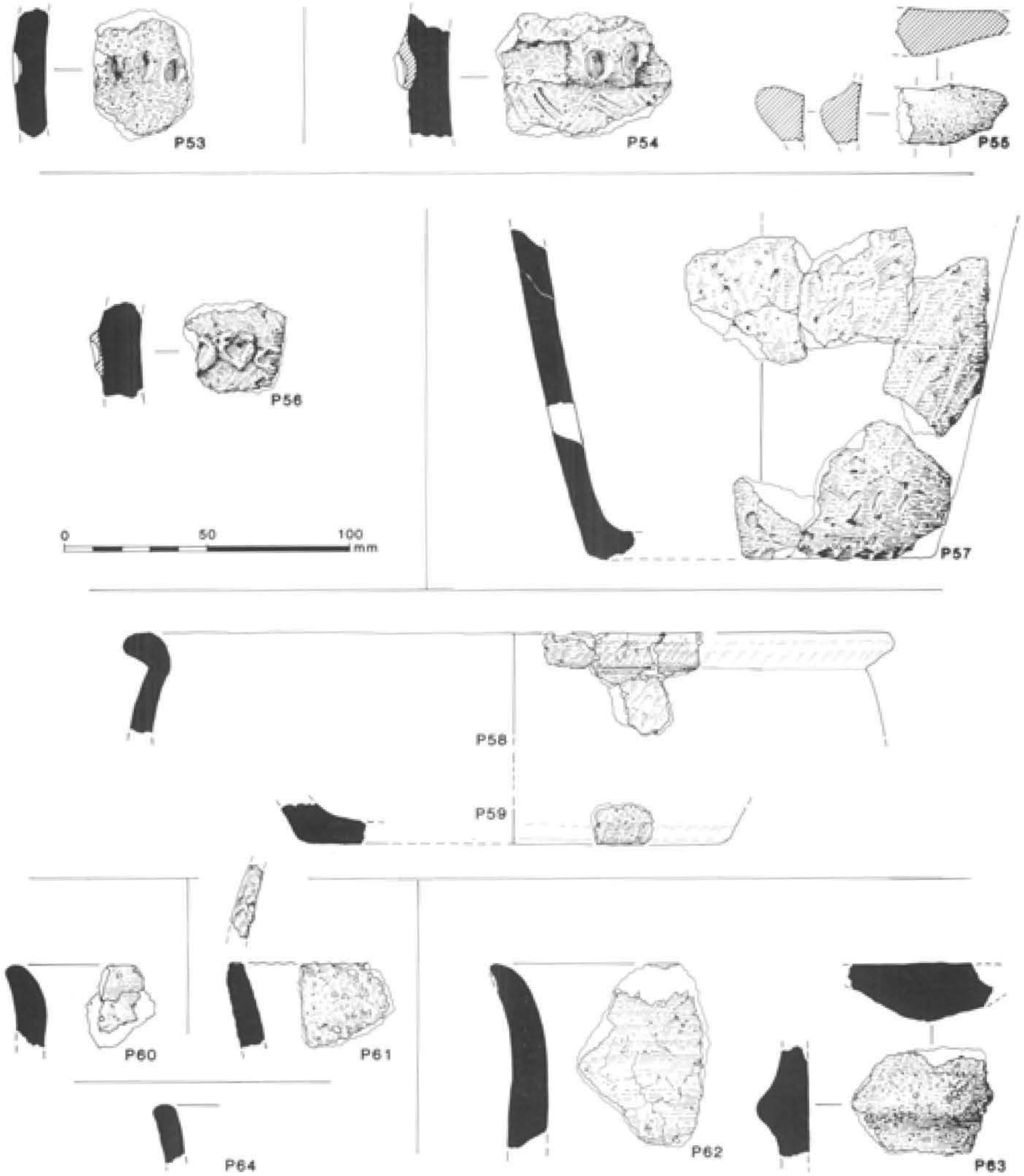



*Fig 198 Pottery: Middle to Late Bronze Age, P53–64. Scale 1:2*

*10013; Hawley cat no 1891; C28.15; context 2582; phase 89; group 00*

P63 Fabric F4; sherd with probably applied lug; exterior and core dark grey, interior red–brown; weathered. From above ditch in eastern part of circuit. *PRN 10869. Hawley cat no 1953; C28.17; context 2588; phase 89; group 00*

P64* Fabric C2; single plain rim sherd; diameter not measurable. Black throughout. Fair condition. (Ashmolean Museum accession no 1932.24); above ditch in south of circuit. *PRN 10022. Hawley cat no 2070; C29; context 3848; phase 89; group 00*

## Flint

*by P A Harding*

All worked flint extant from the excavations and held by Salisbury Museum was examined. This included material from excavations by Gowland, Hawley, and Atkinson *et al*, the debitage from excavations by Pitts (1979–80), which was not included in his publication (Pitts 1982), and a group of flints from excavations by Smith at the Avon end of the Avenue (Smith 1973). It is now impossible to ascertain what the original size of the excavated assemblages may have been.

The total quantity of flint which survives from the excavations at Stonehenge is summarised by phase and group in Table 31 and summarised in Figure 199. It is apparent that 62% falls within the non-phased categories and that of the remaining 487 pieces, 76% can be assigned to the Ditch fills of phases 1 and 2.

### Phased flintwork

#### Phase 1

The flint from phase 1 is principally from the primary fill of the Ditch. This flint is assigned to the 'bottom of the ditch 5′ below ground level — Bag 25' (label on bag). There is no other indication of its provenance. The remaining material is from C41 in the Ditch, excavated by Atkinson *et al* in 1954. This material includes a group of core preparation flakes of which nine pieces refit. Pieces were not recorded individually, so that it is not possible to ascertain the extent of the group; however, the fact that a spot location was considered sufficient and two pieces were recorded separately 2in (50mm) apart suggests that the assemblage was closely spaced. This is diagnostic of *in situ* knapping. Flint from the Counterscarp Bank and the Bank is all from the 1954 excavation.

The tools comprise an end scraper made on a flake from context 1434 (C24; WA obj no 670) and a fabricator (WA obj no 783) from context 1207 in Aubrey Hole 16.

The cores and flakes from this phase will be considered in more detail with the flint from phase 2.

#### Phase 2

This phase contributes the largest number of unbroken flakes and cores from the site, of which 13 flakes and 7 broken flakes are from the 1954 section. The remaining material is from Hawley's excavations. The ratio of cores to flakes (1:2) and of broken flakes to complete flakes (1:5) indicates the degree of selection to which this material has been subjected. Hawley's Diary records some flints as 'not worth keeping'. The quantity of cores, tools, and retouched flakes suggests that the material underwent preliminary examination before many of the flakes were discarded. The flakes which survive therefore have limited value for metrical analysis.

Most of the material from Hawley's excavation undoubtedly came from the Ditch, although it is poorly or totally unprovenanced. Some pieces are annotated 'Stonehenge' whereas others, particularly the cores, are labelled in more detail, for example 'Section 1/Section 2'. It is clear from the condition and patination of the artefacts that they were probably recovered from the primary and secondary fill of the Ditch. There are also isolated pairs of refitting flakes, in addition to those from

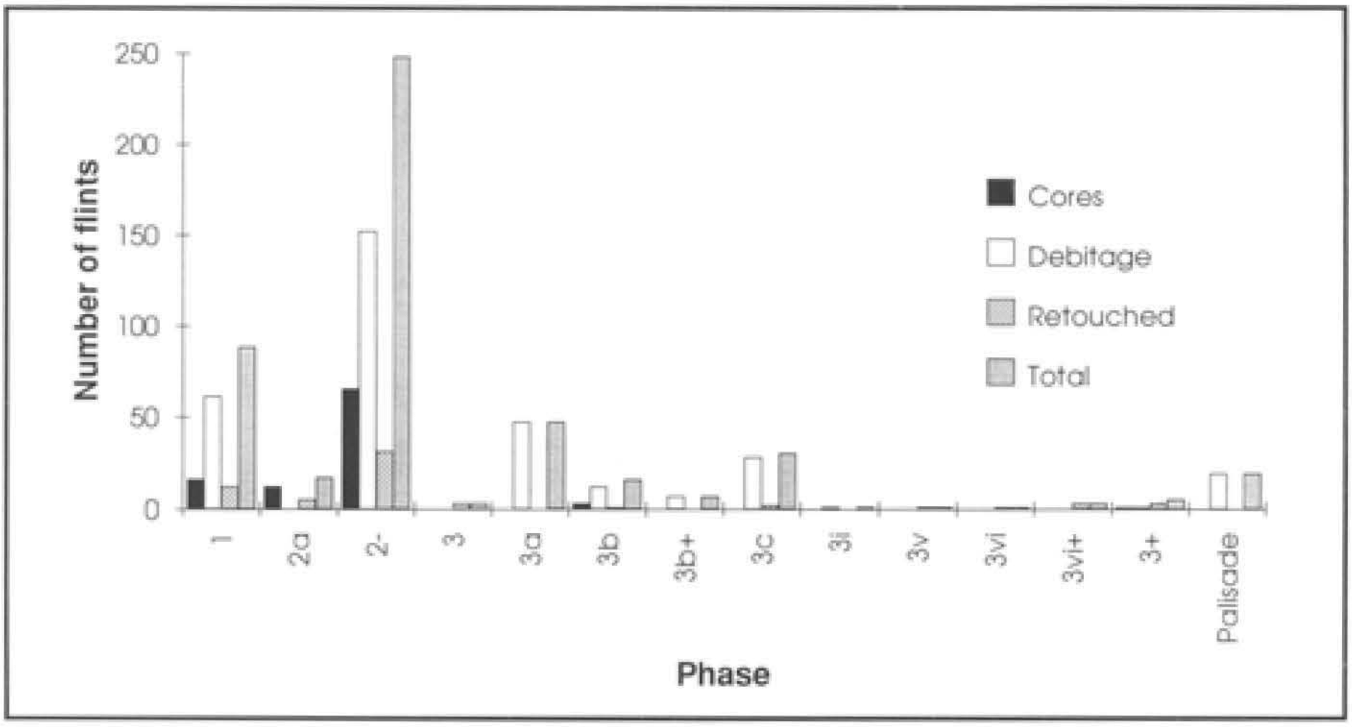



*Fig 199 Summary distribution of phased flint (N = 506)*

**Table 31 Worked flint by phase**

| *Types* *Phase/group* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/03 | 1 | – | – | – | – | – | – | – | – | 1 | – | – | – | – | 2 |
| 1/23 | – | – | 3 | – | – | – | – | – | – | – | – | – | – | – | 3 |
| 1/01 | 14 | – | 41 | 10 | 4 | – | – | – | – | – | 5 | – | – | – | 74 |
| 1/02 | – | – | 5 | 1 | – | – | – | – | – | – | – | – | – | – | 6 |
| 1/26 | 1 | – | 1 | – | – | 1 | – | – | – | – | – | 1 | – | – | 4 |
| *Total phase 1* | *16* | | *50* | *11* | *4* | *1* | | | | *1* | *5* | *1* | | | *89* |
| 2a/17 | 12 | – | – | – | – | 1 | – | – | 1 | – | 3 | – | – | – | 17 |
| 2-/00 | 62 | – | 121 | 26 | 10 | 6 | – | – | 1 | 1 | 7 | 5 | – | – | 239 |
| 2-/13 | – | 1 | – | – | – | – | – | – | – | – | – | – | – | – | 1 |
| 2-/17 | 2 | – | – | – | – | – | – | – | – | – | – | – | – | – | 2 |
| 2-/35 | – | – | 5 | – | 1 | – | – | – | – | – | – | – | – | – | 6 |
| *Total phase 2* | *76* | *1* | *126* | *26* | *11* | *7* | | | *2* | *1* | *10* | *5* | | | *265* |
| 3/00 | – | – | – | – | – | – | 3 | – | – | – | – | – | – | – | 3 |
| 3a/53 | – | – | 18 | 29 | – | – | – | – | – | – | – | – | – | – | 47 |
| 3b/44 | 3 | – | – | – | – | – | – | – | – | – | – | – | – | – | 3 |
| 3b/45 | – | – | – | 1 | – | – | – | – | – | – | – | – | – | – | 1 |
| 3b/50 | – | – | 4 | 1 | 1 | – | – | – | – | – | – | – | – | – | 6 |
| 3b/52 | – | – | – | 1 | – | – | – | – | – | – | – | – | – | – | 1 |
| 3b/93 | – | – | 5 | – | – | – | – | – | – | – | – | – | – | – | 5 |
| 3b+/94 | – | – | 4 | 3 | – | – | – | – | – | – | – | – | – | – | 7 |
| 3c/48 | – | – | 15 | 12 | – | – | – | – | – | – | 1 | – | – | – | 28 |
| 3c/49 | – | – | – | 1 | – | – | – | – | – | – | 1 | – | – | – | 2 |
| 3i/09 | – | – | 1 | – | – | – | – | – | – | – | – | – | – | – | 1 |
| 3iv/07 | – | – | – | – | – | – | – | 1 | – | – | – | – | – | – | 1 |
| 3vi/15 | – | – | – | – | – | – | – | – | – | 1 | – | – | – | – | 1 |
| 3vi+/41 | – | – | – | – | – | 1 | – | – | 1 | – | 1 | – | – | – | 3 |
| 3+/37 | – | – | – | – | – | – | – | 1 | – | – | – | – | – | – | 1 |
| 3+/60 | 1 | – | – | 1 | 1 | – | – | – | – | – | – | – | – | – | 3 |
| 3+/104 | – | – | – | – | – | – | – | – | – | – | – | 1 | – | – | 1 |
| *Total phase 3* | *4* | | *47* | *49* | *2* | *1* | *3* | *2* | *1* | *1* | *3* | *1* | | | *114* |
| 60/42 | 1 | – | – | – | 1 | – | – | – | – | – | – | 1 | – | – | 3 |
| 60/43 | – | – | – | – | 1 | – | – | – | – | – | – | – | – | – | 1 |
| 81/00 | – | – | 5 | 2 | – | – | – | – | – | – | – | – | – | – | 7 |
| 82/00 | – | – | – | 3 | – | – | – | – | – | – | 3 | – | – | – | 6 |
| 86/00 | – | – | – | – | – | – | – | – | – | – | – | 1 | – | – | 1 |
| 87/00 | 4 | 1 | 120 | 126 | – | – | – | – | – | 2 | 5 | 3 | – | – | 261 |
| 87/05 | – | – | – | – | – | 1 | – | – | – | – | – | 1 | – | – | 2 |
| 88–89/00 | 23 | 3 | 79 | 61 | 8 | 15 | 2 | – | 3 | 3 | 23 | 13 | 2 | 1 | 236 |
| 90–98/00 | 3 | – | 105 | 163 | 2 | – | – | 1 | 2 | – | 2 | 3 | – | – | 281 |
| *Total unphased* | 31 | *4* | *309* | *355* | *12* | *16* | *2* | *1* | *5* | *5* | *33* | *22* | *2* | *1* | *798* |
| 00/78 | – | – | 1 | – | – | – | – | – | – | – | – | – | – | – | 1 |
| 00/78 | – | – | 12 | 6 | – | – | – | – | – | – | – | – | – | – | 18 |
| *Total U/S 00* | | | *13* | *6* | | | | | | | | | | | *19* |
| ***Total*** | 127 | 5 | 545 | 447 | 29 | 25 | 5 | 3 | 8 | 8 | 51 | 29 | 2 | 1 | 1285 |

*Key*
*1 = core; 2 = broken core; 3 = complete flake; 4 = broken flake; 5 = retouched flake; 6 = scraper;*
*7 = barbed and tanged arrowhead; 8 = oblique/transverse arrowhead; 9 = piercers; 10 = fabricators;*
*11 = miscellaneous tools and debitage; 12 = hammerstone/maul; 13 = plano-convex knife; 14 = tranchet axe*

Atkinson's excavation included in phase 1. As a result most of the material has been assigned to an undifferentiated ditch fill category and been assessed together. It is regrettable that the assemblage from the interior is insufficient to allow comparisons with that from the Ditch. Much of the material from Hawley's excavations is likely to reside in the so-called Hawley's 'graves').

### Distribution

Although the material is poorly provenanced it is clear that distinct concentrations were present. Hawley's diary makes specific reference to trenches C20, C21 (Ditch Segments 14 and 15), C29 (Ditch segments 20–28) on the south side, and to the Ditch terminals at their junction with the Avenue. C29 is variously described in the Diaries as having 'many flints near the bottom', 'good many [flints] on the floor' or 'a few on the bottom' (*see Chapter 5*). Occasionally concentrations are noted to have 'run out'. Similar 'masses' of flints were recorded mostly on or near the bottom of the ditch. A plan of trench C20 (*Fig 43, above*) shows distinct concentrations towards the centre of the Ditch which may indicate that they lay in the primary silting hollow rather than on the ditch floor.

### Raw material

Although Hawley did not record whether fresh flint outcropped in the Ditch it is likely that isolated nodules were recovered during the original construction of the monument. Some of the cores from the phase 1 Ditch clearly suggest that they have been made from fresh flint. They average 183g in weight and many show signs of incipient thermal fractures. Naturally occurring flint nodules have been seen by the author in a pipe trench along the Larkhill track, north of Stonehenge.

### Cores

The core typology from phases 1 and 2 is shown in Table 32. There are no blade cores and it is unlikely that Hawley discarded any. The principal flaking technique employed alternate flaking to produce discoidal cores, where alternate flaking was used to prepare the striking platform, or biconical cores (where both sides of the core served as flaking surfaces round the circumference of the core). These cores grade into those with a single prepared striking platform or into simple 'chopper' cores.

**Table 32 Flint core types**

| *Core type* | *No* |
|---|---|
| Discoidal | 25 |
| Biconical | 23 |
| Alternate flaking 'choppers' | 18 |
| Single platform | 13 |
| Rotating/globular | 4 |
| Others | 7 |

Most cores are therefore characterised by subspherical/globular forms with sinuous edges.

Some elongated biconical cores may represent rejected cores or bifacial tool roughouts. No evidence of Levallois technique was seen. 'Atypical' Levallois flakes and cores which are present have been interpreted as by-products of discoidal cores.

### Flakes

The flakes from the phase 1 and 2 Ditch fills have been analysed metrically despite the limitations of the assemblage. The results, which include 27 pieces from the 1954 ditch section, are summarised in Figure 200 and confirm the selection of large pieces by Hawley. Flake size exceeds that of all similar sites from the Stonehenge Environs Project (Harding 1990a), which form the nearest comparable assemblages. The most striking feature of the flakes is the incidence of faceted butts. This can occur accidentally as a direct result of alternate flaking, but some flakes from the site have been faceted deliberately to prepare the flaking angle before the flake was detached. Flakes with abraded butts are scarce but not totally absent. The sinuous edges of the cores also suggest that abrasion was not part of the flaking technique. The almost total absence of rejuvenation flakes may also be associated with the use of alternate flaking.

The material from Aubrey Hole 22 (context 1223; phase 2 or earlier) forms a small refitting group. Each piece exceeds 76mm in length and is of blade proportions. Three have well prepared faceted butts. The absence of preparation flakes suggests that this does not represent *in situ* knapping but indicates deliberate selection of pieces at the time when the Aubrey Holes were first dug. Additional material was recorded by Atkinson (1950) from the upper fill of Aubrey Hole 32. This material comprised 46 flakes and chips and may have indicated *in situ* knapping. There is nothing to indicate whether it refitted and it was not present in the material held by Salisbury Museum.

### Tools

The scrapers are all end scrapers made on large flakes except for a discoidal scraper and a side scraper. There is one with a faceted butt. The remaining tools include a denticulate from the secondary ditch fill and a broken fabricator from the top of the Ditch. Much of the retouched material from the Ditch is unclassifiable, suggesting that tool manufacture is represented.

## Phase 3

Material from this phase is also heavily influenced by Hawley's selection technique. All flakes assigned to this phase are from excavations conducted by Atkinson *et al* or Pitts, but 50% of the cores and retouched material are from Hawley's excavations.

Three cores from the South Barrow (C4.2, context 1382; WA obj nos 643–5) conform to the types represented in the ditch. The flakes from Stonehole 97 (C51, context 3261) include refitting pieces from both Atkinson's and Pitts's excavations. Also included are undiagnostic debitage chips from Atkinson's 1956 excavations.

A scraper from Z Hole 4, context 1585, is a well made end scraper made on a flake. The oblique arrowheads consist of a well made example of Clark's (1934) type G from the filling of Stonehole 32c (C45, context 3192; WA obj no 667) and one from Aubrey Hole 7 (context 1172; WA obj no 785), which may not be an arrowhead. A miscellaneous flake tool from the southern Avenue ditch (C91, context 3826; WA obj no 849) has a ground edge (Pitts 1982) and two other pieces are broadly discoidal in shape. The barbed and tanged arrowheads assigned to this phase are those excavated from the Stonehenge Beaker-age burial (C61, context no 4005; WA obj nos 775–7; Evans 1984).

## Non-phased groups

This material forms the largest quantity of flint from the site and originates from three main groups. Unphasable material, overlain by the Stonehenge Layer, is principally from Pitts's excavations of 1979 and 1980 and includes three undiagnostic flake cores. There are also two fabricators from the interior of the monument (C1, context 1051; WA obj no 634 and C2, context 1074; WA obj no 788) and a flake with a ground edge from the South Barrow (C4.2, context 1354; WA obj no 640).

Unstratified finds from the turf and topsoil include nine cores from the southern arc of the Ditch which conform to the types described in phase 2. They also include a core of the type described from Wilsford Down where 'burin' spalls were removed from the edge of a flake (Harding 1990b, 169, fig 118). The flakes are principally from the 1953–1954 excavations, the car park (1967, C82), and Gowland's excavations (C64).

There are five end scrapers made on flakes from the monument of which one, from Aubrey Hole 4 (context 1164; WA obj no 659), has a heavily ground edge. Of the barbed and tanged arrowheads from the Ditch, one is of Green's (1980) Sutton c type (C29, context 2901; WA obj no 774) and the other (C41, context 3891; WA obj no 806) is probably unfinished. One of the fabricators is from Aubrey Hole 13 (context 1197; WA obj no 784) and another from Y Hole 12/13 (context 3858; WA obj no 629). The implement listed as a plano-convex knife is from Y Hole 8 (context 1635; WA obj no 631) and the tranchet axe is from the car park (C94, context 9401; WA obj no 818). Most of the hammerstones/mauls are from C1. They were described by Hawley as 'rough flints' and are characterised by small areas of isolated battering. Some of these pieces may represent poorly developed cores.

Another large group comprises material from unphasable features of probable prehistoric date. This material is from the lower spits of Pitts's sarsen working hollow (C91, context 3830). The cores include discoidal and globular forms and are therefore similar to those from the Ditch. The broken flakes include 52 undiagnostic debitage chips from a sieved artefact sample. The oblique arrowhead (Pitts 1982, fig 28, 1015; WA obj no 668), of Clark's type H, is also from this context.

Individual finds from the smaller groups include tools with ground edges. These were identified on a retouched flake from Y Hole 30 (context 1655; WA obj no 632) and an end scraper from within the Sarsen Circle (C2, context 1075; WA obj no 793). A second, well made end scraper (C12, context 2667; WA obj no 787), a thermal fragment, and a flake from a ground tool (C12, context 2674; WA obj no 862) also provided evidence of grinding in material incorporated in the Stonehenge Layer. Two other end scrapers from this layer (C2, context 1073; WA obj nos 646, 647) were well made as was the plano-convex knife (context 2668; WA obj no 786) from C12, inside the Sarsen Circle.

Finally, flint from the northern Avenue ditch at West Amesbury (Smith 1973) has also been re-examined. The largest concentration of flint was from the upper layer (3), particularly segment E (*see Fig 172, Chapter 7*), where 106 pieces were present. Although this material is poorly stratified the re-examination has shown that three pairs of flakes refit. There is also a group of three refitting pieces of which one piece is retouched. Concentrations which include occasional refitting material are undoubtedly contemporaneous and probably represent dumped waste rather than long-term accumulations.

Technologically, the presence of flakes with abraded butts and others with faceted butts, which probably result from alternate flaking, indicates similarities with flakes from the Stonehenge Ditch. These features, together with Smith's observation (*ibid*, 53) that the scraper illustrated (*ibid*, fig 6) from segment C, layer 3, is similar to those found at the Late Neolithic sites of Woodhenge and Durrington Walls, does not contradict the conclusion that the artefact and indeed the remainder of the assemblage is probably not later than the first half of the second millennium cal BC.

## Discussion

It is surprising that there is no clear evidence for Mesolithic activity in the flint assemblage, given the presence of Mesolithic pits in the car park (*see Chapter 4*). The only possible artefact of this date is the tranchet adze from Young's (1935) excavations in the car park (C94, context 9401; WA obj no 818). Both ends of this implement terminate in a clear 'tranchet' edge; however, the 'blade' end has been flaked subsequently, suggesting that the tranchet blow was not a deliberate attempt to sharpen the implement. Similar implements are very common in Neolithic surface assemblages (eg Gardiner 1988) and it seems likely that this implement is of Neolithic rather than Mesolithic date.

The flint assemblage from the monument can be most suitably compared with well documented assemblages of Late Neolithic date in the area. Aspects of the technology compare well with both domestic/industrial

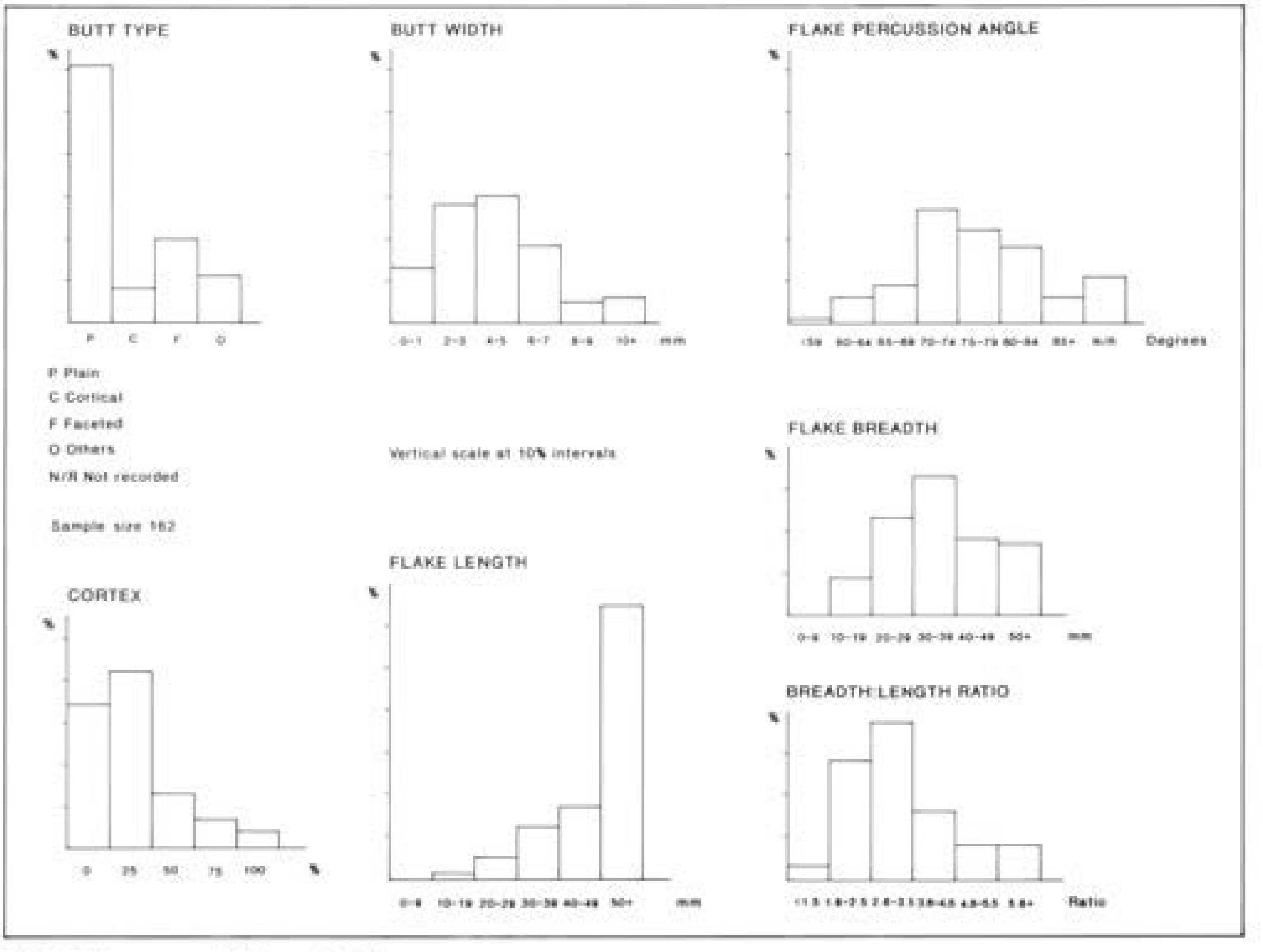



*Fig 200 Summary of flint metrical data*

sites from the Stonehenge Environs (Harding 1990a) and ritual/henge monuments such as at Durrington Walls (Wainwright and Longworth 1971). The incidence of platform faceting as a significant feature of platform preparation has been associated with Late Neolithic industries. Flake shape is more elongated than might be expected from flakes of this date, although this may reflect Hawley's selection procedure. The cores compare well with those examined from King Barrow Ridge (W59) during the Stonehenge Environs survey (Harding 1990c). These cores showed a preference towards 'keeled' and multi-platform flake cores which can result from the use of alternate flaking.

The tool typology is also consistent with a Late Neolithic date. Fabricators, tools (including scrapers) with ground edges, denticulates, and oblique arrowheads are all characteristic. The flint tools and cores associated with Pitts's sarsen floor also conform to this pattern.

**Illustrated flint**

Fig 201

1 Fabricator. Associated with human cremation (Berridge no HC73) in Aubrey Hole 16. *WA obj no 783; Hawley cat no 4529; C32.16; context 1207; phase 1; group 03*

2 Flake. *WA obj no 809; Atkinson cat no 54/91.1; C41; context 3895; phase 1; group 01*

3 Flake. *WA obj no 810; Atkinson cat no 54/91.2; C41; context 3895; phase 1; group 01*

4 Small bifacial core tool. *WA obj no 781; Hawley cat no 4723; C25; context 1554; phase 1; group 01*

5 Large piercer. *WA obj no 780; Hawley cat no 1583A; C20; context 1302; phase 2a; group 17*

6 Rejuvenation tablet. *WA obj no 807; Atkinson cat no 54/81.1; C41; context 3893; phase 2-; group 00*

7 Retouched flake, broken. WA obj no 808; *Atkinson cat no 54/81.2; C41; context 3893; phase 2-; group 00*

8 Scraper. *WA obj no 792; Hawley cat no 1590y; C21; context 1385; phase 2-; group 00*

9 Piercer on nodule. *WA obj no 790; Hawley cat no 249; C2; context 1073; phase 2-; group 00*

10 Fabricator or chisel, broken. *WA obj no 791; Hawley cat no 1590v; C2; context 1385; phase 2-; group 00*

11 Knife/ miscellaneous flake tool. *WA obj no 779; Hawley cat no 4612A; C22; context 1403; phase 2a; group 17*

12 Oblique arrowhead. *WA obj no 667; Atkinson cat no 54/1331; C45; context 3192; phase 3v; group 07*

13 Flake. *WA obj no 861; Atkinson cat no 54/1223; C43; context 3104; phase 81; group 00*

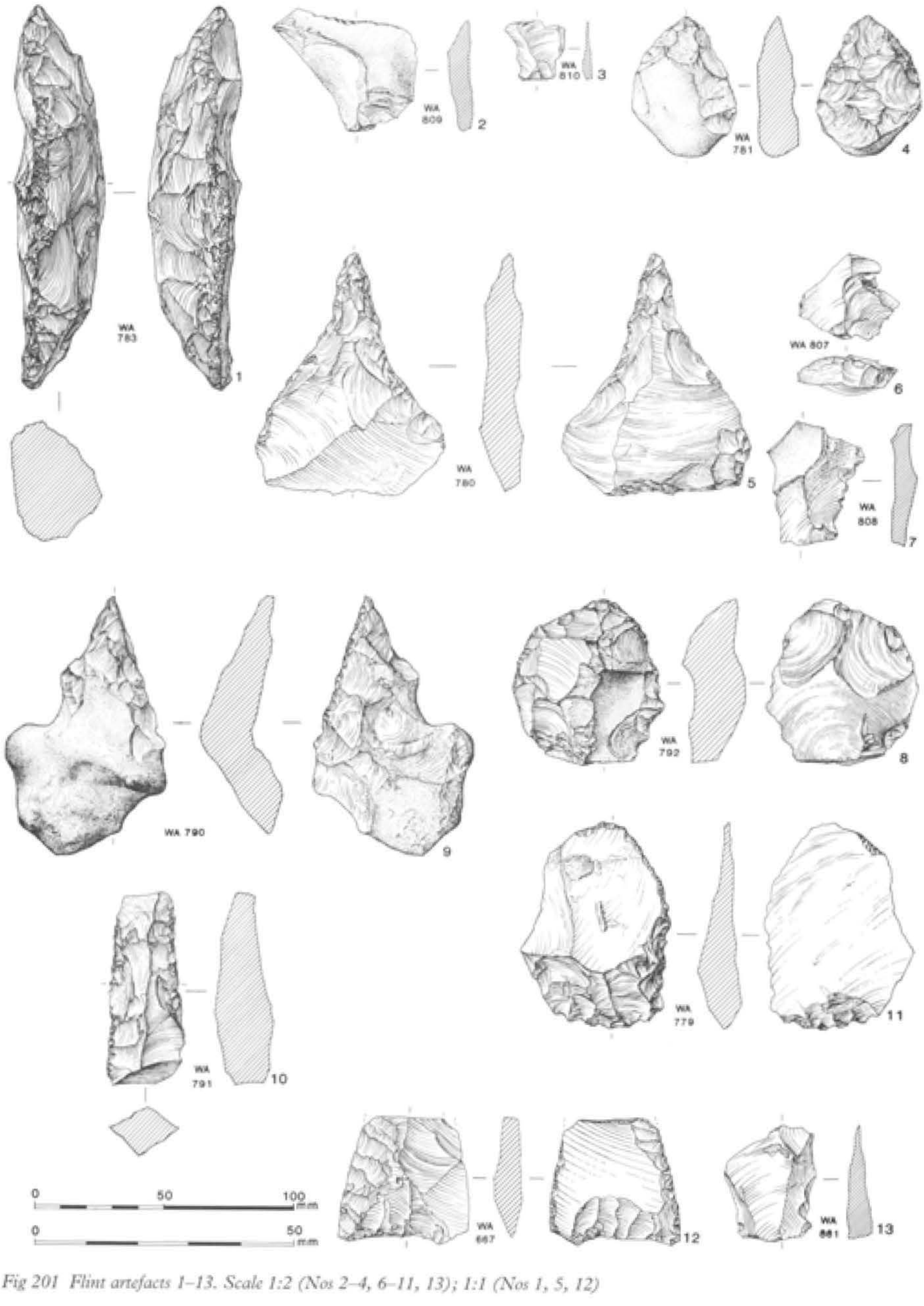



*Fig 201 Flint artefacts 1–13. Scale 1:2 (Nos 2–4, 6–11, 13); 1:1 (Nos 1, 5, 12)*

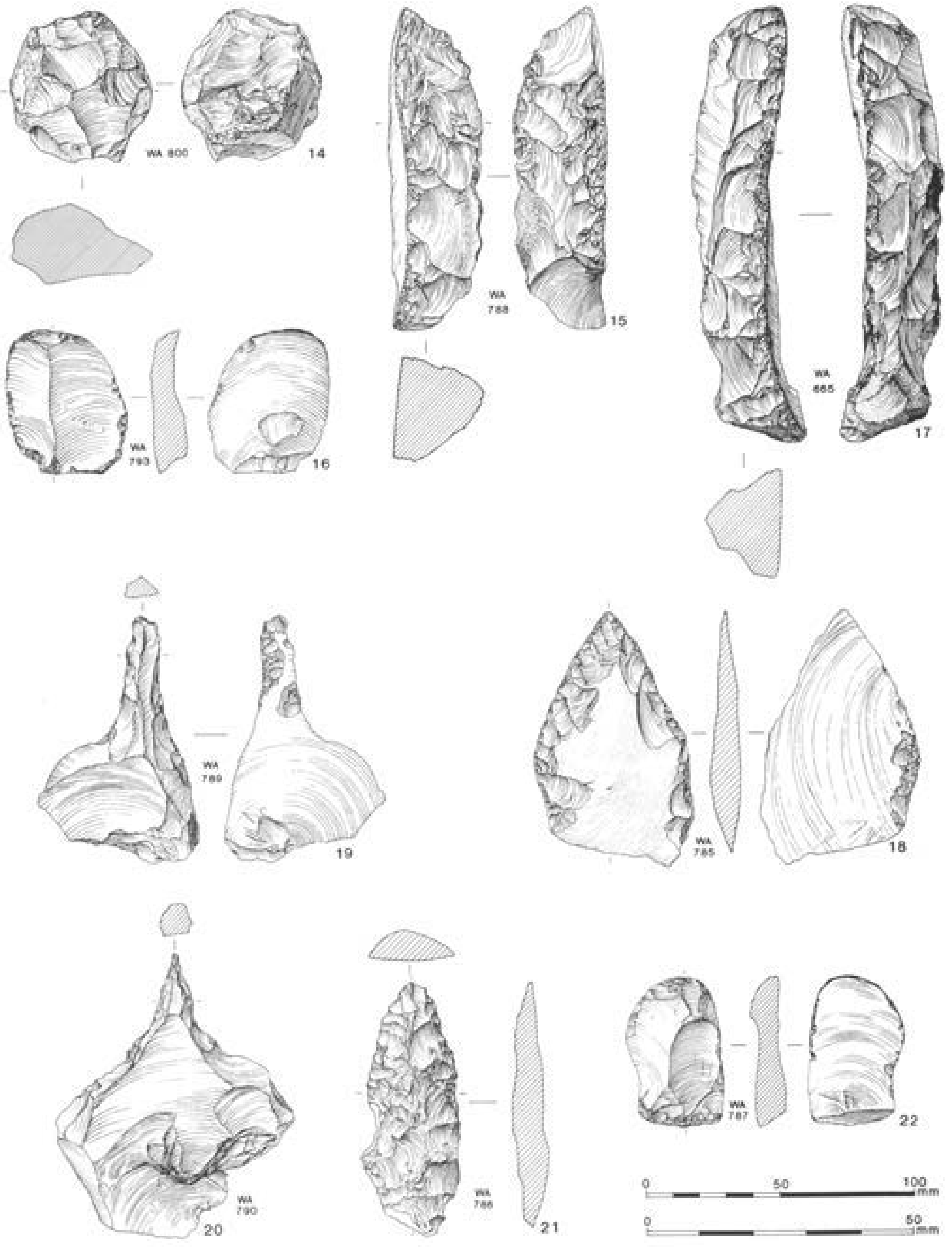



*Fig 202 Flint artefacts 14–22. Scales 1:2 (Nos 14, 16, 22); 1:1 (Nos 15, 17–21)*

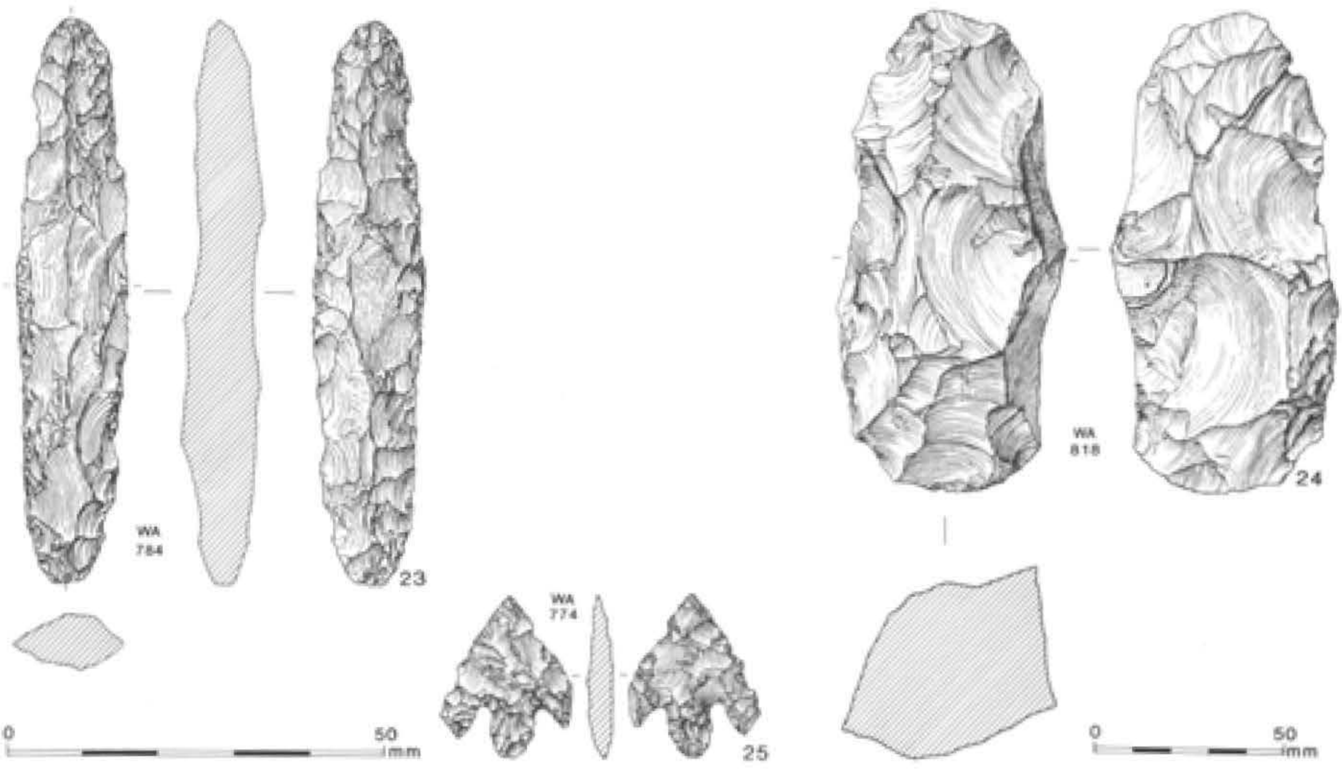



*Fig 203 Flint artefacts 23–25. Scales 1:1 (Nos 23, 25); 1:2 (No 24)*

Fig 202

14. ?Core/hammerstone. *WA obj no 800; Atkinson cat no 53/79; C36; context 3875; phase 87; group 00*

15 Fabricator. *WA obj no 788; Hawley cat no 283; C2; context 1074; phase 87; group 00*

16 Scraper, edge ground. *WA obj no 793; Hawley cat no 285; C2; context 1075; phase 87; group 05*

17 Fabricator. *WA obj no 665; Hawley cat no 235; C2; context 1075; phase 88; group 00*

18 Unfinished arrowhead or knife. ?Associated with human cremation (Berridge no HC9) in Aubrey Hole 7. *WA obj no 785; C32.7; context 1172; phase 88; group 00*

19 Piercer. *WA obj no 789; Hawley cat no 761a; C7; context 1782; phase 88; group 00*

20 Piercer. *WA obj no 790; Hawley cat no 249; C2; context 1073; phase 88; group 00*

21 Plano-convex knife. *WA obj no 786; Hawley cat no 330; C12; context 2668; phase 88; group 00*

22 Scraper with heavy edge grinding all the way round. *WA obj no 787; Hawley cat no 314; C12; context 2667; phase 88; group 00*

Fig 203

23 Fabricator. *WA obj no 784; Hawley cat no 4527; C32.13; context 1197; phase 89; group 00*

24 Tranchet adze. *WA obj no 818; C94; context 9401; phase 89; group 00*

25 Barbed and tanged arrowhead. *WA obj no 774; Hawley cat no 2153a; C29; context 2901; phase 89; group 00*

# Stone

*by R Montague*

## Worked bluestone

### Petrology and sources

Much has been written on the source, significance, and possible methods of transport of the Bluestones to Stonehenge and it is not intended to rehearse those arguments again here. It is enough to say that much of this material is considered to have originated from various outcrops in the Preseli Hills of Pembrokeshire, Wales, though whether the stones arrived on Salisbury Plain by human or natural agencies, such as in glacial till, remains a matter for debate. The reader is referred to Howard (1982) and Thorpe *et al* (1991) for recent discussions of petrology and a review of the possible mechanisms of transportation. There can, however, be no doubt that it would have required considerable organisation and labour to bring them to the site and to shape and erect them.

The term 'bluestone' refers to several types of mostly igneous rocks present at the monument. The main categories are spotted dolerites, rhyolites, and volcanic ash, as well as Cosheston Beds sandstone and micaceous sandstones. Fully accurate identification of all the bluestone pieces from Stonehenge would require investment in a full suite of samples for petrological examination and/or further research by an experienced igneous geologist, since it is clear that a much wider range suite of igneous rocks is represented in the collections than those listed above, including some types previously unsuspected (Dr R Bevins and Dr D G Jenkins, pers comm). Neither resource was available within this project and fascinating as such research is likely to prove it is doubtful that such a detailed study would add much to our archaeological understanding of the materials and their use at the monument.

Identification of the worked bluestone pieces for this report was necessarily brief, and was undertaken by an archaeologist rather than a petrologist. For the most part the main classes of rocks can be readily distinguished by a practised eye, but by nature all are somewhat variable in terms of their mineral composition, and particularly when weathered they can all look very much alike. Consequently there is considerable room for uncertainty. However, since all the extant pieces were examined by one person, using the comparative collection held by Salisbury Museum, the identifications should be internally consistent. It may prove that some of the original identifications of the rock types represented in the comparative collection are incorrect (Dr R Bevins and Dr D G Jenkins, pers comm; Thorpe *et al* 1991, table 12) but at the time of going to press the bluestones are identified according to the currently accepted classification (*cf* Petrology Committee identifications). All the material examined is included in the archive database from which it could be retrieved for reclassification if future work requires it. The approximate relative proportions of the total remaining collection represented by each main rock type are as follows: rhyolite 35%, dolerite 32%, volcanic ash 19%, Cosheston Beds sandstone 9%, micaceous blue sandstone 4%; petrologically identified Group XIII (spotted dolerite) 1%, calcareous ash 1%, and others/uncertain identification 4%. Although these values are statistically meaningless in view of the unknown missing quantity, they are probably acceptable as 'order of magnitude' figures and give some indication of the composition of the surviving collection. Petrologically identified bluestone is listed in Table 33.

### Terminology

Since none of the bluestone rocks is readily available 'on site', all pieces are essentially 'artefacts'. The material occurs in a range of forms from chips and angular fragments through identifiably modified pieces apparently fashioned for use. Others may have been manufactured to resemble familiar cultural items but not for use (skeuomorphs) and some pieces were specifically modified but are of types unknown in other materials or contexts and therefore possibly of purely non-utilitarian function. Finally, there are the dressed Bluestones themselves. It is assumed that all the pieces are derived from the dressing of the Bluestones used in the monument and possibly from others imported for that purpose but rejected . The occurrence of the various types in the form of remaining standing and fallen stones at the monument is shown in Figure 15, above. Since all the bluestone is therefore humanly modified to some extent, but not necessarily in the form of what we would normally consider to be typologically definable 'artefacts', this presents a problem of terminology. In the summary below, and in those for the sarsen and other rocks which follow, the term *piece* is used instead of fragment to refer to any item of bluestone; *waste fragments* are large pieces of broken bluestone which do not exhibit characteristics of deliberate flaking or other obvious signs of further modification; *waste flakes* are pieces which display a bulb of percussion or other signs of deliberate 'knapping' but no secondary retouch; and *objects* are those pieces that have been further modified or, in a few cases, have clearly been detached from a larger worked object and retain evidence of retouch. In some instances it was not possible to tell if the weathered faces apparent on some of the pieces were the result of natural weathering or if they represented weathering on humanly modified surfaces, so again there is some ambiguity in the identifications.

### The database: problems of curation and discard

Only those bluestone pieces housed in Salisbury Museum, with exceptions mentioned below, were analysed for this report, and these are largely derived from the excavations of Hawley and Atkinson *et al*. All are catalogued in the archive.

There are considerable difficulties in working with this material. From his Diaries, it is known that Hawley kept only bluestone pieces of interest to him, ie those that were demonstrably worked or retouched. Other pieces were counted and then discarded at a later date: it is most likely that these are buried in the 'graves' mentioned by Newall. However, their quantification was at least noted in the Diary. Atkinson was much more meticulous in his curation of finds, although we know from the record cards that some have gone missing since excavation (such as all bluestone from the Q and R Holes). It is also known from the work of the Petrological Committee (Davis *et al* 1988, 157–8) that more bluestone pieces than now survive in Salisbury Museum were excavated from the Aubrey Holes. Fragments of bluestone have been widely distributed through various collections, including some very large fragments, and it not always clear from where these pieces derived or what quantities were involved. It is also not at all clear whether Hawley's quantifications refer to material above a minimum size, this point having arisen during a recent augering exercise within the monument (Wessex Archaeology 1994a) in which small, but clearly identifiable, fragments of both bluestone and sarsen were recovered from backfill of Hawley's trenching.

Thus it is not possible to attempt to compare directly the results of the various excavations, as we know that a considerable quantity of material is missing, but not how much. Using the database compiled from Hawley's Diaries, it is possible to attempt to compare some of the

**Table 33 Petrologically identified bluestone**

| *Petrology Committee label* | *Petrology no* | *Thorpe et al sample no* | *Findspot/cutting* | *WA context* | *WA obj no/ Hawley cat no* | *Identification* |
|---|---|---|---|---|---|---|
| *Rock* | 276 | – | 'Stonehenge' | 3813 | – | Cosheston Beds sandstone |
| *Rock* | *306* | – | *'Stonehenge'* | – | – | *Rhyolite* |
| *Rock* | *307* | – | *'Stonehenge'* | – | – | *Calcareous ash* |
| *Rock* | *308* | – | *'Stonehenge'* | – | – | *Group XIII* |
| *?Axe frag* | 391 | – | C4.2 | 1382 | 106/4840 | Group XIII |
| *?Axe frag* | 392 | – | C32 | 1234 | 149/4555a | Group XIII |
| *?Axe frag* | 394 | – | C13 | 2318 | 146 | Rhyolite |
| *Axe frag* | 396 | – | C4.2 | 1382 | 150 | Rhyolite |
| *Axe frag* | 397 | – | C28 | 2582 | 114 | Rhyolite |
| *Rock* | 442 | – | AH 1 | 1149 | – | Group XIII |
| *Rock* | *444* | *OU9** | *AH 1* | – | – | *Cosheston Beds sandstone* |
| *Rock* | 446 | – | AH 4 | 1164 | 140 | Group XIII |
| *Rock* | 448 | – | AH 4 | 1164 | – | Group XIII |
| *Rock* | *450* | – | *AH 5* | – | – | *Cosheston Beds sandstone* |
| *Rock* | 453 | – | AH 5 | 1165 | – | Group XIII |
| *Rock* | *454* | *OU20* | *AH 5* | – | – | *Rhyolite* |
| *Rock* | *456* | – | *AH 5* | – | – | *Group XIII* |
| *Rock* | *457* | – | *AH 5* | – | – | *Calcareous ash* |
| *Rock* | 459 | – | AH 7 | 1172 | – | Group XIII |
| *Rock* | 460 | – | AH 8 | 1176 | – | Group XIII |
| *Rock* | *462* | *OU6* | *AH 10* | – | – | *Group XIII* |
| *Rock* | *463* | *OU24* | *AH 10* | – | – | *Rhyolite* |
| *Rock* | *464* | *OU23* | *AH 11* | – | – | *Rhyolite* |
| *Rock* | 465 | – | AH 11 | 1187 | – | Calcareous ash |
| *Rock* | 466 | – | AH 11 | 1187 | 141 | Rhyolite |
| *Rock* | 467 | – | AH 12 | 1191 | – | Rhyolite |
| *Rock* | *468* | *OU5* | *AH 15* | – | – | *Rhyolite* |
| *Rock* | 470 | – | AH 15 | 1203 | – | Calcareous ash |
| *Rock* | *471* | *OU22* | *AH 16* | – | – | *Rhyolite* |
| *Rock* | *472* | – | *AH 16* | – | – | *Rhyolite* |
| *Rock* | *475* | *OU7* | *AH 17* | – | – | *Rhyolite* |
| *Rock* | 476 | – | AH 17 | 1208 | – | Calcareous ash |
| *Rock* | *477* | – | *AH 17* | – | – | *Calcareous ash* |
| *Rock* | 478 | – | AH 17 | 1208 | – | Group XIII |
| *Rock* | 479 | – | AH 21 | 1217 | – | Group XIII |
| *Rock* | *481* | *OU21* | *AH 21* | – | – | *Rhyolite* |
| *Rock* | 483 | – | AH 22 | 1222 | – | Rhyolite |
| *Rock* | *485* | *OU4* | *AH 22* | – | – | *Rhyolite* |
| *Rock* | *486* | *OU8* | *AH 22* | – | – | *Group XIII* |
| *Rock* | 487 | – | C2 | 1076 | – | Calcareous ash |
| *Rock* | 489 | – | ZH 4 | 1583 | 143 | Calcareous ash |
| *Rock* | *490* | *OU3* | *ZH 6* | – | – | *Rhyolite* |
| *Rock* | 491 | – | YH 5 | 1622 | 151 | Rhyolite |
| *Rock* | *492* | *OU10* | *YH 6* | – | – | *Group XIII* |
| *Rock* | 493 | – | YH 13 | 1922 | – | Rhyolite |

*Information derived from Davis* et al *1988 and Thorpe* et al *1991*
*Entries in italics were not personally examined (no longer in Salisbury Museum)*
* *Thorpe* et al *(1991, 141, table 12) note 'probably lower Palaeozoic Sandstone units of SW Wales not Cosheston Beds'*

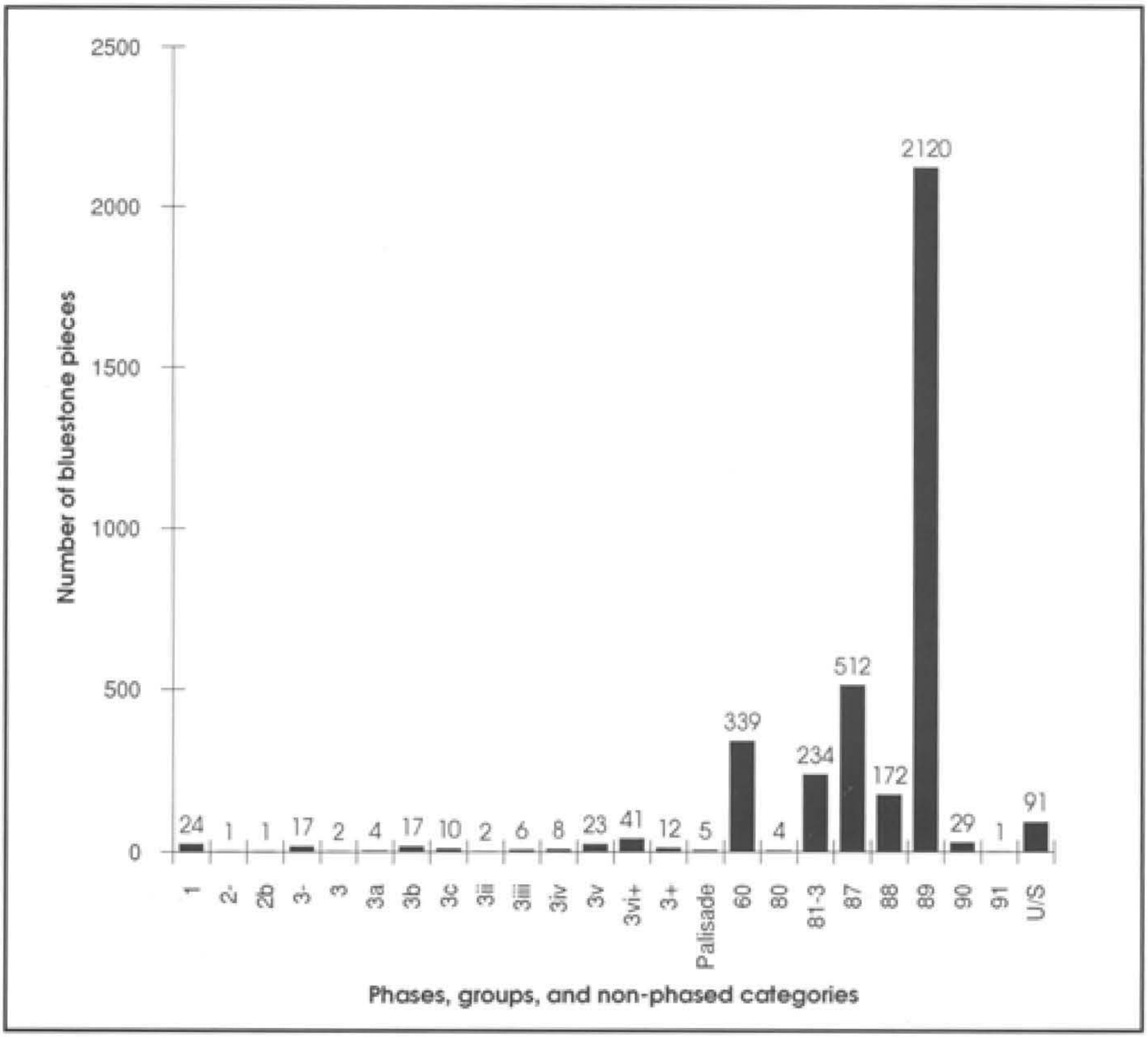



*Fig 204 Distribution of all bluestone pieces (N = 3675)*

excavations, although there were also difficulties involved in assigning contexts to finds mentioned therein.

As an example of the problem of curation and discard we can compare the quantities of bluestone material recovered from Z and Y Holes by Atkinson *et al* and Hawley respectively. Taken at random, Y and Z Holes 11, excavated by Hawley, are recorded in his Diary as having produced 33 and 48 pieces of bluestone respectively (29/10/1923; 31/10/1923).

However, Hawley did not collect waste flakes and fragments and none of the pieces from YH11 or ZH11 were retained. Indeed, of all the bluestone pieces excavated from Y and Z Holes by Hawley only eight objects survive in Salisbury Museum, from YH 2, 4, 5, 9, and 13 and ZH 10, 12, and 30. By comparison, there are 568 pieces of bluestone in the collection from Atkinson's excavation of Y and Z Holes 16, including 273 from topsoil contexts, and of these 9 (1.6%) are objects as defined in this report.

It must also be borne in mind that there are no bluestone finds, nor any records of such, from the pre-Romano-British layers in YH 16, and that these were either never present or are now missing, so the original total for the two holes may have been even higher. This demonstrates clearly the skewing effect of different excavation and curation procedures. It is not clear how much of Atkinson's bluestone is present in Salisbury Museum as we do not know whether all pieces were recorded in the card index, but an order of magnitude estimate for Hawley's excavations indicates that less than 10% of his original bluestone assemblage survives in the collection.

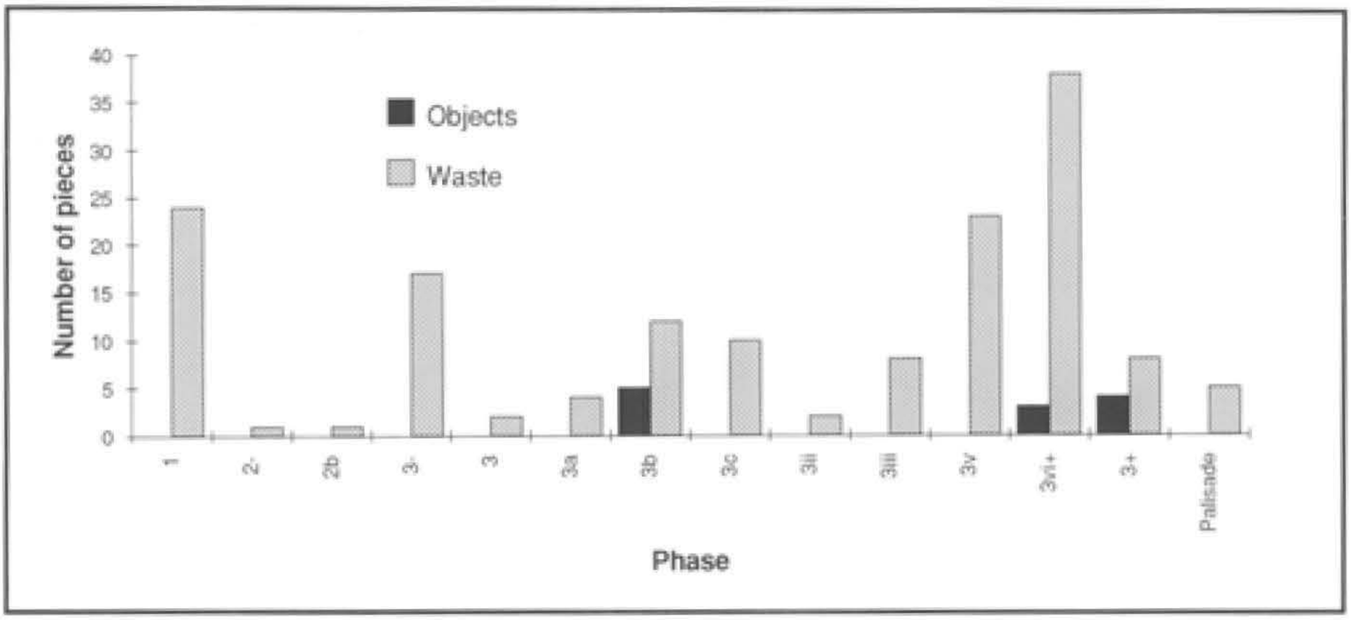



*Fig 205 Distribution of phased bluestone (plus Palisade Ditch) (N = 173)*

The bluestone recovered during Pitts's 1979–80 excavations was not re-examined as it has already been published in detail (Howard 1982, 104–24).

A large quantity of bluestone pieces remain in the collections, but since only an unknown percentage of the total assemblage from the excavations now survives, it was considered that quantification by weight would be both statistically unacceptable and potentially misleading. All quantification (with specific exceptions noted below) was by fragment count only.

### The database: phasing the bluestone

A total of 3675 pieces of bluestone from the various excavations at Stonehenge has been retained and was examined for this report. The occurrence of bluestone pieces by phase is shown in Figure 204 and from phased contexts in Figure 205. Of the 3675 pieces, only 168 come from phased contexts relating to the use of the monument, 4.6% of the total. The remaining 3507 pieces (95.4%) of the collected assemblage come from a variety of contexts, including those resulting from post-monument activity on the site, from animal and modern human disturbance, from the Stonehenge Layer, topsoil and turf layers, from unphasable or unlocatable features, or material that is so poorly documented that its provenance from within the site is unknown.

Bearing in mind the various shortcomings of the material already highlighted, the differences in curation (and probably also collection) strategies, the restriction of this study to the curated material in Salisbury Museum, and the fact that 95% of the material in that Museum does not come from securely phased contexts, it is not possible to draw anything but the broadest of conclusions from the material relating to distribution or to artefact types.

### The phased bluestone pieces

It can be seen from Figures 204 and 205 that 24 bluestone pieces are present in a single phase 1 context, from the Bank of the main Ditch. However, as discussed earlier in this volume (*Chapter 5*), this is in an area where photographic evidence shows postholes cut into the chalk bedrock along the line of the Bank, although the relationship between them is unknown. It may be that the bluestone was in fact present in the posthole fill(s), which were not recognised as such during excavation, so that the bluestone pieces are intrusive in the Bank material.

Another explanation is that this could represent evidence for the cleaning out of the Ditch onto the Bank some time after the start of phase 3, ie when the Bluestones arrived on the site. It is not accepted that these bluestone pieces are contemporaneous with the construction of the Bank. Two pieces come from phase 2 or earlier contexts in the upper parts of the Ditch fills and a solitary piece was recovered from the fill of the Beaker period grave-cut in the Ditch. The number of phasable pieces is thus so small that nothing sensible can be made of the distribution.

### Objects

Out of the total of 3675 pieces of bluestone, 117 have been recorded as objects, forming 3.18% of the total analysed collection. Of these objects, only 12 came from contexts relating to the main period of use of the monu-

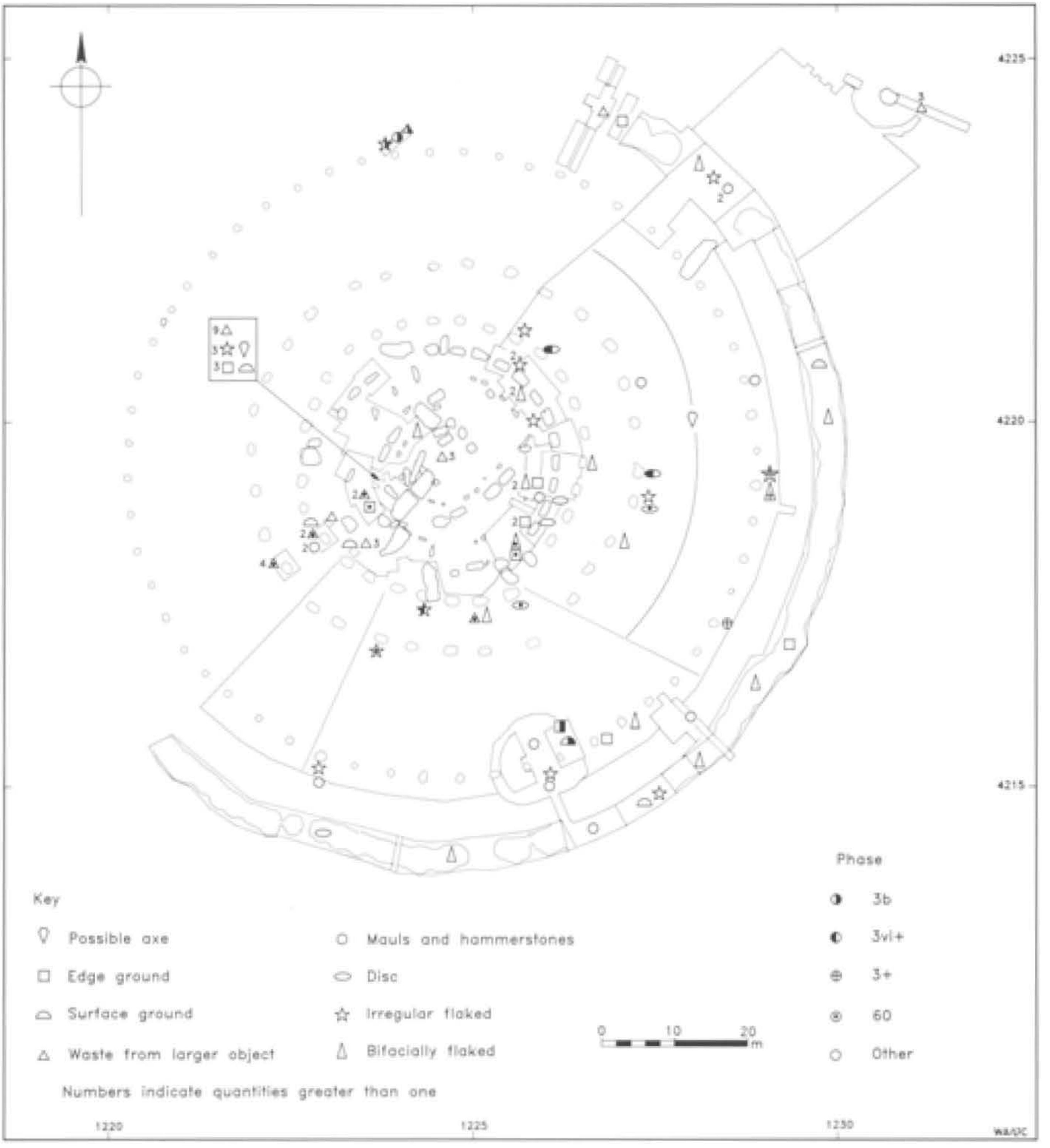



*Fig 206 Distribution of bluestone objects*

ment, ie 0.032% of the total collection. The distribution of the objects is shown in Figure 206 and Table 34 and summarised by phase in Table 35.

**Bifacially flaked objects:** These are essentially ovate in form and bifacially flaked (Fig 208, 12–14). The flaking generally occurs around most of the circumference of the object, and in most cases is invasive. These objects are usually characterised by fresh edges, though in a few cases there are small isolated areas of battering. A total of 16 of these objects was identified. Of these, 11 were of rhyolite, which despite the small sample size suggests a preference for this material. In general these objects do not seem to have seen much use and their function is uncertain. They resemble ovate 'handaxe' forms manufactured from flint (Gardiner 1988, axe type 5) which occur in Neolithic flint mines in Sussex and Norfolk, but the function of those pieces is also uncertain, since they could not be further modified into conventional axe forms and the bluestone objects are

**Table 34 Distribution of bluestone objects by phase and group**

| *Phase/ group* | *Cutting* | *WA context* | *Provenance* | *A* | *B* | *C* | *D* | *E* | *F* | *G* | *H* | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3b/44 | 4.2 | 1382 | South Barrow ditch | – | – | 1 | 1 | – | – | – | – | 2 |
| 3b/46 | 50 | 3253 | North Barrow ditch | – | 1 | – | – | – | – | 1 | – | 2 |
| 3b/52 | 50 | 3251 | North Barrow bank | – | – | – | – | – | – | – | 1 | 1 |
| 3vi+/40 | 34.4 | 1625 | YH4 , no RB material | – | – | – | – | 1 | – | – | – | 1 |
| 3vi+/41 | 33.12 | 1935 | ZH12, no RB material | – | 1 | – | – | – | – | – | – | 1 |
| 3vi+/41 | 33.30 | 1612 | ZH30, lower fill, no RB material | – | – | – | – | 1 | – | – | – | 1 |
| 3+/37 | 32.7 | 1172 | AH7, secondary fill 'bluestone' layer | 1 | 1 | – | – | – | – | – | – | 2 |
| 3+/37 | 32.11 | 1187 | AH11, secondary fill, 'bluestone' layer | – | – | – | – | – | – | 1 | – | 1 |
| 3+/81 | 83 | 9318 | SEB trench; Avenue ditch recut | – | – | – | – | – | – | 1 | – | 1 |
| 60/19 | 17 | 2437 | ?Bluestone hole, fills of empty holes | – | – | 1 | – | – | – | – | 2 | 3 |
| 60/32 | 13 | 2315 | Disturbed fill Stonehole 8 | 1 | – | 1 | – | – | – | – | – | 2 |
| 60/42 | 34.2 | 1615 | YH2, upper fill with RB material | – | – | – | – | – | – | 1 | – | 1 |
| 60/42 | 34.5 | 1624 | YH5, upper fill with RB material | – | – | – | – | 1 | – | – | – | 1 |
| 60/42 | 34.13 | 1923 | YH13, humus with RB material | – | 1 | – | – | – | – | – | – | 1 |
| 60/42 | 34.16 | 3026 | YH16, secondary fill with RB material | – | – | – | – | – | – | – | 4 | 4 |
| 60/43 | 33.9 | 1600 | ZH9, second layer with RB material | – | – | – | – | 1 | – | – | – | 1 |
| 60/43 | 33.10 | 1604 | ZH10, lower fill, with RB material | – | – | – | – | – | – | – | 1 | 1 |
| 60/43 | 33.16 | 3016 | ZH16, upper fill with RB material | – | – | – | – | – | – | – | 2 | 2 |
| 82/00 | 64 | 4076, 4101, 4117 | Gowland's excavation, Stone 56; rabbit & other disturbance | – | 1 | – | 1 | – | – | – | 2 | 4 |
| 87/00 | 1.5 | 1051 | Chalky rubble in Stonehole 6 | – | – | 1 | – | – | – | – | – | 1 |
| 87/00 | 2 | 3881 | Undifferentiated fill, Stonehole 2 | – | 1 | – | – | – | – | – | – | 1 |
| 87/00 | 64 | various* | Gowland's excavation of Stone 56 | – | 1 | 2 | – | – | 1 | – | 4 | 8 |
| 87/05 | 2 | 1075 | Stonehole 30 | 1 | – | – | – | – | – | – | – | 1 |
| 88/00 | 1 | 3661 | Stones 6/7 | – | – | – | – | – | – | 1 | – | 1 |
| 88/00 | 2 | 1073 | Stone 30 | 1 | 2 | – | – | – | – | – | – | 3 |
| 88/00 | 7.48 | 1768 | General trenching | – | – | – | – | – | 1 | – | – | 1 |
| 88/00 | 20 | 1290 | Over Ditch | – | 1 | – | 1 | – | – | – | – | 2 |
| 89/00 | 1 | 1050 | Around Stones 6 & 7 | – | – | 1 | – | 2 | – | – | – | 3 |
| 89/00 | 4.2 | 1367 | South Barrow | – | – | – | – | – | – | 1 | – | 1 |
| 89/00 | 5 | 1451 | Humus and Stonehenge Layer over causeway | 1 | 1 | – | – | – | – | 2 | – | 4 |
| 89/00 | 14 | 3196 | Turf around Stonehole 33a | 2 | – | 1 | – | – | – | – | – | 3 |
| 89/00 | 18.3 | 1264 | Over Ditch | 1 | – | – | – | – | – | – | – | 1 |
| 89/00 | 21 | 1383 | Over Ditch | – | – | – | – | – | – | 1 | – | 1 |
| 89/00 | 26 | 3849 | '3rd crater ditch', layer unknown | 1 | – | – | – | – | – | – | – | 1 |
| 89/00 | 28 | 2519 | Over Ditch | – | – | – | 1 | – | – | – | – | 1 |
| 89/00 | 28 | 2532 | Over Ditch | 1 | – | – | – | – | – | – | – | 1 |
| 89/00 | 28 | 2582 | Over Ditch | – | – | 1 | – | – | – | – | – | 1 |
| 89/00 | 28 | 2593 | Over Ditch | 1 | – | – | – | – | – | 1 | – | 2 |
| 89/00 | 29 | 2862 | Over Dtich | – | – | – | – | 1 | – | – | – | 1 |
| 89/00 | 32.4 | 1164 | AH4 | – | – | – | – | – | – | 1 | – | 1 |
| 89/00 | 32.15 | 1203 | AH15 | 1 | – | – | – | – | – | – | – | 1 |
| 89/00 | 32.16 | 1205 | AH16 | – | – | 1 | – | – | – | – | – | 1 |
| 89/00 | 32.17 | 1208 | AH17 | – | 1 | – | – | – | – | 1 | – | 2 |
| 89/00 | 32.24 | 1234 | AH24 | – | 1 | – | – | – | – | 1 | – | 2 |
| 89/00 | 33.4 | 1583 | ZH4 | 1 | – | – | – | – | – | – | – | 1 |
| 89/00 | 33.10 | 3855 | ZH10 | 1 | – | – | – | – | – | – | – | 1 |
| 89/00 | 33.16 | 3015 | ZH16 | – | – | – | 1 | – | – | 2 | – | 3 |
| 89/00 | 33.29 | 1608 | ZH29 | – | 1 | – | – | – | – | – | – | 1 |
| 89/00 | 34.5 | 1622 | YH5 | – | 1 | – | – | – | – | – | – | 1 |
| 89/00 | 34.6 | 1628 | YH6 | 1 | – | – | – | – | – | – | – | 1 |

**Table 34 (cont)**

| *Phase/ group* | *Cutting* | *WA context* | *Provenance* | *A* | *B* | *C* | *D* | *E* | *F* | *G* | *H* | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 89/00 | ?35/52 | 3880 | Nr Stone 59 | 1 | – | – | – | – | – | – | – | 1 |
| 89/00 | 36 | 3031 | Over Heelstone ditch | – | – | – | – | – | – | – | 3 | 3 |
| 89/00 | 41 | 3891 | Over Ditch | – | – | 1 | – | – | – | – | – | 1 |
| 89/00 | 42 | 3896 | Over Ditch | – | – | – | – | – | – | – | 1 | 1 |
| 89/00 | 44 | 3111 | Over Bank | – | – | – | – | – | – | 1 | – | 1 |
| 89/00 | 64 | various** | Gowland's excavations Stone 56 | – | 1 | 1 | – | – | – | – | 3 | 5 |
| 89/00 | 65 | 4119 | Gowland's excavations Stone 56 | – | – | – | 1 | – | – | – | 3 | 4 |
| 89/00 | 66 | 4120 | Gowland's excavations Stone 56 | – | – | – | – | – | – | – | 1 | 1 |
| 89/00 | 69 | 4123 | Gowland's excavations Stone 56 | – | – | – | – | – | – | – | 3 | 3 |
| 00/00 | | 3813 | Unstratified | – | 1 | – | – | – | – | 1 | 10 | 12 |
| Total | | | | 16 | 17 | 12 | 6 | 7 | 2 | 17 | 40 | 117 |

* *contexts 4053, 4094, 4096, 4103, 4104, 4109*
** *contexts 4057, 4063, 4064*
*A = Bifacially flaked; B = irregularly flaked; C = edge ground; D = surface ground; E = disc; F = possible axe fragment; G = mauls and hammerstones; H = waste from larger dressed objects*

clearly of a later date. It is of course possible that they were not intended for use, but the predominant distribution of surviving pieces within disturbed and topsoil contexts prohibits any suggestion of deliberate deposition.

**Irregularly flaked objects:** This is a more mixed group, with a general trend towards an ovate shape, but with much less regular retouch which is sometimes unifacial (Fig 207, 8, 9). There is inevitably a degree of overlap between this category and the bifacially flaked objects. In general the edges are fresh, but some objects bear small areas of battering. Seventeen were identified; there does not appear to be a preferred material.

**Ground objects:** Two types of ground objects have been identified – *edge ground objects* are generally tabular, and are mostly characterised by wear/grinding around most, if not all, of the circumference with very occasionally some ground surfaces (Fig 207, 1, 4). Twelve were recorded; there does not appear to be a preferred material; and *surface ground objects* which are generally less regular in shape and bear irregular patches of grinding on the surfaces which generally appears to be expedient in nature. Six were recorded, of which four were of rhyolite. None is illustrated.

**Discs:** These are small, tabular, sub-rectangular to discoidal objects, and are generally edge ground only, with a few instances of surface grinding. Seven were identified (Fig 207, 2, 3, 5, 6; Fig 208, 15–17), including one with marks on either face suggesting an attempt at perforation. There is no uniformity of size or shape, though all seven are small with maximum dimensions of 16–38mm. They are all 4–5mm thick. Four of the discs were recovered from Y and Z Holes, from both pre- and post-Romano-British layers, with two more from the tospoil around Stones 6 and 7, and the seventh from topsoil over the terminal of the Ditch near the blocked southern entrance (C29; Ditch Segment 21). All of these are fashioned from volcanic ash, a preference which may relate simply to the softness and ease of working of this material.

There is no obvious function for these pieces and few parallels. Eight larger examples (generally sub-circular, 51–90mm diameter and 26–70mm thick) in sarsen and two in quartzite were recorded at Windmill Hill (Smith 1965, fig 52) and one sarsen disc was recovered at the West Kennett Long Barrow (Piggott 1962, 49). There are no known sarsen examples from Stonehenge.

**Possible axe fragments:** Two such objects were identified (Fig 207, 7, 11), one of which underwent secondary use a hammer- and rubbing stone. One has been thin-sectioned but cannot be identified amongst those reported on by the Petrological Committee.

**Mauls and hammerstones:** These objects have battered and crushed edges, often with a rounded pecked surface, either on the ends of the object or around large areas of the circumference (Fig 208, 10). Any flaking which is apparent can include edge damage through use, with spalls becoming detached during pounding. Seventeen of these objects were identified in the material in Salisbury Museum and some are reused fragments detached from larger ground and/or pecked objects. Rhyolite and dolerite appear to be the preferred material types.

**Fragments of ground and/or pecked bluestone objects:** These objects are essentially waste fragments but are clearly broken from larger dressed objects, with

**Table 35 Summary distribution of bluestone objects**

| *Phase* | *Provenance* | *A* | *B* | *C* | *D* | *E* | *F* | *G* | *H* | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|
| 3b | Heelstone ditch, N & S Barrow ditches | – | 1 | 1 | 1 | – | – | 1 | 1 | 5 |
| 3vi+ | Y & Z Holes, no RB material | – | 1 | – | – | 2 | – | – | – | 3 |
| 3+ | Aubrey Holes secondary fills, 'bluestone' layer, Avenue ditch tertiary & recut fills | 1 | 1 | – | – | – | – | 2 | – | 4 |
| 60 | Post-monument activity – fills of empty Bluestone Circle holes, fills of empty Sarsen holes, Y and Z Holes with RB material | 1 | 1 | 2 | – | 2 | – | 1 | 9 | 16 |
| 82 | Animal disturbance | – | 1 | – | 1 | – | – | – | 2 | 4 |
| 87 | Layers of unknown date | 1 | 2 | 3 | – | – | 1 | – | 4 | 11 |
| 88 | Stonehenge Layer | 1 | 3 | – | 1 | – | 1 | 1 | – | 7 |
| 89 | Turf and topsoil | 12 | 6 | 6 | 3 | 3 | – | 11 | 14 | 55 |
| 00 | Unstratified | – | 1 | – | – | – | – | 1 | 10 | 12 |
| Total | | 16 | 17 | 12 | 6 | 7 | 2 | 17 | 40 | 117 |

*A = Bifacially flaked; B = irregularly flaked; C = edge ground; D = surface ground; E = disc; F = possible axe fragment; G = mauls and hammerstones; H = waste from larger dressed objects*

one or more surfaces exhibiting pecking or smoothing (Fig 208, 18, 19). Some bear very clear signs of percussion. These objects may be derived from the dressed bluestones on the site, and underwent no further modification after their removal from the parent object. The presence of this material may be indicative of post-monument wrecking. Forty pieces were recorded, all of dolerite, but this apparent preference may well result from the greater ease of recognition of dressed dolerite pieces than, for example, rhyolite, which displays weathered surfaces on which it is much more difficult to identify deliberate modification. However, the fact that all the pieces so recognised were of one material suggests that this is not entirely a recognition bias.

### Waste material

There are two categories, both of which underwent no further modification after their detachment from the parent bluestone. Unfortunately the lack of well phased pieces means that it is impossible to determine if this waste is derived from the original dressing of the bluestones or from their later destruction, or if it represents a combination of both.

**Waste flakes:** These exhibit some or all features familiar from worked flint, such as a bulb of percussion, radial scars, conchoidal fracture (in a few cases) on the ventral surface, and negative flake removal scars on the dorsal surface. A total of 703 waste flakes was recorded, which is likely to be a small fraction of the original assemblage.

**Waste fragments:** These are the unretouched lumps, chips, and blocks of bluestone. They probably also represent debitage, but due to the varying nature of the parent materials do not exhibit flaking characteristics. A total of 2855 pieces was recorded.

### Illustrated bluestone

Fig 207

1 Edge ground object. Rhyolite. Ground on both sides of distal end with intermittent patches of surface grinding. L 102.8 W 65.4 T 20.6. *WA obj no 150; Hawley cat no 1590t; petrology ser 396; C4.2; context 1382; phase 3b; group 44*

2 Disc. Volcanic ash. Sub-rectangular, ground all round edges. L 31.1 W 25.9 T 6.8. *WA obj no 116; Hawley cat no 3170; C34.4; context 1625; phase 3vi+; group 40*

3 Disc. Volcanic ash. Sub-circular ground around complete circumference and possibly on both faces. Max. diam. 25.3 T5.4. *WA obj no 193; Hawley cat no 4071; C33.29; context 1612; phase 3vi+; group 41*

4 Edge ground object. Rhyolite. Roughly axelike in shape but with very blunt 'blade'. Most edges look worn. L 77.5 W 51.7 T 15.1. *WA obj no 146; Hawley cat no 423a; petrology ser 394; C13; context 2315; phase 60; group 32*

5 Disc. Volcanic ash. Oval, ground around complete circumference and possibly on both faces. L 33.6 W 22.1 T 5.5. *WA obj no 194; Hawley cat no 4255; C33.9; context 1600; phase 60; group 43*

6 Disc. Volcanic ash. Roughly ovate, ground around complete circumference. L 21.6 W 18.6 T 3.7. *WA obj no 115; Hawley cat no 3169; C34.2; context 1624; phase 60; group 42*

7 Possible axe fragment. ?Dolerite. Apparently lenticular section though broken on three sides, roughly pecked. L 50.9 W 54.1 T 30.5. *WA obj no 356; C64; context 4094; phase 87; group 00*

8 Irregularly flaked object. Rhyolite. Roughly ovate with small area of battering; possibly used as a hammerstone. L 101.8 W 84.1 T 31.2. *WA obj no 103; Hawley cat no 1552b; C20; context 1290; phase 88; group 00*

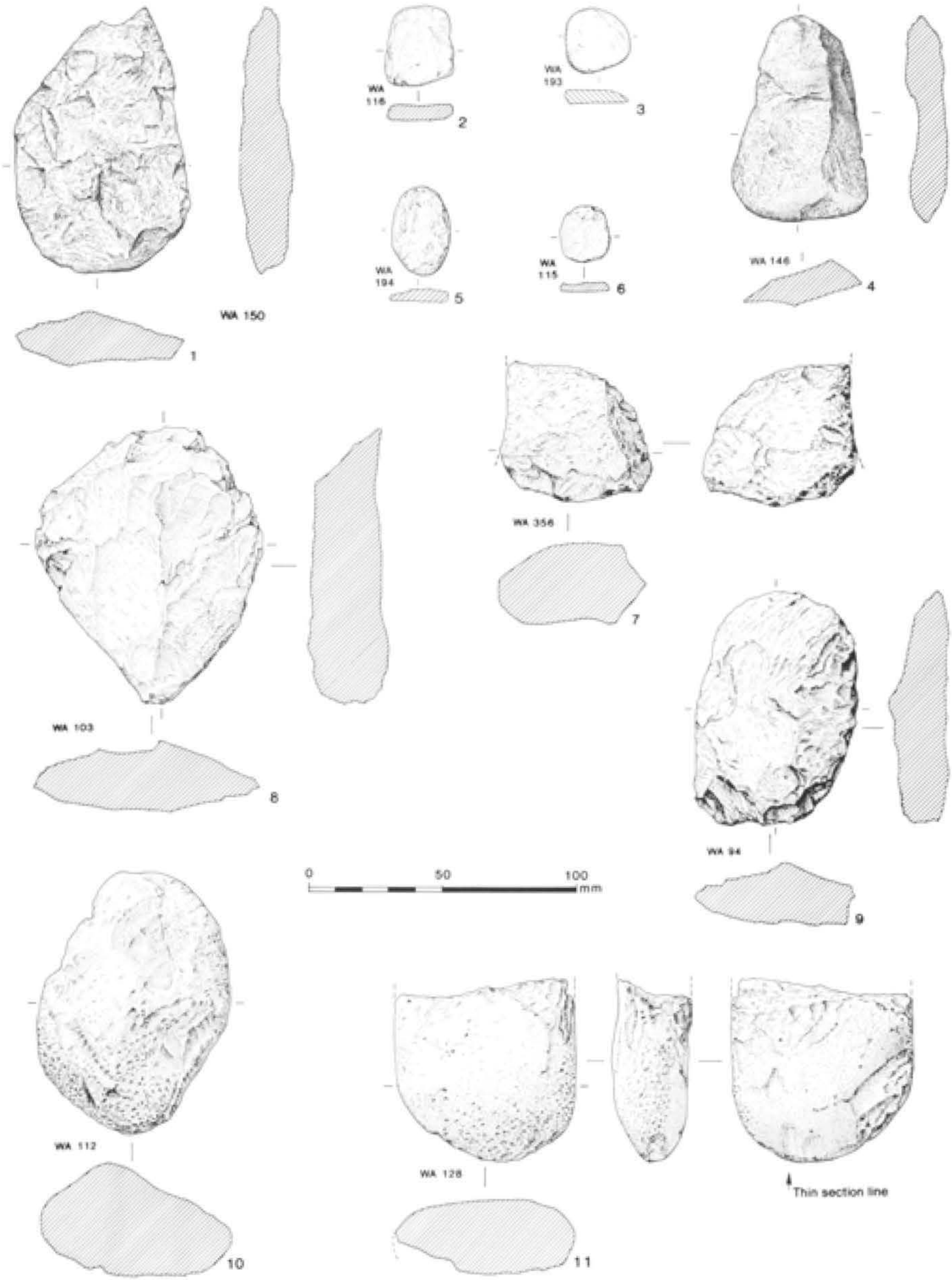



*Fig 207 Bluestone objects 1–11. Scale 1:2*

*no 128; Hawley cat no 754a; C7; context 1768; phase 88; group 00*

Fig 208

12 Bifacially flaked object. Rhyolite. Ovate, battering on tip only. Has been thin-sectioned but it has not been possible to establish the reference. L 102.1 W 69.4 T 34.8. *WA obj no 147; Hawley cat no 4272a; C33.10; context 3855; phase 89; group 00*

13 Bifacially flaked object. Rhyolite. Ovate. Has been thin-sectioned but it has not been possible to establish its reference. L 138.0 W 83.7 T 34.2. *WA obj no 148; Hawley cat no 1689a; C26; context 3849; phase 89; group 00*

14 Bifacially flaked object. Rhyolite. Elongated oval on tabular piece with flattened, unworked butt and sharp edges. L 96.1 W 58.2 T 16.0. *WA obj no 109; Hawley cat no 1740b; C28; context 2532; phase 89; group 00*

15 Disc. Volcanic ash. Subcircular, ground all round circumference. Max. diam. 17.0 T 4.4. *WA obj no 117; Hawley cat no 63; C1; context 1050; phase 89; group 00*

16 Disc. Volcanic ash. Rectangular with rounded corners, ground all round circumference. Unfinished hourglass perforation. L 36.7 W 33.0 T 7.2 max. diam. of perf. 5.6 mm. *WA obj no 195; Hawley cat no 2108a; C29; context 2862; phase 89; group 00*

17 Disc. Volcanic ash. Pointed oval, broken, ground round circumference, some concretion on surface. L 24.2 W 18.3 T 4.2. *WA obj no 196; Hawley cat no 185; C1; context 1050; phase 89; group 00*

18 Large flake of spotted dolerite. Dorsal surface completely pecked. Probably a flake from large dressed object. L 125.6 W 137.2 T 36.0. *WA obj no 145; context 3813; phase 00; group 00*

19 Large flake of spotted dolerite. Dorsal surface completely pecked. Probably a flake from large dressed object. L 81.0 W 125.6 T 34.0. *WA obj no 144; context 3813; phase 00; group 00*

## Worked sarsen

A total of 2173 pieces of sarsen extant in Salisbury Museum was examined. As with the bluestone the results are skewed by many factors, such as differential collection and curation of the pieces, and the paucity of pieces from phased contexts relating to the main period of use of the monument. These factors were discussed above in relation to the bluestone. It is very difficult to estimate the amount of sarsen which has been discarded or otherwise made unavailable, but it is notable that by far the largest concentration of surviving pieces (515, 23.7%) is from C64, Gowland's relatively small-scale excavations around Stone 56. Although this a very large stone which probably necessitated a commensurately large amount of packing, this can surely be interpreted only as an indication of differential recovery/curation. Once again these factors allow only the broadest of conclusions to be drawn from the data.

Two types of sarsen were identified: 'saccaroid' sarsen, which has a granular texture akin to broken sugar loaf, and 'hard' sarsen, which as its name implies is extremely hard, and often contains casts of fossilised vegetable matter. A fuller discussion of both these types can be found in Howard (1982, 120–3).

The terminology used in this report corresponds with that used for the bluestones (*above*), since all the sarsen material is assumed to have been imported to the site (*see* Bowen and Smith 1977 for a discussion of the distribution of naturally occurring sarsen in the region) and has been detached from larger parent blocks.

As with the bluestone, material recovered by Pitts in 1979–80 was not re-examined (Howard 1982, 104–24).

### Phased sarsen

The overall occurrence of sarsen pieces is shown by phase in Figure 209. Of the 2173 pieces remaining in the collections, only 217 (10%) come from phased contexts. Of these, 29.5% are from stoneholes of the Sarsen Circle where 63 of the 64 pieces are mauls used as packing. Sarsen from phased contexts is summarised in Figure 210. The number of phased sarsen pieces is so small as to be uninformative about the inception and development of the use of sarsen on the site. The presence of anomalous bluestone in a phase 1 context has been discussed earlier (*Chapter 5*), and the presence of sarsen pieces in the same contexts can be similarly explained.

### Objects

A total of 282 objects has been recorded, forming just under 13% of the total analysed collection. Of these, 25.5% are from phased contexts (3.3% of the total collection). Their occurrence by phase and context type is shown in Table 36. The function of some of the objects is uncertain. The overwhelming preponderence of mauls in the collection can be seen partly as a result of curation procedures after excavation; it is known, for instance, that Hawley collected mauls and waste flakes and fragments but retained only the mauls.

**Mauls and hammerstones:** These are the major class of sarsen artefact in the collection, and are present as both complete and broken examples (Fig 213, 1, 3; Fig 214, 5). Inevitably there are a few ambiguous pieces which may or not be complete. The general shape of the mauls is a flattened sphere. Some display battering over the entire surface, whereas others have only a zone of battering around the 'equator'. It is assumed that the mauls were used for dressing the structural stones before erection, but whether they were manufactured from pieces which were themselves detached from stones during initial dressing, or from smaller sarsens brought in and broken up especially for the manufacture of mauls, cannot be determined. In some cases intensive use, probably pounding, has led to the development of facets on the surface. Negative flake scars suggest that spalls became detached during pounding. Often the

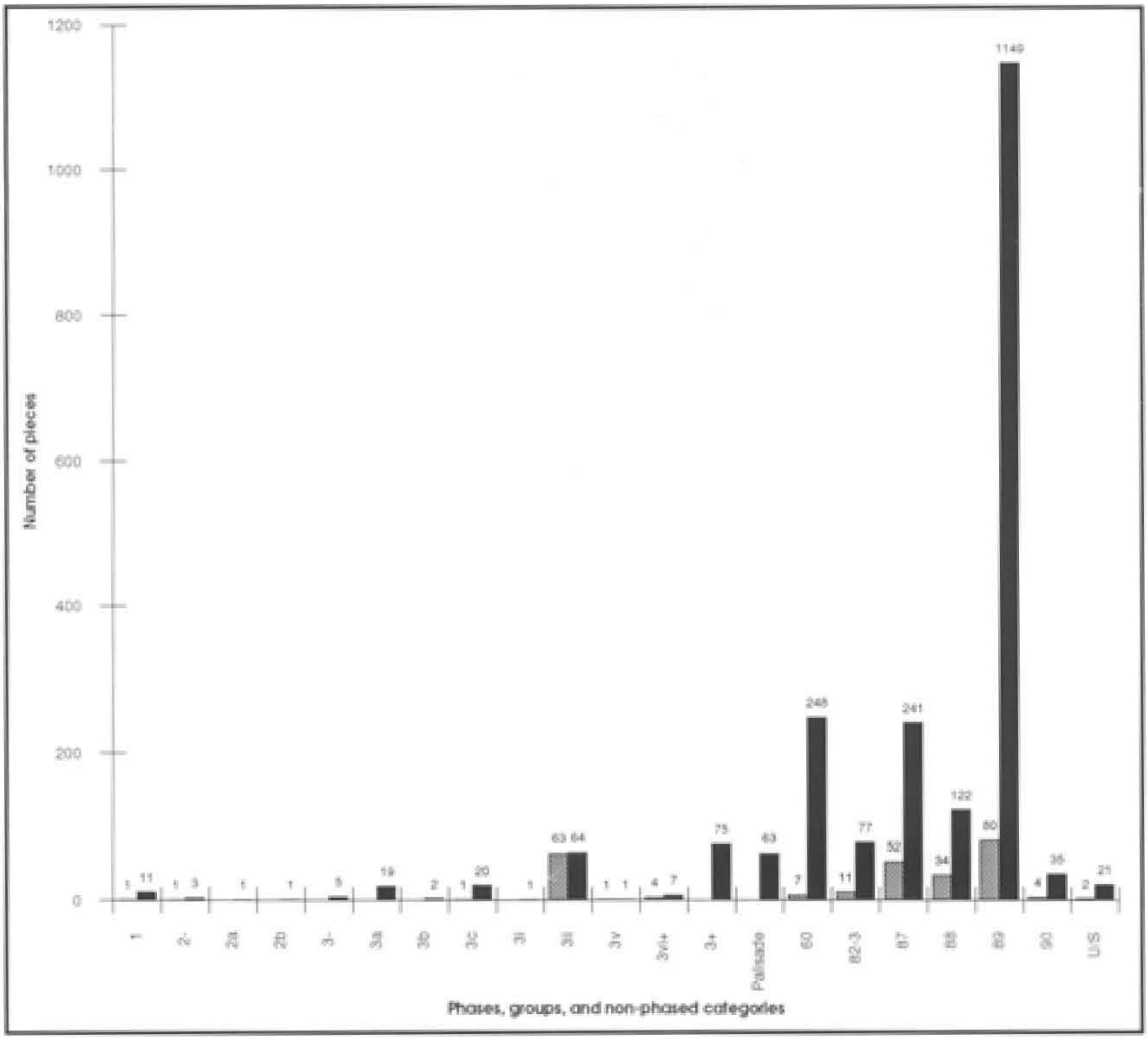



*Fig 209 Distribution of all sarsen pieces (N = 2173)*

mauls also display patches of use-polish or possibly deliberate smoothing among the much rougher battered surface. This may have been caused by a much gentler rubbing or pecking motion, for instance using the mauls for a finer type of dressing. A total of 261 of these objects was identified at Salisbury Museum. Unsurprisingly, hard sarsen is the preferred material type, used for 247 (95%) of the total.

All the mauls were weighed. With the exception of nine very large and heavy examples, the distribution of weights of complete examples (Figure 211) forms a neat but slightly skewed curve with almost 75% of mauls weighing between 200 and 1000g, the average being just under 450g with the heaviest maul weighing 29,200g. The weight distribution for broken mauls is in close agreement with this pattern except that, unsurprisingly, there is a fairly high proportion of small fragments weighing under 100g (33% of broken mauls). The occurrence of several fragments weighing in excess of 1600g (the largest weighing 10,200g) suggests that a fair number of these outsize examples were originally present. Even the largest examples have clearly seen heavy use. The distribution of the mauls and other sarsen objects by phase and context type is shown in Table 36.

**Irregularly flaked objects:** Four of these objects, which resemble objects in bluestone similarly classified, were recorded in this analysis. None is illustrated.

**Ground objects:** Eight objects display grinding and wear on surfaces or edges, though whether it was the object itself that was deliberately ground, or whether this is due to use, was not generally clear. One possible quernstone fragment survives, probably of saddle-quern type. Morphologically there is some overlap with the mauls; for example WA obj no 197 (Fig 213, 2) has a very well developed rubbing surface on what is essentially a maul, but because of the size and clear definition

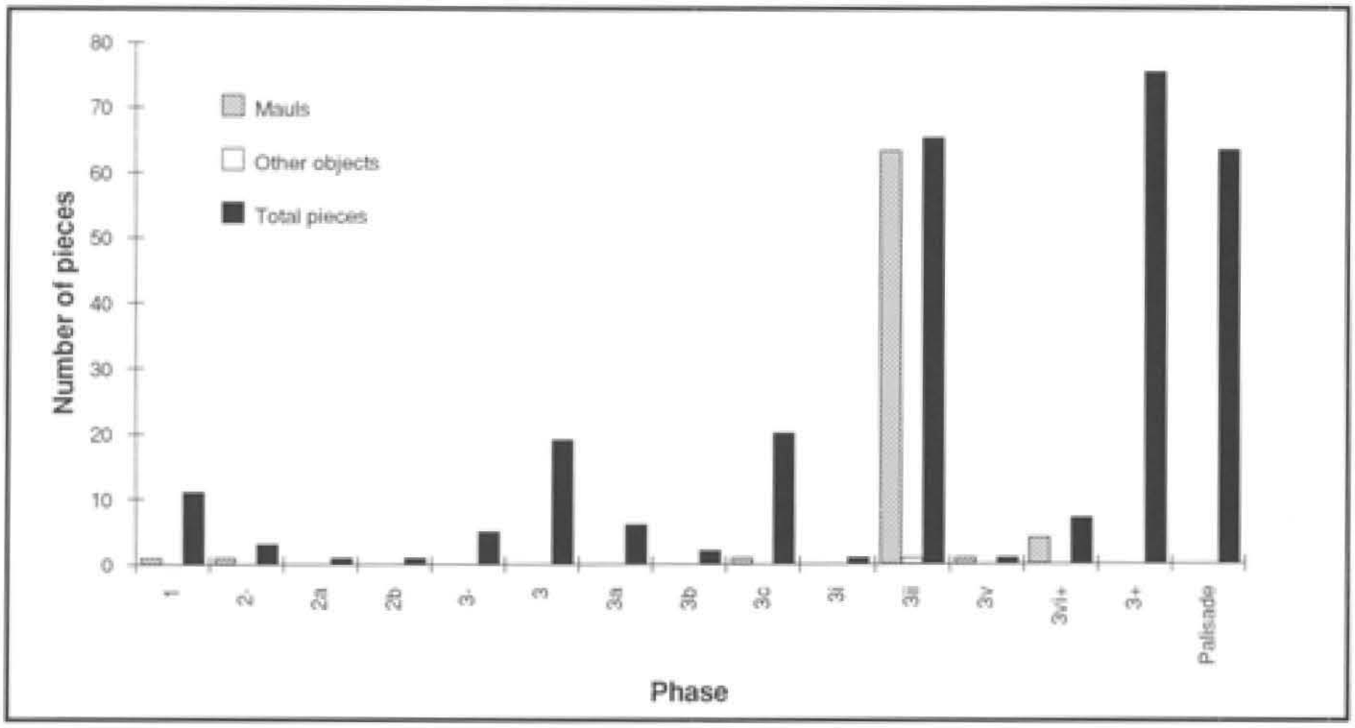



*Fig 210 Distribution of phased sarsen (plus Palisade Ditch) (N = 280)*

of the rubbing surface it has been classified as a ground artefact.

**Fragments of ground and/or pecked sarsen objects:** These are clearly broken from larger dressed objects, with one or more surfaces exhibiting pecking. Some bear very clear signs of percussion (and it may be argued by inference that the others of this type are probably also debitage). These objects may be derived from the dressed sarsens on the site, and underwent no further modification after their removal from the parent object. The presence of this waste material may alternatively be indicative of post-monument wrecking. A total of nine pieces was recorded.

### Waste material

These comprise two categories, both of which underwent no further modification after their detachment from the parent sarsen. For definitions see the bluestone report above. Unfortunately the sample of well phased pieces is not large enough to determine if this waste material is derived from the original dressing of the sarsens or from their later destruction, or if it represents a combination of both. Of the 2173 sarsen pieces re-

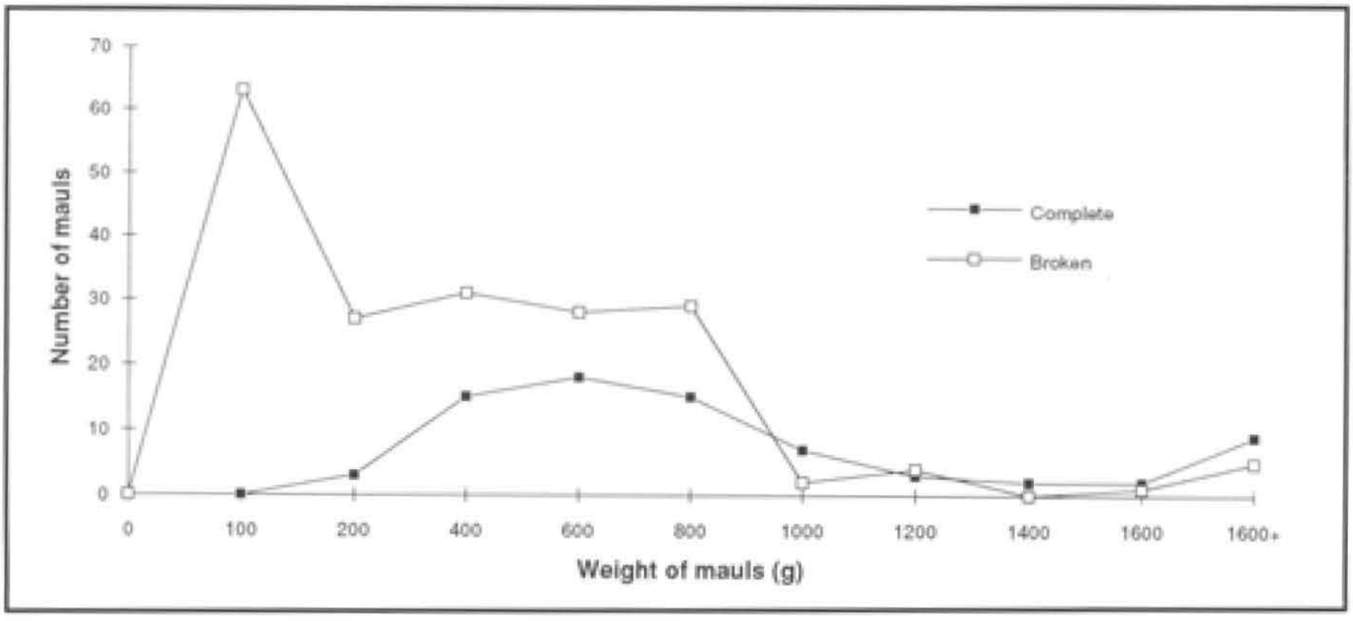



*Fig 211 Weight of sarsen mauls (N = 261)*

**Table 36 Distribution of sarsen objects by phase and context type**

| *Phase* | *Provenance* | *A* | *B* | *C* | *D* | *Total* |
|---|---|---|---|---|---|---|
| ?1* | Bank | 1 | – | – | – | 1 |
| 2- | Postholes | 1 | – | – | – | 1 |
| 3c | Avenue bank and ditch | 1 | – | – | – | 1 |
| 3ii | Sarsen Circle | 63 | – | 1 | – | 64 |
| 3v | Bluestone Horseshoe | 1 | – | – | – | 1 |
| 3vi | Y and Z Holes | 4 | – | – | – | 4 |
| *Total phased sarsen objects* | | | | | | *72* |
| 60 | Post-monument activity | 7 | – | – | – | 7 |
| 82 | Disturbance | 11 | – | – | 1 | 13 |
| 87 | Layers of unknown date | 52 | 1 | – | 2 | 54 |
| 88 | Stonehenge Layer | 34 | 1 | 4 | – | 39 |
| 89 | Turf & topsoil | 80 | 2 | 3 | 2 | 87 |
| 90 | Unprovenanced/unphasable layers & features | 4 | – | – | 3 | 7 |
| 00 | Unstratified | 2 | – | – | 1 | 3 |
| *Total unphased sarsen objects* | | | | | | *210* |
| Total | | 261 | 4 | 8 | 9 | 282 |

*A = Mauls & hammerstones; B = irregularly flaked objects; C = ground objects; D = waste from larger pecked/dressed objects*

corded in this study, 1891 are classified as waste pieces, ie just over 87%.

**Waste flakes:** These exhibit some or all features associated with deliberate removal from a larger object but with no further modification. These features include the presence of a bulb of percussion, radial scars, and/or conchoidal fracture (in a few cases) on the ventral surface, and negative flake removal scars on the dorsal surface. A total of 272 waste flakes was recorded.

**Waste fragments:** These are unretouched lumps, chips, and blocks of sarsen. They probably also represent debitage, but do not exhibit flakelike characteristics. A total of 1619 pieces was recorded.

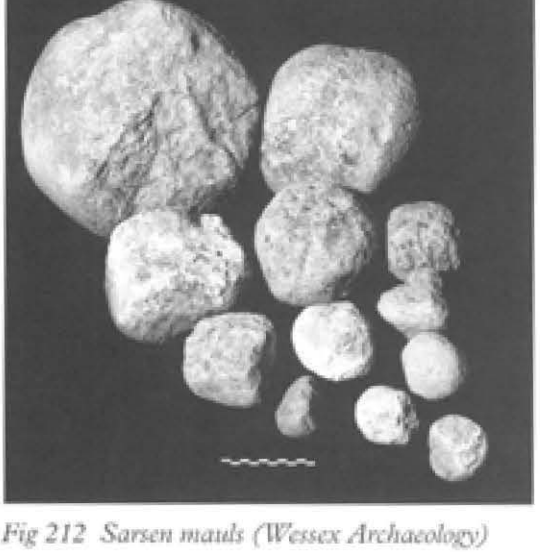


*Fig 212 Sarsen mauls (Wessex Archaeology)*

**Illustrated sarsen**

Fig 213

1 Complete maul. One flat surface retains some cortex; heavily battered over most of surface with one area rubbed smooth. L 139.9 W129.9 T 112.0 Wt 3044. *WA obj no 395; Hawley cat no 4858; C2; context 1099; phase 3ii ; group 05*

2 Ground object, ?rubber, reused maul. Heavily pecked sub-spherical maul with one face slightly dished and polished through use. L 93.9 W 78.8 T 71.0 Wt 790. *WA obj no 197; Hawley cat no 4871; C2; context 1099; phase 3ii; group 05*

3 Maul fragment. Heavily battered around widest part and on one surface; some areas of use-polish, especially on unbroken flat surface. L 71.1 W 65.9 T 43.6 Wt 277. *WA obj no 413; Hawley cat no 901a; C7; context 1850; phase 88, group 00*

4 Ground object, possible saddle quern fragment. Broken, one surface only finely ground. L111.1 W 105.1 T 37.3. *WA obj no 198; Hawley cat no 4611; C22; context 1397; phase 88, group 00*

Fig 214

5 Complete maul. Sub-spherical, battered heavily over entire surface, slightly faceted, possibly deliberately 'squared off'. L 103.1 W 99.6 T 80.4 Wt 1288. *WA obj no 394; Hawley cat no 4859; C2; context 3888; phase 89; group 00*

6 Ground object. Made on flake from larger dressed sarsen and subsequently broken; small area of grinding over pecked surface. L 168.0 W 80.5 T46.0. *WA obj no 199; Hawley cat no 4519a; C32.9; context 1179; phase 89; group 00*

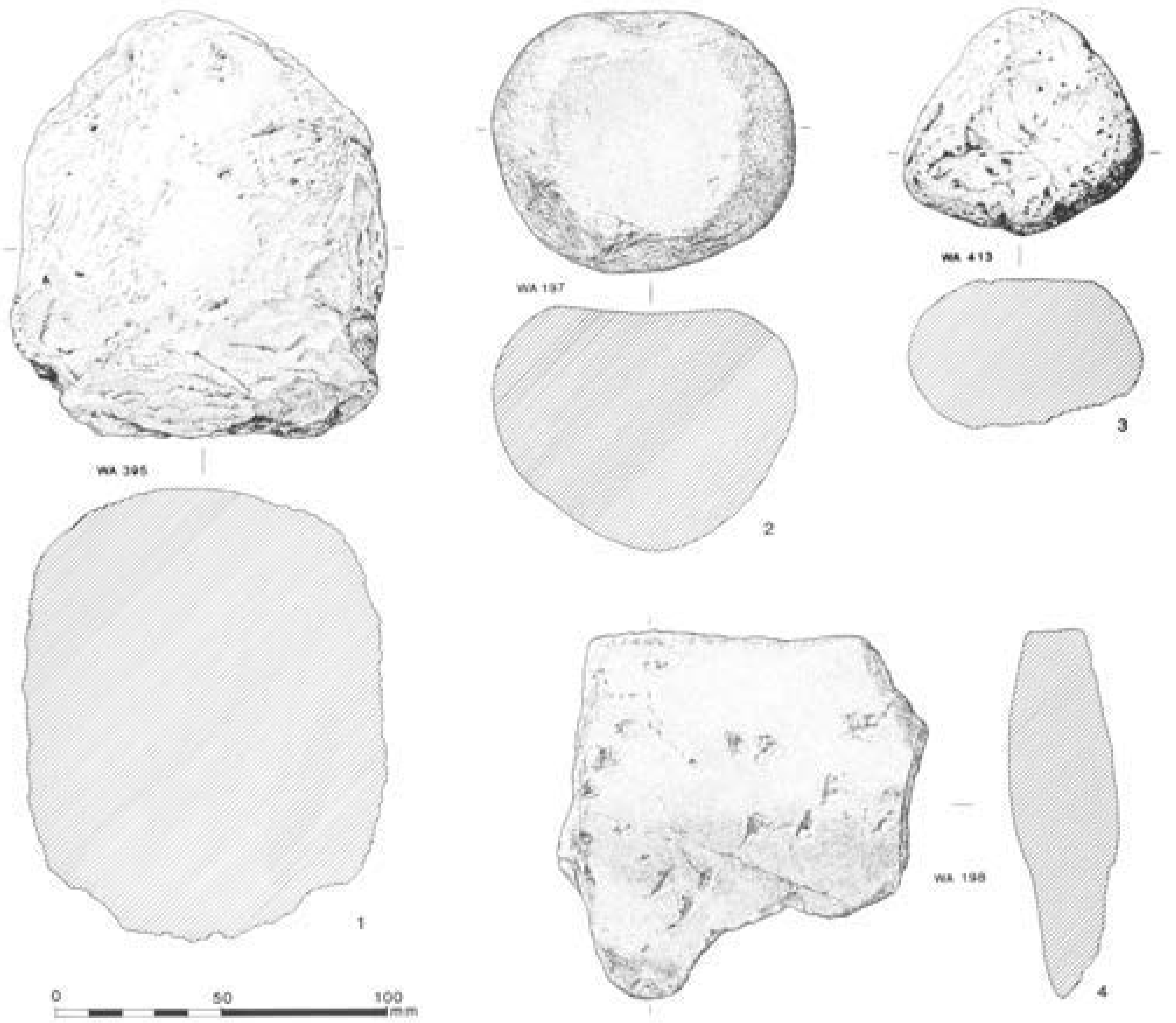



*Fig 213 Sarsen objects 1–4. Scale 1:2*

7 Flake from dressed sarsen object. Part of dorsal surface pecked. L 111.5 W 125.1 T 34.8. *WA obj no 472; Hawley cat no 4555b; C32.24; context 1234; phase 89; group 00*

## Other stone

*by R Montague and Julie Gardiner*

A variety of other stone types is present in the collection at Salisbury Museum, and as with the sarsen and bluestone it can be safely assumed that much more stone was recovered than survives. At least 20 individual rock types have been identified but for purposes of discussion these can be conveniently grouped. Identifications were undertaken as for the bluestone pieces described above, except where examined by the Petrological Committee. The occurrence of the 'other stones' by phase is shown in Table 37 and all pieces examined are listed by rock type in the finds database in archive.

Of the 267 pieces examined, 18 (6.7%) including a broken slate pencil may be classified as objects according to the terminology used for the bluestone and sarsen above. This total does not include the polished wrist-guard accompanying the Beaker period burial in the Ditch published by Evans (1984) or material from Pitts's 1979–80 excavation (Howard 1982, 123–4) which was not re-examined for this report. The remainder consists of flakes, fragments, and apparently unutilised pebbles and nodules. The occurrence of the other stones by type is given in Table 38 and the distribution of artefacts by phase in Table 37. Table 39 lists the petrologically identified stones (other than bluestone or sarsen) from the monument.

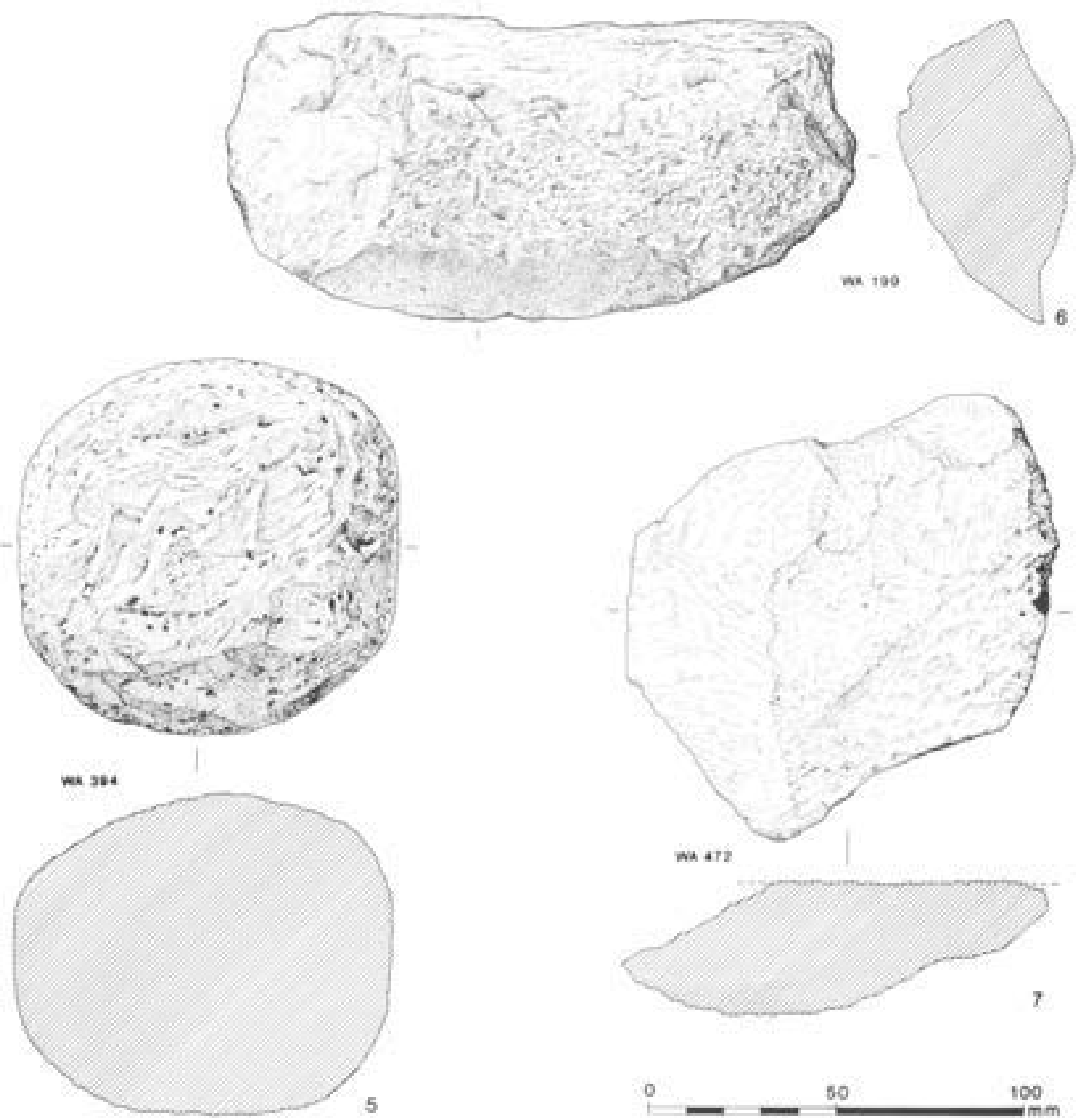



*Fig 214 Sarsen objects, 5–7. Scale 1:2*

Only ten pieces (3.5%) are from phased contexts, and of these two are objects.

### Phased objects

A beautiful folded gneiss macehead was recovered from a cremation in a shallow scoop near the South Barrow, just inside the Bank of the main Ditch (C10, context 2014, WA obj no 490). This has been allocated to phase 2. An incomplete Group I axe was recovered from the original fill of a disturbed feature in C17 (context 3638, WA obj no 489; phase 3iii). The distribution of phased stone artefacts is shown in Figure 217.

### Phased stone

Five of the ten pieces from phased contexts are nodules of iron pyrites; three from phase 2b contexts in the Ditch close to the northern terminal at the main entrance (C42), one from the North Barrow in phase 3b (C50), and one from Z Hole 16 (phase 3vi or later). A single fragment of sandstone comes from a phase 3 context in the Heelstone ditch (C36) and a fragment and pebble of quartzite come from C86, the Vatchers' Avenue excavation (phase 3 or later). The pyrites nodules are discussed further below.

### Artefacts

**Ground artefacts:** Five sandstone objects and one each of coarse sand/gritstone and an unidentified fine-grained rock with various degrees and extents of surface grinding and polishing are extant in the collection. These comprise a possible polisher, two whetstones or hones, and four whetstone/sharpeners. The fragment of unidentified fine grained rock (Hawley cat no 5) is a rectangular sectioned rod with areas of wear on the edges and ends. It may be a burnisher. None of these artefacts is closely datable and all are from turf or topsoil contexts or are unstratified. None is illustrated.

**Axe fragments:** Three stone axes are represented, two fragments and one almost complete axe (Fig 216,

**Table 37 Other stone by phase**

| *Material* | *Phase* | | | | | *Palisade Ditch* | *Non-phased categories and groups* | | | | | | | | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *2* | *2b* | *3b* | *3iii* | *3+* | | *60* | *80* | *81–2* | *87* | *88* | *89* | *90* | *U/S* | |
| *Group I* | – | – | – | 1 | – | – | – | – | – | 1 | – | – | – | – | 1 |
| *Group Ia* | – | – | – | – | – | – | – | – | – | – | – | 1 | – | – | 1 |
| *Group III* | – | – | – | – | – | – | – | – | – | – | 1 | 1 | – | – | 2 |
| *Folded gneiss* | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | 1 |
| *Niedermendig lava* | – | – | – | – | – | – | – | – | – | – | 1 | – | – | – | 1 |
| *Vesicular basalt* | – | – | – | – | – | – | – | – | – | – | – | 1 | – | – | 1 |
| *Slate* | – | – | – | – | – | – | – | 1 | – | 1 | – | – | – | – | 2 |
| *Limestones* | – | – | – | – | – | – | – | – | 1 | 2 | – | 2 | – | 1 | 6 |
| *Quartzites* | – | – | – | – | 2 | 2 | – | – | 4 | 4 | – | 8 | – | 42 | 22 |
| *Sandstones inc greensand* | – | – | – | – | 1 | – | 3 | – | 2 | 15 | – | 22 | 1 | 5 | 49 |
| *Sedimentary* * | – | – | – | – | – | – | – | – | – | 6 | – | 12 | – | – | 18 |
| *Tabular calcite* | – | – | – | – | – | – | – | – | – | 2 | 46 | 5 | – | – | 53 |
| *Pyrite* | – | 3 | 1 | – | 1 | – | – | – | 3 | 3 | 15 | 70 | 1 | 1 | 97 |
| *Coal* | – | – | – | – | – | – | – | – | 1 | – | – | 12 | – | – | 13 |
| *Total* | 1 | 3 | 1 | 1 | 4 | 2 | 3 | 1 | 11 | 33 | 63 | 134 | 1 | 9 | 267 |

* = *chert, mudstone, gritstone/conglomerate, jet, shale, unidentified*

**Table 38 Other stones by type**

| *Material* | *Ground objects* | *Axe frag* | *Axe-hammer* | *Mace-head* | *Ball* | *Hammer-stone* | *Armlet* | *?Mould frag* | *Bead* | *Pencil* | *Nodule/ pebble* | *Flakes* | *Frags* | *Clinker* | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Group I* | – | 1 | – | – | – | – | – | – | – | – | – | – | – | – | 1 |
| *Group Ia* | – | 1 | – | – | – | – | – | – | – | – | – | – | – | – | 1 |
| *Group III* | – | 1 | 1 | – | – | – | – | – | – | – | – | – | – | – | 2 |
| *Folded gneiss* | – | – | – | 1 | – | – | – | – | – | – | – | – | – | – | 1 |
| *Niedermendig lava* | – | – | – | – | – | – | – | – | – | – | – | – | 1 | – | 1 |
| *Vesicular basalt* | – | – | – | – | – | – | – | – | – | – | – | – | 1 | – | 1 |
| *Slate* | – | – | – | – | – | – | – | – | – | 1 | – | – | 1 | – | 2 |
| *Limestones* | – | – | – | – | – | – | – | – | – | – | – | – | 6 | – | 6 |
| *Quartzites* | – | – | – | – | – | 1 | – | – | – | – | 6 | 4 | 11 | – | 22 |
| *Sandstone including greensand* | 6 | – | – | – | 1 | – | – | 1 | – | – | – | 4 | 37 | – | 49 |
| *Sedimentary* | 1 | – | – | – | – | – | 1 | – | 1 | – | – | 3 | 12 | – | 18 |
| *Tabular calcite* | – | – | – | – | – | – | – | – | – | – | – | – | 53 | – | 53 |
| *Pyrite* | – | – | – | – | – | – | – | – | – | – | 97 | – | – | – | 97 |
| *Coal* | – | – | – | – | – | – | – | – | – | – | – | – | – | 13 | 13 |
| *Total* | 7 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 103 | 11 | 122 | 13 | 267 |

** = chert, mudstone, gritstone/conglomerate, jet, shale, unidentified*

**Table 39 Other stone petrologically identified**

| *Petrology Committee label* | *Petrology no* | *Findspot/cutting* | *WA context* | *WA obj no/ Hawley cat no* | *Identification* | *Source* |
|---|---|---|---|---|---|---|
| *Rock* | *277* | *Altar Stone (80)* | – | – | *Micaceous sandstone* | |
| *Axe frag* | 389 | South Barrow, C4 | 3890 | 486/4841 | Group Ia | Cornwall |
| *Axe frag* | 390 | South Barrow, C4 | 1141 | 487/4840a | Group III | Cornwall |
| *Axe-hammer* | 393 | C2 | 1073 | 488/225 | Group III | Cornwall |
| *Rock* | *409* | *Stone floor, C91* | – | – | *Sheared diabase* | – |
| *?Implement* | *411* | *C42, 'Beaker' grave-fill* | *4005* | – | *Rhyolitic tuff* | – |
| *Axe frag* | *426* | *C64* | – | – | *Group XVIII* | *Whin Sill** |
| *Rock* | 443 | AH 1 | 3853 | – | Silicified rock | – |
| *Rock* | 458 | AH 7 | – | – | Ferruginous sandstone | – |
| *Rock* | *461* | *AH 8* | – | – | *Glauconitic quartzite* | – |
| *Rock* | *473* | *AH 16* | – | – | *Glauconitic quartzite* | – |
| *Rock* | *482* | *AH 21* | – | – | *Silicified rock* | – |
| *Rock* | 484 | AH 22 | 1226 | – | Glauconitic quartzite | – |
| *Rock* | 488 | ZH 2 | 1577 | 471 | Ferruginous sandstone | – |
| *Flake* | *597* | *'Stonehenge'* | – | – | *Limestone* | – |
| *Axe frag* | *946* | *'Stonehenge Avenue'* | – | – | *Group VI* | *Grt Langdale* |
| *Axe frag* | 947 | C17 | 3638 | 489 | Group I | Cornwall |
| *Rock* | 959 | C12 | 2676 | – | Niedermendig lava | N Germany |

*Information taken from Davis* et al *1988*
*Entries in italic not personally examined (not in Salisbury Museum)*
* *As yet unpublished, identified by Fiona Roe*

2, 12, 13). These have been petrologically identified (Evens *et al* 1962; Table 39) as one each of Groups I, Ia (both uralitised gabbro, epidiorite, or greenstone), and III (epidiorite or greenstone), all of which derive from sources in Cornwall. A fourth axe fragment of Group VI (epidotised intermediate tuff) from Great Langdale, Cumbria (petrology ser 946), could not be found in the collection. A fragment of polished axe from Gowland's excavations by Stone 56 (C64) which was not recognised by the excavator, has now been identified as Group XVIII (quartz dolerite).

Axes of Groups I, Ia, and VI occur over a long period spanning most of the Neolithic but Group III seems to have been used from the later Neolithic only, with some battle-axes extending its use into the earlier Bronze Age (Smith 1979). Cornish Group I and Ia and Great Langdale axes are relatively common in Wiltshire and elsewhere on the southern chalklands (*cf* Cummins 1979) and their presence at Stonehenge is not unsurprising. Group III axes are not very common, however, and the occurrence of both an axe and an axe-hammer fragment here may be of some significance. Group XVIII is present as glacial erratics in the Whin Sill of northern England. Although not very common in southern England this material does have a fairly wide distribution (Clough and Cummins 1988, map 18).

**Axe-hammer:** The butt end of a probable axe-hammer in Group III was recovered from the Stonehenge Layer in C2. It is not possible to identify the form (Fig 216, 5).

**Macehead:** A complete perforated macehead from C10 is recorded in Hawley's Diary (19–20/5/24, 6–7) as having been found with a cremation 'a small depression or cist scraped 2" [51mm] deep in the solid chalk. It was 172 long by 52 wide ... macehead accompanied cremation' (Berridge cat no HC 48). The cremation no longer survives. The macehead, of Roe's (1968; 1979) ovoid b type, is in a black and white folded gneiss, beautifully made and highly polished (Plate 8; Figs 215, 216, 1). It has a straight perforation.

Roe notes that the main association for ovoid and pestle maceheads is with Grooved Ware, ie providing a generally later Neolithic rather than earlier Bronze Age context as is frequently the case with shafthole implements. Its occurrence here with a cremation is a further indication that the use of the monument for cremation burial began during the later Neolithic.

**Ball:** A single almost spherical sandstone ball with areas of grinding and battering was recovered from topsoil over the ditch in the southern part of the monument (Figs 216, 14 and 219). Several chalk balls are also recorded (*see below*).

**Hammerstone:** One quartzite pebble displays areas of battering. Quartzite hammerstones are a frequent

*Fig 215 Macehead of banded gneiss (length 56.3mm) (Wessex Archaeology)*

component in Neolithic and earlier Bronze Age assemblages (not illustrated).

**Armlet:** Part of a shale armlet, presumably of Iron Age or Romano-British date was recovered from topsoil near Stones 6 and 7 (C1). It and the bead (*below*) seem likely to have been dropped by tourists (*not illustrated*).

**Possible mould fragment**

A fragment of an object in ferruginous sandstone comes from the upper fill of Z Hole 7 (Fig 216, 16). One side of the object is flat and the other has two grooves of semicircular profile, the most complete of which has a maximum diameter of 16.3mm narrowing to 6mm at the point at which the object is broken. The concave areas are smooth and much darker in colour than the rest of the piece, ie dark grey–brown rather than red-brown, possibly indicating exposure to heat. The function of the piece is unknown but it may be a fragment of a mould or tuyère (A Lawson, pers comm).

**Bead:** A jet bead, probably of Victorian date, comes from a topsoil context within the stone settings (C45).

**Pencil:** A broken slate pencil was recovered from the Stonehenge Layer in C17 (not illustrated).

**Pyrites nodules**

Ninety-seven nodules of iron pyrites are present in the collection. Pyrites nodules can occur naturally in chalk but it is likely that these pieces were deliberately collected. Their distribution does not appear to be random, but the most are from topsoil contexts and that it is not known how many other nodules may have been present but not collected (Hawley does not record them). The three nodules from phase 2b contexts in the Ditch (C42) occurred close to the northern terminal of the main entrance, with a further 35 nodules in topsoil contexts

**Table 40 Stone objects by phase**

| *Object* | *Phase* | | | | | *Total* |
|---|---|---|---|---|---|---|
| | *2* | *3ii* | *87* | *88* | *89* | |
| *Ground* | – | – | – | – | 7 | 7 |
| *Mould fragment* | – | – | – | – | 1 | 1 |
| *Armlet* | – | – | – | – | 1 | 1 |
| *Axe fragment* | – | 1 | – | – | 2 | 3 |
| *Axe-hammer frag* | – | – | – | 1 | – | 1 |
| *Macehead* | 1 | – | – | – | – | 1 |
| *Ball* | – | – | – | – | 1 | 1 |
| *Bead* | – | – | – | – | 1 | 1 |
| *Hammerstone* | – | – | 1 | – | – | 1 |
| *Pencil* | – | – | 1 | – | – | 1 |
| *Total* | 1 | 1 | 2 | 1 | 13 | 18 |

in the same area. Also in the entrance area, two nodules were recovered from the topsoil of the Heelstone ditch (C36). Eleven nodules come from Gowland's excavations around Stone 56 (C64). A single example is from the primary chalk silt of Z Hole 16 with three nodules in the topsoil layer of YH16 and another from the North Barrow ditch (C50). A further 40 nodules are extant from Young's 1935 excavations in the car park (C94). A single nodule was unstratified.

These nodules show no indication of modification and it is not known why they should have been collected. It is, of course, possible that they were simply picked up and kept as talismen or lucky stones ( possibly because of their odd appearance and comparatively heavy weight) perhaps in the same way that Palaeolithic handaxes were sometimes collected as 'thunderstones' in the Roman period (*cf* Witham temple, Essex; Turner in prep). The presence of one nodule close to the grave fill of the Beaker burial and others near the terminal of the Ditch is worth noting, though it must be borne in mind that the excavations here were by Atkinson *et al* who collected pyrites nodules rather than by Hawley who probably did not. Clarke (1970) lists a minimum of 14 Beaker burials which were accompanied by nodules of iron ore or pyrites. All the burials are of males and most were also associated with flint 'strike-a-lights'. The Stonehenge burial was a male but was not accompanied by a 'strike-a-light'.

**Catalogue**

Fig 216

1 Macehead. Folded gneiss. Beautiful striped ovoid B type perforated macehead with straight perforation; polished all over (Plate 8). L 56.3 W39.0 T26.7. *WA obj no 490; Hawley cat no 1053a; C10; context 2014; phase 2; group 29*

2 Axe fragment. Group I. Almost complete with damaged blade; all-over pecked and ground. L 144.5 W 64.9 T 47.6. *WA obj no 489; Atkinson cat no S56; petrology ser 947; C17; context 3638; phase 3iii; group 21*

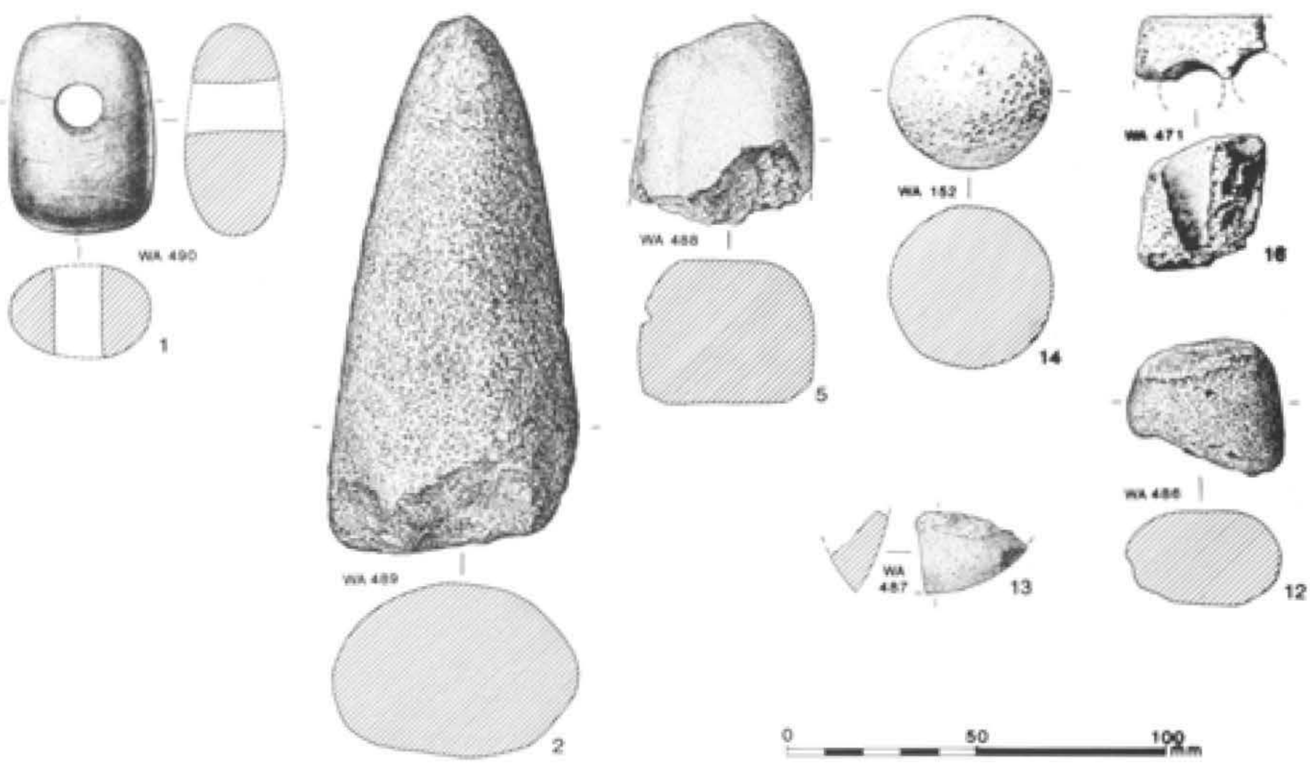



*Fig 216 Other stone objects. Scale 1:2*

3 *not illustrated* Hammerstone. Quartzite pebble with areas of edge battering. *WA obj no 126; Hawley cat no 281g; C2; context 1075; phase 87; group 05*

4 *not illustrated.* Pencil. Slate, broken. Diam 7.4. *WA obj no 125; Hawley cat no 690; C7; context 1735; phase 87; group 00*

5 Axe-hammer fragment. Group III. Perforation does not survive but this appears to be fragment of butt end; pecked and ground with polishing visible on upper surface. L 53.6 W 48.2 T 38.3. *WA obj no 488; Hawley cat no 225; petrology ser 393; C2; context 1073; phase 88; group 00*

6 *not illustrated.* Whetstone. Sandstone. Broken, tapers at one end, nicks and grooves at narrow end; sub-rectangular section; one surface very flat, ground and worn on all surfaces. Has been thin-sectioned but it has not been possible to establish the reference. L 60.0 W 35.0 T 40.9. *WA obj no 519; Hawley cat no 1118b; C10; context 2105; phase 89; group 00*

7 *not illustrated.* Whetstone. Sandstone. Broken, 2 conjoining fragments; tabular, surfaces worn; one straight edge bevelled. L 65.9 W38.3 T10.9. *WA obj no 520; Hawley cat no 1369 a/b; C11; context 2504; phase 89; group 00*

8 *not illustrated.* ?Burnisher. Very fine-grained unidentified rock. Rectangular-sectioned rod, worn on ends and sides. Polished in places. L 54.9 W 20.0 T 13.6. *WA obj no 521; Hawley cat no 5; C1; context 1050; phase 89; group 00*

9 *not illustrated.* ?Whetstone or hone. Sandstone. Small, tapering, roughly wedge-shaped though broken on all sides; both surfaces ground smooth. L 25.7 W 17.9 T 11.6. *WA obj no 124; Hawley cat no 4068; C33.29; context 1608; phase 89; group 00*

10 *not illustrated.* Whetstone/sharpening stone. Sandstone. Broken; sub-rectangular with rectangular section; smoothing and grinding on both faces with some wear, much more pronounced on edges. V-shaped groove in upper surface. L 38.9 W 35.9 T 25.6. *WA obj no 518; C33.29; context 3775; phase 89; group 00*

11 *not illustrated.* ?Whetstone fragment. Coarse sand/gritstone. Fragment with one ground edge. L 40.4 W 28.4 T 25.5. *WA obj no 380; Gowland; C69; context 4123; phase 89; group 00*

12 Axe fragment. Group 1a. Butt end, small fragment, ground and pecked. L 31.7 W41.6 T25.1. *WA obj no 486; Hawley cat no 4841; petrology ser 389; C4; context 3890; phase 89; group 00*

13 Axe fragment. Group III. fragment of blade, very highly polished. L 29.7 W 16.9 T 12.3. *WA obj no 487; Hawley cat no 4840a; petrology ser 390; C4; context 1141; phase 89; group 00*

14 Ball. Sandstone. Almost perfectly spherical, ground with some battering. Max diam 44.1. *WA obj no 152; Hawley cat no 2028a; C29; context 2858; phase 89; group 00*

15 *not illustrated.* Armlet. Shale. Small fragment; oval section. Iron Age or Romano-British. L27.6 W 11.1 T 7.4. *WA obj no 470; Hawley cat no 186; C1; context 1050; phase 89; group 00*

16 ?Mould fragment. Ferruginous sandstone. One side flat, the other with two grooves (one a small remnant), most complete of which is 25.7 mm long with max diam 16.3 and min diam 6.0mm at break. Grooves dark

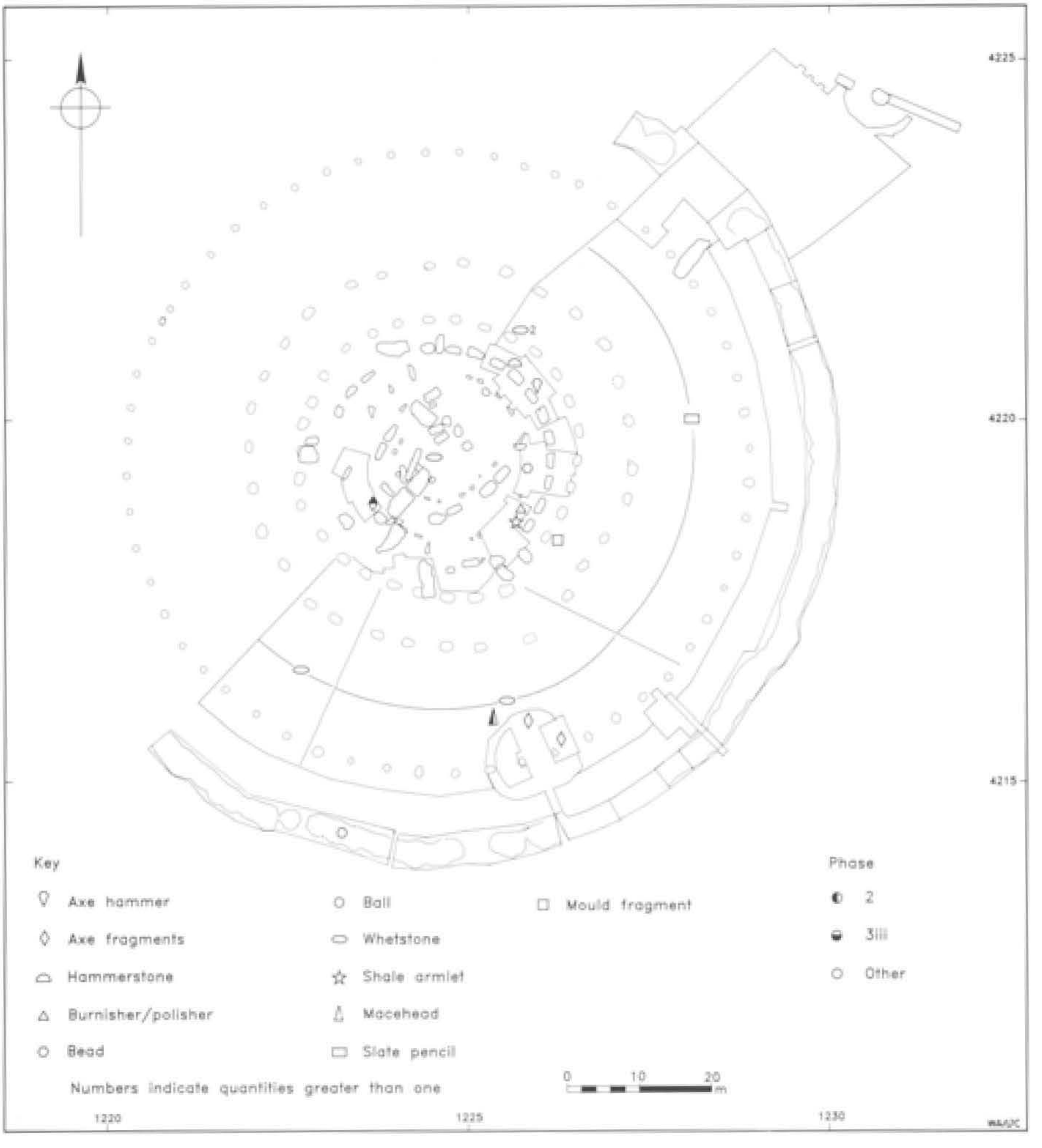



*Fig 217 Distribution of other stone objects (not plotted: one unstratified polisher)*

grey–brown, possibly due to heat, rest of piece red–brown. Some polishing on surface of grooves; other surfaces pecked. L 111.5 W 125.1 T 34.8. *WA obj no 471; Hawley cat no 4208; C33.7; context 1594; phase 89; group 00*

17 *not illustrated.* Bead. Jet. Small, crudely faceted, almost spherical; perforation wider at one end than other. Victorian? diam 8.1. *WA obj no 592; Atkinson cat no S54 1317.1; C45; context 3126; phase 89; group 00*

18 *not illustrated.* ?Polisher. Micaceous sandstone. Tabular, rectangular piece with one surface and two long edges ground smooth. L 29.6 W 21.7 T 15.8. *WA obj no 122; context 3813; phase 00; group 00*

### Discussion

With few exceptions, the assemblages of stone artefacts and pieces can all be viewed as having a fairly direct relationship with the construction and use of the stone monument. Leaving aside the modern items, the stone axes, macehead, whetstones, polishers, possible mould fragment, saddle quern fragment, and possibly the pyrites nodules might be expected to occur at the site had the stones for the settings not been introduced. As such, most of these items are unremarkable. The axes are not outside their normal distributions at this site; the possible saddle quern would not be out of context on a later Neolithic site; the gneiss macehead is a very fine object but not particularly rare; pyrites nodules are known from a number of sites, often in association with Beaker burials, though there is no stratigraphic relationship at Stonehenge (*see above*); and the whetstones and polishers are frequent finds on prehistoric sites from the Neolithic onwards. The mould fragment is the one really unusual piece, but since its identification is open to debate and its context not securely stratified little comment can be offered. It is to be hoped that a suitable parallel will come to light in the future.

Most of the surviving collection clearly relates to the dressing of the various stones, with many of the resulting flakes and fragments being utilised for other purposes. Sarsen mauls were obviously used in great quantity for dressing and many of these were reused as packing stones. In addition, a range of stones is present which does not correspond with the materials used for the settings. However, as each of these stone types (various sandstones, limestone, etc) is present only as a small number of pieces it is difficult to comment on their presence. Suffice it to say that the presence of a number of 'foreign' stones at a henge monument in southern England is not unexpected.

## General discussion: the stone assemblages

It is not intended here to discuss the origin and transportation of the stones to Stonehenge, but it is worth pointing out that there is little direct evidence for the dressing of the Bluestones either on or away from the immediate vicinity of their settings. It seems likely that final dressing would have occurred close to the place of erection of each, if only to ensure that stone and stonehole were of reasonably compatible size, but the nature and distribution of the bluestone pieces does not show any obvious concentrations close to the Bluestones themselves, they do not seem to have been used as packing within the relevant stoneholes, and the size of pieces is generally small, apart from the objects. The main distribution of the bluestone pieces is within and above the Stonehenge Layer and has been the subject of some debate. Hawley, on the evidence of this distribution, believed the Stonehenge Layer to date to the time of the dressing of the Bluestones, whereas Atkinson argued that the pieces and chips related to a much later phase of monument wrecking (*see Chapter 8, above*). The evidence remains inconclusive. In contrast, the presence of large numbers of sarsen mauls and other pieces used to pack many of the stoneholes indicate that the sarsen stones were dressed on site.

Some shaping and reduction of both Bluestones and Sarsens may have occurred in the area but at some distance from the site. To date, however, the evidence for this is limited. In 1980, during excavation of C91 beside the A344, Pitts encountered a sarsen working floor lying directly on the weathered chalk surface. It was associated with a hearth, Beaker pottery, flint artefacts including an oblique flint arrowhead, and some animal bone (Pitts 1982, 83), but had no stratigraphic relationship with any other archaeological feature. Pitts concluded that it was Late Neolithic in date (the radiocarbon determination from the hearth is not considered secure on technical grounds, *see Appendix 2*) and that it might have lain within some kind of structure. The material recovered included large amounts of debitage, mauls, bifacially worked tools, hammerstones, and miscellaneous reused flakes, all typical of the assemblage described above. These occurred within the floor and also in the Heelstone ditch and elsewhere in the cutting. Some worked fragments of bluestone were also present.

A small quantity of both bluestone (weighing 3lb (*c* 1.35kg)) and sarsen (weighing 19lb 11oz (*c* 8.95kg) was recovered by W E V Young during excavations in the car park (C94). Young informed J F S Stone that 6 pieces of rhyolite, 2 of volcanic ash, and 2 of dolerite were found (Stone 1947, 16). In his note to Stone, Young says:

> The most interesting, and at the same time the most important finds, were the chips of foreign stone and sarsen, but these again were superficial and not the result of work carried out on the actual spot where they occurred.
>
> (Young, unpublished note to J F S Stone, 1947)

However, there were also 19 pieces of sarsen, including 2 maul fragments and 1 complete example weighing 4560g. Although the quantities are small the presence of the mauls suggests that some stoneworking was being carried out.

Stone himself (1947) cut a section through the bank and ditch of the Stonehenge Cursus 76 yards (*c* 69.5m) east of Fargo Plantation and recovered in upper levels 'in contact with the original chalk surface and 1 foot [0.3m] below the present surface' (*ibid*, 14) a piece of bluestone identified as Cosheston Beds sandstone and a fragment of sarsen rubber. More significantly, however, a field on Countess Down was ploughed in 1947 and a concentration of of bluestone fragments found in the north-west corner of the field close to the terminal of the Cursus (*ibid*, 16–17, fig 4). Stone was at pains to point out that 'they do not represent one type of rock only and hence we cannot infer that one block *en route* for Stonehenge was dressed here' (*ibid*, 17). Instead, he suggested that a stone monument of 'late Neolithic or Grooved Ware age' may have stood at the end of the Cursus and been subsequently dismantled for use at Stonehenge itself. Julian Richards's work in the area (1990, 93–6) recorded some further bluestone fragments in the general vicinity but could not positively identify the scatter described by Stone.

Stone reviewed the small number of other finds of bluestone from the local area, including a fragment from a grave near Fargo Plantation which included Peterborough Ware (*op cit*; RCHM(E) 1979, 7). The Stonehenge Environs Project recorded a number of tools and fragments of bluestone indicating a sparse but wide scatter in the area around the monument (Richards 1990, 229–32). The artefacts illustrated by Richards are roughly worked bifacial tools similar to examples from Stonehenge itself. All known finds from the area were summarised in Thorpe *et al* (1991; table 2). Richards (*op cit*, 109–23) also recovered a small quantity of sarsen fragments in fieldwalking on King Barrow Ridge and further pieces were found during the investigation of barrows on the ridge damaged by the fall of trees (Cleal and Allen 1994). Overall, the distribution of bluestones and sarsen away from the monument itself is more suggestive of the fortuitous use of individual fragments than actual stoneworking.

Two final points should be noted. Firstly the use of crushed bluestone in the fabric of later Neolithic/earlier Bronze Age (possibly Beaker) pottery recorded in excavations at the Lesser Cursus (Raymond in Richards 1990, 82) and North Kite (*ibid*, 185). Secondly, although artefacts of Group XIII (spotted dolerite) are not common, and their distribution in southern England is widely scattered (Thorpe *et al* 1991, figs 3 and 4), there is a small concentration of this material in the Stonehenge environs. Six of the seven finds recorded by Thorpe *et al* are fragments, however, and the only implement is a battle-axe fragment from barrow Wilsford 54, where it was associated with a late Beaker burial accompanied also by a copper alloy dagger (*ibid*). It is quite possible, therefore, that Stonehenge itself provided a secondary source for this material.

## Chalk objects

*by R Montague*

A total of 27 pieces of worked chalk has been recovered from the various excavations at Stonehenge. Twenty-six of these come from the monument itself and one piece from the Palisade Ditch. The present whereabouts of some of the objects is unknown. Most are in the collection of Salisbury Museum, though a few are held in the Ashmolean Museum, Oxford, the University Museum of Archaeology and Anthropology at Cambridge, the National Museum of Wales, and the British Museum. Only those in Salisbury Museum were examined in detail and are illustrated here. In addition there is one piece of chalk which displays pick marks and one with a fragment of antler pick embedded in it (Fig 98, above). These are not 'objects' and are not discussed here.

Details of all known chalk objects, together with their present whereabouts, are given in Table 41. This table includes references to two pieces of worked chalk which are mentioned only in Hawley's Diaries and to the two pieces with pick marks/fragments, and a footnote about the mistaken attribution of a chalk ball.

### Occurrence by phase

A summary of the occurrence of chalk objects by phase is presented in Table 42.

#### Phase 1

Five chalk objects come from the primary fills of the Ditch: four balls (WA obj no 503, Hawley cat nos 4636a, 4676, 4677) and a perforated object (WA obj no 505). All five came from close to the north-eastern entrance, with one from Segment 99 (C25), the penultimate segment to the west, three from Segment 2 (C23), the penultimate segment to the east, and the fifth from Segment 3 near the terminals (C22).

#### Phase 2 or earlier (2-)

Twelve chalk objects are assigned to this phase, 11 of which come from the Ditch and one from an Aubrey Hole (Hawley cat no 4548; AH24). The Ditch objects comprise five balls (WA obj nos 493–7), one 'cup' (WA obj no 498), one perforated object (WA obj no 500), a possible skeuomorphic axe (WA obj no 492), two tabular objects – one clearly incised (WA obj no 506) and the other possibly incised with chevrons (WA obj no 499) – and an incised lump (WA obj no 507). Nine of the 11 objects from the Ditch come from near the blocked southern entrance (C29). The ball from AH 24 (Hawley cat no 4548) came from a depth of 24in (0.61m) below ground level.

#### Phase 2a

Two chalk balls were recovered from the secondary fills of the Ditch. One of these came from the eastern terminal of the blocked southern entrance (C29; Ditch Segment 21; Hawley cat no 2062A); the other (WA obj no 502) from C20 (Ditch Segment 14/15).

#### Phase 3ii

A skeuomorphic axe was recovered from the ramp for Stone 56 (C17; context 2449; WA obj no 508), 'along the edge of Trilithon IV, in the lower soil' (21/10/1924).

#### Phase 3 or later (3+)

A 'piece of worked chalk' was recorded in Hawley's Diary (12/3/1920) as coming from AH25.

#### Palisade Ditch (C81)

A chalk disc (WA obj no 510) comes from the bottom of the Palisade Ditch, at the terminal end.

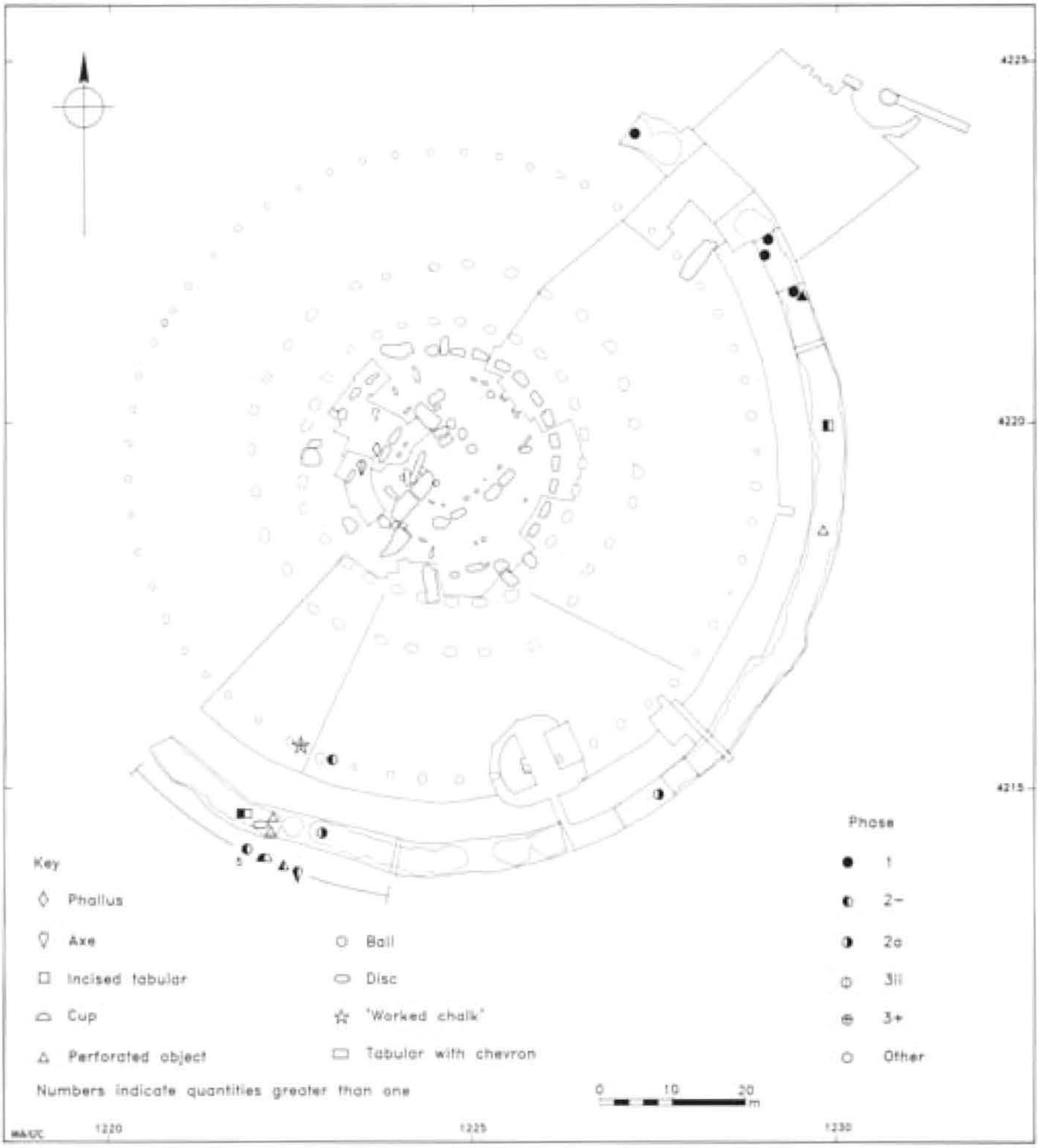



*Fig 218 Distribution of chalk objects (not plotted: incised lump from the Ditch, year and cutting unknown; disc from the Paisade Ditch (WA obj no 507)*

**Disturbed contexts (phase 83)**

A chalk phallus (Atkinson cat no S58.16), now missing, was recovered from a disturbed context near Stonehole 57 (C52). However, this was seen by Peter Berridge and drawn, although the scale of the drawing is not known. It is likely to be at 1:1. His drawing is reproduced as Figure 224.

**Topsoil contexts (phase 89)**

Four objects, three perforated pieces (WA obj nos 501, 504 and Hawley cat no 2095c) and a disc (WA obj no 509), were recovered from topsoil contexts over the Ditch.

**Table 41 Details of chalk objects in phase order**

| *WA obj no* | *Object* | *Original cat no* | *Berridge no* | *Findspot/ cutting* | *WA context* | *Phase/ group* | *Collection* | *Comments/Diary/Catalogue (Cat) ref* |
|---|---|---|---|---|---|---|---|---|
| 503 | Ball | 4729 | CHO.13 | Ditch, C25 | 1561 | 1/01 | Salisbury | In dirty soil near bottom close to horn core which was just below ox vertebra. '... a 3 parts round piece of chalk' (23/10/1922) |
| 505 | Perforated object | 4635a | CHO.15 | Ditch, C22 | 2946 | 1/01 | Salisbury | On bottom in or near depression. '... a roughly hand made whirl or child's toy of chalk with a hole pierced through it also an oval or rounded piece of chalk bearing knife marks' (see 4636a) (22/5/1922) |
| – | ?Ball | 4636a | CHO.16 | Ditch, 22 | 2946 | 1/01 | Brit Mus | With WA obj no 505 |
| – | Ball | 4676 | CHO.21 | Ditch, C23 | 2798 | 1/01 | Cambridge, Museum of Archaeol & Anthrop | On bottom. '... an object of chalk shaped like and much resembling the form of an apple: marks of cutting could be slightly seen and it had evidently been slightly rubbed down after cutting' (16/8/1922). 'Chalk ball ... from under s. of Avenue in ditch ... it has a depression in it' (Cat) |
| – | Ball | 4677 | CHO.26 | Ditch, C23 | 2932 | 1/0 | National Museum Wales | On 'bottom in clean white chalk' (1/9/1922). 'Chalk ball ... under Avenue in Ditch on bottom' (Cat) |
| 502 | Ball | 1555b | CHO.12 | Ditch, C20 | 1291 | 2a/17 | Salisbury | With horn core and animal bone inc fragments of skull '... in digging it out a small flattish round piece of chalk was found artificially made and showing marks of cutting at the side' (23/4/1921) |
| – | Ball | 2062a | CHO.20 | Ditch, C29 | 2864 | 2a/17 | Oxford, Ashmolean | In 3rd section (Oxford register incorrect) *c* 0.3m from bottom (23/7/1926) *(see note)* |
| 492 | ?Skeuomorphic axe | 2090a | CHO.1 | Ditch, C29 | 3814 | 2-/00 | Salisbury | In Cat 'very doubtful chalk axe'* |
| 493 | Ball | 2081a | CHO.2 | Ditch, C29 | 3814 | 2-/00 | Salisbury | * |
| 494 | Ball | 2082a | CHO.3 | Ditch, C29 | 3814 | 2-/00 | Salisbury | * |
| 495 | Ball | 2083a | CHO.4 | Ditch, C29 | 3814 | 2-/00 | Salisbury | * |
| 496 | Ball | 2084a | CHO.5 | Ditch, C29 | 3814 | 2-/00 | Salisbury | * |
| 497 | Ball | 2086a | CHO.6 | Ditch, C29 | 3814 | 2-/00 | Salisbury | * |
| 498 | 'Cup' | 2087a | CHO.7 | Ditch, C29 | 3814 | 2-/00 | Salisbury | * |
| 499 | Tabular piece | 2088a | CHO.8 | Ditch, C29 | 2889 | 2-/00 | Salisbury | Poss chevron design. Not in Diary. Cat: 'piece of cut chalk'; object: 'silt bay 3 1926' |
| 500 | Perforated object | 2089a | CHO.9 | Ditch, C29 | 3814 | 2-/00 | Salisbury | * |
| 506 | Incised tabular piece | 1740a | CHO.17 | Ditch, C28 | 2955 | 2-/00 | Salisbury | Not in Diary. Cat says 'piece chalk ingraved lines' |
| 507 | Incised lump | – | CHO.18 | Ditch C18–29 | 3872 | 2-/00 | Salisbury | No cat no. 'Ditch' in pencil by Newall |
| – | Ball | 4548 | CHO.24 | AH24 | 1236 | 2-/35 | Unknown | 'Found 24in below G.L.' (11/3/1920) |
| 508 | Skeuomorphic axe | 4586 | CHO.19 | WA 2448, C17 | 2449 | 3ii/06 | Salisbury | 'Depression along the edge of Trilithon IV'. Close to Stone 57 (2/10/1924) |
| – | Piece with pick mark | – | CHO.22 | WA 2448, C17 | 2449 | 3ii/06 | ?not collected | 2/10/1924 |
| – | 'worked chalk' | – | CHO.25 | AH25 | 1240 | 3+/37 | Unknown | Listed under 'objects in hole' (12/3/1920) |
| 548 | Lump | S64/7 | DA197** | Stonehole 9, C13 | 2335 | 60/32 | Salisbury | Not clear if in fill. Natural lump with antler pick embedded |
| – | Phallus | S58.16 | CHO.27 | Nr Stonehole 57, C52 | 3911 | 83/00 | Unknown | Recorded as being in Salisbury Museum but could not be found |
| 509 | Disc | 2095a | CHO.28 | Ditch, C29 | 2891 | 89/00 | Salisbury | 'In the humus', see below, Diary 1925 |
| 501 | Perforated object | 2095b | CHO.10 | Ditch, C29 | 2891 | 89/00 | Salisbury | With above '... part of chalk spindle whorl' Diary 1925 |
| – | Perforated object | 2095c | CHO.11 | Ditch, C29 | 2891 | 89/00 | Oxford, Ashmolean | With above. Diary 1925 |
| 504 | Perforated object | 1807a | CHO.14 | Ditch, C28 | 2556 | 89/00 | Salisbury | 22/6/1925 |
| 510 | Disc | PUP59 | – | Palisade Ditch, C81 | 9810 | 00/76 | Salisbury | 'Chalk from base of ditch near end' |

*In addition, Berridge's card index records a further ball (CHO.23) from the Ditch (C29.4) but this seems to be the result of confusion between Newall's reading and annotation of the Diary and catalogue, and the labelling on ball 2062a. There is no Diary entry for a ball from C29.4. This is almost certainly CHO.20 in the Ashmolean, Oxford.*

* = *Listed in catalogue under 'the following objects, though not mentioned in the diary 1926 belong to the Ditch for that year'.*

** = *DA stands for Deer Antler in Berridge's catalogue*

**Table 42 Chalk objects by phase**

| *Object* | *Phase* | | | | | | | | *Total* |
|---|---|---|---|---|---|---|---|---|---|
| | *1* | *2a* | *2-* | *3ii* | *3+* | *Palisade Ditch* | *Disturbed* | *Topsoil* | |
| *Ball* | 4 | 2 | 6 | – | – | – | – | – | 12 |
| *Disc* | – | – | – | – | – | 1 | – | 1 | 2 |
| *Perforated object* | – | – | 1 | – | – | – | – | 3 | 5 |
| *'Cup'* | – | – | 1 | – | – | – | – | – | 1 |
| *Phallus* | – | – | – | – | – | – | 1 | – | 1 |
| *Skeuomorphic axe* | – | – | ?1 | 1 | – | – | – | – | 1 or 2 |
| *Incised tabular piece* | – | – | 2 | – | – | – | – | – | 2 |
| *Incised lump* | – | – | 1 | – | – | – | – | – | 1 |
| *Worked* | – | – | – | – | 1 | – | – | – | 1 |
| *Total* | 5 | 2 | 12 | 1 | 1 | 1 | 1 | 4 | 27 |

## Distribution

The distribution of the worked chalk objects is shown in Figure 218. Of the 26 pieces from the monument itself, the majority (22) are from the Hawley's Ditch excavations, with two from Aubrey Holes (AH24 and AH25), one from the large feature WA 2448 in C17, and one from the disturbed rubble outside Stonehole 57 (C52).

Within the Ditch, there are concentrations of chalk objects at the main northern entrance and the blocked southern entrance. This clearly non-random distribution can, in conjunction with the distribution of other artefacts from Stonehenge and from other contemporaneous monuments, be seen as evidence for deliberate deposition. It should be noted here that the actual stratigraphic position of some objects, particularly from Hawley's excavations, is not necessarily as discussed by, for instance, Pollard (1993, 142–54, fig 3.24); it has been possible to refine the phasing of some contexts containing chalk objects, as it has for those containing other material categories. The evidence for deliberate deposition of artefacts and artefact groups is discussed in detail in Chapter 5, *above*.

Two objects, the only ones from the interior of the monument, may be considered to be of symbolic or cult significance, namely a skeuomorphic axe and a phallus. The first comes from the ramp for Stone 56 and the second from nearby, close to Stone 57. Stone 57 bears the so-called mother goddess figure (*see Chapter 3*) and this may be more than coincidence, though the identification of the carving is open to question.

## Objects

A wide range of object types was recovered, including most of the types known from other third and early second millennium cal BC sites. These are listed in Table 41.

### Balls

Chalk balls are a not infrequent class of artefact on sites dating from the early third–early second millennia cal BC (Wainwright and Longworth 1971, 203). The Stonehenge examples (Figs 219 and 221, 2, 4–9) are typical: roughly shaped, apparently by pecking and scraping, as indicated by their scraped and/or pitted surfaces. There are no finely finished smoothed examples like some of those from, for instance, Maumbury Rings (Bradley and Thomas 1984, 132, plate 3) and Mount Pleasant (Clarke *et al* 1985, fig 7.8). As elsewhere, the size of the balls seems to be essentially random; they range in size from a diameter of 29.2mm to 55.8mm (mean 45.1mm). At Maumbury Rings and Mount Pleasant some illustrated examples are much larger (diam 90mm+), but there is no obvious significance in this. A single sandstone ball was also recovered (*see above*).

### Cup

The 'cup' (WA obj no 498: Fig 221, 11) is again not a well finished example of the type. Cups from Windmill Hill (Smith 1965) have smoothed or pecked exteriors and flat bases whereas those from Woodhenge (Thomas 1952, fig 1) are less carefully made and resemble more closely the Stonehenge example. It is worth noting here that the example mentioned by Thomas, a 'roughly rectangular block of chalk which has had a small hole gouged out of its upper surface. That it is a cup in the making is strongly suggested by the size and regularity of the block of chalk itself. It was discovered in the ditch of Stonehenge I, in the white chalk silt' (Thomas 1952, 457) now appears to be missing, with no references to it in the Diaries or reports by Hawley.

### Perforated pieces and discs

The round perforated objects from topsoil contexts over the Ditch (WA obj no 501; C29; Fig 223, 18 and Hawley cat no 2095c) seem most likely to be spindle-

*Fig 219 Chalk and sandstone balls (Wessex Archaeology)*

*Fig 220 Chalk ?skeuomorphic axes, WA obj nos 492 and 508 (Wessex Archaeology)*

whorls, possibly of Iron Age date (eg Wheeler 1943, 294, plate xxxiii; Sharples 1991, fig 169), and the chalk disc (WA obj no 509; Fig 223, 17) found with them is perhaps an unfinished whorl. Certainly these three objects are much more regular and 'finished' than is generally the case for perforated chalk objects from Late Neolithic–Early Bronze Age contexts in southern England and very much more so than the small, irregular pieces from Grime's Graves which Mercer tentatively identifies as spindle-whorls (Mercer 1981, 60, fig 33 C1–6). The two small, sub-rectangular perforated pieces (WA obj no 500, C29, phase 2; and WA obj no 504, C28, phase 89; Fig 221, 12, Fig 223, 19) are similar in size and shape to an example from the primary ditch fill at Windmill Hill and another unstratified example from that site (Smith 1965, fig 57, C18, C19).

The perforated object from the bottom of the ditch (WA obj no 505, C22; Fig 221, 3) is a more typical example which finds its best parallels in the large irregular perforated pieces, again from primary fills of the Windmill Hill ditches (*ibid*, 132, fig 57, C16). A further unperforated disc, with three more or less straight edges and one rounded (Fig 221, 1), was recovered from the base of the Palisade Ditch (C81) during the Vatchers' 1967 excavation (*see Chapter 6*).

**Skeuomorphic axes**

The skeuomorphic chalk axe (WA obj no 508; Fig 223, 16) from close to Stone 57 (C52) is snapped *c* 100mm from the blade. The break seems to be recent but no other fragments of the object have been identified in the collection. A second, much less convincing example from the Ditch (C29; WA obj no 492; Fig 223, 10), is a lump with apparent faceting but with a very irregular outline and section . By analogy with flint artefacts from the chalk downlands it seems more likely to have been made as (or in imitation of) a chopping or undifferentiated heavy-duty tool (J Gardiner pers comm). The two chalk axes from Stonehenge have been the subject of some debate. Hawley described WA obj no 508 as a 'neolithic axe-shaped implement and of a decided type' (2/10/1924) but this claim was dismissed by Nicholas Thomas: '... the writer is not convinced by Col Hawley's suggestion that this piece of roughly worked chalk is, in fact, a model axe' (Thomas 1952, 462); Pollard (forthcoming) repeats Thomas's view. However, the object has a more or less regular, flattened oval section and slightly faceted sides typical of many pecked stone axes and is no cruder in form than many an unfinished stone or flint example (J Gardiner, pers comm). The faces have areas of smoothing but because of the softness of the stone and the frequent handling to which this piece has undoubtedly been subjected this may be a post-depositional phenomenon.

Chalk 'axes' are very rare: two examples are recorded from Woodhenge (Cunnington 1929, 112, plate 22) and another broken example is known from a barrow at Leighton Villa, Westbury, Wiltshire (Evens *et al* 1962, 231, 260; Pollard forthcoming). They are undoubtedly symbolic since they are functionally useless.

**?Incised pieces**

A broken plaque with carefully shaped edges and a possible shallow incised chevron motif (WA 499; Fig 222) was found in the 'silt' of the Ditch near the western terminal of the blocked southern entrance (C28). Its precise location within the silt is unknown. The chevron incisions are slightly deeper than others on the piece which appear to be marks from the preparation of the flat surface. The incisions are not nearly as deep as those on the two chalk plaques recovered from a pit containing Grooved Ware on King Barrow Ridge (Harding 1988) just 1km east of Stonehenge, but the chevron pattern on the border of the smaller of these two is similar to that of the Stonehenge example, and such patterning is a common Grooved Ware motif. A piece from an Iron Age pit at Durrington Walls has numerous incised lines, some of which taper and join to form ill-defined chevrons (Stone *et al* 1954, pl xix), though it is not clear how deliberate this might be. The Stonehenge piece's position close to the entrance may lend support to the argument for deliberate design. It is mentioned in Hawley's Catalogue (no 2088a) simply as a 'piece of cut chalk'; the possible design does not seem to have been noticed before the present study but it is acknowledged that it is not entirely convincing as a deliberate pattern.

Two other pieces, a pecked and crudely incised tabular piece (WA obj no 506, C28; Fig 221, 13) and an irregular, roughly pecked lump (WA obj no 507, C18–29, Fig 221, 14) with incised lines, are recorded as coming from the Ditch.

**Phallus**

A chalk phallus (Atkinson cat no S.58.16), of unknown dimensions, was apparently recovered from close to Stone 57 (C54) but cannot now be traced, though Berridge's drawing of it was found (Fig 224). Phalli are again known from a number of both earlier and later Neolithic sites including Mount Pleasant (Wainwright 1979, fig 75, C2; fig 76, C15), Windmill Hill (Smith 1965, fig 57, C9, C10), the Trundle (East Sussex; unpublished), and Maumbury Rings, Shaft 10 (Bradley 1976, fig 7, 6). They range in size from *c* 20mm (eg the Trundle) to the particularly well endowed (Maumbury Rings, 220mm) and may be somewhat stylised (Mount Pleasant, C15) or rather more anatomically correct (Maumbury Rings).

**?Animal scratched pieces**

In Hawley's Diaries there are references to animal-scratched pieces of chalk, which were not retained: '... a disturbance by rabbits a piece of chalk showed their clear marks' (23/10/1922). It is not clear from the illustrations of worked chalk from Wyke Down henge (Barrett *et al* 1990, 96, fig 3.21) to what extent those pieces were deliberately modified, or what the depth and profile of the incisions are, but it is not impossible that Hawley could have mistaken seemingly random designs like these for animal scratches. Two scratched pieces of chalk, interpreted as possibly part of badger scratching posts, were excavated from the fill of the Beaker period burial pit within the Ditch (C61; Evans 1984, 22).

## Discussion

Chalk objects have been recovered from a fairly large number of sites, mostly in southern England and are generally associated with third and early second millennium monumental sites, particularly henges such as Durrington Walls, Woodhenge, Mount Pleasant, and Wyke Down. However, they also occur in primary levels at Windmill Hill, in funerary monuments such as the West Kennet Long Barrow (Piggott 1962), and the Folkton barrow, Yorkshire (Kinnes and Longworth 1985, cat 241), and in unenclosed pits as on King Barrow Ridge close to Stonehenge itself (Harding 1988).

Carved chalk finds from the Windmill Hill ditches include 2 'figurines', 2 phalli, 27 balls, 3 perforated pieces, 14 incised objects, 6 cups, and 3 pieces with drilled or scraped pits (Smith 1965, 131–4).

No carved chalk objects were retrieved from the excavation of the henge monument at Durrington Walls, though four chalk objects were recovered from Iron Age pits on the site (Wainwright and Longworth 1971, 9). At Avebury a single chalk ball was found in the upper fills of the Ditch (St George Gray 1935, 147). At Maumbury Rings, carved chalk objects were retrieved from the fills of the Neolithic shafts, from probably the lower part of the chalk bank, and from Roman layers within the site (Bradley 1976, 25; Bradley and Thomas 1984, 132–3), and comprised balls, a phallus, a drum, a partly perforated piece, and various incised pieces.

At Woodhenge nine pieces of worked chalk were recovered from the postholes of the monument (Pollard forthcoming) including two skeuomorphic axes. At Mount Pleasant (Wainwright 1979, 167–71) worked chalk artefacts including balls, discs, phalli, cylinders, and blocks were recovered from the terminals of the main enclosure ditch, dug and then extended in the period dating from 2500–2150 cal BC; and a similar range of artefacts including 30 balls was recovered from the palisade trench dating from *c* 2200–1900 cal BC (Burleigh in Wainwright 1979, 186 and table xx). At Wyke Down (Barrett *et al* 1990) the carved chalk objects were found only in the primary fills, either in the pits near the terminals flanking the entrance or in the pit directly opposite the entrance. This clustering of chalk objects around an entranceway can be seen at Stonehenge also, where the chalk objects from the primary fills of the Ditch all occur around the northern entranceway.

It is difficult to imagine to what functional use most of the chalk objects could be put and by analogy with their occurrence and distribution at other monumental sites (*cf* Bradley and Thomas 1984; Pollard 1993; forthcoming) the nature and distribution of most of the pieces at Stonehenge suggest a purely symbolic or ceremonial function manifested largely through incidences of formal deposition (*see Chapter 5*).

**Catalogue of chalk objects**

Fig 221

1 Disc with one slightly squared-off end. Worked on both surfaces, both pecked and scraped. L 64.5 W 59.7 T 21.5. *WA obj no 510; Vatcher cat no PUP 59; C81; context 9810; phase 00; group 75*

2 Rough ball with pecked surface, some scratch marks. Max diam 43.0. *WA obj no 503; Hawley cat no 4729; C25; context 1561; phase 1; group 01*

3 Oval piece with hour-glass perforation, slightly off-centre, with tooling scratches visible. L 68.0 W 54.0 T 22.2. *WA obj no 505; Hawley cat no 4635A; C22; context 2946; phase 1; group 01*

4 Broken flattened ball. Max diam 55.8, T 31.2. *WA obj no 502; Hawley cat no 1555b; C20; context 1291; phase 2a; group 17*

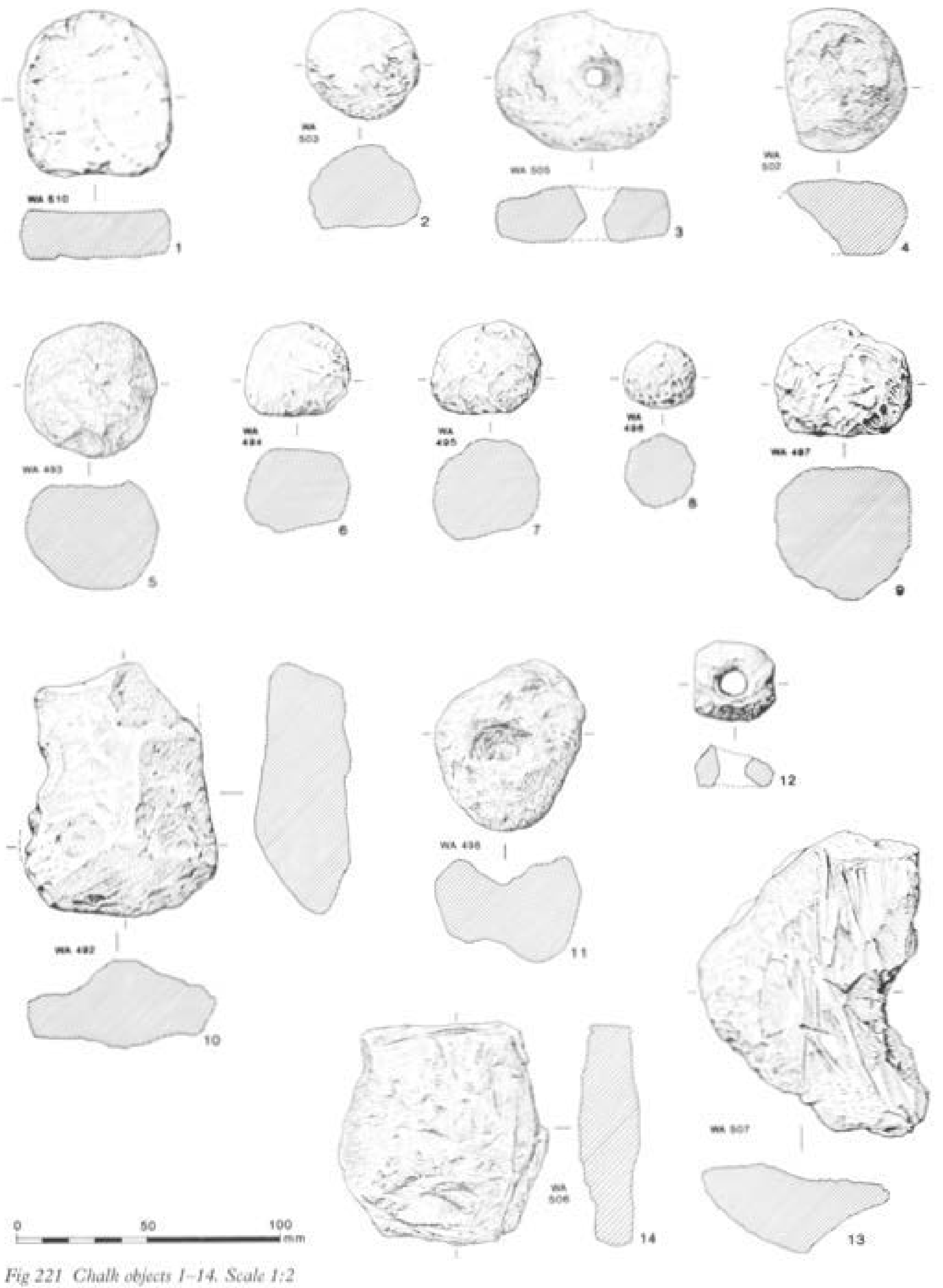



*Fig 221 Chalk objects 1–14. Scale 1:2*


*Fig 222 Tabular piece of chalk (WA obj no 499) with possible incised chevron pattern (Wessex Archaeology)*

5 Ball with modern break. Max diam 50.1. *WA obj no 493; Hawley cat no 2081a; C29; context 3814; phase 2-; group 00*

6 Ball, scraped surface. Max diam 39.9. *WA obj no 494; Hawley cat no 2082a; C29; context 3814; phase 2-; group 00*

7 Roughly worked ball with scraped and pecked surface. Max diam 44.2. WA obj no 495; *Hawley cat no 2083a; C29; context 3814; phase 2-; group 00*

8 Small ball with rough pecked surface.Max diam 29.2. *WA obj no 496; Hawley cat no 2084A; C29; context 3814; phase 2-; group 00*

9 Flattened ball with roughly scraped surface. Max diam 53.5. *WA obj no 497; Hawley cat no 2086a; context C29; 3814; phase 2-; group 00*

10 Roughly axe-shaped piece, some faces with only slight traces of working, with 'blade' end of piece scraped and rounded. Possible roughout for a skeuomorphic axe? L 95.7 W 72.3 T 35.8. *WA obj no 492; Hawley cat no 2090a; C29; context 3814; phase 2-; group 00.*

11 'Cup', roughly shaped piece with a small depression on one surface *c* 24.8mm diam and *c* 11mm deep. L 67.9 W 55.2 T 42.6. *WA obj no 498; Hawley cat no 2087a; C29; context 3814; phase 2-; group 00*

12 Perforated sub-square piece. Hourglass perforation with tooling scratches visible. L 31.3 W 30.7 T 19.8. *WA obj no 500; Hawley cat no 2089a; C29; context 3814; phase 2-; group 00*

13 Roughly tabular sub-square block of chalk, roughly pecked on one side with deep incised lines round three of the four sides, possible preparatory to finer shaping of the piece. L 84.4 W 78.8 T 27.2. *WA obj no 506; Hawley cat no 1740a; C28; context 2955; phase 2-; group 89*

14 Incised lump with sub-parallel and intersecting scratches. L 117.0 W 83.4 T 37.2. *WA obj no 507; C18–29; context 3872; phase 2-; group 00*

Fig 222

15 Tabular piece with curving edge, both surfaces carefully worked but one flatter and with some fairly deep striations, including a possible chevron design . L 43.5 W 38.7 T 12.9. *WA obj no 499; Hawley cat no 2088a; C29; context 2889; phase 2-; group 00*

Fig 223

16 ?Skeuomorphic axe, modern break, 'blade' edge not very well defined. L 103.4 W 70.9 T 38.9. *WA obj*

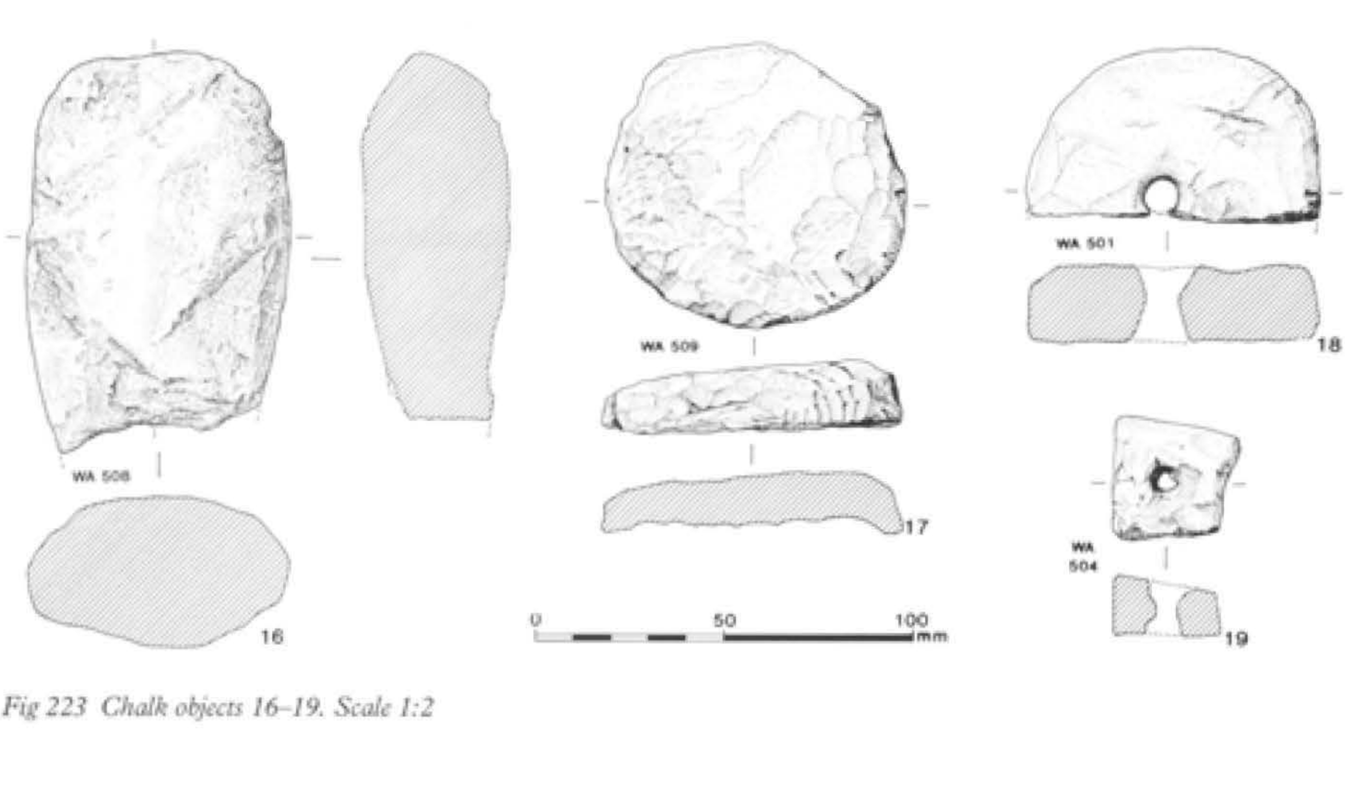



*Fig 223 Chalk objects 16–19. Scale 1:2*

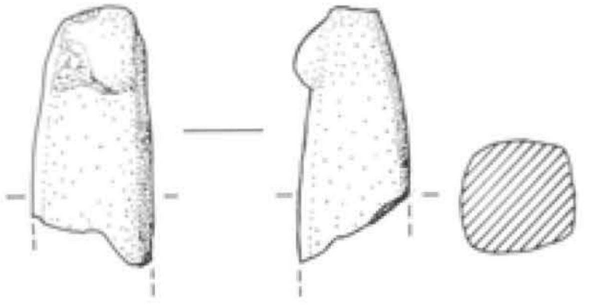


*Fig 224 Chalk phallus. Scale unknown but probably 1:1*

*no 508; Hawley cat no 4586; C17; context 2449; phase 3ii; group 06*

17 Disc with worked flattish upper surface, and a minimally worked lower surface. Max diam 82.2 T 17.3. *WA obj no 509; Hawley cat no 2095a; C29; context 2891; phase 89; group 00*

18 Broken perforated disc, carefully shaped with hourglass perforation. Diam 78.0, T 21.3. *WA obj no 501; Hawley cat no 2095b; C29; context 2891; phase 89; group 00*

19 Perforated sub-square piece. Hourglass perforation. L 33.5 W 33.0 T 17.2. *WA obj no 504; Hawley cat no 1807a; C28; context 2556; phase 89; group 00*

Fig 224

20 Phallus. Dimensions unknown. Present whereabouts unknown. *Atkinson cat no S58.16; C52; context 3911; phase 83; group 00*

## Bone and antler small objects

*by R Montague*

A total of 33 small objects and fragments of worked bone recovered during the excavations at Stonehenge and now housed in Salisbury Museum was examined. Some of the fragments join to form a minimum number of 27 fragments, representing a minimum number of 23 objects. This total does not include the large number of antlers modified for use as picks and rakes and ox scapula shovels which are discussed by Dale Serjeantson (*below*). No other bone artefacts are known to exist in museum collections and there are no certain references to any more having been found. Details of all the finds are given in Table 43, although in the case of the skewer pins it should be noted that each fragment has a separate entry, for reasons explained below. A summary of the artefacts by phase is provided in Table 44. Identifications of species and skeletal element was provided by Dale Serjeantson.

## Occurrence by phase

### Phase 1

A bone point (WA obj no 21) was recovered from the chalk silt near the eastern terminal of the northern entrance of the Ditch (C24, Ditch Segment 1).

### Phase 2 or earlier (2-)

Three fragments of skewer pin were recorded from Aubrey Hole 24. In the museum collection there are now four fragments, two of which conjoin (WA obj nos 11–14). These may belong to a single pin.

### Phase 2a

A spatulate antler object (WA obj no 25) comes from the secondary fills of the Ditch to the west of the northern entrance (C25, Ditch Segment 99).

### Phase 2b

A skewer pin was found in association with a cremation cut into the secondary fills of the Ditch (WA obj no 9; C26); a bone 'chisel' was found in a scoop also cut into the secondary fills (WA obj no 23; C26). This scoop also contained unburnt human and animal bones.

### Phase 3 or later (3+)

Eight fragments of skewer pin, representing at least two pins, were recovered from Aubrey Hole 5, from the fill of a recut containing two cremations (WA obj nos 1–8), and an almost complete skewer pin was recovered from Aubrey Hole 13 (WA obj no 10).

### Post-monument destruction/disturbance (phase 60)

Two worked bone objects: a perforated point (WA obj no 24; C13) and a broken cylindrical object (WA obj no 53; C33.16), possibly a point.

### Disturbed contexts (phases 82 and 83)

Two objects, a composite tool (WA obj no 22; C34.4) and a post-medieval knife or fork handle (WA obj no 26; C52).

### Layers of unknown date, Stonehenge layer, topsoil, and unstratified (phases 87–9, 00)

Two possible skewer pin fragments were recorded in topsoil over Aubrey Hole 12. Other items recovered from these phases are a post-medieval/modern knife or fork handle, three broken points, a Romano-British hairpin, two modern buttons, a post-medieval/modern dress fastener, and two bones with evidence for the use of groove and splinter technique.

## Distribution

The distribution of all worked bone objects is shown in Figure 225. It is notable that the four objects retrieved from the Ditch all come from close to the entranceways. The two earliest phased artefacts, the bone point from phase 1 (WA obj no 21; Fig 228, 1) and the antler spatula from phase 2a (WA obj no 25; Fig 228, 2), both come from close to the north-eastern entrance. The two later phased objects, the 'chisel' (WA obj no 23; Fig 228, 4) and the skewer pin (WA obj no 9; Fig 228, 3), both from phase 2b features cutting the secondary Ditch fills,

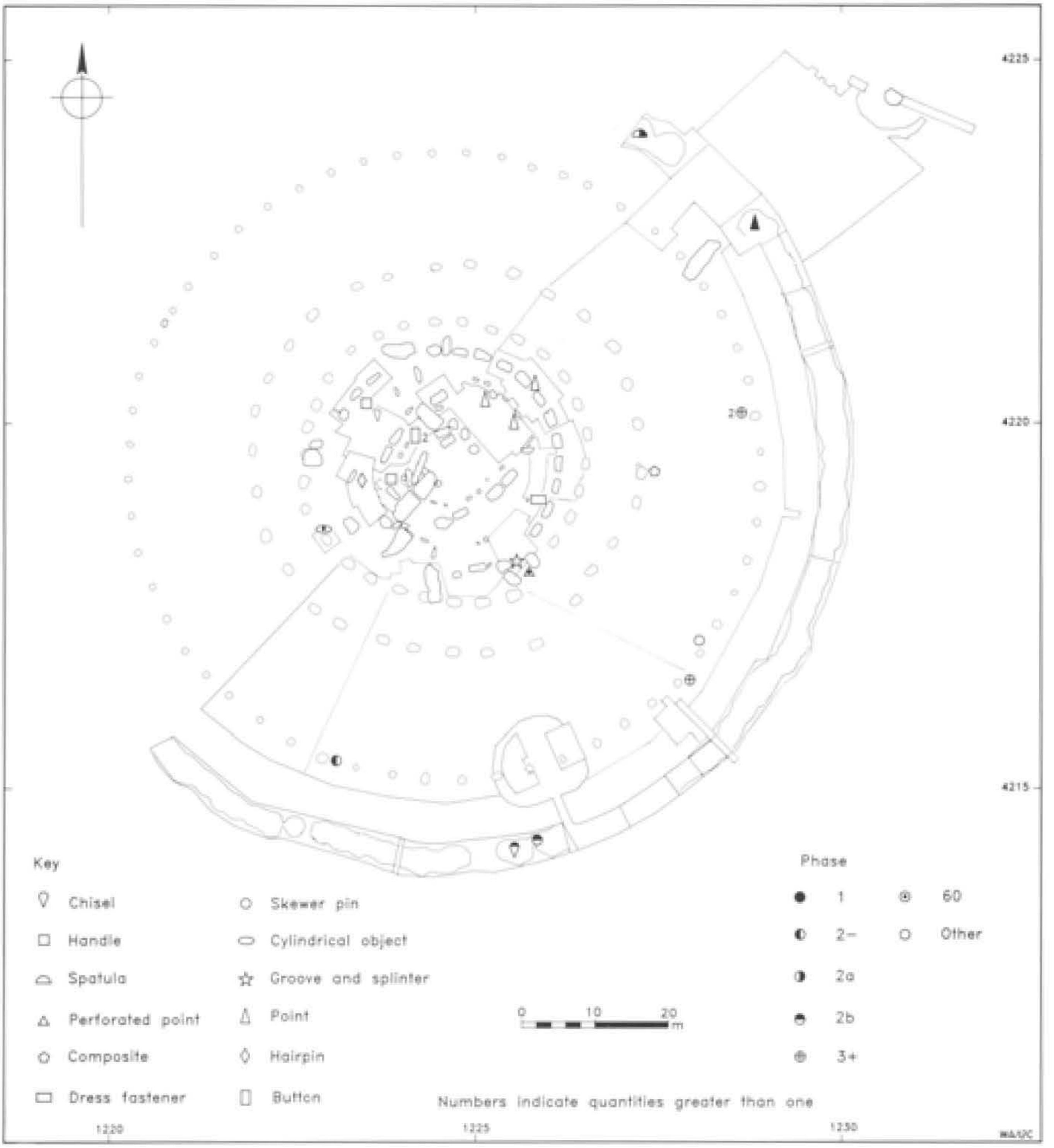



*Fig 225 Distribution of bone and antler small objects (not plotted: unstratified bones with groove and splinter)*

come from close to the eastern side of the southern entrance. As noted above, six of the seven phase 1 and 2a chalk artefacts also came from near the entrances (*see Chapter 5* and Fig 218).

The skewer pins were recovered from four of the Aubrey Holes (AH5, 12, 13, and 24), all of which contained cremations, and from a 'cist' (C26; context 3905) within the Ditch also containing a cremation. In addition, Newall recorded (unpublished notes on the Aubrey Holes, 27) that there may have been a pin in Aubrey Hole 26, the first of these features to be dug:

> If I remember correctly, after eight years, this Hole had what we took to be a 'queer fossil' in it and did not think much more about it. I am sure now that if it was this hole, as I believe it to be, it was part of a bone pin.

However, there was no evidence of a cremation in AH26, and as all the other skewer pins from the site were directly or indirectly associated with cremations, it could be argued that, despite Newall's misgivings, the 'queer fossil' was indeed just that.

There are no other notable distribution patterns in the worked bone objects around the monument, though it is possibly of significance that three of the four points came from a small area in the north-east of the stone monument (Fig 225; C12). All came from the Stonehenge layer or from topsoil contexts, but their concentration in a confined area (on the axis, as it happens) is noteworthy.

## Objects

### Skewer pins

The skewer pins are characteristically round-sectioned. Where present the head is a simple dome, and they are so carefully worked that it is not possible to discern what was the parent bone. Dale Serjeantson (pers comm) notes that, on the basis of the length of the largest surviving fragment and the thickness of the shaft of the pins, they must have been made on splinters of either antler beam or cattle or red deer long-bone shaft. They are all burnt and associated with cremations. The two complete/near-complete pins are both twisted, and it seems likely that this was their original shape, rather than the result of deformation by burning (J McKinley, pers comm). The Stonehenge examples are of a type described by Atkinson *et al* as 'plain' skewer pins (1951, 142–4). Two bone fragments from topsoil contexts show evidence for groove and splinter technique (WA obj nos 30 and 31, *see below*).

Skewer pins were recovered from four Aubrey Holes and from a cremation cut into the secondary fill of the Ditch (C26). Certain difficulties have been encountered in attempting to establish the number of skewer pins represented. Most are in fragments, and the subsequent mixing of these fragments, most of which do not bear their Hawley catalogue numbers, has led to some confusion.

The skewer pin fragments in Aubrey Hole 24 were recorded by Hawley as 'A burnt bone pin in three fragments, at different places and depths about half way between top and bottom of hole, exact position not recorded, came out in spoil' (11/4/1920. There are now four fragments, two of which conjoin. It is not possible to be certain whether these fragments belonged to a single pin or if more than one is represented. None of the fragments has a point, and only one head is present. Their total combined length is 132.1mm (the almost complete skewer pin from the site (WA obj no 9; Fig 228, 3) measures 172.6mm), so it is possible that only one is represented.

The Diary entry for the excavation of AH5 on 31/3/1920 records two burnt pins from 25in (0.63m) below ground level (Hawley cat nos 4512 and 4513).

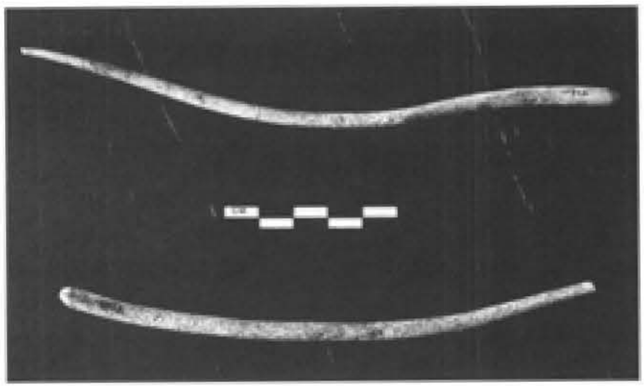


*Fig 226 Skewer pins. WA obj nos 9 (above) and 10 (below) (Wessex Archaeology)*

There are eight fragments of skewer pin from this hole in the collection at Salisbury Museum. Four fit to form a complete, rather short, skewer pin with possible damage to the head (WA obj nos 1–4, including fragments from both cat nos 4512 and 4513, suggesting the fragments have become mixed at some stage after excavation). The other four fragments (WA obj nos 5–8) refit to form two larger fragments, one a head and body section, and the other a body and point section. It is possible that these two fragments belong to the same pin, although they too contain fragments of both catalaogue nos 4512 and 4513. Thus it is possible to suggest a minimum number of two pins for Aubrey Hole 5, in agreement with Hawley's observations.

Two fragments of possible skewer pin body were recovered from within AH12, although as the depths are not given, they have been assigned to the topsoil layer. They do not join, but may come from the same object. An almost complete skewer pin was recovered from 18in (0.46m) below ground level in AH13, with a flint fabricator at 22in (0.56m) below ground level. The hole contained a single cremation at 29in (0.74m) below ground level. Thus, a minimum number of six skewer pins was recovered from the site: one each from AH12, 13, and 24, two from AH5, and one from the cremation cut into the secondary fills of the Ditch.

Skewer pins are dated by their associations to the later Neolithic and earlier Bronze Age, and almost always occur in funerary contexts. Atkinson *et al* published an appendix of all examples known at the time (1951, 142–2), and of the 29 listed (the list omits no 28), 16 are associated with cremations (including 2 from the Cairnpapple henge, Scotland, and 5 from the henge complex at Dorchester on Thames, Oxfordshire), 6 with inhumations, 2 were found on or in barrows, and 1 was probably associated with a chambered tomb. Only four did not come directly from funerary contexts: three from domestic contexts at Skara Brae and one apparently from Stonehenge (comprising three fragments), though with no recorded findspot. At the time of writing these three fragments have not been identified in the Salisbury Museum collection but all the others have

**Table 43 Worked bone and antler small objects**

| *WA obj no* | *Object* | *Original cat no* | *Berridge no* | *Findspot/ cutting* | *WA context* | *Phase/ group* | *Species/element* | *Comments* |
|---|---|---|---|---|---|---|---|---|
| 21 | Point | 4709 | BO9 | Ditch, C24 | 1425 | 1/96 | medium/large sized mammal long-bone splinter | |
| 25 | Spatulate objct | 4735 | BO10 | Ditch, C25 | 1562 | 2a/17 | antler | |
| 9 | Skewer pin | 1592a | SP1 | Ditch, C26 | 3905 | 2b/24 | | with cremation |
| 23 | 'Chisel' | 1593a | BO1 | Ditch, C26 | 2476 | 2b/24 | ?bovid radius splinter | |
| 11 | Skewer pin frag | 4554 | SP8 | AH24 | 1236 | 2-/35 | | WA obj nos 11 & 12 join |
| 12 | Skewer pin frag | 4554 | SP8 | AH24 | 1236 | 2-/35 | | |
| 13 | Skewer pin frag | 4554 | SP8 | AH24 | 1236 | 2-/35 | | |
| 14 | Skewer pin frag | 4554 | SP8 | AH24 | 1236 | 2-/35 | | |
| 1 | Skewer pin frag | 4513 | SP2 | AH5 | 1166 | 3+/37 | | WA obj nos 1–4 join |
| 2 | Skewer pin frag | 4512 | SP3 | AH5 | 1166 | 3+/37 | | |
| 3 | Skewer pin frag | 4512 | SP3 | AH5 | 1166 | 3+/37 | | |
| 4 | Skewer pin frag | 4512 | SP3 | AH5 | 1166 | 3+/37 | | |
| 5 | Skewer pin frag | 4513 | SP2 | AH5 | 1166 | 3+37 | | WA obj nos 5 & 6 join |
| 6 | Skewer pin frag | 4512 | SP4 | AH5 | 1166 | 3+/37 | | |
| 7 | Skewer pin frag | 4512 | SP3/4 | AH5 | 1166 | 3+/37 | | WA obj nos 7 & 8 join |
| 8 | Skewer pin frag | 4512 | SP3/4 | AH5 | 1166 | 3+/37 | | |
| 10 | Skewer pin | 4528 | SP7 | AH13 | 3766 | 3+/37 | | |
| 24 | Perforated point | 421 | BO7 | Stonehole 8, C13 | 2315 | 60/32 | ?bovid limb bone splinter | |
| 53 | Cylindrical object, ?point | S53/13 | – | ZH16 | 3016 | 60/43 | | |
| 22 | Composite tool | 3165 | BO6 | YH 4 | 1619 | 82/00 | | in animal disturbance |
| 26 | Knife/fork handle | S58/40 | BO2 | End of Stone 22, C52 | 3408 | 83/00 | ivory | |
| 543 | Knife/fork handle | – | – | nr Stone 56, C64 | 4096 | 87/00 | | |
| 17 | Point | 317 | BO2 | nr Stone 31, C12 | 2667 | 88/00 | sheep/goat or roe deer metapodial | broken |
| 19 | Point | 248 | BO4 | Between Stones 1 & 30, C2 | 1073 | 88/00 | large mammal, probably bovid, limb bone | |
| 20 | Hairpin | 461a | BO5 | by Stone 41, C17 | 3309 | 89/00 | sheep sized mammal | |
| 27 | Dress fastener | 147b | BO11 | NW Stone 6, C1 | 1051 | 89/00 | | broken |
| 15 | ?Skewer pin frag | 4526 | SP6 | AH12 | 1191 | 89/00 | | in topsoil |
| 16 | ?Skewer pin frag | 4525 | SP5 | AH12 | 1191 | 89/00 | | in topsoil |
| 541 | Button | S56/62 | – | C35 | 3212 | 89/00 | | in topsoil |
| 542 | Button | S56/62 | – | C35 | 3212 | 89/00 | | in topsoil |
| 18 | Point | 334 | BO3 | Stones 48/9, C18 | 2956 | 89/00 | large ungulate limb bone splinter | in topsoil |
| 30 | Shaft | 422 | BO8 | nr Stone 9, C13 | 2957 | 89/00 | horse radius/ulna used for groove and splinter | |
| 31 | Shaft | – | – | Unstrat | 3813 | 00/00 | red deer metatarsal used for groove and splinter | |

been accounted for. The burnt state of the Stonehenge examples suggests that they were pyre goods, probably worn by the deceased as clothes fasteners or personal ornaments and accompanying them to the pyre, to be collected up with the bones after cremation for burial.

### Chisel or gouge

The 'chisel' or gouge (WA obj no 23; Fig 228, 4; Plate 8), possibly from a feature cutting the secondary fills of the Ditch (C26), is of a common bone tool type in Neolithic and Early Bronze Age contexts. It is formed

**Table 44 Worked bone and antler small objects by phase**

| *Object* | *Phase* | | | | | | | | | | | | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *1* | *2-* | *2a* | *2b* | *3+* | *60* | *82* | 83 | *87* | *88* | 89 | *U/S* | |
| *Point* | 1 | – | – | – | – | – | – | – | – | 2 | – | 1 | 4 |
| *Spatula* | – | – | 1 | – | – | – | – | – | – | – | – | – | 1 |
| *'Chisel'* | – | – | – | 1 | – | – | – | – | – | – | – | – | 1 |
| *Skewer pin** | – | 3(1) | – | 1(1) | 4(3) | – | – | – | – | – | 2(1) | – | 10(6) |
| *Perforated point* | – | – | – | – | – | 1 | – | – | – | – | – | – | 1 |
| *Composite tool* | – | – | – | – | – | – | 1 | – | – | – | – | – | 1 |
| *Cylindrical object/point* | – | – | – | – | – | 1 | – | – | – | – | – | – | 1 |
| *Knife/fork handle* | – | – | – | – | – | – | – | 1 | 1 | – | – | – | 2 |
| *Hairpin* | – | – | – | – | – | – | – | – | – | – | 1 | – | 1 |
| *Dress fastener* | – | – | – | – | – | – | – | – | – | – | 1 | – | 1 |
| *Button* | – | – | – | – | – | – | – | – | – | – | 2 | – | 2 |
| *Shaft with groove & splinter* | – | – | – | – | – | – | – | – | – | – | 2 | – | 2 |
| *Total* | 1 | 3 | 1 | 2 | 4 | 2 | 1 | 1 | 1 | 2 | 8 | 1 | 27(23) |

** Minimum no of fragments; minimum no of pins given in brackets (see text)*

on a split bone, probably a bovid radius, with a ground edge, and exhibits characteristic polish. Two similar chisels were recovered from the 'secondary filling' of West Kennet long barrow (Piggott 1962, 49–50), two were associated with a female burial in Upper Swell chambered long barrow in Gloucestershire (Kinnes and Longworth 1985, 110, fig 232, 2, 3), and there were three from the excavations at Windmill Hill (Smith 1965, 128), as well as examples from Skara Brae and Poles Wood East, among others (Piggott 1954, 333, 146). Smith suggests (1965, 128) that these gouges may have been skinning tools. The object provided a radiocarbon date of 3100–2700 cal BC (OxA–4883, 4300±70 BP).

### Antler spatula

A small spatulate antler object (WA obj no 25), *c* 88mm long and *c* 51mm wide with a slightly dished profile (Fig 228, 2), was recovered from a phase 2a context of the Ditch (C25, Ditch segment 99). No close parallel for this piece has been found and it may be a small wedge or digging tool. It is also possible that it is a non-utilitarian object, as perhaps indicated by its deposition just to the north of the northern entrance. However, *contra* Pollard (1993, 143), it was not in a primary context nor associated with a chalk ball.

### Points

Bone points are a ubiquitous tool type throughout prehistoric and historic periods, and only a few types are useful as chronologically refined 'type fossils'. Points similar to the broken example (WA obj no 17; Fig 228, 17) were recovered from Windmill Hill (Smith 1965, 129, fig 54, 9–13), where they were interpreted as awls, possibly for piercing soft materials such as leather; and from the Bronze Age midden deposits at Grimes Graves (Legge 1992, 43). Such points formed on sheep/goat and similar sized mammal metapodials are again common finds from the Neolithic and Bronze Age through to post-medieval sites.

Perforated points are also known from Neolithic and Bronze Age contexts, as well as later ones. Bronze Age examples include Upton Lovell Barrow G2(a), Wiltshire, where two primary inhumations in a bowl barrow were associated with 41 perforated bone points amongst other objects (Annable and Simpson 1964, 49, figs 244–9), and Snailwell Barrow A, Cambridgeshire (nine perforated points (Clarke *et al* 1985, 292).

The perforated point, WA obj no 24 (Fig 227 and Fig 228, 12), finds no direct parallel. The closest parallel drawn to the author's attention seems to be a perforated point from Hockwold, Norfolk. This was unstratified but was associated with a Middle Bronze Age assemblage (J Davies, pers comm). The Stonehenge piece is manufactured from a splinter of ?bovid long-bone and has a polished lenticular-sectioned 'blade'. It is perhaps


*Fig 227 Perforated point, WA obj no 24 (Wessex Archaeology)*

most reminiscent of a paper-knife blade. Although not from a securely stratified context (disturbed fill of Stonehole 8, C13, context 2315) the piece was considered to be of sufficient intrinsic interest to be submitted for radiocarbon dating. The determination of 2840±60 BP (OxA–4885) calibrates to 1260–840 cal BC (*Appendix 2*), confirming a later Bronze Age date. The function of the piece is not obvious but use with soft materials, for instance in association with textiles, perhaps as an early form of pin-beater, is suggested (J Davies, S Margeson, pers comm).

**Other ?prehistoric objects**

A composite tool, consisting of a broken and well worn point at one end and a spatula or scoop at the other (WA obj no 22; Fig 228, 14) comes from a disturbed context over Y Hole 4. Undiagnostic composite bone tools in various combinations of points, gouges, chisels, etc, are again found in assemblages of many periods.

A broken horse radius/ulna shaft (WA obj no 30: Fig 228, 26; C13) and a broken red deer metatarsal (WA obj no 31; Fig 228, 27), both from topsoil layers, each bear cut grooves. It is possible that these are prehistoric bones from which it was intended to cut splinters for use.

**Post-Bronze Age objects**

A small number of post-Bronze Age bone and ivory objects are extant in the collections and are listed in the catalogue. These include a Romano-British hairpin, a possibly eighteenth-century clothes fastener, knife/fork handles, and buttons. These finds are all from the area within the stone monument and are presumably casual losses by visiting tourists.

## Discussion

The limited number of bone artefacts from Stonehenge fall into three groups: skewer pins associated with cremations, other Neolithic/Bronze Age pieces, and those associated with use of the monument during the historic periods.

There is little to add on the subject of the skewer pins, other than that they confirm the later Neolithic–earlier Bronze Age date of the cremations themselves, which for the most part do not survive for study (*McKinley, below*). It was hoped that the date of the cremations could be more closely defined and to this end four fragments of skewer pin were submitted for radiocarbon dating to the Oxford Accelerator. Unfortunately, insufficient bone collagen was present for any of the samples to be dated, so the date range of the cremations remains unresolved (*Appendix 2*).

The remaining prehistoric artefacts are very few in number but include two unusual items: the antler spatula (WA obj no 25) and the perforated point (WA obj no 24). Evidence for structured deposition in relation to the bone objects is discussed in Chapter 5, above.

**Catalogue of worked bone and antler objects**
Fig 228

1 Broken bone point with asymmetrical tip. Fashioned on a limb bone splinter, probably from a medium/large sized mammal. L 39.2 diam 6.5. *WA obj no. 21, Hawley cat no 4709, C24; context 1425; phase 1; group 96*

2 Spatulate antler object with slightly dished profile. L 87.7 W50.9. *WA obj no 25; Hawley cat no 4734; C25; context 1562; phase 2a; group 17*

3 Complete skewer pin apart from small area of modern damage to point. In six pieces, stuck together. Burnt. L 172.6 diam 5.6. *WA obj no 9, Hawley cat no 1592a; C26; context 3905; phase 2b; group 24*

4 'Chisel'-like tool. Probably fashioned on a bovid radius. Smooth slightly rounded working edge, and areas of polish on both faces, especially on the inner face. L 71.8 W34.8. *WA obj no. 23; Hawley cat no 1593a; C26; context 2476; phase 2b; group 24*

5 *not illustrated.* Two conjoining fragments of skewer pin, forming part of the head and body. Burnt. L 82.1, diam 6.9. *WA obj nos 11 and 12; Hawley cat no 4554; C32.24; context 1236; phase 2-; group 35*

6 *not illustrated.* Fragment of skewer pin, forming part of the body of the pin. Burnt. L 26.8, diam 5.0. *WA obj no 13; Hawley cat no 4554; C32.24; context 1236; phase 2-; group 35*

7 *not illustrated.* Fragment of skewer pin, forming part of the body of the pin. Burnt. L 23.2 diam 4.3. *WA obj no 14; Hawley cat no 4554; C32.24; context 1236; phase 2-; group 35*

8 *not illustrated.* Complete skewer pin formed from four conjoining fragments. Possible damage to the head. Burnt. L *c* 90.0 diam 4.0. *WA obj nos 1–4; Hawley cat nos 4512 and 4513; C32.5; context 1166; phase 3+; group 37*

9 *not illustrated.* Two conjoining fragments of skewer pin, forming part of the body and point. Burnt. L 52.8, diam 4.6. *WA obj nos 5 and 6; Hawley cat nos 4513 and 4512; C32.5; context 1166; phase 3+; group 37*

10 *not illustrated.* Two conjoining fragments of skewer pin, forming part of the head and body. Burnt L 65.4 diam 6.3. *WA obj nos 7 and 8; Hawley cat no 4512; C32.5; context 1166; phase 3+; group 37*

11 Nearly complete skewer pin, tip broken in antiquity. In three pieces, stuck together. Burnt. L155.4 diam 6.1. *WA obj no 10; Hawley cat no 4528; C32.13; context 3766; phase 3+; group 37*

12 Broken perforated point. Tip and body of point are highly polished, point with lenticular section. L 74, W 10.0. *WA obj no 24; Hawley cat no 421; C13; context 2315; phase 60; group 32*

13 *not illustrated.* Fragment of broken object, possibly a ?point. Cylindrical, broken both ends. Probably only slightly modified bone, with medulla visible. Burnt. L12.9 diam 6.6. *WA obj no 53; C33.16; context 3016; phase 60; group 43*

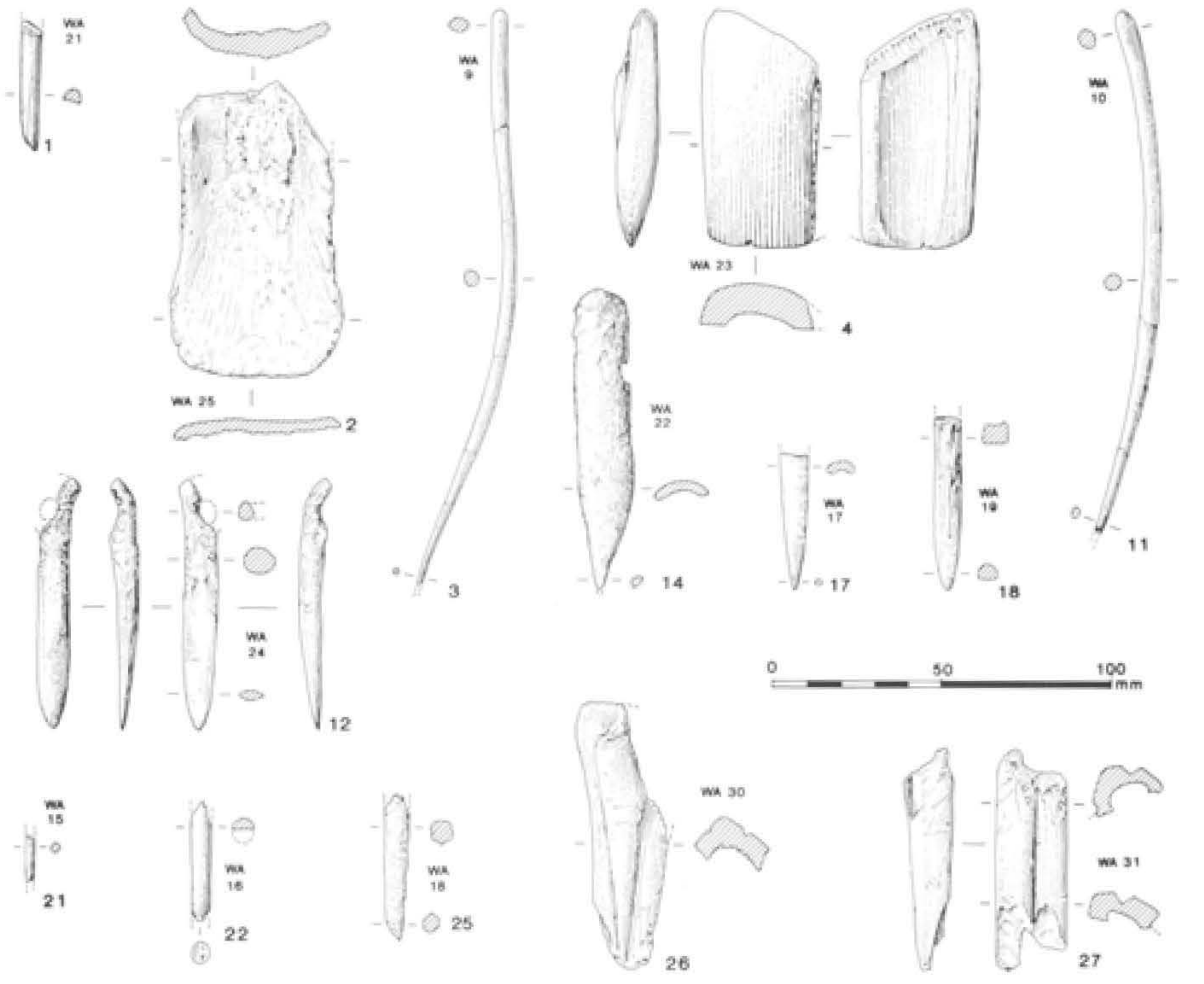



*Fig 228 Bone and antler small objects. Scale 1:2*

14 Composite tool; point at one end and spatula/scoop at the other. Tip of point broken, with much wear visible. L89.7 W16.8. *WA obj no 22; Hawley cat no 3165; C34.4; context 1619; phase 82; group 00*

15 *not illustrated.* Ivory knife or fork handle. Octagonally faceted handle with circular perforation to accommodate tang. Compares well with a bone fork handle of post-medieval date from North Elmham, Norfolk (Goodall 1980, 510, fig. 265/44). L35.0 W 22.2. *WA obj no 26; Atkinson cat no S58/40; C52; context 3408; phase 83; group 00*

16 *not illustrated.* Ornately carved bone knife/fork handle with flaring terminal. Post-medieval/modern. L 34.1 diam 10.9. *WA obj no 543; C64; context 4096; phase 87; group 00*

17 Broken point fashioned from a sheep/goat or roe deer metapodial. L 40.9 W 8.5. WA obj no 17; Hawley cat no 317; C12; context 2667; phase 88; group 00

18 Broken point, square-sectioned shaft coming down to round-sectioned tip. All sides with striations and wear traces. L 51.8 W8.4. *WA obj no 19; Hawley cat no 248; phase 88; group 00*

19 *not illustrated.* Broken hairpin, head a roughly faceted ovoid with two grooves cut below the head. Compares well with Crummy's type 2 Romano-British bone pins (Crummy 1983, 21, esp fig 18/197–8 ). L 46.5 diam 3.2. *WA obj no 20; Hawley cat no 4661a; C17; context 3309; phase 89; group 00*

20 *not illustrated.* ?Clothes fastener with two loops, incomplete, broken into at least three pieces. Comparable with similar object in copper alloy from a context dating from 1720–1750 in Norwich (Margeson 1993, fig 10, 96). L 27.0 diam loop 13.8. *WA obj no 27; Hawley cat no 147b; C1; context 1051; phase 89; group 00*

21 Possible skewer pin fragment. Burnt. L 13.4, diam 3.3. *WA obj no 15; Hawley cat no 4526; C32.12; context 1191; phase 89; group 00*

22 Possible skewer pin fragment. Burnt. L35.,6 diam 6.1. *WA obj no 16; Hawley cat no 4525; C32.12; context 1191; phase 89; group 00*

23 *not illustrated.* Button, flat with inner incised circle, four holes. Diam 11. *WA obj no 541; Atkinson cat no S56/62; C35; context 3212; phase 89; group 00*

24 *not illustrated.* Button, shallow domed upper surface, broken central shank. Diam 12. *WA obj no 542; Atkinson cat no S56/62; C35; context 3212; phase 89; group 00*

25 Broken point, sub-circular section. L 43.2 diam 8.8. *WA obj no 18; Hawley cat no 334; C18; context 2956; phase 89; group 00*

26 Broken horse radius and ulna shaft with groove cut on either side of the ulna. L 80.3 W 23. *WA obj no 30; Hawley cat no 422; C13; context 2957; phase 89; group 00*

27 Broken (probably chopped) red deer metatarsal, distal end, with grooves. L 67.3 W 21.0. *WA obj no 31; context 3813; phase 90; group 00*

## Red deer antler implements and ox scapula shovels

*by Dale Serjeantson with Julie Gardiner*

Over 130 antler implements are known to survive from excavations by Gowland, Hawley, and Atkinson *et al.* Antler implements have frequently been associated with Neolithic and Early Bronze Age monuments in Britain located on chalk or limestone, and it is generally assumed that they were the principal implements used in the digging of ditches, postholes, and stoneholes.

The aim of this study has been to catalogue and describe the surviving material in the collections at Salisbury Museum and to discuss aspects of the manufacture, use, and procurement of antler implements. Some aspects of the deposition and distinctive features of the antler from each phase or group have already been described in the preceding chapters and will not be repeated in detail here.

In a paper on Neolithic engineering Atkinson wrote 'The tools used – antler picks, bone wedges and occasionally stone axes – are well known and require no further discussion' (Atkinson 1961). However, some of the generalisations made in the literature about antler implements require modification in the light of the finds from Stonehenge. As has been pointed out 'In spite of their abundance, antler picks have not been given the attention granted to other aspects of Neolithic technology' (Legge 1986). Some studies of the manufacture and use of antler picks have been published (Fox 1876; Sandars 1910; Ashbee and Cornwall 1961; Jewell 1963). There have been studies of two major assemblages of antler picks, and a number of smaller ones. The major assemblages are from Durrington Walls (Clutton-Brock 1984) and from the flint mines at Grimes Graves, where one group from the Department of the Environment excavations (Legge 1981) and a second from British Museum excavations (Clutton-Brock 1984) have been studied, and it is chiefly with these that the Stonehenge antlers have been compared. Comparisons have also been made with three smaller collections which have been reported in some detail, Maumbury Rings (Bradley 1976), Hazleton long barrow, Gloucestershire (Levitan 1990), and Barrow Hills, Radley, Oxfordshire (Levitan and Serjeantson forthcoming).

In addition, a small number of cattle scapulae, also generally considered to have been used as digging tools during the Neolithic, are discussed.

### Methods

All surviving antlers in Salisbury Museum were examined in the Museum. None of the antlers from Stonehenge known to be in the British Museum (*c* four examples), Cambridge University Museum (three antlers), Ashmolean Museum (four antlers), or the National Museum of Wales in Cardiff (six antler picks) from Stonehenge have been studied. The 118 antlers and antler fragments in Salisbury Museum constitute about 87% of the known extant collection. A full catalogue of the 118 antler implements and a supplementary list of nine fragments found with the bones is in archive. The distribution by phase is shown in Table 45.

Measurements were taken following Clutton-Brock (1984). Some were taken on those parts of the antler which are unmodified and from these it is possible to estimate the size of the animals from which the antler was obtained. Additional measurements of cultural significance were taken, including the length of the pick and the angle between the used tine and the beam (*see below*). A summary of measurements is in Table 46 and the complete list is in archive (Table Antler 1).

Popular works have tended to oversimplify the antler tools and also to perpetuate some interpretations which do not stand up to scrutiny. Examination of the assemblage from Stonehenge has shown that the methods of modification, and the form of the picks, are more varied than has hitherto been appreciated. More attention is therefore paid to this aspect than to those which have previously been discussed. The results have been tabulated as numbers and percentages (Tables 46 and 47). Although percentages can be statistically justified for the larger samples, such as numbers of lefts and rights, the percentages in the smaller samples from individual phases are not statistically significant.

### Terminology

The implements discussed here can for the most part be classified as either 'picks' or 'rakes', the shape of the antler determining the description. The part of the antler which arises from the skull can readily be fashioned into a 'pick'. It 'has the shape of a figure seven, and is not unlike the small single-tined pick-axe still in use by well-diggers and flint-miners in recent time for work in confined spaces' (Atkinson 1979, 96). Also, following convention, implements made on the beam have been listed as picks, but as discussed below they were not always, or not necessarily, used for this purpose. The upper or distal part forms the rake. The parts of an antler and the terms used in this report are shown in Figure 230, and defined below, where antler selection is discussed. The names are antiquated, and vary between different writers. In the Diaries, Hawley described what he found as 'stag-horn picks' but he referred to other fragments as 'pieces of antler'. The terminology used for the tines also varies; the second tine, referred to in this report as the bez tine, is referred to as the 'bes-tine' by Hawley in his reports. Newall, who wrote a note on the antler finds which was appended to the report on the animal bones by Jackson (Kennard and Jackson 1935, 440), used the term 'bay tine'.

#### The dataset

Gowland (1902) records finding numerous splinters or fragments of antler scattered throughout the excavation of C64. He found one pick (context 4117; *ibid*, 71–2 and fig 24). Hawley recovered large numbers of picks from the Ditch: according to Atkinson (1979, 98) the number of antler picks found abandoned on the floor of this area was about 80. Newall (1935, 440) reported that 'rather more than 100 [antlers] were found in the ditch'. Hawley's Diaries also make numerous reference to small fragments of antler, especially from the Ditch but also from the upper levels of the Aubrey, Y, and Z Holes and from general trenching. Fragments are also recorded in Berridge's card index of finds from excavations by Atkinson *et al.* Two picks (S54, C41, context 3921, and S54.832, C42, context 3898), a rake (S54, unstratified), a further broken crown which may have formed part of a rake (S56.52, C17, context 2452), three tine tips, and nine other small undiagnostic fragments survive from the latter excavations.

It seems likely that most if not all of the complete or only slightly damaged examples were retained from Hawley's excavations, so it is possible to discuss aspects such as selection, modification, use, and discard in some detail. As with all the other categories of artefact already discussed, it must be borne in mind that inferences and conclusions are based on an incomplete assemblage.

A total of 118 pieces of antler are catalogued (archive) and discussed, of which 87 are implements made on the beam and 31 on the crown. The former include 65 implements listed as picks and 18 whose use was uncertain, some catalogued as picks or rakes. The 31 implements made on the crown are listed as rakes.

One unworked and probably unused antler examined is from a phase 3 or later context, from the upper fill (context 1655) of Y Hole 30. This is confirmed by Newall (1935, 440) who wrote 'no antler was complete, except those in Y 1 [*sic*; YH 30 was the first of the Y Holes to be excavated (14/6/1923)]'.

## Phased antlers

One hundred and six of the antler implements (90% of those examined) are from phased contexts, in strong contrast to the low proportions of artefacts of other categories described in this chapter. The distribution of antler implements by phase is given in Table 45 and Figure 229.

#### Phase 1

Thirty-four antler implements are securely dated to phase 1, occurring in the primary fill of the Ditch. Five picks and three rakes are from C25 (context 2815) and are described by Hawley thus:

> there were 5 picks on the bottom and up to 9 inches or a foot [0.23–0.3m] above also part of upper antler and several decayed parts of other broken picks in loose chalk ... the picks overlaid each other in some cases touching one another.
>
> (10/10/1922)

Five more implements are from the Ditch in each of C20 and C22 and 11 from C28. Seven examples were submitted to Belfast for high precision radiocarbon dating and have been completely destroyed (*see Appendix 2*). Photographs of these pieces are included in the archive.

#### Phase 2 or earlier (2-)

Thirty-nine implements are from contexts which date to phase 2 or earlier. These include 8 from C29, 15 from C26, and 8 from C21.

#### Phase 2a

Seventeen antlers can be assigned to phase 2a. They come from C20, C22, C23, C25, C28, C41, and C42. Two examples were submitted to the Oxford Accelerator for radiocarbon dating (*see Appendix 2*) and have been returned to the archive in Salisbury Museum.

#### Phase 3b

One pick was recovered by Hawley from the South Barrow (C4).

#### Phase 3c

Two picks come from the northern Avenue ditch at the Stonehenge terminal in C6 (context 1912).

#### Phase 3ii

A single pick comes from Stonehole 1 of the Sarsen Circle (C2, context 1093). A pick and a broken crown, probably a rake, are from the ramp for the Trilithon Stone 56 (C17, contexts 2449 and 2452). A tine tip was recovered from the stonehole of Stones 53/54 (C56, context 3516), also of the Sarsen Trilithons. Three of these were submitted for radiocarbon dating, one to Belfast and two to the Oxford Accelerator (*see Appendix 2*). The last two have been returned to the archive.

#### Phase 3iv

A tine tip was recovered from the original stonehole fill for Stone 40c of the Bluestone Circle (C17, context 2427). This was submitted to the Oxford Accelerator for

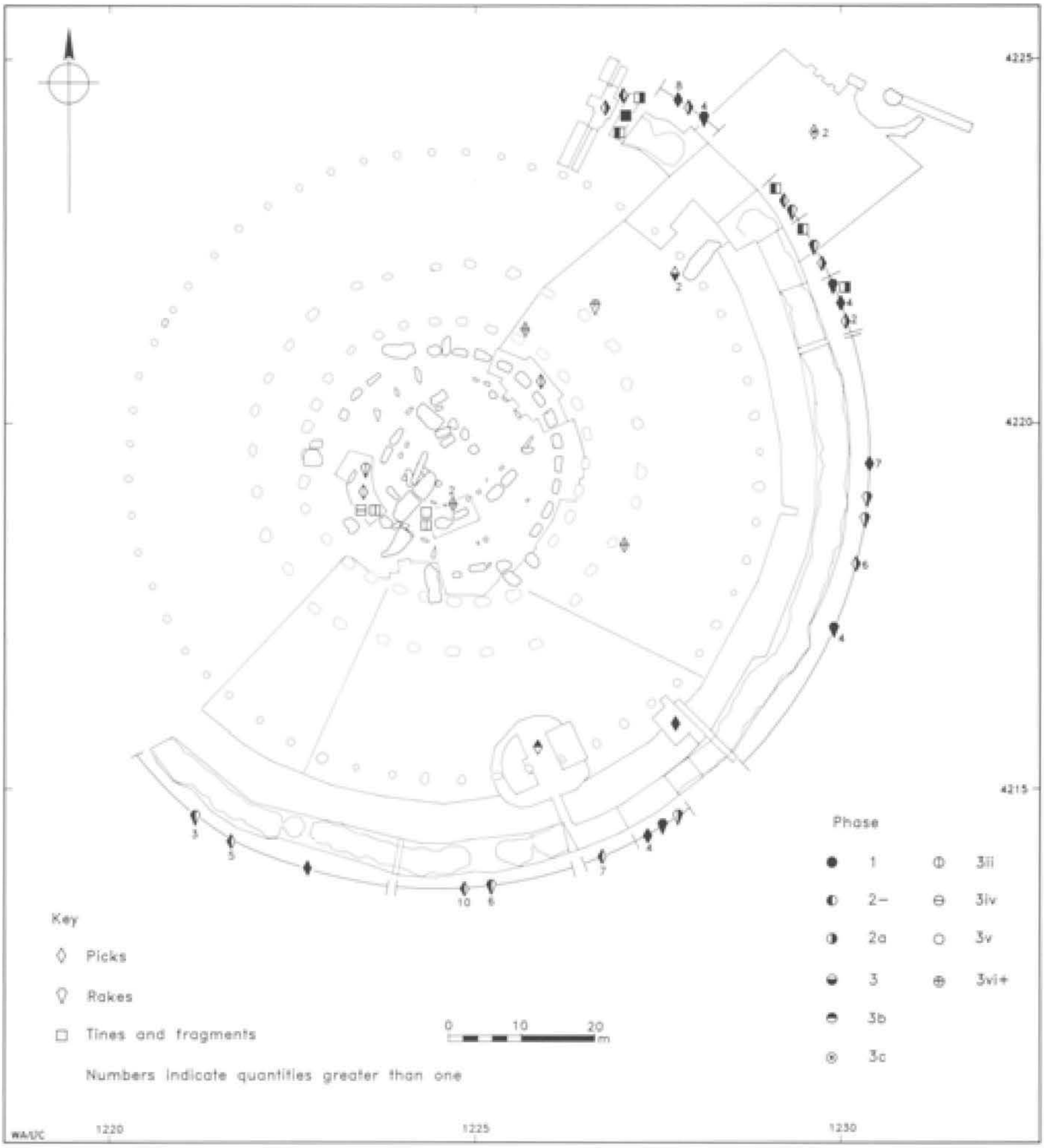



*Fig 229 Distribution of antler picks and rakes*

radiocarbon dating (*see Appendix 2*) and has been returned to the archive.

**Phase 3vi or later (3vi+)**

Seven implements are assigned to this phase, of which six are catalogued. Hawley recovered five antlers from the base of Y Hole 30 (context 3927; Hawley cat nos 3101b–f), one of which was submitted to the Isotope Incorporated Laboratory for radiocarbon dating by Atkinson in 1967 (*see Appendix 2*) and was completely destroyed. The antlers were 'resting on bottom of pit – they were entangled and difficult to remove' (Hawley 1924, 37). The four remaining antlers were catalogued; three of these were submitted to Belfast for high precision radiocarbon dating (Table 64) and have been destroyed. One pick was recovered from each of the uppermost fills of Y Hole 6 and Z Hole 29.

#### Phase 3

The remaining implements, a pick and a short pick or rake, are from Stonehole E (C3, context 1131).

#### Non-phased implements

A further 12 antler implements are from poorly or unstratified contexts.

## Distribution

The antler implements from phases 1 and 2 derive from the primary and secondary Ditch silts. With the exception of the 'stack' in C25 there is no clear indication in the records that the rest of material was clustered or, more specifically, piled up. Implements, often in some quantity, were encountered in most excavated segments of the Ditch (Fig 229). The antlers from phases 1 and 2 show a high degree of similarity (*see below*). It is likely that implements were associated with the initial excavation of the Ditch, with phase 2 material used in later recutting, or residual in these layers. The antlers appear to show continuity of tradition in selection, manufacture, and use. The characteristics of the 12 unphased antlers also fit with these.

The 16 antlers from phase 3 contexts are, with one exception, from cut features other than the Ditch. With the exception of the find from the South Barrow they are all from features either directly associated with settings of the stone monument (ie from stoneholes and a ramp), from the Y and Z Holes, or from the northern Avenue Ditch, and were presumably associated with the construction of these features. The 15 antlers which were complete enough for identification as picks or rakes show some features in common with the earlier material, but the 6 from phase 3vi or later contexts, in the Y and Z Holes, are atypical in many ways. They are described separately below.

In the discussion which follows the antlers are considered as a single group, but the generalisations do not apply to the Y and Z Hole finds. Where characteristics of the antlers do show minor differences in the proportions between phases, these are discussed.

## Selection of antler

The stag or male deer grows a new antler each year; the females or hinds do not have antlers. In the past, especially in Scotland, red deer antler was referred to as 'stag horn' (as it was by Hawley), but it is not horn in the strict sense. Antler is shed in March to May and begins to grow again shortly afterwards. It is fully grown and hard after about five months, in time for the rut, when it is used for display and combat. The shed antler of a mature deer is illustrated in Figure 230. The bone which arises from the skull is described here as the pedicle, and the growth of bone where the antler develops each year is here termed the burr. The lowest tine, the brow tine, arises from the main stem of the antler, the beam, close to the burr. The second, the bez tine, arises from the beam above this, sometimes close above the brow and sometimes some centimetres higher. A third tine, the trez, is higher again. Above the trez tine the antler branches into the crown, which has up to seven tines, and exceptionally as many as ten. In normal conditions, with adequate nutrition for the deer, the antler increases in size, and in the number of tines or 'points', each year from the second year onwards, for the first eight or so years. The full head (as in Fig 230) develops from about the fourth year (Schmid 1972). Anomalies are found, such as absent or vestigial tines, two brow tines, or vestigial additional tines. In old age the antlers begin to 'go back'; that is, they diminish in size and number of points.

Most (90%) of the antlers collected for use at Stonehenge in phases 1 and 2 have a brow, bez, and trez tine, and are therefore from stags of at least five years old and above (Table 45). A few which appear never to have had a trez tine are from younger deer. One third of the crowns have four tines, and a further 26% have five or

**Table 45 Distribution of antler implements by phase**

| | N | % | Phase 1 | 2- | 2 | 3 | u/s |
|---|---|---|---|---|---|---|---|
| ***Slaughter/collection*** | | | | | | | |
| *Shed* | 51 | 64.6 | 10 | 16 | 8 | 11 | 6 |
| *Unshed* | 28 | 35.4 | 13 | 10 | 3 | – | 2 |
| *Uncertain/damaged* | | | 11 | 13 | 6 | 5 | 4 |
| *Total* | 118 | | 34 | 39 | 17 | 16 | 12 |
| ***Side*** | | | | | | | |
| *Left* | 48 | 52.7 | 15 | 13 | 9 | 8 | 3 |
| *Right* | 43 | 47.3 | 9 | 18 | 3 | 5 | 8 |
| *Uncertain* | 27 | | 10 | 8 | 5 | 3 | 1 |
| *Total* | 118 | | 34 | 39 | 17 | 16 | 12 |
| ***Development*** | | | | | | | |
| *Beam* | | | | | | | |
| *Brow, bez, trez* | 63 | 90.0 | 18 | 22 | 8 | 9 | 6 |
| *Brow & bez only* | 7 | 10.0 | – | 3 | 1 | 1 | 2 |
| *Uncertain* | 17 | | 6 | 2 | 6 | 1 | 2 |
| *Total* | 87 | | 24 | 27 | 15 | 11 | 10 |
| *Crown* | | | | | | | |
| *Two tines* | 4 | 14.8 | – | 2 | – | 1 | 1 |
| *Three tines* | 7 | 25.9 | 2 | 4 | – | 1 | – |
| *Four tines* | 9 | 33.3 | 5 | 1 | 2 | – | 1 |
| *Five tines* | 5 | 18.5 | 3 | 2 | – | – | – |
| *Six tines* | 1 | 3.7 | – | 1 | – | – | – |
| *Seven tines* | 1 | 3.7 | – | 1 | – | – | – |
| *Uncertain* | 4 | | – | 1 | – | 3 | – |
| *Total* | 31 | | 10 | 12 | 2 | 5 | 2 |

more. One of these (Hawley cat no 1594q, C26, context 3851) is from a deer with six tines in the crown, that is 18 points, and another (Hawley cat no 2106a, C29, context 3814) has seven tines, or 20 points. There was therefore deliberate selection of antler from fully mature stags.

Left and right hand antlers were selected in approximately equal numbers at Stonehenge, 53% left and 47% right (Table 45). This is similar to other sites such as Durrington Walls (Wainwright and Longworth 1971), the pits excavated by Longworth and Sieveking at Grimes Graves (Clutton-Brock 1984), and Hazleton, Gloucestershire (Levitan 1990). The Grimes Graves assemblage studied by Legge (1981) from the 1971 pit had twice as many from the left side as from the right. Legge has proposed that this is because a pick made on a left hand antler is more efficient for a right handed worker, and those who excavated the mine shafts at Grimes Graves were specialist miners.

## Method of obtaining antler

Antlers were obtained both from slain deer and from those shed each year. All the unshed antlers examined are from deer killed during the late summer and the following spring, as all implements are from fully grown antler.

After the antler has been shed it can be collected for use. Just under 65% of the Stonehenge antlers are shed (Table 45). Antlers are sometimes chewed by deer themselves, especially if they live in an environment poor in calcium and nutrients. Two antlers only, one rake (Hawley cat no 4719, C25, context 2815) and one pick (Atkinson cat no S54, C41/2, context 3921), have the parallel tooth marks characteristic of gnawing by deer, which must have occurred before the antlers were collected. Given the location of the monument on chalk the small number chewed by deer is not unexpected. No antlers from phases 1 and 2 have evidence of rodent gnawing. As nearly all the shed Stonehenge antlers appear to have been recovered undamaged, it can be assumed that they were collected soon after shedding.

The hypothesis proposed by Legge (1981), that there was deliberate and careful collection of shed antler, seems likely (*see below*). Clutton-Brock even considers the possibility that antlers from the same individual were collected in successive years. Antler retains its strength and elasticity for months if not years if carefully stored, so both shed antler and antler from killed animals can be stored for later use. Although it is likely that shed antler was collected during the winter and spring for use in the summer, this cannot be proved.

Altogether, over 35% of the antlers where the base is preserved are from slain deer (Table 45). The proportion is highest in phase 1, where over half (13 out of 23, 57%) are from killed deer, lower in contexts of phase 2 or earlier, with 10 out of 26 (39%) unshed, and yet lower in phase 2a, with 3 of 11 (27%) unshed. None of the phase 3 antlers is unshed. The proportion from slain deer at other sites is 13% from Durrington Walls; 19% and 10% from the two groups from Grimes Graves; and 13% from Hazleton. The unquantified evidence from other earlier Neolithic sites suggests that the great majority of picks were made on shed antler at that period. The contrast with other sites is not a change in behaviour over time, as Hazleton and Durrington Walls pre-date Stonehenge Ditch, and the pits at Grimes Graves are later. There is no obvious single reason which necessarily

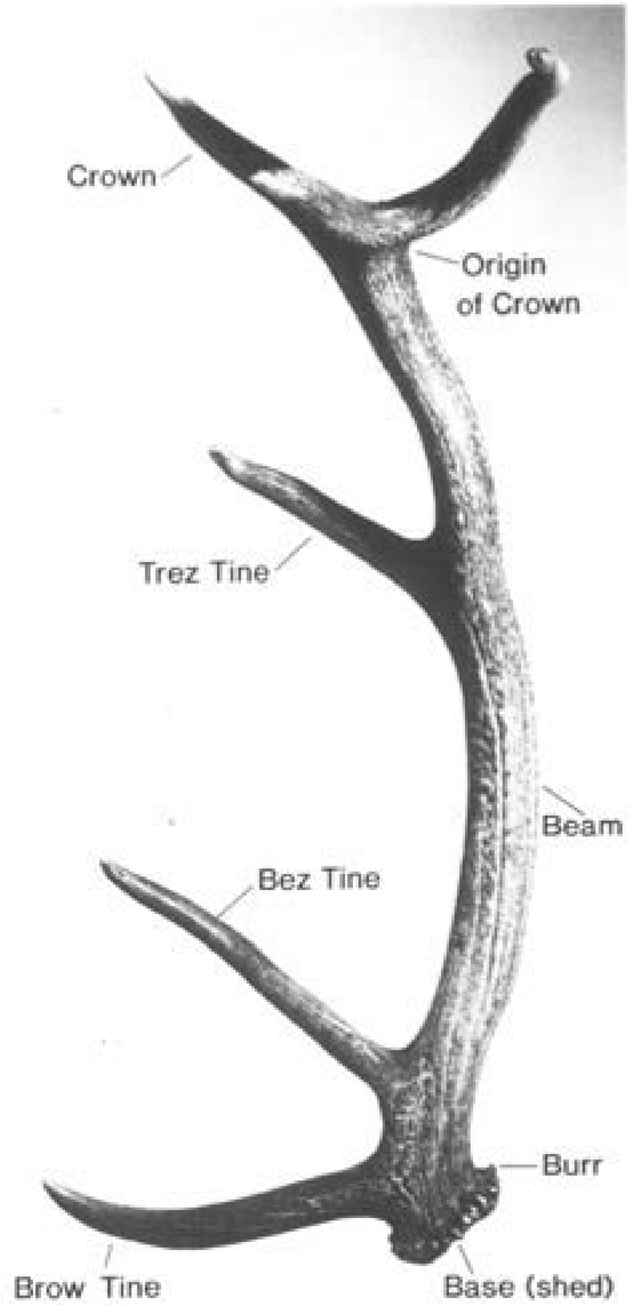



*Fig 230 Antler (shed) of recent mature male red deer with terms used in this report indicated. This example has three tine arising from the beam – brow, bez, and trez – and a crown with two tines (courtesy of the Trustees of the British Museum)*

**Table 46 Summary of antler measurements**

| | *Length pick* | *Length brow tine* | *Length bez tine* | *Angle brow/ beam* | *Angle bez/ beam* | *Circ burr* | *Diam burr* | *Circ brow* | *Diam brow* | *Circ bez* | *Diam bez* | *Circ beam* | *Diam beam* | *Length to trez* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *N* | 59 | 29 | 27 | 15 | 20 | 33 | 39 | 31 | 31 | 38 | 38 | 65 | 65 | 61 |
| *Max* | 710.0 | 260.0 | 210.0 | 100.0 | 119.0 | 299.0 | 95.9 | 139.0 | 34.6 | 126.0 | 39.8 | 202.0 | 72.1 | 340.0 |
| *Min* | 175.0 | 35.0 | 30.0 | 43.0 | 76.0 | 155.0 | 27.7 | 65.0 | 19.2 | 61.0 | 18.2 | 95.0 | 31.6 | 150.0 |
| *Mean* | 418.6 | 156.2 | 115.7 | 69.5 | 97.6 | 222.2 | 66.9 | 101.5 | 27.7 | 88.1 | 28.1 | 138.7 | 47.7 | 216.1 |
| $\sigma$ | 93.7 | 61.4 | 48.7 | 14.8 | 9.5 | 28.5 | 12.8 | 12.3 | 4.2 | 14.3 | 5.0 | 20.9 | 7.7 | 38.7 |

*Key: Angle brow/beam = angle between brow tine and beam; Angle bez/beam = angle between bez tine and beam; Circ = circumference; Diam = diameter*

accounts for the high proportion of antlers from deer which were killed in the lowest fills of the Ditch.

The dating evidence suggests that the Ditch was dug rapidly, so that a large number of antlers would have been needed quickly. Alternatively, it is possible that the high proportion of antler from slain deer from Stonehenge may be explicable in terms of the status of the site. The animal bones, as discussed below, include three hunted species (excluding carnivores): red deer, aurochs, and wild pig. The proportion is higher than is generally found on other sites of the period at which the species are mainly domestic cattle and pigs. The surviving bone from the Stonehenge asssemblage is a highly selected sample, as discussed below, but even so, it reflects a high component of hunted animals compared with other domestic and non-domestic sites. The proportion of antlers from deer which have been hunted and killed is also high in comparison with other large late Neolithic–earlier Bronze Age assemblages.

In full developed agricultural societies 'the presence/absence of wild animals may have little to do with their distributions in the wilds surrounding their locality' (Greenfield 1986, 212). In later prehistoric Europe (eg Clark 1952) hunting ceased to be a necessary means of obtaining food and became, in some areas at least, an occupation of an elite class freed from the needs of day-to-day subsistence activity. It was particularly appropriate for a warrior class for whom it provided practice for combat as well as, presumably, evidence of individual prowess. By the Late Neolithic–Early Bronze Age the specialised hunting gear that forms the so-called Beaker package is evidence of individuals with the status of huntsmen.

Stonehenge, even in its earliest phase, was obviously a site of great significance to the essentially farming communities that built and used it. The presence of an unusually high proportion of hunted animals and antlers from freshly killed animals is difficult to explain in terms other than deliberate choice, since the antlers used in the construction of the monument could have been obtained over a number of years without slaughtering the deer. The number of antlers from the length of Ditch excavated is hardly enough to have dug the whole Ditch but it is still a large sample, and it would require special pleading to argue that the proportion of antler recovered from slain deer, as opposed to shed antler, is not representative of the total assemblage.

## Size of deer

In modern deer populations there is a relationship between antler size and the size of the animal (Clutton-Brock 1984). Some dimensions increase with age: the circumference of the burr has been shown to increase up to the age of about seven years in modern animals (Clutton-Brock 1984, fig 8); the antlers from following years are about the same size. However, the measurements taken on the Stonehenge sample cannot be related to the size of the Neolithic herd, as nearly all the antlers used came from older stags with a good 'head'.

They can be compared with the two other samples from which measurements have been taken. The circumference of the burr of the Stonehenge antlers which could be measured ranges from 155mm to an exceptionally large specimen from phase 1a (Hawley cat no 4735, C25, context 2934) of nearly 300mm (Figure 231) The mean is 222.2mm. This is larger than the means for both Grimes Graves (212.97mm) and Durrington Walls (198.5mm) .

The distribution of the distance between the burr and the trez tine is closely similar to the Grimes Graves sample but greater than that from Durrington Walls (Figure 232). Clutton-Brock argued that the greater size of the Grimes Graves antlers analysed by her compared to those from Durrington Walls was a consequence of the more wooded character of the Grimes Graves environment. The landscape around Stonehenge and Durrington Walls was essentially one of open grassland (*see Chapter 5*). The environmental hypothesis does not seem to be confirmed by the Stonehenge measured antlers, but as there is a strong discrepancy in the sample numbers between Stonehenge on the one hand, and

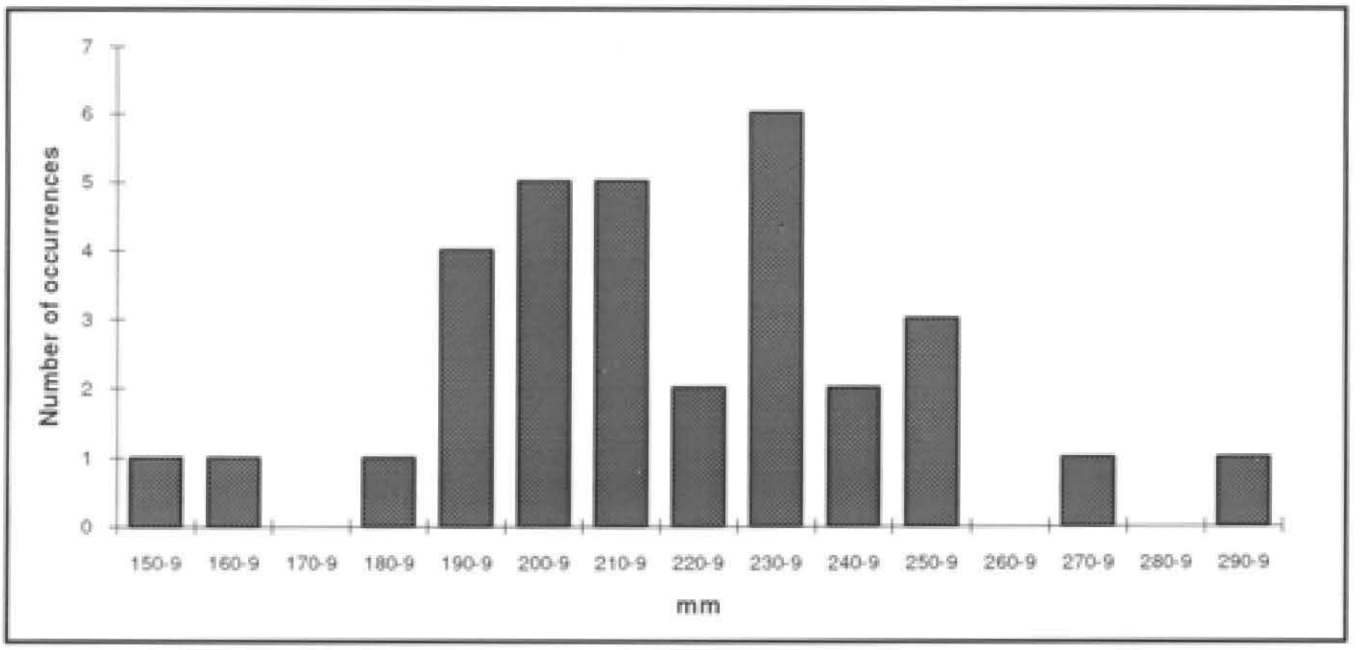



*Fig 231 Antlers: circumference of the burr*

both Durrington Walls and Grimes Graves on the other hand, this must remain inconclusive.

## Modification

Two implements (one pick and one rake) could be created from a single antler by dividing the beam in two. The most typical location (eg Legge 1981) for the bisection of the beam in assemblages of antlers is between the trez tine and the crown, as in the pick illustrated in Figure 233 (Hawley cat no 4606, C29, context 2806) but the proportion for which this is the case has not been quantified in assemblages from other sites. At Stonehenge, the overall proportion is 75% (Table 47). Over 10% were chopped above the bez tine, and a further 10% were chopped through the origin of the crown. The crown, usually with no further modification, forms a rake, with a handle and two or more tines.

### Use of heat

The evidence that the antlers were exposed to heat as part of the process of working was clear on many of the implements. The numbers where heat was used for removal of the skull and bisection of the beam and removal of tines are shown in Table 47. On a few picks blackened patches are visible; these could be seen clearly on the interior of two skulls and on one pedicle. Two have charred patches on the beam (Figs 234 and 235) at the point where it has been chopped through. Two have charring where the trez tine was chopped from the beam (Fig 238). In one (Hawley cat no 1739e, C28, 2938, not illustrated) the burning shows as a pinkish brown colour in the region of the chop. These also show areas of cracking and exfoliation. In other antlers there is little or no discolouration, but the cracked and exfoliated antler surface in the region of chopping bears witness to their exposure to fire. Where antlers are well preserved, this exfoliation is clearly visible, but in the few in which the surface is very eroded, heat cracking could not be clearly recognised and the incidence may therefore have been underestimated.

Exposure to fire was usually only local, though on at least one antler (Hawley cat no 4715, C25, context 2815) fire has damaged a substantial area of the surface, presumably by accident. Evidence for the use of charring was seen on the skull bones in 12 (55%) of the picks with some skull remaining. Skulls no doubt could be treated more ruthlessly, as they presented a large area of unwanted bone which needed to be removed. The use of heat was noted on 47 (56%) of the antler beams and at the base of 24 (33%) of the tines which had been removed. The proportions vary between the phases of occupation, but they show no clear trend, so the fluctuations are most likely to be a consequence of the small sample numbers involved.

Heating the antler surface has the effect of making the material locally more brittle so that it snaps more cleanly. It has been demonstrated experimentally that applying heat to bones allows less force to be used in smashing them (Lupo and Schmitt unpublished; Stokes unpublished), and the same is true for antler. Rendering the surface brittle also allows jagged ends to be smoothed.

It has been suggested that the method of heating by applying a burning brand of wood (Clutton-Brock 1984); this would be the most effective way of applying localised heat. Hawley remarks (1923, 17; 1924, 31;

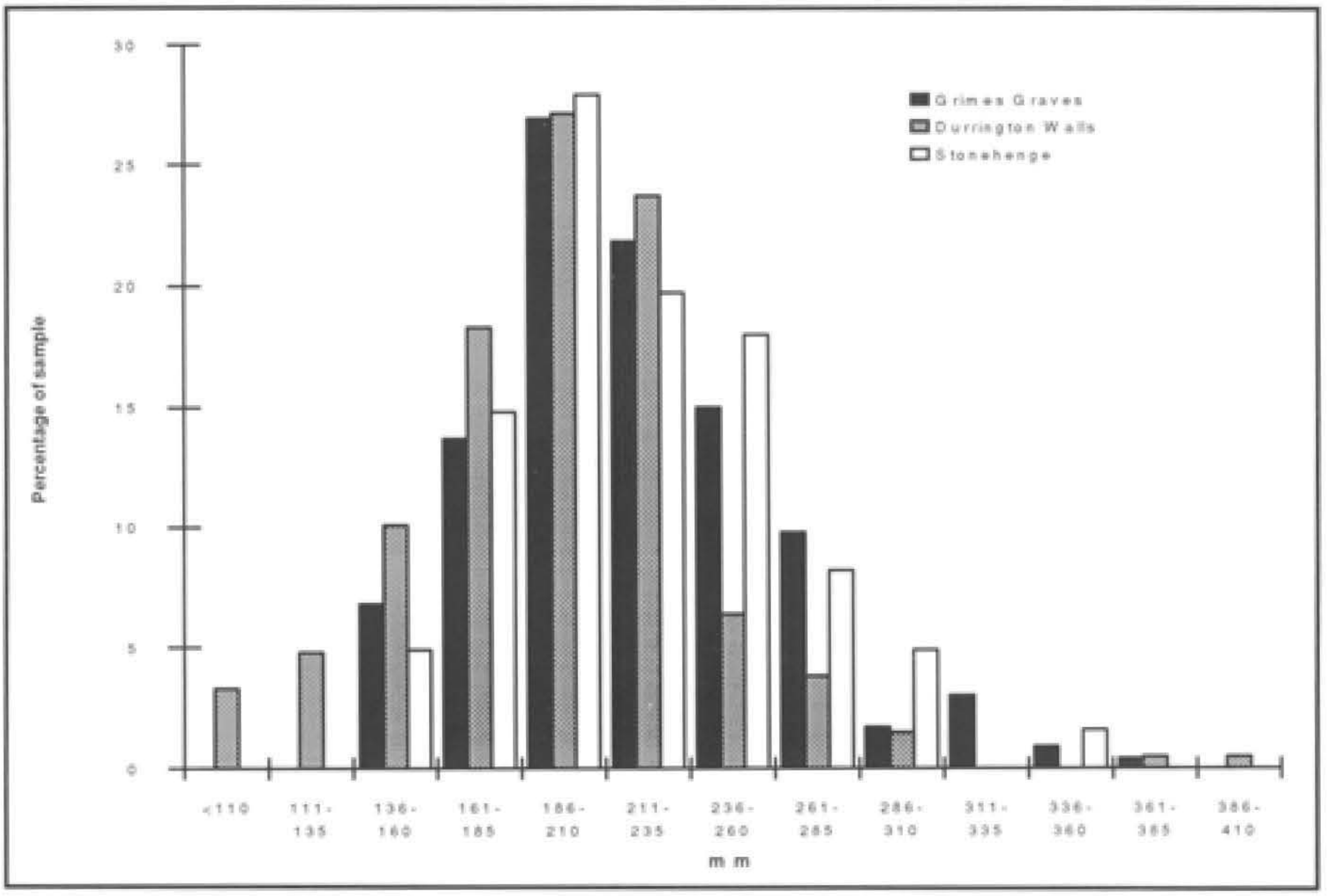



*Fig 232 Distance between the burr and the trez tine of the Stonehenge antlers (N = 61) compared with those from Grimes Graves (N = 234) and Durrington Walls (N = 207)*

1928, 165) that there were a few instances of fire on the bottom of the Ditch (*see Chapter 5*) and that the only two of consequence were close to the north-eastern entrance in C25 (Ditch Segment 100), where the stack of antlers was found. He also notes that there were indications of a fire on the bottom which had injured some of the antlers (10/10/1922). 'There were traces of fires on the bottom of both the last craters, but they were apparently only temporary and not sufficient in quantity to suggest long occupation' (1926, 5). If the occasional references to fires and burnt patches do indeed suggest that small temporary fires were lit in the Ditch, this may have been to assist in trimming antler implements.

Hawley in his original reports noted that heat was used in manufacture of picks, and it has also been noted in other collections, such as that from the Neolithic flint mine site of Harrow Hill, Sussex (Curwen 1930, 96–122, fig 20; Pull 1932). According to Legge (1981), heat was used on 'most' of the antlers he examined from Grimes Graves, particularly to smooth the handle end of the pick, and Clutton-Brock recorded some burning on 52% of the Grimes Graves collection studied by her. It has also been noted on picks from other Neolithic sites: the author has seen evidence on a high proportion of the worked antler from Hambledon Hill, and it was common at Hazleton, Maumbury Rings (Bradley 1976), and Barrow Hills, Radley (Levitan and Serjeantson forthcoming).

However, the proportion of antlers from Durrington Walls with evidence for burning was only 15%. As preservation of the bones and antler from the base of the henge ditch at Durrington Walls is exceptionally good, most being white in colour with surfaces barely eroded, the evidence for burning is easily recognised. Work in progress by the author and U Albarella has shown that a high proportion of the bones was exposed to fire. Although the evidence for charring could be missed at other sites, this is unlikely with the material from Durrington Walls, so the low proportion of heat-treated antler is real. Where the use of heat is concerned, Stonehenge is typical of other Neolithic sites; it is Durrington Walls where use of the technique is apparently atypical.

### Removal from the skull

Where the antler was originally attached to the skull the bone was removed and the basic form of the antler base, that is the distal end of the pick, varies according to whether the antler was shed or taken from a slain animal. The base of a shed antler is flat or slightly rounded and

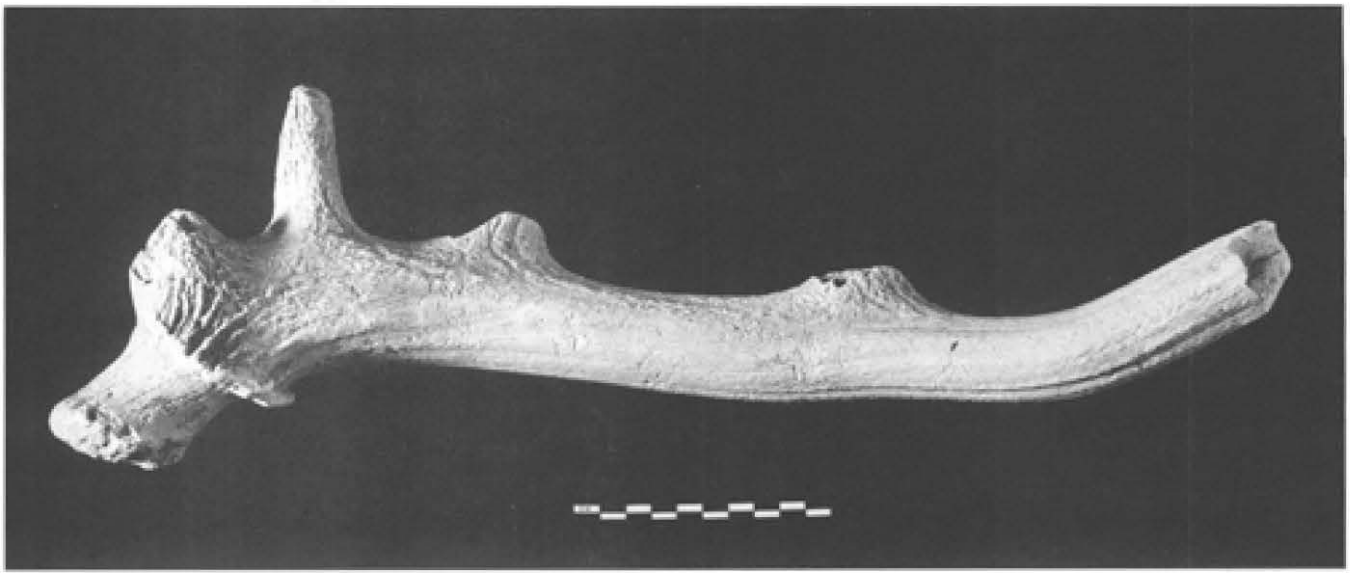


*Fig 233 Antler pick (Hawley cat no 4606, phase 1) using second brow tine. The skull has been removed using heat and chopping, leaving a rounded and smoothed pedicle. The first brow tine is broken, probably smashed off, the bez and trez tines are chopped off with some smoothing. The tip of the utilised tine is worn and chipped. The beam is chopped above the trez tine with no trace of heat cracks. The ends of the pedicle and burr are battered (Wessex Archaeology)*

no modification is needed to that part of the pick before it is used. Where the antler was still attached to the skull, substantial butchery was needed to detach it. Approximately a dozen picks have some of the frontal bone of the skull still attached to the pedicle, as in the case of Hawley cat no 1556c (C20, context 2801; Fig 236). Though the effect is not as careful as in some others, the bone still attached did not prevent these picks from being used. In a greater number (22 out of 29) the skull has been chopped away, leaving only the pedicle.

At least 12 out the the 29 unshed antlers have traces of damage from heat where the skull was removed (Table 47). Two skulls (Hawley cat no 1594j, C26, context 3851 and Hawley cat no 1590q, C21, context 1385) have blackened areas in the interior where the skull has been placed in the fire. No charring or cracking was visible on ten examples, and the evidence was unclear on seven more. On the most finished picks made from unshed antler the pedicle is rounded and smoothed to a neat knob (Fig 233). At least ten finished in this way were noted, from contexts of phases 1, 2 or earlier, and 2a, and one from an unstratified context.

### Separation of beam and crown

In all but a few damaged examples, it was clear where the beam was divided. As already discussed, most (75%) were chopped above the trez tine (as in Fig 233 and Fig 234), apparently close below the crown, and a smaller number (10%) were chopped through the base of the crown. In 15%, the beam was separated above the brow or bez tine, leaving a shorter handle. In 13 examples, both the brow and bez were retained (as in Fig 236), and the beam chopped leaving a shorter than usual handle. In over half of those seen there are traces of the application of heat. In most it had apparently been used to assist the chop. In some it was used to assist in smoothing the handle end, as with some of the pedicles. Where no heat was used, heavy chopping was required, and the marks are clearly visible on some specimens (eg Fig 236).

Finds from excavations by Atkinson *et al*, which include broken and chopped fragments, and the patches of charred material within the ditch already referred to, suggest that antlerworking, and probably reworking, were carried out within the Ditch and other features. Hawley interpreted the finds of chopped and broken tines within the features as the refuse of antlerworking.

### Pick length

Length was recorded (archive table, Antler 1) for the 59 picks which survive to full length, or are only slightly damaged at the handle end. The picks range in length from an exceptional 710mm to 175mm (Fig 237). The mean length is *c* 420mm and most fall between 350mm and 550mm. The mean length of the picks from Grimes Graves (437mm) is therefore greater than Stonehenge, and the mean for those from Durrington Walls is lower (Clutton-Brock 1984, fig 21). Only ten of the picks from Stonehenge are less than 350mm long, a smaller proportion of the total than the substantial group of small picks from Durrington Walls. In this respect the Stonehenge sample is closer to those from the flint mine at Grimes Graves. The pick length is less variable than the length from the burr to the trez tine, which confirms that there tended to be a preferred length of pick.

### Choice of tine

In fewer than half of the antlers studied, the brow tine alone was used, and the bez and trez chopped off, as in Figure 238. In nearly as many (36%), the bez tine was used, and the brow tine chopped off, as in Figure 233.

*Fig 234 Antler pick (Hawley cat no 4735, phase 1) made on a shed antler. The beam has a charred area above the trez tine. The brow and trez tines are chopped off; the bez has an ancient break, ?perhaps damaged in use (Wessex Archaeology)*

In just over 20% both brow and bez tines were retained (Table 47). In a few examples where a tine was broken close to the beam it was not quite clear whether it had been used and had broken off in use, or had been removed deliberately. Hawley (1923, 13) also noted 'A peculiarity about some of the picks is the bes-tine being left on the stock in addition to the brow-tine'.

It is not clear what dictated the choice between the brow or the bez tine. There are several possible explanations. Hawley suggested that:

> this may have been to afford a second point in case of fracture, but more probably to enable the pick to be held in both hands for tearing up loose chalk, the left hand grasping the bes-tine whilst the right held the stock. In one instance the bes-tine is worn smooth by the hand, showing almost certainly that it was so used.
>
> (*ibid*, 13–14)

It could have been dictated by the relative length of the two tines, the curvature, the relative robustness, or the angle of the tine to the beam. The first two are impossible to test, because by the time the pick was discarded or deposited the unwanted tine had been removed and the utilised tine was very worn. The third possibility was also difficult to test, as the only measure of relative robustness would have been the the circumference of the tine close to the beam, and on many of the sample too little survived of the tine which was chopped off to allow reliable measurements to be taken.

The fourth possibility, relating to the angle of the tine to the beam, was examined (Brazier, unpublished). The angle was recorded between the preserved tine, whether brow or bez, and the main shaft, from full size sketches of each antler. For the first group, the brow tine (n=16), all the angles between the brow tines and the beam except one were acute, and the mean angle was 70°. For the bez tine group (n=20), all angles except four were obtuse and the mean was 98°. There is also a great deal of variation within each group (*details in archive, Table Antler 2*). This seems to point at the fact that those who dug the Stonehenge ditches and pits were unspecific about the angle tines made to the main shaft or each other, and the selection may have been made *ad hoc* according to the angle needed for the specific block or area of chalk which was to be worked on.

**Removal of tines**

The tines which were removed were chopped off between about 20mm and 70mm from the beam, occasionally quite cleanly but often crudely and irregularly, leaving splintered ends. Gowland (1902) referred

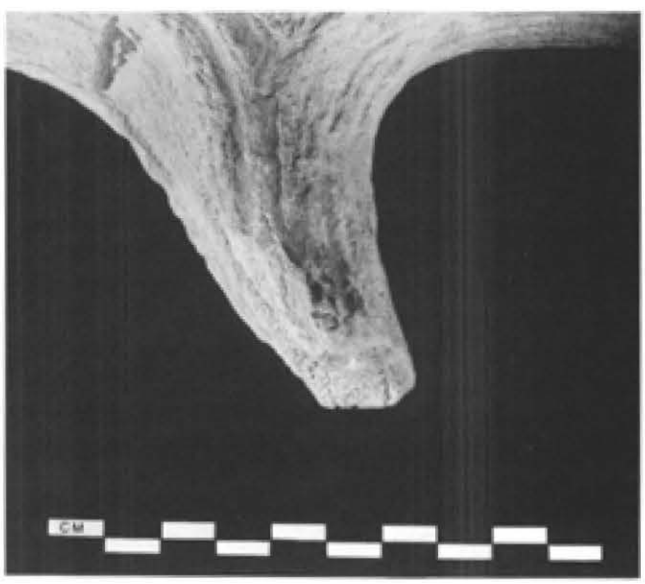


*Fig 235 Detail of antler 4735. Trez tine, chopped off, with patch of charring at chopped end (Wessex Archaeology)*

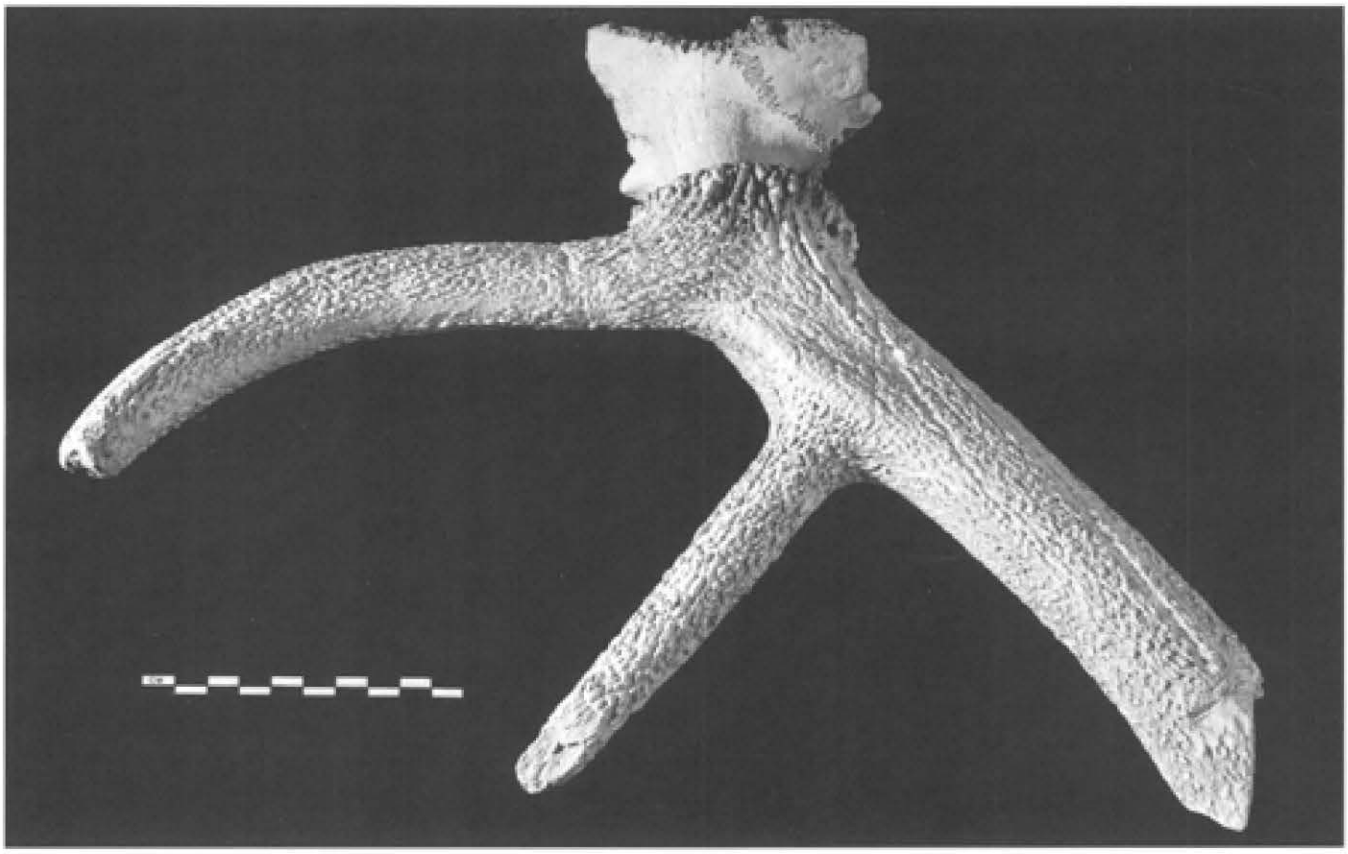


*Fig 236 Antler rake or short pick (Hawley cat no 1556c, phase 1). Part of the frontal and occipital bones remain attached to the pedicle. The beam is broken above the bez tine with clear chopmarks but no heat. The tip of the brow tine is worn, that of the bez worn and chipped. There is no battering (Wessex Archaeology)*

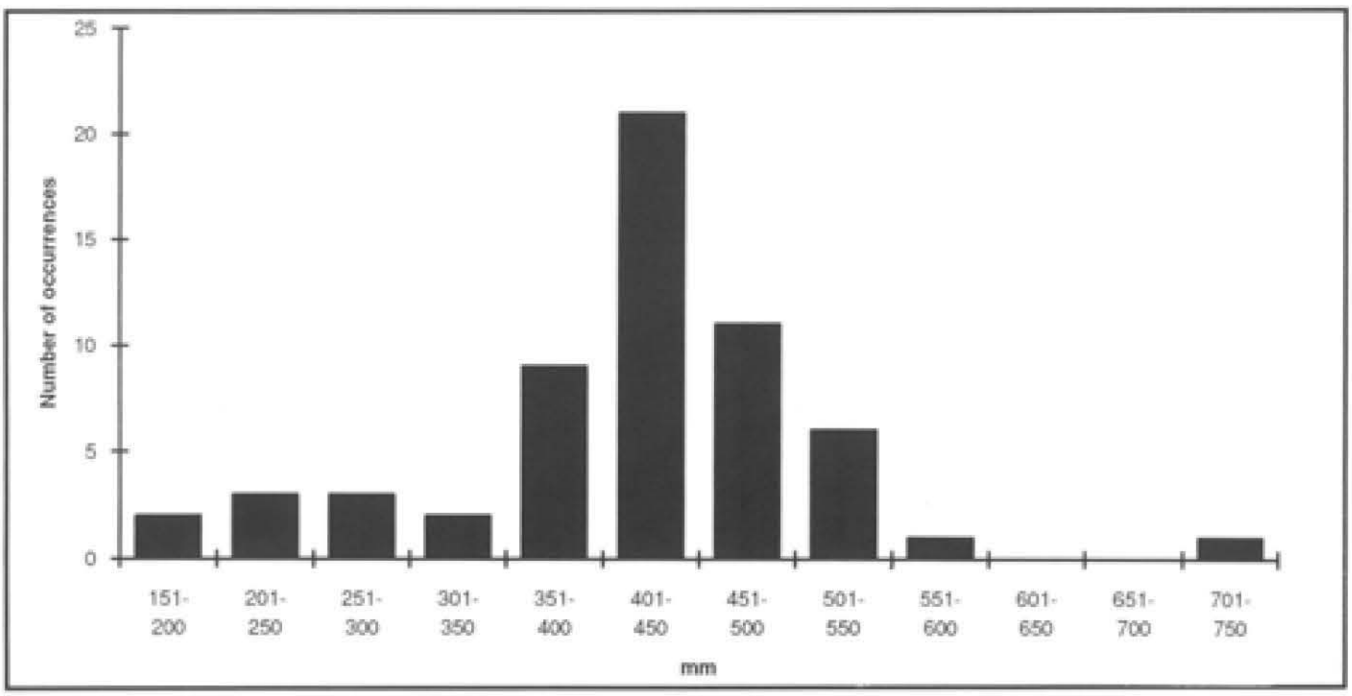



*Fig 237 Length of antler picks (Wessex Archaeology)*

**Table 47 Antler implements: modifications and use wear**

| | *Total* | | *Phase 1* | | *Phase 2-* | | *Phase 2* | | *Phase 3* | | *Post-phase 3* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Modifications*** | *N* | *%* | *N* | *%* | *N* | *%* | *N* | *%* | *N* | *%* | *N* | *%* |
| ***Location of bisecting chop*** | | | | | | | | | | | | |
| *Pick: beam chopped above trez tine* | 50 | 74.6 | 19 | 95.0 | 12 | 57.1 | 7 | 87.5 | 6 | 66.7 | 6 | 66.7 |
| *Pick: beam chopped above bez tine* | 8 | 11.9 | 1 | 5.0 | 3 | 14.3 | 1 | 12.5 | 2 | 22.2 | 1 | 11.1 |
| *Pick: chopped at crown* | 7 | 10.4 | – | – | 6 | 28.6 | – | – | – | – | 1 | 11.1 |
| *Pick or rake: beam chopped above brow tine* | 2 | 3.0 | – | – | – | – | – | – | 1 | 11.1 | 1 | 11.1 |
| *Rake: beam chopped below crown* | 23 | 85.2 | 7 | 77.8 | 13 | 100.0 | 1 | 33.3 | 1 | 100.0 | 1 | 100.0 |
| *Rake: beam chopped at crown* | 4 | 14.8 | 2 | 22.2 | – | – | 2 | 66.7 | – | – | – | – |
| *Uncertain/damaged* | 24 | | 5 | | 5 | | 6 | | 6 | | 2 | |
| *Total* | 118 | | 34 | | 39 | | 17 | | 16 | | 12 | |
| ***Picks: tine used*** | | | | | | | | | | | | |
| *Brow tine used; bez & trez chopped off* | 25 | 42.4 | 7 | 35.0 | 7 | 36.8 | 4 | 50.0 | 4 | 57.1 | 3 | 60.0 |
| *Bez tine used; brow & trez chopped off* | 21 | 35.6 | 8 | 40.0 | 9 | 47.4 | 3 | 37.5 | – | – | 1 | 20.0 |
| *Brow & bez used; trez chopped off* | 13 | 22.0 | 5 | 25.0 | 3 | 15.8 | 1 | 12.5 | 3 | 42.9 | 1 | 20.0 |
| *Uncertain/damaged* | 23 | | 4 | | 6 | | 5 | | 5 | | 3 | |
| *Total* | 82 | | 24 | | 25 | | 13 | | 12 | | 8 | |
| ***Use of Heat*** | | | | | | | | | | | | |
| *Removal of skull — unshed only* | | | | | | | | | | | | |
| *Chopped from skull, using heat* | 12 | 54.5 | 7 | 35.0 | 2 | 33.3 | 2 | 100.0 | – | – | 1 | 33.3 |
| *Chopped from skull, no heat* | 10 | 45.5 | 3 | 40.0 | 4 | 66.7 | – | – | 1 | 100.0 | 2 | 66.7 |
| *Chopped from skull, uncertain* | 7 | | 3 | 25.0 | 3 | | 1 | | – | | – | |
| *Total* | 29 | | 13 | | 9 | | 3 | | 1 | | 3 | |
| *Bisection of beam* | | | | | | | | | | | | |
| *Beam chopped, using heat* | 47 | 56.0 | 16 | 69.6 | 14 | 43.8 | 9 | 81.8 | 4 | 44.4 | 4 | 44.4 |
| *Beam chopped, no heat* | 37 | 44.0 | 7 | 30.4 | 18 | 56.3 | 2 | 18.2 | 5 | 55.6 | 5 | 55.6 |
| *Uncertain/damaged* | 34 | | 11 | | 8 | | 5 | | 7 | | 3 | |
| *Total* | 118 | | 34 | | 40 | | 16 | | 16 | | 12 | |
| *Heat & chop used to remove tines* | 24 | 32.9 | 11 | 50.0 | 7 | 33.3 | 3 | 25.0 | 1 | 10.0 | 2 | 25.0 |
| *Chop only used* | 49 | 67.1 | 11 | 50.0 | 14 | 66.7 | 9 | 75.0 | 9 | 90.0 | 6 | 75.0 |
| *Uncertain/damaged* | 9 | | 2 | | 4 | | 1 | | 2 | | – | |
| *Total* | 82 | | 24 | | 25 | | 13 | | 12 | | 8 | |
| ***Use Wear*** | | | | | | | | | | | | |
| *Pattering on picks* | | | | | | | | | | | | |
| *Battered on pedicle/base, burr, & beam* | 16 | | 2 | | 8 | | 4 | | 2 | | – | |
| *Battered on pedicle/base & burr* | 14 | | 6 | | 3 | | 1 | | 3 | | 1 | |
| *Battered on beam only* | 5 | | 1 | | 1 | | 1 | | 1 | | 1 | |
| *Sub-total battered* | 35 | 46.1 | 9 | 40.9 | 12 | 48.0 | 6 | 50.0 | 6 | 54.5 | 2 | 33.3 |
| *No trace of battering* | 41 | 53.9 | 13 | 59.1 | 13 | 52.0 | 6 | 50.0 | 5 | 45.5 | 4 | 66.7 |
| *Uncertain/damaged* | 6 | | 2 | | – | | 1 | | 1 | | 2 | |
| *Total* | 82 | | 24 | | 25 | | 13 | | 12 | | 8 | |

to finds of 'splinters of antler' which may derive from this process and one tine survives which has been chopped off the beam (S54.85, C41, context 3893, phase 2a). It has evident chopping facets round the base of the tine. There is less evidence of the use of heat in this process compared with dividing the beam.

### Comparisons with other sites

The high proportion of picks in which the bez tine rather than the brow tine was used stands out. The proportion of picks in which the bez tine was used is much higher than at both Grimes Graves and Durrington Walls, but both Stonehenge and Durrington Walls have many picks in which the brow and bez were retained.

## Antlers from Y and Z Holes (phase 3vi or later)

The modifications of the group of six antlers from Y Hole 30 and the Z Holes sets these apart from them from other contexts. Two antlers are complete, with both beam and crow retained, the only examples from Stonehenge. The only evidence for use on one (Hawley cat no 3101e) is two tiny cuts or scratches on one crown tine, and some wear on the crown tines, all damage which could have been done while the antler was still on the deer. This antler was submitted for radiocarbon dating (UB-3823, 3300±19 BP; *see Appendix 2*) and has now been destroyed. The other (Hawley cat no 3101d) has one tine in the crown very battered by use, but is otherwise unmodified. A third (Hawley cat no 3171a) from Y Hole 6 also retains part of the crown, though the crown tines are all broken, and none of the tines appears to have been deliberately removed: the bez tine is lacking but appears to have broken in use. It is not possible to tell if the antler from Z Hole 29 (Hawley cat no 4068b) was originally complete, as the break above the trez tine is recent. It appears to have been modified, as the brow tine was snapped off, probably a deliberate chop.

The only antler in this group which appears to have been exposed to heat is part of a beam with trez tine and part of the crown. This was catalogued as a rake, but is untypical of the rakes discussed above in retaining part of the beam and trez tine.

The only antler from Stonehenge (C34.6, context 1630, Hawley cat no 3171a) which has the narrow parallel grooves found in rodent gnawing is from this group. Rodents are inclined to gnaw on antler rather than bone if it is available. There is no means of telling whether the antler was gnawed before it was used or after it was discarded.

Though this is a small group, the antlers appear to have been used by individuals who did not follow the traditions in the manufacture of antler implements used in the earlier phases.

## Use of picks and rakes

### Picks

It is usually considered that that pick was 'used as a handled wedge' (Atkinson 1979, 97); that is, the tine tip was hammered into a crack in the chalk and the block levered out. Before that, the crack was created by hitting the chalk block, and for this the pick was presumably swung like a modern pick; those who took part in digging the experimental earthwork on chalk at Overton Down found this the easiest way to use them (Ashbee and Cornwall 1961). A block of chalk was found during the excavation of C13 by Atkinson *et al* with the broken tip of a tine embedded in it (Fig 98, *above*). Three tine tips which appear to have broken in use survive from the excavations of Atkinson *et al*. One is from Stonehole 53/54 of one of the Sarsen Trilithons (phase 3ii, C56, context 3516, S64.21). It is *c* 90mm long, broken off in antiquity, with a polished tip and scratches round the tine, probably from use. The second is from the Bluestone Circle (phase 3iv, C17, context 2427, S56.39), a polished and worn tine tip with a single long chip, which itself is slightly polished from continued use. The third is from a disturbed context (S54.910.17, C42,

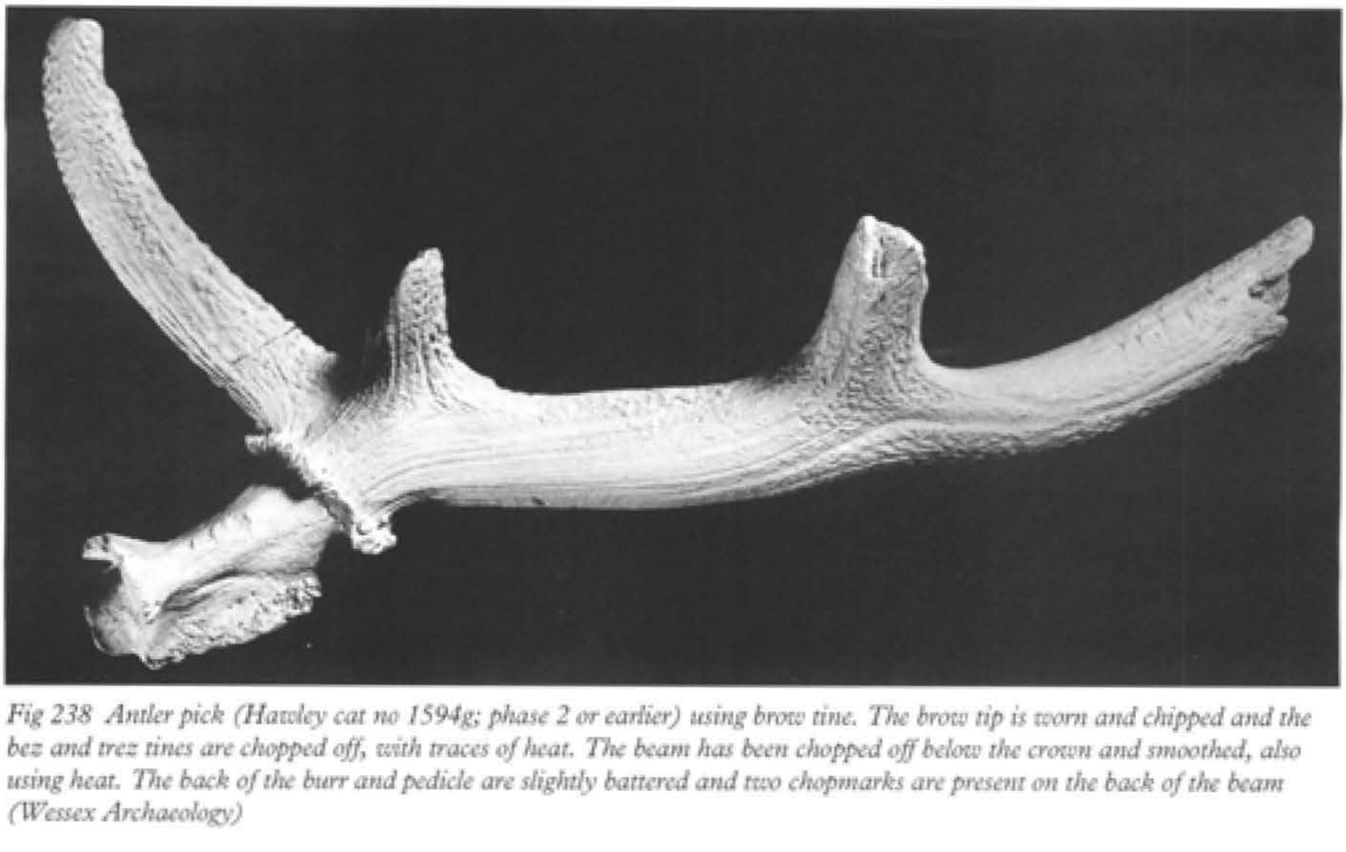


*Fig 238 Antler pick (Hawley cat no 1594g; phase 2 or earlier) using brow tine. The brow tip is worn and chipped and the bez and trez tines are chopped off, with traces of heat. The beam has been chopped off below the crown and smoothed, also using heat. The back of the burr and pedicle are slightly battered and two chopmarks are present on the back of the beam (Wessex Archaeology)*

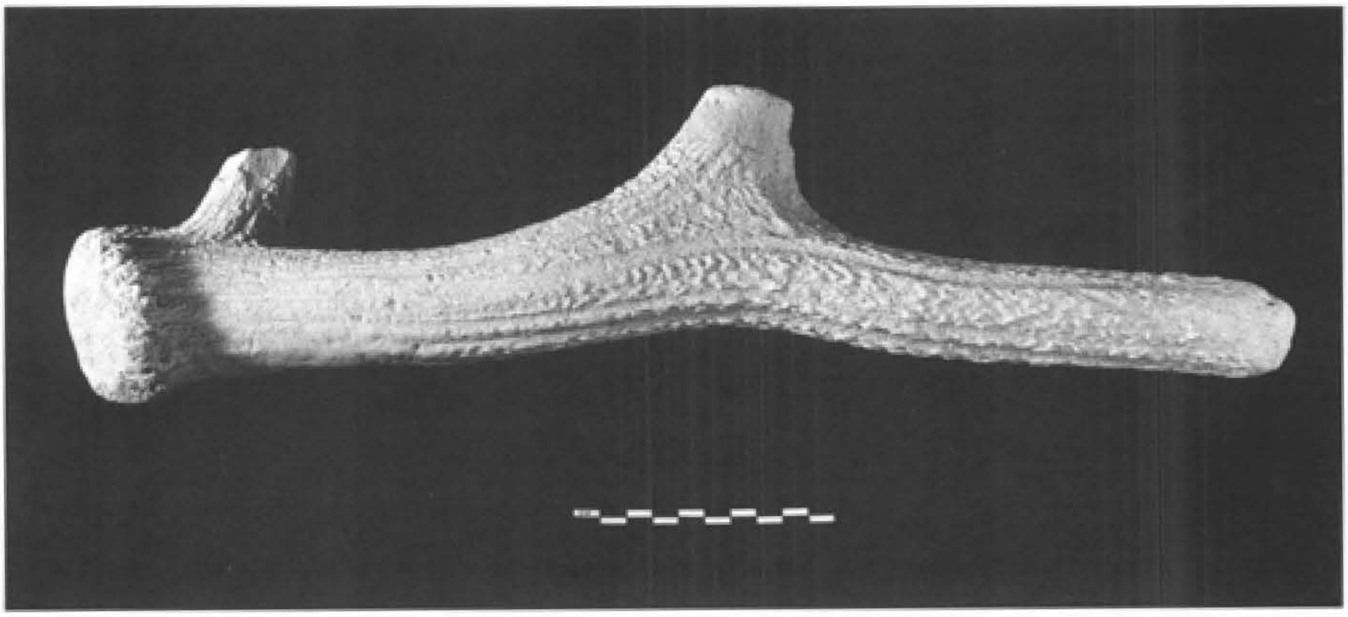


*Fig 239 Antler pick (Hawley cat no 4710, phase 1). Brow (not visible) and trez chopped off with heat cracking. Beam chopped above trez with smoothed end. Base, burr, and beam heavily battered on the back opposite the bez tine. Bez tine worn and chipped (Wessex Archaeology)*

context 3897); it is the tip of a tine, 36.8mm long, broken in antiquity.

When used as a wedge, the back of the pick was hammered; the crushing and battering seen on some picks must have been done with a stone hammer. Just under half (46%) of all the picks show clear traces of battering. Nearly half (16 out of 35) are battered on the base or pedicle, burr, and back or side of the beam (eg C25, context 1552, Hawley cat no 4710; Fig 239) and half only on the burr and base or pedicle; five are battered only on the beam (Table 47). One has been battered on the side.

Legge (1986) points out that short-handled picks are an advantage for working in a confined space, but that they cannot be swung as effectively as longer examples. Paradoxically, the mean length of the picks from Grimes Graves flint mines is longer than from Durrington Walls henge, though the huge henge ditches must have offered more working space than the mine shafts. The reason why the mean length is shorter at Durrington Walls, and also at Stonehenge, seems to be that these assemblages include more short picks with the handle chopped or broken above the bez tine. It is impossible to assess whether these were originally intended as long picks, but broke during manufacture or use and were retrimmed and reused. Though some of these may have been used as rakes, at least four are heavily battered on the burr and/or beam, and were presumably used as wedges in the same way as the longer picks.

Nearly all the tines are worn, and most are damaged in other ways. Only one pick (C29, context 2806, Hawley cat no 2097a) has no wear on the surviving tine, the brow tine. This was found with the beam broken above the bez, and if this was an accidental break during manufacture or first use it may have made the pick useless for its intended purpose.

Tines become worn while still on the head of the deer, for instance when they are rubbed on the ground or on trees to remove the velvet, and in stand-offs and fights with other stags. Polish and traces of wear on an antler tip do not therefore necessarily mean that the tine has been utilised. However, most of the tines from both picks and rakes are chipped, scratched, and/or gouged, as well as worn. In about 10% of the picks small pieces of bone are chipped off the tine used, and three of the rakes have tines which have suffered in the same way. One pick tine only (C28, context 2938, Hawley cat no 1739b, from phase 1) has gouges on the tine. Three tines of rakes have gouges, from both phases 1 and 2. The proportion with scratches or lighter gouges is similar: one pick tine tip and four rakes show this.

In the great majority of the picks, the tine or tines which were used have been broken or worn. The mean length to which the brow tine was reduced was *c* 155mm, and the mean length to which the bez was reduced was shorter, *c* 115mm (Table 46).

### Rakes

The differential wear on the rakes from Stonehenge sometimes suggests how the rake was used. One (C25, context 2934, Hawley cat no 4736) has five tines, the lower tines heavily worn but the higher ones with slight wear only. The former were probably used as the prongs of the rake, whereas the only damage to the latter appears to have been suffered while the antler was still unshed. None of the rakes made on an antler crown has traces of battering. As discussed, some of the short picks with two tines and no battering may have been used as rakes rather than picks.

Antler rakes continued to be made and used into the Roman period (MacGregor 1985, 178). As in earlier periods, they were made either from a red deer antler crown or from the base with the brow and bez tine. The examples from the Roman period usually have a hole by which they were hafted. These are believed to have been used as rakes (for straw or hay) and also as hoes and rakes for loosening the soil.

## Ox scapula shovels

Since Curwen's excavation of Harrow Hill, from which he reported (Curwen and Curwen 1926) the find of an ox scapula with a socket suitable for hafting, and the scapular spine removed, scapula shovels have been included in the lists of typical tools used for digging Neolithic ditches and pits. They received widespread acceptance as a tool because the illustration is reproduced in the influential work *Prehistoric Europe: the Economic Basis* (Clark 1952, 178). Two scapulae were found in the Avenue ditches, one of which (AMS B1, C86, context 9714) survives; the other (AMS3, C86, context 9718) was submitted for radiocarbon dating (Plan 4, Zone C). The identification of the latter as a bovid scapula has been confirmed from the excavation photographs in the site archive.

Altogether 11 cattle scapulae survive from the Stonehenge campaigns, 2 from phase 1 (AB48, C19, context 1288; AB124–30, C26, context 3670), 3 from contexts of phase 2 or earlier (AB1049–51, AB151–3, AB1002–3, C21, context 1385), and 2 from phase 2a (AB60, C20, context 1291); the 2 from the Avenue referred to above; and 2 more from late, disturbed contexts. Even allowing for the fact that the scapula blade tends to survive badly in the ground, this proportion is very small compared to the number of antlers, but is broadly comparable with the numbers of other main cattle limb-bones. On one scapula (AB60) the coracoid process is still fusing, evidence that it is from a calf. The example from the Avenue ditch (Fig 240) is most nearly complete; the others consist of the glenoid end only or broken area of blade, three because they have been chopped, and one (AB60) because the glenoid has been chewed off by a carnivore.

The photographs of AMS3 show only the ventral side of the bone, so it is not possible to say whether the scapular spine was removed. The damage at the proximal end may be from wear, but need not be. No description of boneworking or wear traces survives, but the bone was labelled on a site plan of C86 as 'scapula shovel' (Plan 4, Zone C).

There appears therefore to be at most one scapula shovel surviving from Stonehenge, and that (if it was indeed a shovel) from a late context. In fact, such implements are also rare on other sites. There are no records of modified cattle scapulae at Durrington Walls

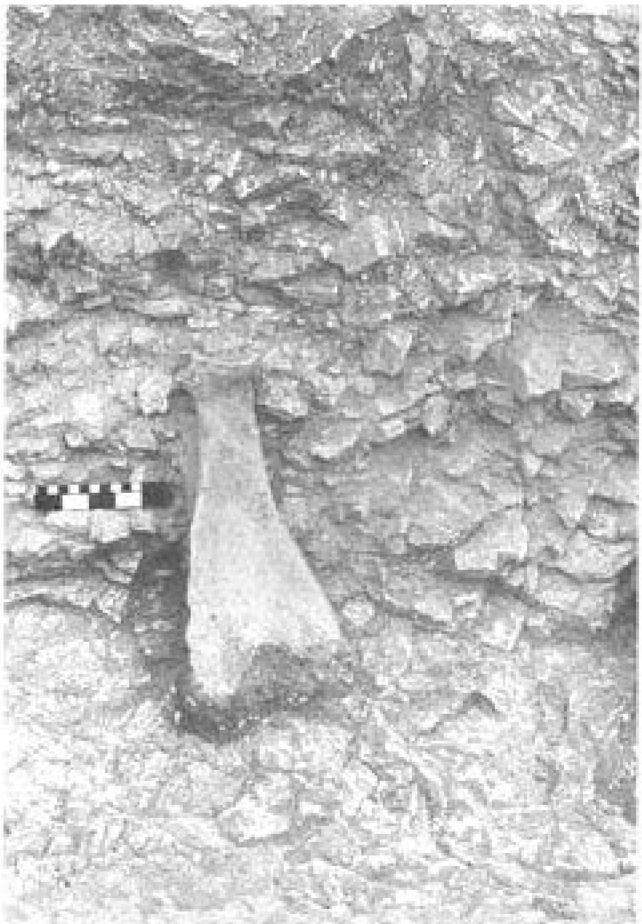


*Fig 240 Cattle scapula (AMS 3, context 9718) on the base of the Avenue ditch in C86 (Vatcher archive V2/6)*

(Wainwright and Longworth 1971) or Grimes Graves (Legge 1981), both sites where the faunal remains as well as the antler tools have been examined in detail. The only site where a collection of scapulae clearly modified for digging has been found is the Early Bronze Age settlement at Ardnave, Islay, Scotland (Harman 1983). The soils on Ardnave are sandy and lighter than those on the chalk, and here a scapula could have been used as a shovel or spade. The experimental construction of the earthwork at Overton Down (Ashbee and Cornwall 1961) showed that the scapula was very inefficient on chalk and attempts to use it there were abandoned.

In view of the scarcity of finds from sites excavated since the 1930s which would confirm Curwen's claim that scapulae were used as shovels, it would seem preferable that the shovel made on an ox scapula should cease to be included with the repertoire of digging tools from Neolithic sites on chalk geology.

## Discard and deposition

It is clear from Hawley's accounts that antler picks and rakes were very often found both on the base and in the fill of the Stonehenge Ditch and in other features (Fig 229). Deposition of antlers at other sites has been interpreted in purely functional terms (Wainwright and

Longworth 1971), but it may also have a non-utilitarian character. Interpretation of antler deposition at Stonehenge is to some extent complicated by the absence of detailed context descriptions for most of the collection and the loss of the small fragments, though as discussed, the antler implements, if at all complete, appear to have been kept.

Only one antler from phases 1–2 appears to have been gnawed by a dog or other carnivore (Hawley cat no 1594h, C26, context 2927, phase 2–). Though there is no medullary cavity in antler, and it is therefore less attractive to dogs than long-bones which contain marrow, they will chew on antler for the other nutrients it contains. Of the identified bones from phases 1 and 2 (excluding skeletons), 12% are gnawed (*see below*), a similar proportion to that found on other Neolithic sites (Serjeantson 1991). The proportion of antler which has been chewed, less than 2%, is therefore small. This suggests that implements were covered rapidly after they were discarded or deposited, which fits the fact that most were found on the base of the ditch and in the primary fills which would have accumulated fairly rapidly.

The strongest evidence in favour of a functional explanation for antler finds is that the used tines are all worn, and nearly all were well worn if not worn out when discarded. In many the tine which was used has broken in use. In some picks the beam was broken in antiquity. According to Hawley's description, at least one pick (Hawley cat no 4715, C25, context 2815) was accidentally burned so heavily that it broke, and was discarded as unusable. The only unmodified antler, as discussed, is from phase 3, Y Hole 30.

The rakes were less obviously well worn or broken. There is an imbalance between the number of picks (82) and rakes (27), despite the fact that each antler potentially yielded one of each. One reason for the imbalance may be that picks were specifically selected for deposition after completion of a piece of work, but the alternative is that the pick was more important functionally than the rake, and became broken and worn more quickly, so more of these are likely to have been used than rakes. Few useful elements remain on a pick with very worn tines, whereas some of the tines on the discarded rakes could have been used as points or wedges.

Though there are functional reasons for discarding antlers, this does not rule out a ritual element in the deposition, and the circumstances of the finds at Stonehenge are compatible with deliberate deposition on the floor of the Ditch. According to the published reports, at least one group of antlers from phases 1 and 2, those found at the base of C25, appears to have been deliberately placed. The same may well be true of the individual remaining antlers found in phase 1 contexts, which were unequivocally stratified on the base of the Ditch, and also of some of the phase 2 or earlier antlers, which are from undifferentiated phase 1 or phase 2 Ditch fills or from early phase 2. The second set deposited together is the late anomalous group in the base of Y Hole 30 (phase 3). The deposition of stacks or groups of antlers does not necessarily imply a high level of 'ritual' activity but is clearly a deliberate act.

The distribution of the antlers must also be viewed alongside that of other artefacts, notably the chalk and small bone and antler objects and certain deposits of animal bone (*see below*). These distributions are discussed in detail above (*Chapter 5*). There is certainly some element of deliberate deposition in the placing of these objects.

Antlers have been found discarded in groups on other Neolithic sites, apparently deliberately. At Durrington Walls, 57 antlers were found together at the base of the main enclosure ditch, 18m from the terminal (Wainwright and Longworth 1971, 187); at Barrow Hills, Radley, a group was found arranged round the perimeter of a cut feature (Levitan and Serjeantson forthcoming), and groups of antlers have been found on the base of some flint mines. The interpretation of these groups has been that it was considered important to deposit the picks on completion of the work. It is surprising that there is not more positive evidence for deliberate placing of antlers and groups of antlers in the Stonehenge Ditch.

## Conclusions

Although the antler implements from Stonehenge have many of the familiar features of those from other Neolithic sites, some additional characteristics of antlerworking have been identified in this assemblage.

It has been observed in the past that the antler was exposed to a fire or to heat prior to being worked. Traces of this process were recorded on about half of the Stonehenge collection, and the rest were worked using chopping only. Heat treatment was recognised not only from colour change, which was not very common, but from the characteristic cracking and exfoliation of the surface. Except in the studies referred to above, the incidence of heat treatment of antler and bone has probably been underestimated in the past.

The typical pick is thought of as one in which the brow tine is used and the others removed. At Stonehenge almost as many of the picks use the bez tine as the brow tine and over 20% retain both tines. There was no obvious reason why either tine was selected. Though the typical pick is between about 350mm and 550mm long, there is a significant proportion of short picks. These probably served as wedges or rakes, rather than swung picks. The range of pick types and sizes is greater at Stonehenge and Durrington Walls than at Grimes Graves. Left and right hand antlers are present in approximately equal numbers, compared to one set from Grimes Graves which was more highly selected for the left side antler. That would fit well with the hypothesis that Grimes Graves was excavated by specialists, whereas a wider range of individuals in the community contributed to the excavation of the ceremonial sites.

A higher proportion of the antlers from Stonehenge are from hunted animals than among those from Grimes

Graves or Durrington Walls. This could reflect the fact that the antlers had to be obtained quickly, as the construction of the Ditch appears to have taken place over a relatively short time. Alternatively it may reflect the high prestige of the site.

The deposition may have had a ritual or at least non-functional element, as many picks were placed on the bottom of the ditches in similar positions to some of the placed deposits of bone and other artefacts, as though deposited on completion of the work, but all appear to have been discarded after heavy use, probably when no longer usable.

The role of 'scapula shovels' has been overemphasised in the literature. Scapulae may have been used occasionally, but few were found at Stonehenge, and there is no evidence that any of these were modified or used as shovels. This may, at least in part, be related to their relative inefficiency in chalk.

## Copper alloy 'bead' and awl

*by Andrew J Lawson*

Only two metal objects of possible pre-Iron Age date have been identified (Fig 241). These are a copper alloy 'bead' and an awl. The 'bead' is from a phase 3 or later context, namely the upper fill of Aubrey Hole 18. The awl comes from the Stonehenge Layer over the Ditch near the north-eastern terminal (C24).

### Awl or bradawl

This simple copper alloy awl or bradawl (WA obj no 491; Fig 241, 1) is a fragment from which both ends are missing. It has been published by Moore and Rowlands (1972, no 87). Awls are amongst the earliest metal objects in the British Isles as implied by the hoard from Knocknague, Co Galway (Burgess 1979, 209). However, these first examples, contemporary with early Beakers are double-pointed and probably of copper. Bronze awls with one end squared or made rectangular in section are considered to be later (Burgess 1979, 209, stage VI), contemporary with Wessex style burials and broadly contemporary with the stone monuments of Stonehenge (phase 3). This is conveniently demonstrated by the grave goods, including three different single-pointed awls, from the Manton Barrow, Preshute G1a (Annable and Simpson 1964, no 207). This burial, typical of Gerloff's Wessex I/II Wilsford Series, is dated around 1600 calendar years BC (Gerloff 1993, 74–86). Such awls are not uncommonly found in burials of the Early Bronze Age; excavations in Wiltshire by Colt Hoare and Cunnington as well as later excavators produced more than 30 examples (Annable and Simpson 1964; Moore and Rowlands 1972, 46; Gingell 1988, fig 38). Although this simple type occasionally recurs in later contexts, for example the Middle Bronze Age hoard from Monkswood, Somerset (*Inv Archaeol* GB 42, no 19), or the Late Bronze Age assemblages from Thorndon, Suffolk (*Inv Archaeol* GB 11, no 5), and Heathery Burn, Co Durham (*Inv Archaeol* GB 55, no 89), it is most likely that the example from Stonehenge is of Early Bronze Age date. Although the type has been found among grave goods elsewhere, it is likely that it was a relatively common utilitarian tool, and no particular status can be afforded to its deposition or loss at Stonehenge.

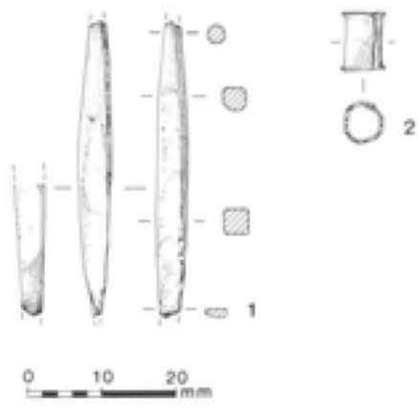



*Fig 241 Copper alloy awl and bead. Scale 1:1*

### 'Bead'

This object (WA obj no 77; Fig 241, 2) is a small tubular sheet copper or alloy 'bead'. Such items were made from Beaker times as shown by the Migdale hoard, Sutherland (*Inv Archaeol* GB 26, nos 11–53; Burgess 1979, 209). However, similar isolated finds such as that from Stonehenge are not sufficiently distinct in form to enable a secure date to be offered. Indeed, this object could be of almost any date. The cremations within the Aubrey Holes are likely to date from the early–middle third millennium cal BC; it is unlikely that this object is as early as this, and hence may be regarded as intrusive. If the object were of late third millennium date and were not intrusive, it might indicate a Beaker date for the cremation. However, this is stretching the evidence.

Fig 241

1 Awl or bradawl. Copper alloy (not analysed), both tips missing. One tapering end has circular cross-section but shank is squared showing poor workmanship, other end originally flattened. L 39, W (max) 4.5. *WA obj no 491; Hawley cat no 4703; C24; context 1423; phase 89; group 00*

2 'Bead'. Copper alloy cylindrical sheet object (not analysed) with flanged ends formed from single strip of overlapping metal. L 8 diam 6. *WA obj no 77; Hawley cat no 4543a; C34.18; context 1566; phase 3+, group 37*

# Other finds

## Coins

*by John A Davies*

Only those coins actually examined by the author are discussed here. The finds database held in archive includes coins for which contexts could be assigned but which could not be positively identified amongst those examined, though some of them are almost certainly present, and others are clearly missing. Since the excavators' identifications of some of the surviving coins are incorrect it was felt unwise to include these in the discussion.

Thirty-eight coins have been assembled from the excavations at Stonehenge. They cover a wide date range and can be separated into four chronological groups, relating to the Roman, Late Saxon, medieval, and post-medieval periods. The largest of these groups is Roman.

There are 20 Roman coins. All are bronzes and the varying degree of surface wear indicates that they have undergone widely differing lengths of circulation. Their chronological range spans the whole period from the earliest years of Imperial rule to the final years of Roman Britain. There are three issues of the first century AD. The earliest is a *dupondius* of Antonia, mother of Claudius, dating from AD 41–50. There are two *asses*, of Nero, struck between AD 63–68, and Domitian, of AD 81–96. The *dupondius* is in better condition than the *asses*, which are very worn and appear to have seen prolonged circulation.

The coin list is light during the second century, with just one *sestertius* of Marcus Aurelius (161–180), before the sequence revives in the later third century. There are four *antoniniani* dating from 268–284, which exhibit varying degrees of wear. The bulk of the collection belongs to the later fourth century, with the remaining 12 coins all having been struck between 330–395. Again, they exhibit a wide range of condition. From Hawley's catalogue entries it is likely that more of the coins recovered were bronzes of the later third and fourth centuries.

These coins cover the duration of Roman Britain and contain some of the very earliest and latest types to enter the province. The collection contains a range of types that might be expected from a small site of long duration. Individual issues belong to the most prolific episodes of coin loss in Britain, in particular those of the late third and later fourth centuries. Both were periods when the currency was dominated by large numbers of small bronze coins. However, the emphasis of loss in the latter period is slightly high if this group were to be compared with a typical site assemblage. The chronological distribution of these coins can be summarised, employing the main phases of coin production.

Phase A (To AD 259) 4; phase B (259–294) 4; phase C (294– 30) 0; phase D (330–402) 12.

Following the Roman period, there is a gap in the coin list until the Late Saxon period, when there is a single silver penny of Aethelred II (978–1016). This long cross type was struck at the mint of London. There is a single medieval coin. This is a silver cut halfpenny of Henry II, of his 'Tealby', cross-and-crosslets issue, of 1158–1180.

The next losses occurred much later, during the reign of Elizabeth I. These are a silver sixpence and halfgroat, both from her fifth issue coinage (1582–1600). The seventeenth and eighteenth centuries are then well represented by a steady presence of copper and bronze denominations, from Charles II (1675) to George III (1799). There are no trade tokens or jettons in the assemblage. The final losses are two twentieth-century pennies of George V (1910–1936).

### Catalogue of coins

The coins are listed in chronological order of issue. The degree of wear has been indicated for individual coins. These abbreviations are used against each coin face: (w) = worn, (f) = fair, (g) = good, (v) = very. RIC = *Roman Imperial Coinage*; BMC = *British Museum Catalogue*; North = North 1963.

Roman

1 Antonia. *Dupondius*. *c* AD 41–50. *Obv* ANTON[IA] AVGVSTA (w); *Rev* [TI CLAVDI]VS CAESAR AVG PM TRP IMP; SC (f). *WA obj no 583; Gowland; C64; context 4081; phase 87; group 00*

2 Nero. *As*. AD 62/3–68.*Obv* ---ESAR AVG--- (vw); *Rev* illegible, worn flat (vw). *Context 3813; unstratified*

3 Domitian. *As*. AD 81–96. *Obv* illegible (vw); *Rev* illegible (vw). *WA obj no 569; Hawley cat no 1297a; C10; context 2210; phase 89; group 00*

4 Marcus Aurelius. *Sestertius*. AD 161–180. *Obv* illegible (vw); *Rev* illegible. Female figure standing right holding sceptre left, and figure of Victory right; SC (w). *WA obj no 584; Gowland; C64; context 4050; phase 89; group 00*

5 Claudius II. *Antoninianus*. AD 268–270. *Obv* IMP C[CL]AVDIUS AVG (g); *Rev* [G]E[NI]VS EXERCI (f); Rome mint. RIC 5, 48. *Context 3813; unstratified*

6 Tetricus I. *Antoninianus*. AD 270–274. *Obv* illegible (vw); *Rev* illegible (vw). *WA obj no 565; Hawley cat no 363b?; C1; context 3661; phase 88; group 00*

7 Tetricus II. *Antoninianus*. AD 270–274. *Obv* illegible (vw); *Rev* [SPES ---] (vw). *WA obj no 574; Hawley cat no 4051; C34.14; context 1926; phase 89; group 00*

8 Barbarous radiate: Tetricus I type. AD 270–284. *Obv* [IMP TE]TRICVS AVG (vg); *Rev* LETIT[IA] (vg); diam 14mm. *Context 3813; unstratified*

9 Constantine I. *Follis*. AD 332–333. *Obv* VRBS [ROMA] (g); *Rev* Wolf and twins (g); Trier mint; RIC 7, 542. *WA obj no 561; C17; context 3636; phase 81; group 00*

10 Constantine II. *Follis*. AD 333–334. *Obv* CONSTANTINVS IVN NC (g); *Rev* GLORIA EXERCITVS, 2 standards (g); Arles mint; RIC 7, 376. *WA obj no 581; Hawley cat no 1845b; C28; context 2562; phase 89; group 00*

11 House of Constantine. Irregular *follis*. AD 341–346. *Obv* illegible (vw); *Rev* [GLORIA EXERC]ITVS, 2 standards (w); diam 15mm. *WA obj no 568; Hawley cat no 1143b; C10; context 2128; phase 89; group 00*

12 Constans. AE3. AD 347–348. *Obv* [DN CONSTA]NS PF AVG (g); *Rev* VOT/XX/MVLT/XXX; within wreath (f); mintmark missing. *WA obj no 582; C24; context 1423; phase 89; group 00*

13 Magnentius. AE2. AD 351–352. *Obv* illegible. Letter A behind bust (f); *Rev* [VICTORIAE DD NN AVG ET CAE] (f); Amiens mint; as RIC 8, 20. *WA obj no 575; C34.10; context 1644; phase 89; group 00*

14. Magnentius. AE2. AD 350–353. *Obv* illegible (vw); *Rev* [SALUS DD NN AVG ET CAES]; Chi-Rho (vw). *WA obj no 578; C7; context 1783; phase 89; 00*

15 House of Constantine. AE3. AD 350–360. *Obv* illegible (vw); *Rev* [FEL TEMP REPARATIO], falling horseman (vw). *WA obj no 573; C3; context 3847; phase 89; group 00*

16 House of Constantine. Irregular. AD 354–364. *Obv* illegible (vw); *Rev* [FEL TEMP REPARATIO], falling horseman (w); diam 9mm. *WA obj no 560; Vatcher; C81; context 9797; phase 79 group 00*

17 Valens. AE3. AD 367–375. *Obv* DN VALENS PF AVG (vg); *Rev* SECVRITAS REIPVBLICAE (vg); Siscia mint; RIC 9, 15b. *Context 3813; unstratified*

18 House of Valentinian. AE3. AD 364–378. *Obv* illegible (vw); *Rev* [GLORIA ROMANORVM] (vw). *Context 3813; unstratified*

19 House of Valentinian. AE3. AD 364–378. *Obv* illegible (vw); *Rev* [SECVRITAS REIPVBLICAE] (vw). *Context 3813; unstratified*

20 House of Theodosius. AE4. AD 388–395. *Obv* illegible (vw); *Rev* [SALVS REIPVBLICAE] (w). *WA obj no 572; Hawley cat no 4666; C23; context 1416; phase 89; group 00*

Saxon

21 Aethelred II. Penny. AD 997–1003. Long cross type, slightly chipped flan. *Obv* +EDELRED REX ANGLO (g); *Rev* +EDELPERD MO LVND (g); Weight 1.65g, diam 19mm Die-axis 270°. London mint; Moneyer: Aethelwerd; North 774; BMC iva. *WA obj no 567; Hawley cat no 735; C7; context 1741; phase 88; group 00*

Medieval

22 Henry II. Cut halfpenny. AD 1158–1180. Cross-and-crosslets ('Tealby') type; *Obv* illegible (vw); *Rev* illegible (vw). *WA obj no 585; CEU; C92; context 4139; phase 87; group 00*

Post-medieval

23 Elizabeth I. Sixpence. AD 1582. *Obv* ELIZABETH D G ANG FR ET HI REGINA (g); *Rev* POSVI DEV ADIVTORE M MEV (g); mintmark = bell; 5th issue. *WA obj no 586; Hawley cat no 181c; C1; context 1051; phase 88; group 00*

24 Elizabeth I. Halfgroat. AD 1591–1594. *Obv* E[D G] RO[SA SINE S]PINA (vw); *Rev* [CIVIT]AS LON[DON] (w); London mint; mintmark = tun; 5th issue. *WA obj no 579; C7; context 1807; phase 89; group 00*

25 Charles II. Copper farthing; AD 1675. *Obv* CAROLVS.A.CAROLO (w); *Rev* BRI[TAN]NIA 1675 (w). *WA obj no 580; Hawley cat no 363a?; C2; context 1072; phase 89; group 00*

26 James II. Farthing. AD 1685–1688. *Obv* [IACOBVS SECVNDVS] (vw); *Rev* [BRITANNIA] (vw). *WA obj no 587; Gowland; C64; context 4081; phase 89; group 00*

27 William III. Halfpenny. AD 1694–1702. *Obv* [GVLIELMVS TERTIVS] (vw); *Rev* [BRITANNIA] (vw). *WA obj no 570; C2; context 1072; phase 89; group 00*

28 George I. Halfpenny. AD 1714–1727. *Obv* GEORGI[VS REX] (vw); *Rev* [BRITANNIA] (vw). *WA obj no 588; Gowland; C64; context 4078; phase 82; group 00*

29 George II. Farthing (young bust). AD 1732. *Obv* GEORGIVS II REX (vg); *Rev* BRITANNIA 1732 (vg). *WA obj no 564; Hawley cat no 181d; C1; context 1058; phase 87; group 00*

30 George II. Halfpenny (young bust). AD 1734. *Obv* GEORGIVS II REX (g); *Rev* BRITANNIA 1734 (g). *WA obj no 589; context 3813; unstratified*

31 George II. Halfpenny (young bust). AD 1739. *Obv* [GEOR]GIVS II [RE]X (w); *Rev* BRITANNIA 1739 (f). *WA obj no 571; C2; context 1072; phase 89; group 00*

32 George II. Halfpenny. AD 1727–1760. *Obv* [GEORGIVS II REX] (vw); *Rev* [BRITANNIA] (vw). *WA obj no 590; Gowland; C64; context 4091; phase 89; group 00*

33 George III. Halfpenny. AD 1774. *Obv* GEORGIVS III REX (f); *Rev* BRITANNIA 1774 (f); London mint; 1st issue. *WA obj no 562; C3; context 1126; phase 86; group 00*

34 George III. Halfpenny. AD 1799. *Obv* GEORGIVS [III DEI] GRATIA REX (f); *Rev* BRITANNIA [179]9 (f); Soho mint; 3rd issue. *WA obj no 591; Atkinson cat no S53.43; C34.16; context 3026; phase 60; group 42*

35 George III. Halfpenny. AD 1799. *Obv* [GEOR]GIVS [III DEI GRATIA] REX (f); *Rev* [BRITANNIA] 1799 (f); Soho mint; 3rd issue. *WA obj no 563; C3; context 1126; phase 86; group 00*

36 George III. Halfpenny. AD 1799. *Obv* GEORGIVS III DEI GRATIA REX (f); *Rev* BRITANNIA [17]99 (f); Soho mint; 3rd issue. *WA obj no 566; Gowland; C64; context 4051; phase 89; group 00*

37 George V. Penny. AD 1913. *Obv and Rev* (g). *WA obj no 576; C36; context 3031; phase 89; group 00*

38 George V. Penny. AD 1920. *Obv and Rev* (g). *WA obj no 577; C36; context 3031; phase 89; group 00*

## Metalwork

*by R Montague, identification of gilding and X-rays by Margaret Brooks*

In addition to the two copper alloy objects described above, 85 metal objects from unphased contexts are extant in the collections of Salisbury Museum. It is known from his diaries that Hawley recovered other metal objects but that these were not retained by him. None of these items is from a phased context and none is typologically earlier than Iron Age in date. Details of all metalwork finds can be found in the finds database housed with the main archive. A summary catalogue only is provided here; none of the objects is illustrated.

There is a wide range of objects present but with the exception of the billhook/scythe, chisel, awl, gin trap, and possibly some of the unidentified fittings, all the objects may be seen as representing personal ornaments, dress fittings, or other portable items which could have been carried on the person (or horse). The small number of Romano-British objects are personal items such as brooches, pins, and toilet implements but the majority of pieces are medieval and post-medieval/modern. Most probably represent accidental losses by tourists, picnickers, shepherds, visitors to the fairs regularly held at the monument during the nineteenth century (see Chapter 8 and Chippindale 1983 for discussion of the medieval and post-medieval history of the site), and the nails, horseshoe fragments, and miscellaneous bits and pieces may again derive from the fairs or represent traffic along the former cart-tracks.

It is of some interest that, of the seven medieval arrowheads recorded, three are hunting types (WA obj no 522, 523, and 524), and the remaining four are all essentially military forms, probably for use with a crossbow. There is no particular reason why they should have been lost in anger but the presence of these three arrowheads may be a further indication of the long history of military activity on Salisbury Plain.

### Catalogue of metal objects

SSWM = Salisbury and South Wiltshire Museum catalogue (Saunders and Saunders 1991); MLDA = Museum of London Dress Accessories catalogue (Egan and Pritchard 1991).

1 Ring, iron. Broken, int diam 5.0. *WA obj no 57; Hawley cat no 4083/A/1; C33.2; context 1574; phase 60; group 43*

2 Part of lock or padlock, iron. Rectangular cross-section. *WA obj no 61; C22; context 1398; phase 80; group 00*

3 Nail, iron. *Gowland; C64; context 4078; phase 82; group 00*

4 Sheet fragment, copper alloy. Long edges slightly burred, no decoration, ?modern. L 57.7 W 12.2 T 0.2. *WA obj no 546; Gowland; C64; context 4078; phase 82; group 00*

5 Horseshoe fragment, iron. *WA obj no 550; Gowland; C64; context 4117; phase 82; group 00*

6 Tack, gilded copper alloy. flat circular head split into 6 segments by radial incisions. Head diam 14.6; shank L 19, square section tapering to point. ?Medieval. *WA obj no 81; Gowland; C64; context 4117; phase 82; group 00*

7 Nail, iron. *Hawley cat no 362; C12; context 2722; phase 87; group 00*

8 Cleat, iron. *Hawley cat no 361; C12; context 2722; phase 87; group 00*

9 Pin, copper alloy. Broken at both ends, circular section, surviving L 44, diam 0.8. *WA obj no 70; Hawley cat no 363; C12; context 2722; phase 87; group 00*

10–14 Fittings, copper alloy, one ?silver gilded, ?two plated. Various small strips and sheets with holes, studs, and hooks for attachment. *WA obj nos 76–80; Hawley cat nos 363, 359, 360, 370a; C12; context 2722; phase 87; group 00*

15 Chape, copper alloy. sheet folded over lengthways then lower ends folded. Two incised lines on front surface at open end, small hole in rear surface. Similar to examples from North Elmham, Norfolk (Wade-Martins 1980, fig 263, 18, 19). Medieval/post-medieval. *WA obj no 529; Hawley cat no 358; C12; context 2722; phase 87; group 00*

16 Awl, iron. Badly corroded, circular section changing to rectangular at one end. Other end slightly clenched. L 121.4 diam (centre) 13.8. ?Medieval. *WA obj no 512; Gowland; C64; context 4065; phase 87; group 00*

17 Chisel, iron. Rectangular, broken, slightly expanded and burred chisel end. L 47.1 W 18.0 T 15.0. *WA obj no 513; Gowland; C64; context 4065; phase 87; group 00*

18 Nail, iron. *Gowland; C64; context 4082; phase 87; group 00*

19 Knife, iron. Small, tanged, slightly angled back. L 41.7 W 11.4 tang T 3. Saxon or medieval. *WA obj no 544; Gowland; C64; context 4099; phase 87; group 00*

20 Arrowhead, iron. Bullet-headed, SSWM cat no 99. L 53.4. Medieval. *WA obj no 527; Hawley cat no ?646; C7; context 1734; phase 87; group 00*

21 Knife, iron. Blade only, tang broken. *WA obj no 54; C7; context 1736; phase 87; group 00*

22 Brooch, copper alloy. ?Early crossbow type, bow broken, crossbow heptagonal in section terminating with bead and reel; central knob of reel missing; pin almost complete. Compares well with Bushe-Fox 1928, 43, no 14, pl xvii. Romano-British, ?3rd century. *WA obj no 534; Hawley cat no 529; C7; context 1699; phase 88; group 00*

23–24 Fittings, iron. One possibly an angle binding. *WA obj no 59, 64; Hawley cat no 563, 564; C7; context 1717; phase 88; group 00*

25 Fiddle key nail, iron. *Hawley cat no 721; C7; context 1738; phase 88; group 00*

26 Ferrule, iron. Perforated at wider end, circular section. *WA obj no 55; Hawley cat no 720; C7; context 1738; phase 88; group 00*

27 Belt fitting, silver. Double hooked fastener, sheet silver in one piece with decorated oval plate in centre. Side arms bent to accommodate thickness of *c* 7.5 mm. Scratched and incised lines around edge of central plate and along central axes. *Cf* Margeson 1993, copper alloy fasteners 80 and 81, fig 9. L 30.8 W 13.2 T 0.4. *WA obj no 535; Hawley cat no 707; C7; context 1738; phase 88; group 00*

28 Fitting, iron. Spike, flattened and expanded at other end and bent round. *WA obj no 65; C7; context 1816; phase 88; group 00*

29 Tack, gilded copper alloy. Slightly domed head, with incised lines dividing head into 6 segments, traces of gilding in incisions. Shank has square section. Compares with MLDA fig 1301. Diam 18.7 T 0.6, shank L 16.1. Medieval. *WA obj no 528; C7; context 1973; phase 89; group 00*

30. Jew's harp, copper alloy. Reed missing. Post-medieval/modern. *WA obj no 66; Hawley cat no 1078b; C10; context 1986; phase 89; group 00*

31 Sheet fragment, copper alloy. L 15.5 W 12.2 T 0.5. *WA obj no 74; Hawley cat no 1250a; C10; context 2158; phase 89; group 00*

32 Toilet implement, copper alloy. Spoon probe, slightly bent; octagonal sectioned shaft, bead moulding, spatulate end broken. L 117.8, max diam 3.9. Romano-British. *WA obj no 531; Atkinson cat no S56/1; C12; context 2654; phase 89; group 00*

33 Fitting, iron. *WA obj no 60; C14; context 3196; phase 89; group 00*

34 Bell, copper alloy. Fragment of ?rumbler bell with punched decoration in 3 concentric circles and remains of central circle segmented by punched lines. Medieval. *WA obj no 530; Hawley cat no 449a; C16; context 2392; phase 89; group 00*

35 Toilet implement, copper alloy. Concave blade with serrated back, bead and reel moulding at junction with subcircular sectioned shaft with perforated terminal. L 51.0, W 6.3 T 0.8. Romano-British. *WA obj no 532; Hawley cat no 449B/1263A; C16; context 2392; phase 89; group 00*

36 Hobnail, iron. C1; context 1050; phase 89; group 00

37 Ring, copper alloy. Min int diam 19.5, wire T 3. *WA obj no 71; Hawley cat no 181e; C2; context 1050; phase 89; group 00*

38 Armlet, copper alloy. Fragment of cable armlet, now straight. *cf* Crummy 1983, fig 41, 1611. L 42.2 T 4.5. Romano-British. *WA obj no 72; Hawley cat no 4; C1; context 1050; phase 89; group 00*

39 Ring, iron. Broken, int diam 50. *WA obj no 56; C2; context 1072; phase 89; group 00*

40 Armlet, copper alloy. Penannular, ?child's, both terminals slightly squashed. Max int diam 40. ?Romano-British. *WA obj no 69; Hawley cat no 4664; C23; context 1416; phase 89; group 00*

41 Button, gilded copper alloy. Impressed crown over 3 swords with shields. ?Eighteenth century. *WA obj no 68; C26; context 2929; phase 89; group 00*

42 T-shaped horseshoe nail, iron. *C28; context 2565; phase 89; group 00*

43 Brooch, copper alloy. Colchester type, spring and catchplate broken, pin missing. *Cf* Hattatt 1982, 61, no 15. Romano-British, first–third century AD. *WA obj no 533; Hawley cat no 2026a; C21; context 2597; phase 89; group 00*

44 Fiddle key nail, iron. *C28; context 2550; phase 89; group 00*

45 T-shaped horseshoe nail, iron. *C28; context 2550; phase 89; group 00*

46 Arrowhead, iron. Small, broadheaded; SSWM cat no 33. L 50.3. Medieval. *WA obj no 523; Hawley cat no ?2153b; C29; context 2931; phase 89; group 00*
47 Arrowhead or spearhead, iron. L 56.3. Medieval. SSWM cat no 47. *WA obj no 524; Hawley cat no ?2153; C29; context 2931; phase 89; group 00*
48 Fitting, copper alloy/iron. Copper alloy strip with rounded terminal and stud, other end bent round iron rod. L 21. *WA obj no 75; Hawley cat no 4297/a/1; C33.11; context 1606; phase 89; group 00*
49 Fiddle key nail, iron. *C33.12; context 1933; phase 89; group 00*
50 Nail, iron. C33.13; context 1937; phase 89; group 00
51 Unidentified, iron. Rectangular, slightly bent, square section, tapers in thickness. *WA. obj no 62; C33.13; context 1937; phase 89; group 00*
52 Brooch, iron. Badly corroded and fragmentary brooch. Catchplate solid and grooved for pin. Spring missing. *Cf* example from Baldock, Hertfordshire; Stead and Rigby 1986, fig 48, 127. Romano-British (probably AD 90–140). *WA obj no 63; Hawley cat no 4068a; C33.29; context 1608; phase 89; group 00*
53 Cleat, iron. *Hawley cat no 4095a; C33.3; context 1578; phase 89; group 00*
54 ?Pendant, copper alloy. Subcircular perforated disc, not a coin (J A Davies, pers comm); max diam 24.9 T 2.8. *WA obj no 67; Hawley cat no 3261; C33.10; context 1644; phase 89; group 00*
55 Unidentified, iron. *C34.8; context 1635; phase 89; group 00*
56 Arrowhead, iron. Small, broadheaded, straight barbs set very close to socket, SSWM cat no 29. L 60.0. Medieval. *WA obj no 522; Atkinson cat no ?S54/1021; C44; context 3111; phase 89; group 00*
57 Arrowhead; iron. Bullet-headed, small barbs set against socket. SSWM cat no 88. L39.1. Medieval. *WA obj no 525; Atkinson cat no ?S54/1021; C44; context 3111; phase 89; group 00*
58 Bottle top, aluminium. *Atkinson cat no S56/62; C48; context 3212; phase 89; group 00*
59 Ferrule, ?aluminium. *Atkinson cat no S56/62; C48; context 3212; phase 89; group 00*
60 Gin trap, iron. Complete. Modern. *WA obj no 537; Atkinson cat no S56/61; C48; context 3212; phase 89; group 00*
61 Sheet object, cast iron. Long narrow sheet with modern breaks; slight bevelling of one edge. L 57.3 W 30.3 T 8.0. Modern. *WA obj no 511; Gowland; C64; context 4064; phase 89; group 00*
62 Pin, copper alloy. Complete knob-headed pin, tip of circular sectioned shank protrudes through head. Head appears to be copper alloy strip wound round shank in slight spiral. L 44.1 head diam 4.1, shank diam 1.2. ?Romano-British. *WA obj no 547; Gowland; C64; context 4066; phase 89; group 00*
63 Fitting, copper alloy. Openwork mount comprising quatrefoil lobes defined by incised lines. Two integral copper alloy rivets on back. L 25.9 W 18.6 T 1. ?Medieval. *WA obj no 82; Gowland; C64; context 4091; phase 89; group 00*
64 Arrowhead, iron. Bullet-shaped, broken. L 22.7. Medieval. *WA obj no 545; Gowland; C64; context 4091; phase 89; group 00*
65 Fiddle key nail, iron. *Gowland; C66; context 4120; phase 89; group 00*
66 Fiddle key nail, iron. *C7; context 3844; phase 89; group 00*
67 Square-ended horseshoe nail, iron. *C7; context 3844; phase 89; group 00*
68 Nail, iron. *C7; context 3844; phase 89; group 00*
69 Awl, iron. Diamond section, both ends broken. *WA obj no 58; Hawley cat no 535; C7; context 1701; phase 89; group 00*
70 Arrowhead, iron. Bullet-headed, SSWM cat no 92. L 40.1. Medieval. *WA obj no 526; Hawley cat no ?534; C7; context 1701; phase 89; group 00*
71–72 Fiddle key nails, iron. *C8; context 1871; phase 89; group 00*
73 Ring, copper alloy. Broken, flattened oval section. Int diam 14.9 ext diam 21.1 T 2.3. *WA obj no 515; Vatcher; C86; context 9732; phase 89; group 00*
74–75 Nails, iron. *Context 3813; phase 90; group 00*
76 T-shaped horseshoe nail, iron. *Context 3813; phase 90; group 00*
77 Rod, iron. *Context 3813; phase 90; group 00*
78 Unidentifed object, iron. *Context 3813; phase 90; group 00*
79 Earring, unidentified gold-coloured metal. Screwclip attachment, tear-shaped drop earring with bead and bowed strip under a hollow cylinder dangling on a short, 8 link chain. Victorian. *WA obj no 536; context 3813; phase 90; group 00*
80 Fiddle key nail, iron. *Context 3813; phase 90; group 00*
81–84 Nails, iron. *Context 3813; phase 90; group 00*
85 Billhook, iron. Broken, rectangular-sectioned tang and part of curved blade survive. L 171.1 max W 25 T 7.9. Post-medieval/modern. *WA obj no 514; Vatcher; C86; context 9731; phase 98; group 00*

## Post-Bronze Age pottery

All post-Bronze Age pottery extant in Salisbury Museum has been examined and details of fabric, form, date, and context (as appropriate) are entered in the archive pottery database. It is not possible to determine what fraction of the original assemblage now survives.

### Later prehistoric pottery

*by Elaine L Morris*

A total of 241 sherds (1384g) of Late Bronze Age–Late Iron Age pottery was examined in Salisbury Museum (*see Cleal, above for definition of Late Bronze Age pottery*). Of this total 60 sherds (504g) may be classified as Late Bronze Age, mostly in sandy fabrics, six sherds (24g) are diagnostically Early Iron Age, 59 sherds (397g) Middle Iron Age, and just two (7g) diagnostically Late Iron Age. The remaining 114 sherds (452g) are undiagnostic but represent various traditions within the later prehistoric periods. The material is represented by a variety of fabrics including flint-tempered and flint-gritted sandy fabrics, sandy fabrics, shelly wares, and two different sandy fabrics with rare and moderate amounts of organic matter respectively. Although the surviving assemblage is small, it is typical of the range of wares expected for the first millennium BC. The quality of the sherds is generally poor, with a mean sherd weight of less than 6g.

Very few rim sherds are extant in the collections but amongst these are represented three Late Bronze Age ovoid jars, one Late Bronze Age fingertip impressed rim sherd, one Early Iron Age long-necked, shouldered jar, two red-slipped haematite-coated bowl rims, several simple jars, a proto-saucepan pot/jar, and a saucepan pot. This range of diagnostic forms indicates that there does not appear to have been any major break in the ceramic sequence since each main period is represented.

There are no significant distributions among this material. Sherds derive from the uppermost layers in various trenches. The presence of later prehistoric pottery in the Y and Z Holes led Hawley to assign these features to a date not earlier than the Iron Age, a view challenged by Atkinson (*see Walker, Chapter 7, above*). All the later prehistoric pottery from these features comes from the uppermost fills. The largest single collection of sherds (45 weighing 350g) comes from the upper 0.30m of Z Hole 12. These seem all to belong to a single vessel of Middle Iron Age proto-saucepan pot/jar type.

### Romano-British pottery

*by Rachael Seager Smith*

A total of 1857 sherds, weighing 6305g, of Roman pottery has been examined. Full details of the pottery are in archive. The assemblage is extremely fragmentary (average sherd weight 3.4g) and abraded with very few featured sherds. No clearly defined Romano-British components within features or context groups were recognised; rather, the assemblage is typical of material found as a surface scatter or in the upper fillings of features, derived from manuring or generalised activity in the area.

Romano-British coarsewares account for 91% of the sherds, mainly comprising a variety of sandy greyware fabrics, probably from a number of sources including north Wiltshire (Anderson 1978) and the New Forest (Fulford 1975). Black Burnished Ware from the Wareham/Poole region of Dorset, and a few probably locally produced grog-tempered wares are also represented. Jars, straight-sided bowl/dish forms, and a variety of less common forms including flagons, jugs, and lids were recognised amongst the few featured sherds present.

Romano-British finewares account for 9% of the sherds. These are mostly derived from the Oxfordshire and New Forest production centres together with a few unprovenanced pieces. New Forest colour-coated sherds, mainly from Beaker forms, are the most numerous in this group with the Oxfordshire kilns supplying the majority of the red-slipped wares, including the only mortarium to be recognised. Only six sherds of imported fineware were recognised, three probably from a single North Gaulish colour-coated beaker, in addition to three plain samian fragments from Central and Southern Gaul.

### Post-Roman pottery

*by L N Mepham*

A total of 461 post-Roman sherds was recorded in Salisbury Museum. There is no obvious significance in the distribution of any of the material.

**Saxon:** Seven sherds (31g) were identified as Saxon on the basis of organic tempering. Such fabrics were in widespread use during the Early and Middle Saxon periods (fifth–eighth centuries) and there is now increasing evidence to suggest some continuation of use in Wessex and south-west England into the Late Saxon period.

**Medieval:** A total of 142 sherds (427g) of medieval pottery was examined. In general the medieval assemblage comprises small, abraded sherds which might be considered characteristic of deposits associated with manuring. Diagnostic sherds are scarce, and the various fabric types are dated largely on the basis of comparison with potential production sites and other well dated assemblages in the region.

A restricted range of fabric types is represented. Just under half the assemblage consists of sherds in a calcareous fabric which shows some similarity with tenth-century wares found at Cheddar (Rahtz 1979). A similar proportion comprises sherds of sandy coarsewares and finer sandy glazed wares comparable to products of the Laverstock kilns outside Salisbury which were in operation in the thirteenth century (Musty *et al* 1969). Micaceous and calcareous wares of a type common in west Wiltshire and probably deriving from the Crockerton production centre are present in smaller quantities; a date range of late twelfth to thirteenth century is likely for these wares. A small number of sherds in a coarse, flint-tempered fabric can be compared to fabrics with a distribution across west Berkshire and north Wiltshire, with a date range of twelfth–thirteenth century and a putative source in the Savernake Forest (Vince forthcoming, fabric A). The remaining sherds occur in nondescript sandy and calcareous fabrics of uncertain date and source.

**Post-medieval:** Post-medieval material examined comprised 133 sherds (1127g). The majority consists of coarse earthenwares, glazed and unglazed, mostly of the pale-firing type characteristic of the Verwood production centre of the Hampshire/Dorset border (Algar *et al* 1979). Other types represented include stonewares of various types, some possibly of German origin; and fine earthenwares of late eighteenth-century date or later, such as Jackfield ware.

**Modern:** The 179 sherds (1869g) of modern material examined include a large proportion of fine whitewares, as well as stonewares and bone china, all of nineteenth- or twentieth-century date.

## Glass

*by Rachael Seager Smith*

There are 339 pieces of glass extant in the collection at Salisbury Museum, though much more is likely to have been recovered in excavation. There is no glass from phased contexts. The material is widely spread through the Stonehenge Layer and topsoil but there are some concentrations, for instance over the Ditch near the main entrance (51 sherds), in C45 around Stones 32 and 33 (25), in C56 around Stones 53 and 54 (12), in the topsoil above Y Hole 16 (17), and particularly in C48 of the Avenue just north-east of the road (163).

The majority of fragments are undiagnostic vessel sherds (79%) and all of it is post-medieval and modern. There is a single complete wine bottle, a tall dark green example with the wax stopper in place, dated 1820 (*cf* Hume 1961, no 23). Wine and other bottle fragments, three sherds from a decanter and seven pieces of broken wine glass attest to the pleasures of picnicking at Stonehenge, an activity particularly favoured by the Victorians (*see, for instance*, Chippindale 1983, 152–3).

## Clay pipe

*by R Montague*

Salisbury Museum contains 131 fragments of clay pipe from the Stonehenge excavations. Of these 19 (14.5%) are bowl fragments with or without remnants of the base or spur. These are all from disturbed and topsoil contexts and many were recovered by Atkinson *et al* during excavation of previously opened areas. The largest concentrations are from C48 (54 fragments) and C56 (12), two cuttings which also produced quantities of post-medieval glass. Pipes of mid-seventeenth-century to late nineteenth-century date occur including 12 fragments which retain makers' marks or stamps, or other decoration which assists in dating. Full details of all the pipes recovered are in the archive.

## Environmental data

*edited by Michael J Allen*

### Introduction: nature of the evidence

Environmental archaeology as a discipline has only recently achieved maturity in its own right and it is therefore not surprising that the majority of interventions at Stonehenge, with the obvious exception of the work conducted by John Evans in collaboration with Richard Atkinson in 1978, have not undertaken significant, or indeed any, environmental sampling programmes. On the whole, the nature of the archaeology at Stonehenge is not ideally suited to the recovery of environmental data, because it consists largely of a series of stratigraphically unrelated and backfilled post- or stoneholes.

Some of the pits, Aubrey Holes, and a number of other features are recorded as having contained charcoal. Although Lt-Col Hawley consistently recorded the presence of charcoals he retained very little and no sampling was undertaken for charcoal or carbonised plant remains. This practice was unknown at the time. In the Diaries Hawley also recorded the presence of land snails in the Ditch, a few of which were kept and still survive in the archive (*see below*). He commented on the species and indicated that their presence was of some micro-environmental significance (eg Hawley 1922, 14).

More importantly, however, Hawley took soil samples during the excavations from a variety of locations in the Ditch and from postholes in the interior. Either he or Newall forwarded these samples to A S Kennard (the pioneer of land snail analysis), probably in 1926, who had examined them by November of that year. A short published account appeared in 1935 (Kennard and Jackson 1935). He concluded that when Stonehenge was built '... the scrub had been removed and that it was grassland ...' (*ibid*, 433). It was on the basis of Kennard's comments on these snails that M E Cunnington erroneously postulated evidence for the prevailing climate and date of Stonehenge (1933), an argument reiterated by her nephew R H Cunnington in his book *Stonehenge and its Date* (1935). Needless to say, it is impossible to use these data for such interpretations (Evans 1972; 1984, 27).

Hawley's inquiring mind led him to send away to various experts other occasional pieces of material that he was not able to identify or understand. Had he been more fully aware of the needs and potential of environmental archaeology there is little doubt that he would have wholehearted appreciated its significance and engaged further personnel to analyse and comment upon material for him.

The Vatchers collected occasional carbonised material from their excavations of the Avenue (C86) and took small soil samples, but the reason for taking them is not indicated. These samples have been briefly examined and processed by Wessex Archaeology for land snails and plant macrofossils and the residues are now archivally stable. They proved to contain only a small number of plant remains and some small flecks of charcoal (*Scaife below*). However, they served to provide confirmatory evidence for the broad field descriptions provided by the excavators, and 25ml samples of each have been retained in the archive for future soil chemistry and granulometric analysis.

Atkinson *et al* worked in the 1950s and 60s, largely before the wholesale adoption of environmental archaeology, and took few samples during their excavation campaigns. The exception to this was the engagement of Dr Ian Cornwall to examine soils from the Y Holes in 1953 because of their extraordinarily silty nature. This was duly published by Cornwall in his important paper in the *Proceedings of the Prehistoric Society* (Cornwall 1953).

More comprehensive sampling strategies (other than the hand recovery of bone) have thus been undertaken only in more recent excavations. In 1973 George Smith engaged Dr Susan Limbrey (then of the Ancient Monuments Laboratory) to comment on the soils from his excavation of the Avenue (C87), and small soil samples were taken for mollusc analysis. Unfortunately the samples proved too small and shell survival was poor. A number of samples were taken by Michael Pitts during his excavations around the Heelstone in 1979 (C91) for the recovery of charcoal (Pitts 1982, 101; Keepax 1980) and also for both mollusc and phosphate analysis. The result of both of these analyses was unfortunately inconclusive.

John Evans's section across the Ditch in 1978 (C61) enabled him to describe the remnant buried soil and to sample both buried soil and the Ditch section for molluscs. The results of this analysis have provided a key sequence for the monument and enabled Evans to offer a refinement of the archaeological sequence by the identification of a phase of reduced activity or abandonment (Evans 1984).

More recent excavations reported here (*Chapter 4*) afforded opportunities for sampling and analysis for both molluscs and pollen from chalk-cut pits in the car park and prompted augering of the Bank and the acquisition of samples from the buried soil beneath it, which were tested for pollen. Results of the analysis of the car park pits are presented in full in Chapter 4. They provide a major contribution to our understanding of the chalk landscape. As these features are not located within the circumference of the monument and pre-date it by nearly four millennia, the environmental data relevant to Stonehenge itself are essentially limited to John Evans's work and all the hand-collected bone and antler.

The detailed report on the bones retained from the major episodes of excavation is presented below. The surviving antlers, though obviously faunal in origin, are almost entirely artefactual in their use and have been discussed above.

There has been only limited recovery and retention of charcoal, snails, and shells and limited analysis of pollen and soils and only a few specimens in any of these catagories of data are reported on here. The recovery of animal bone has been better, though the surviving assemblage is clearly incomplete, and rather less of the human bone assemblage has been retained; most of the cremated material recovered by Hawley is no longer available for study because it was not considered worthy of analysis at that time. Although these bone assemblages are not without recovery, selection, and retention biases, it is true to say that these categories of evidence provide the best environmental data from the monument itself, and more detailed reporting has been possible than for other classes of environmental data.

## Animal bones

*by Dale Serjeantson*

The surviving animal bones present in the collections at Salisbury Museum were examined; of the approximately 1000 bones counted by Berridge, 536 were recorded (Table 48); the balance lack information which allows them to be assigned to context. The majority are from excavations by Hawley and Atkinson *et al*, with 67 recovered by the Vatchers. The bones from Gowland's excavations were scanned. A report was written on the bones by J W Jackson of Manchester Museum (Kennard and Jackson 1935).

The aim was to make a record of the animal bone, to examine it in terms of the overall composition of the assemblage and any changes through time, and to consider the evidence for use, butchery, and deliberate deposition. This has been used in Chapters 5–8 to aid interpretation of the monument. The bones from a site such as Stonehenge can raise questions of selection of animals for other than domestic reasons, such as ritual use and deposition, and food and feasting in a sacred context. Both the species chosen, and the activities which led to bone deposition, can make an important contribution.

Here the method by which the record was made is summarised, the selection and retention of material is discussed, and the criteria for the identification of species, size, and sex of the cattle, pigs, and canids are described. The bones are then described by phase. The 37 bones from phase 1 (Table 50), the base of the Ditch and the Bank, are individually important, and are described in detail. The major part of the report is concerned with the 252 bones which could be assigned to phase 2 (Tables 51, 52, 54), all from the secondary fill of the Ditch apart from 4 from the fill of a posthole

**Table 48 Animal bone by phase**

| *Phase* | *Provenance* | *Hawley* | *Atkinson et al* | *Vatcher (C86)* | *Total* |
|---|---|---|---|---|---|
| | Pre-phase 1 | – | 1 | – | 1 |
| 1 | Primary Ditch fill | 19 | 17 | – | 36 |
| 1 | Bank | – | 1 | – | 1 |
| 2- | Posthole C13 | 4 | – | – | 4 |
| 2- | Secondary Ditch fill | 86 | 4 | – | 90 |
| 2a | Secondary Ditch fill | 47 | 43 | – | 90 |
| 2b | Secondary Ditch fill | – | 49 | – | 49 |
| 2b | Pit 1284 | 1 | – | – | 1 |
| 3- | R Hole 10 | – | 1 | – | 1 |
| 3b | North Barrow | – | 6 | – | 6 |
| 3i | Q Hole | – | 1 | – | 1 |
| 3i | ?pre-Stonehenge layer | 12 | 4 | – | 16 |
| 3iv | Stonehole fill | – | 1 | – | 1 |
| 3v+ | Stonehole fills | – | 2 | – | 2 |
| 3+ | Avenue C86 | – | – | 12 | 12 |
| 60 | Post-monument | – | 15 | – | 15 |
| 87–91 | Unstratified/ disturbed | 54 | 101 | 6 | 161 |
| 98 | Intrusive sheep skeleton | – | – | 31 | 31 |
| 00 | Palisade Ditch, C81 | – | – | 18 | 18 |
| Total | | 223 | 246 | 67 | 536 |

(context 1884, C13; Table 48). The 18 bones from the Palisade Ditch (Table 55), though strictly unphased, are probably assignable to phase 2 (*see Chapter 6*). The 39 bones which could be assigned to features belonging to phase 3 are fragments from the fill of stoneholes, the North Barrow (Table 48), and the phase 3 or later fill of the Avenue ditches (Table 56). The remainder recorded are from the Stonehenge Layer (*see Chapter 8*) and later and mixed contexts (Table 48).

As the material does not constitute a bone assemblage in the conventional sense, much of the analysis which would be appropriate for a conventional report is not applicable here. The disparities in the numbers of bones from each phase and the uncertainties about the extent to which the material kept is representative of what was originally present rule out detailed discussion of changes through time or over the site. Some general comments can nevertheless be made.

### The dataset: selection and retention

The published accounts of Hawley's excavations and his Diaries make it clear that animal bones were found at the base of the early features, within the fill, and in all the later horizons. In each report a few individual finds, 'some bone fragments' or a 'few small fragments of bone' are referred to. However, it became apparent during recording that the surviving material from these excavations was highly selected. Some of the animal bone assemblage may have been buried in 'Hawley's Graves' (*see above and Chapter 2*). Otherwise, according to Chippindale (1993, 194) the bones ('nearly a cubic yard'; *op cit*) were sent to Jackson in 1929. Jackson was instructed to destroy 'all bones that are of no direct interest' and he returned 'four sandbags full' (*op cit*) to Salisbury Museum in 1934. Though Chippindale interprets the records as suggesting that these were buried in Aubrey Hole 7 (with the human cremations) in the following year, this does not seem to have been the case. The quantity of bone which survives in the Museum seems to be approximately what could have filled 'four sandbags'.

Jackson discussed the bones in two groups: those from the 'upper or humus layers' and those from the 'lower or silt layer' following Hawley's terminology (*see Chapters 5 and 6*). Most of the bones he describes from the 'lower' layer can be recognised as material now identified as coming from the phase 1 or 2 Ditch fill, so if any material was buried in AH 7 it is likely to be from the 'humus layers' (ie Stonehenge Layer and above).

Atkinson, by contrast, appears to have kept every fragment of bone recovered. In discarding bones considered unimportant, Hawley, Newall, and Jackson followed what was common practice in excavations in England until as late as the 1960s; when Atkinson was excavating, retention of all bones recovered was exceptional.

There is a single published reference by Hawley to bones being examined by others: 'expert opinion identified them' [ie pieces of ox skull] as 'belonging to an adult of *Bos primigenius* and a calf'. Other than that, it was stated that the bone remains have not been examined (1928, 167). Skulls were of course recognised. Jaws of cattle and pig were also distinguished and noted in the reports. Cattle scapulae were also recognised: a 'bladebone of an ox' was noted in the base of the Ditch in 1925. Cattle limb-bones, not specified, are sometimes referred to in the reports, presumably identified mainly from size. Hawley's identifications of animal bones are unreliable, just as those of the human bones were often inaccurate (*see McKinley, below*); some smaller fragments identified in the Diaries as being of animal bone are in fact human and vice versa.

One of the first aims of the investigation was therefore to assess the degree of selection in the surviving collection both by those who constructed and used the monument and which took place during or subsequent to the excavations. Small fragments appear not to have been perceived as important by Hawley during the excavation: 'fragments of animal bone were met with occasionally dispersed in the silt, but were of little account' (1928, 162). This accords with the many Diary references to fragments of antler which also do not survive in the collections (*above*).

In order to establish the nature of the material which was discarded, the bones from the excavations of Hawley

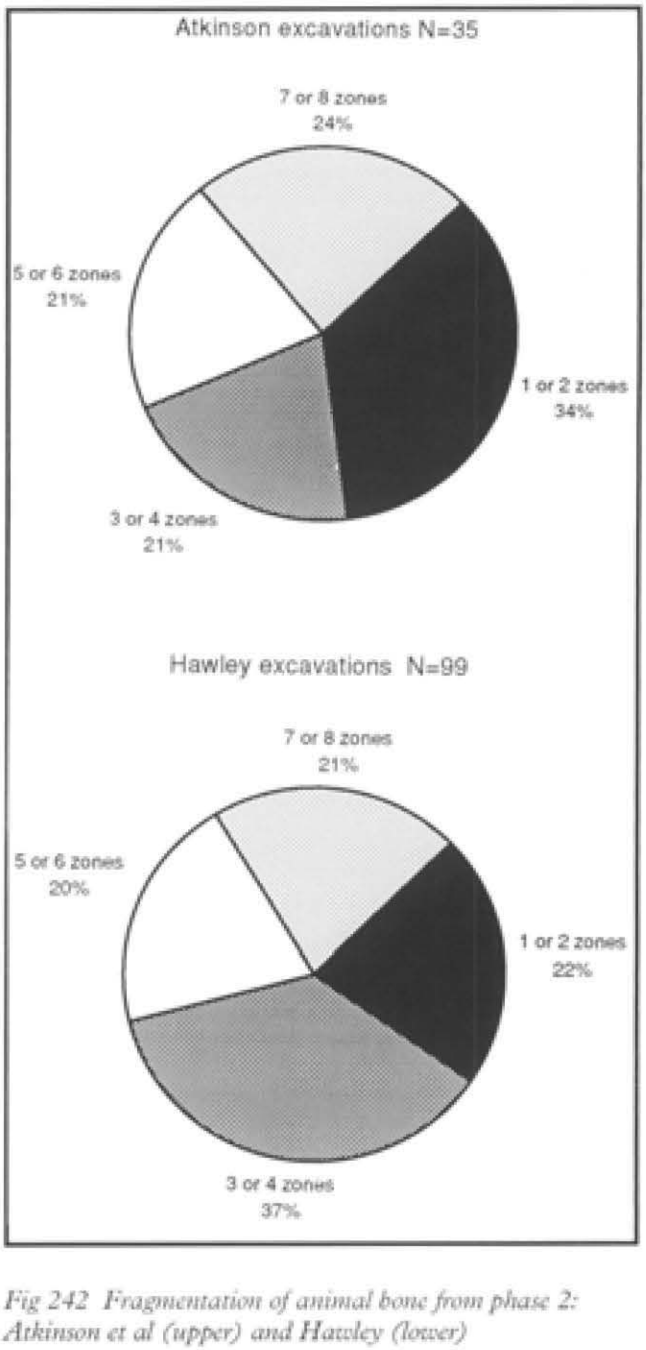



*Fig 242 Fragmentation of animal bone from phase 2: Atkinson et al (upper) and Hawley (lower)*

and of Atkinson *et al* from phase 2, the secondary fill of the Ditch, have been compared. The proportion of unidentified bones, the degree of bone fragmentation, and the parts of the skeleton are compared between the two groups. Only 1 (<1%) of the 137 bones from the Hawley excavations (Table 48) was not identified to species. By comparison, if the bones from the piglet skeleton from phase 2b are excluded, 25 (42%) of the 59 bones from C41 and C42 were too fragmentary for identification to species (Tables 48 and 54). The proportions from the Atkinson *et al* sample are similar to what would be expected from an excavation where bone is carefully excavated and retained (eg Serjeantson 1991).

In order to investigate bone fragmentation, the proportion of the bone present was recorded, using the zone record method described in Serjeantson (1991). Analysis of the results shows that bones recovered by Atkinson *et al* from C41/C42 are more fragmented (Fig 242, upper); the proportion with one or two zones only present is 35% in C41/C42, and only 22% in the Hawley Ditch segments (Fig 242, lower). The contrast confirms that some small unidentified pieces of bone were present in the Ditch fills excavated by Hawley but were either not collected or have since been discarded.

Most parts of the skeleton are represented in the bones from the Hawley sample, but some are lacking. As well as skulls and jaws, some loose teeth were kept. Examples of the main limb-bones were kept, as were complete vertebras. Ribs are lacking except from part skeletons. By contrast, pieces of rib and vertebra, limb-bone splinters, tarsal bones, and phalanges are present in the sample from C41/C42. It therefore appears that the fill of the Ditch and other features included fragmentary bone which was not retained.

Whether selective retention was also applied to the species is more difficult to establish. As discussed below, the range of species is similar in the segments excavated by Hawley to the range from C41/C42, so the surviving bones may therefore, broadly reflect the species involved in bone deposition, but doubts must remain about relative proportions.

### Method and identifications

The bones were recorded at Salisbury Museum, where they are stored, except for the material from the Vatcher excavations which was identified at the Faunal Remains Unit (FRU), Southampton. The author, Mary Iles, and Pippa Smith identified and recorded the bones. Kate M Clark examined some of the canid bones and has provided information on identification and size. Some of the bones have the earlier identification of the species written on the bone, presumably by Jackson, in ink or pencil. The present author agreed with all of these except two, a roe deer humerus (C28, context 3809; AB133–50) which was originally identified as sheep and a piglet humerus fragment included with bones from a juvenile fox skeleton (C21, context 1385; AB1005). The bones were recorded on the FRU database, and the results are included in the archive. As well as a record of identification, age data, and dimensions, evidence for surface condition, chopping or smashing, burning, and cut-marks was recorded.

The cattle and pigs from phases 1 and 2 presented identification problems, as both wild and domestic examples were clearly present. The small number of bones from Stonehenge precludes consideration of the ratio of wild and domestic pigs and cattle at the population level, but the identification of individual bones is considered here. In 1928, Hawley wrote with confidence of the presence of both wild cattle and wild pigs (1928, 167), though it is not clear on what basis. Here the distinctions between the domestic and wild pig, and domestic and wild cattle have been made on the basis of measurements

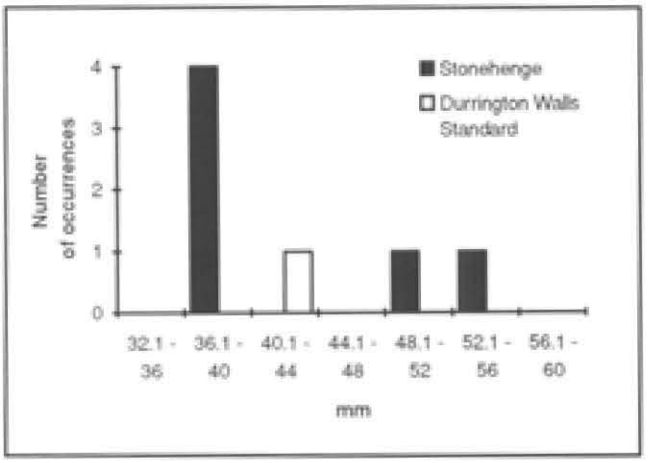



*Fig 243 Pig bones: distal humerus:distal breadth (Bd). Two of the six are considerably larger than the Neolithic standard established from the pig bone from Durrington Walls*

(archive table Animal Bone 1) taken following von den Driesch (1976).

When he was preparing his report, Jackson (Kennard and Jackson 1935) was able to compare the material visually with specimens of aurochs in Manchester Museum and cattle and pig bones from several other prehistoric sites which he had studied. Few published measurements were available at that time with which comparisons could be made.

**Pig:** *Sus scrofa* **and** *Sus domesticus*: In the past the distinction between these has been based on absolute size, still the criterion for recognising large wild boar. The distinction is complicated by the separation in size between boars and sows, and the likely overlap in size between wild sows and domestic boars (Payne and Bull 1988). Instead, individual bones from phases 1 and 2 have been compared with the Neolithic standard for pig size, which has been derived from the large assemblage from Durrington Walls (Albarella and Payne forthcoming). Where a bone clearly falls outside the range for Durrington, it has been identified as wild. This will identify bones of male wild pigs, but sows may be missed.

Teeth are least dimorphic between the sexes, and are therefore the most useful part of the skeleton for distinguishing wild from domestic pigs (Payne and Bull 1988). The anterior breadth of the lower third molar in the mandible from C23, context 2811 (AB96–7) exceeds the Durrington standard of 15.7mm by 1.6mm, and is probably from a wild boar. Measurements of the distal breadth (Bd) of two humeri (C20, context 1291 and C23, context 2811) (Fig 243) and the distal breadth (Bd) of two radii (contexts 1291 and C19, 1282) also exceed the relevant Durrington standards. Thus the presence of at least five elements from wild boar is suggested, though this number may well be a minimum, as no attempt was made to separate other elements or other incomplete or immature bones.

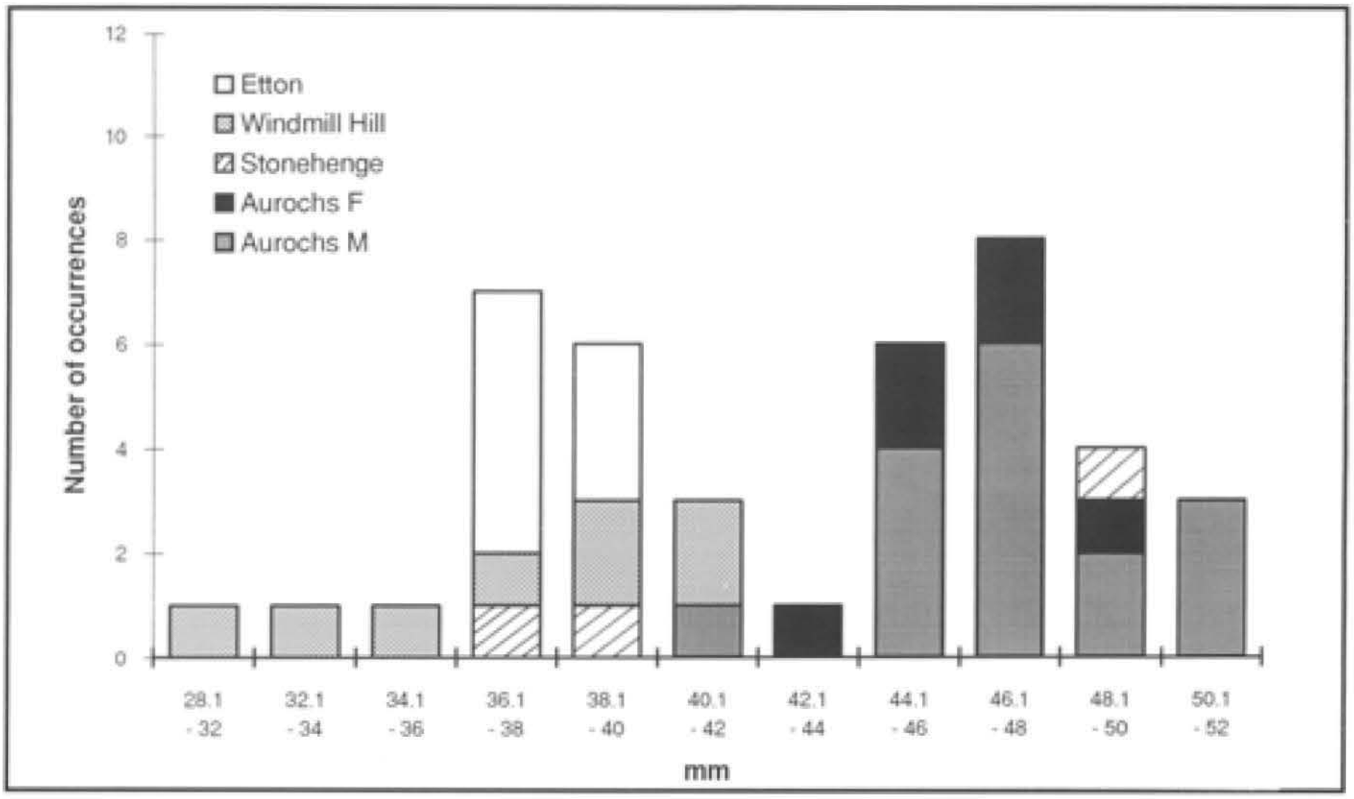



*Fig 244 Cattle: length of the lower third molar (M3). The Stonehenge teeth are compared with those of male and female aurochs from Denmark, Windmill Hill, and Etton, Cambridgeshire. One is from a large male aurochs*

**Cattle:** *Bos primigenius* **and** *Bos taurus*: It has been demonstrated that there was an overlap in the size of some bones between the female wild ox and the domestic bull (Grigson 1969; Rowley-Conwy 1984). It is possible that some interbreeding took place between domestic cows and wild bulls, which would also account for bones of intermediate size between wild and domestic. The distinction in some Stonehenge bones is therefore uncertain. The elements for which metrical comparisons could be made have here been assigned to one of seven groups: domestic cow, domestic bull, domestic F/M, intermediate, wild cow, wild bull, and wild F/M (Table 49). The measurements have been compared with late and post-glacial Danish aurochs (Degerbøl and Fredskild 1970), Hungarian aurochs (Bökönyi 1972), other early Danish cattle (Rowley-Conwy 1985), cattle from Windmill Hill, Wiltshire (Grigson 1965), Etton, Cambridgeshire (Armour-Chelu forthcoming), and Hambledon Hill, Dorset (Legge 1981).

On the basis of the comparisons, at least one of the lower third molar teeth (AB101, C24, context 3922) is unlikely to have come from anything other than an aurochs bull (Fig 244). One scapula (AB1049–51, C18/29, context 2942) also exceeds the size for domestic cattle. One of three measured radii, an unfused epiphysis (AB1006, C21, context 1385) is also probably aurochs rather than domestic cattle. One first phalanx (C18, context 1267) also falls in the size range for aurochs. A massive horn core, identified as from a female from its oval shape, is also from aurochs (Fig 245). Two scapulae, an astragalus, and a first phalanx are of intermediate size and could be from domestic bulls or female aurochs. All other measurable bones, including four skulls with surviving horn cores, are identified as domestic cows or bulls.

Jackson identified only one bone as certainly being aurochs, the phalanx. He recognised that the horn core (AB78) was very large, but rejected an identification for it of aurochs because the morphology of the attached skull did not match that of the aurochs specimen he had available for comparison.

**Wolf, fox, and dog:** *Bones from wolf (Canis lupus)*, fox (*Vulpes vulpes*), and dog (*Canis familiaris*) are present, and metrical evidence was used to distinguish these. Using comparative data from Clark's (1994) and Harcourt's (1974) estimates of withers height, one bone, an atlas vertebra (AB113–50, C28, context 3809), is identified as wolf. Jackson identified this as coming from a dog but the greatest breadth of this specimen (103.5mm) exceeds the largest modern dogs at the FRU (greyhound, 92.9mm) and also a modern timber wolf (96.9mm). Correlation tests showed that the greatest length (GL), 50.0mm in this specimen, is the most useful dimension for prediction of relative stature. Using regression analysis on 19 comparative dog skeletons

**Table 49 Cattle: bones assigned to domestic or wild, male or female, in phase order**

| *Bone no* | *Context/ Cutting* | *Phase* | *Element* | *Domestic F* | *Domestic M/F* | *Domestic M* | *Intermediate* | *Wild F* | *Wild M/F* |
|---|---|---|---|---|---|---|---|---|---|
| AB131 | 2480, C26 | 1 | Mandible | – | 1 | – | – | – | – |
| AB126 | 2943, C26 | 1 | Mandible | – | 1 | – | – | – | – |
| AB48 | 1288, C19 | 1 | Scapula | – | – | – | 1 | – | – |
| AB124 | 3670, C26 | 1 | Scapula | 1 | – | – | – | – | – |
| AB123 | 3670, C26 | 1 | Radius uf | – | – | 1 | ? | – | – |
| AB41 | 3930, C29 | 1 | Skull (UM2) | – | 1 | – | – | – | – |
| AB11 | 1549, C25 | 2- | Skull (horn core) | 1 | – | – | – | – | – |
| AB103 | 3922, C24 | 2- | Skull (horn core) | 1 | – | – | – | ? | – |
| AB101 | 3922, C24 | 2- | M3 | – | – | – | – | – | 1 |
| AB 1002–3 | 1385, C21 | 2- | Scapula | – | – | – | 1 | – | – |
| AB1049–51 | 2942, C21 | 2- | Scapula | – | – | – | – | – | 1 |
| AB84 | 1385, C21 | 2- | Humerus | – | 1 | – | – | – | – |
| AB151–3 | 2939, C29 | 2- | Radius | – | – | 1 | – | – | – |
| AB1006 | 1385, C21 | 2- | Radius uf | – | – | – | – | – | 1 |
| AB151–3 | 2939, C29 | 2- | Tibia | 1 | – | – | – | – | – |
| | 2941, C26 | 2- | Metatarsal | 1 | – | – | – | – | – |
| AB1049–51 | 2942, C18–29 | 2- | Phalanx 1 | – | – | ? | 1 | ? | – |
| AB78 | 1291, C26 | 2a | Skull (horn core) | – | – | – | – | 1 | – |
| AB60 | 1291, C20 | 2a | Scapula | 1 | – | – | – | – | – |
| S54.810 | 3899, C42 | 2a | Scapula | 1 | – | – | – | – | – |
| S54.72 | 3893, C41 | 2a | Pelvis | – | – | 1 | – | – | – |
| 77.1920 | 1267, C18 | 2a | Phalanx 1 | – | – | – | – | – | 1 |
| III.7.1921 | | | Astragalus | – | – | ? | 1 | ? | – |
| *Total* | | | | 7 | 4 | 3 | 4 | 1 | 4 |

*? indicates possible alternative identification*

(Clark, *op cit*) a relationship between humeral length and greatest atlas length was found with $r^2$ of 0.91. Applying the derived equation ((GL(atlas) x 4.57) - 11.5 = GL(humerus)) and Harcourt's factor for the computation of estimated shoulder height ((GL(humerus) x 3.43) - 26.54) = Estimated shoulder height), the stature is likely to exceed 71 cm.

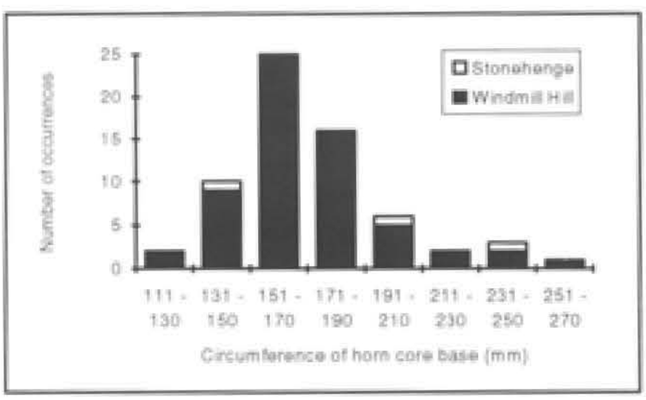



*Fig 245 Cattle horn cores: circumference of base compared with examples from Windmill Hill. Those over 200mm are considered to be from aurochs*

Harcourt's maximum estimated shoulder height for Neolithic dogs is 62cm, based on a tibia length of 211mm from Nympsfield Long Barrow, reported in 1938. Bate (Clifford 1938) discounted the possibility of the Nympsfield bones being wolf on the grounds of size, diminution of articular ends, feeble development of sites of muscle attachment, and more rounded aspect of the bones. However, no skull material was recovered on which to base a more justified statement. If the Nympsfield specimen is included in the range for Neolithic dog, this Stonehenge atlas represents an animal exceeding it in stature by about 10cm. On the metrical information, therefore, it is probable that this atlas derives from a wolf.

## Phased bone

### *Pre-phase 1*

A cattle-sized long-bone fragment from Stonehole 27 of the Sarsen Circle (phase 3ii) unexpectedly provided a radiocarbon date of 4360–3990 cal BC (OxA–4902, 5350±80 BP), a date which is considerably earlier than those for phase 1 and indicates that the bone was residual.

**Table 50 Phase 1: summary of species and anatomical elements**

| *Element* | *Cattle* | *Pig* | *Red deer* | *Dog* | *Uniden-tified* | *Total* |
|---|---|---|---|---|---|---|
| *Skull* | 1 | – | – | – | – | 1 |
| *Maxilla* | – | 1 | – | – | – | 1 |
| *Mandible* | 2 | 1 | – | – | – | 3 |
| *Tooth* | 3 | – | – | – | – | 3 |
| *Scapula* | 2 | – | – | – | – | 2 |
| *Humerus* | 1 | – | – | – | – | 1 |
| *Radius* | 2 | – | – | – | – | 2 |
| *Ulna* | – | – | – | 1 | – | 1 |
| *Femur* | 1 | – | 1 | – | – | 2 |
| *Tibia* | – | – | 1 | – | – | 1 |
| *Astragalus* | 1 | – | – | – | – | 1 |
| *Metatarsal* | 1 | – | – | – | – | 1 |
| *Metacarpal* | – | 1 | – | – | – | 1 |
| *Unidentified* | – | – | – | – | 17* | 17 |
| *Total* | 14 | 3 | 2 | 1 | 17 | 37 |

* *includes long-bone splinter from the Bank (C44)*

***Phase 1***

Thirty-seven bones could be securely assigned to phase 1 contexts (Table 50). Seventeen of these are from the primary silts of Hawley's Ditch excavations and 18 are from the primary fill of the segment excavated by Atkinson *et al*, C42. One limb-bone splinter of sheep/pig size was recovered from the Bank (C44, context 3112). The species identified from the primary Ditch fill are cattle, pig, red deer, and dog. No wild cattle or pig bones were positively identified among these.

The most common species in the Ditch is cattle. A skull (context 3930; AB41) was recovered in a fragmentary condition from the base of C29 at the putative blocked southern entrance. It is from a young adult. The skull was referred to as 'much decayed and broken' (Diary 1926, 1 July etc) when it was excavated. The horn cores were smashed off in antiquity and the nasal and premaxillary bones have traces of chewing by carnivores; some of this damage was probably caused by secondary digging in the ditch fill. This skull produced a radiocarbon date of 3510–2920 cal BC (OxA–4842, 4520±100 BP).

Two mandibles and a probable third were examined. Two, from contexts 3929 (AB126) and 2480 (AB131), are from the Ditch terminus at the Southern Entrance in C26. The first (Fig 246) is a right mandible from a large beast. Other than two gouges on the buccal surface which may be ancient butchery or recent damage, the mandible has not been butchered. Wear on the teeth shows that the jaw is from an old animal (Grant 1975). This bone produced a radiocarbon date of 3350–2920 cal BC (OxA–4834, 4460±45 BP). The second (Fig 247) is also a right mandible. The front of the jaw and incisors have broken off and the premolars were lost post-mortem. It is from a smaller, also adult, animal. There are one long and several short cutmarks, typical of cuts made with a flint when skinning the face or removing the muscle covering the jaw (Binford 1981). This bone produced a radiocarbon date of 3340–2920 cal BC (OxA–4835, 4455±40 BP), statistically identical with the first.

The loss of some teeth from each jaw suggests that they were not deposited until some time after death, a conclusion that was also reached for the cattle skulls from the Irthlingborough barrow (Davis and Payne 1993). The radiocarbon dates support this hypothesis (*see Chapter 5 and Appendix 2*). The surface of the bone is good, however, suggesting that though teeth were lost, both jaws must have been in a protected environment before being placed in the ditch. A left-hand side cattle tooth row (C26, context 3670), with deciduous fourth premolar at stage j and M2 half erupted, is from a younger animal, aged approximately two years. This could have been a complete jaw when deposited in the Ditch, from which teeth, more resilient to soil pressure than bone, are the only part to survive.

Two cattle scapulae survive, one from C19, context 1288 (AB48), and the second from C26, context 3670. The second appears to be chopped through the blade above the glenoid. Both are broken. Scapulae are very prone to break in the ground under pressure from sediment compaction. As discussed in connection with the antler implements above, it has been proposed that cattle scapulae, as well as antler, were used in digging and clearing the Ditch and other features. The first could have been discarded after use, but the butchery chop makes this unlikely for the second.

The most complete limb-bone is a cattle radius and ulna (AB123) from C26, context 3670 (Fig 248). The size suggests that it is from a domestic bull. It is labelled 'large ox'. The proximal ulna is broken off, but the shaft is unbroken. The radius has a hole in the front of the bone and the area around the hole and particularly above it has a battered surface where it has been smashed open. The exfoliation also suggests that it was exposed to heat by being placed on a fire or next to a burning brand of wood, prior to being smashed to expose the marrow. The blow failed to break the bone in two, and it has cracked, but not broken, in the ground. It is hard to believe that the bone would be in this condition unless it was buried soon after it was smashed open.

Other cattle limb-bones are a humerus, radius, femur, and metatarsal from C26, context 3670. The humerus has been chopped midshaft to expose the bone marrow, and the others are broken or smashed. All four have been gnawed by a dog or other large carnivore. An astragalus from C20, context 2801 (AB52) is complete, but has cutmarks similar to those ascribed to skinning (Binford 1981).

Two pig bones have been identified as coming from the base of the Ditch, both from C26, context 3670. A

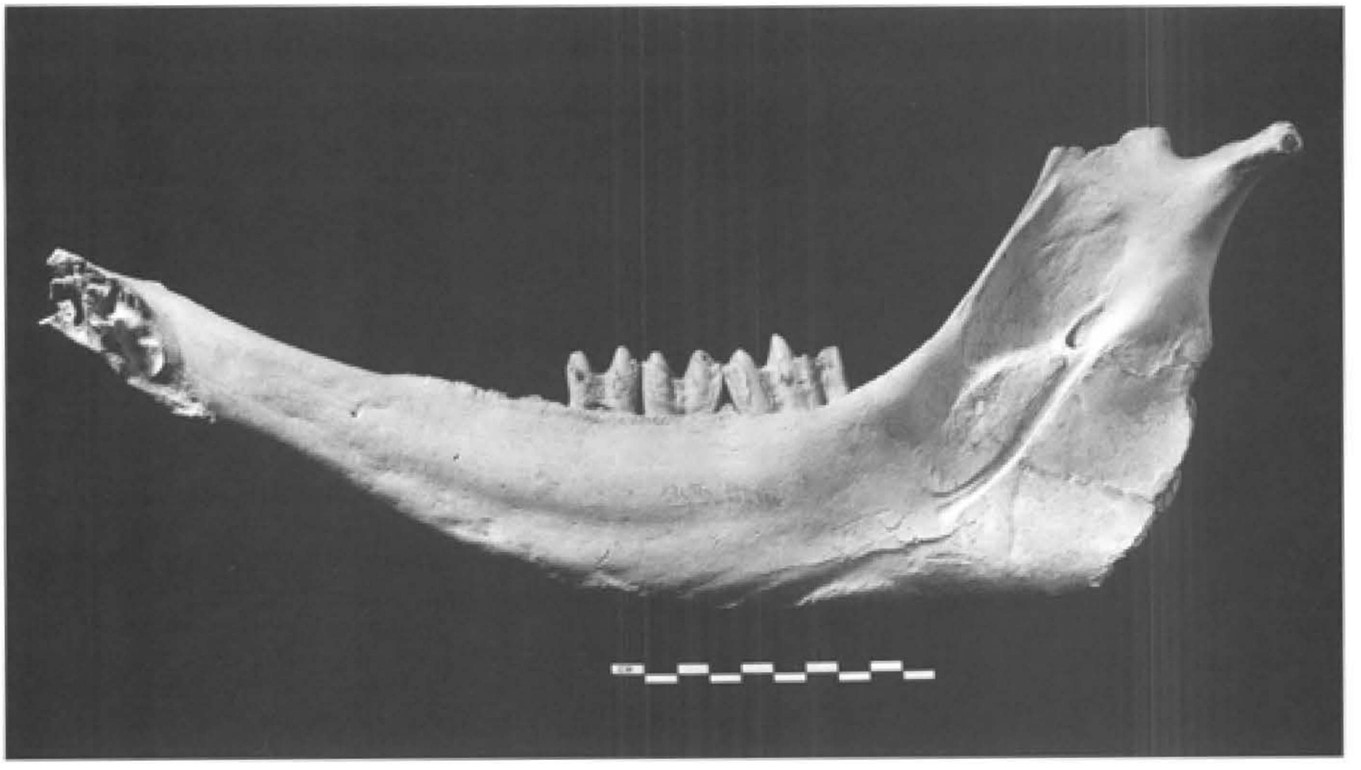


*Fig 246 Right mandible of large domestic cow or bull (AB131, C26, context 2480, phase 1). Premolars P2–4 lost after death. Two short cutmarks are visible below M3 and a further series of 3 longer cuts on the lingual face of the jaw below M3. The V-shaped profile is typical of cuts made with a flint blade (Wessex Archaeology)*

*Fig 247 Cattle right mandible (AB126, C26, context 3929, phase 1) with post-mortem loss of P2 and worn molar teeth. There is post-depositional cracking and erosion of the surface and peripheral damage to the ends of the bone. Two gouges on the buccal surface may be ancient butchery or recent damage. No cutmarks (Wessex Archaeology)*

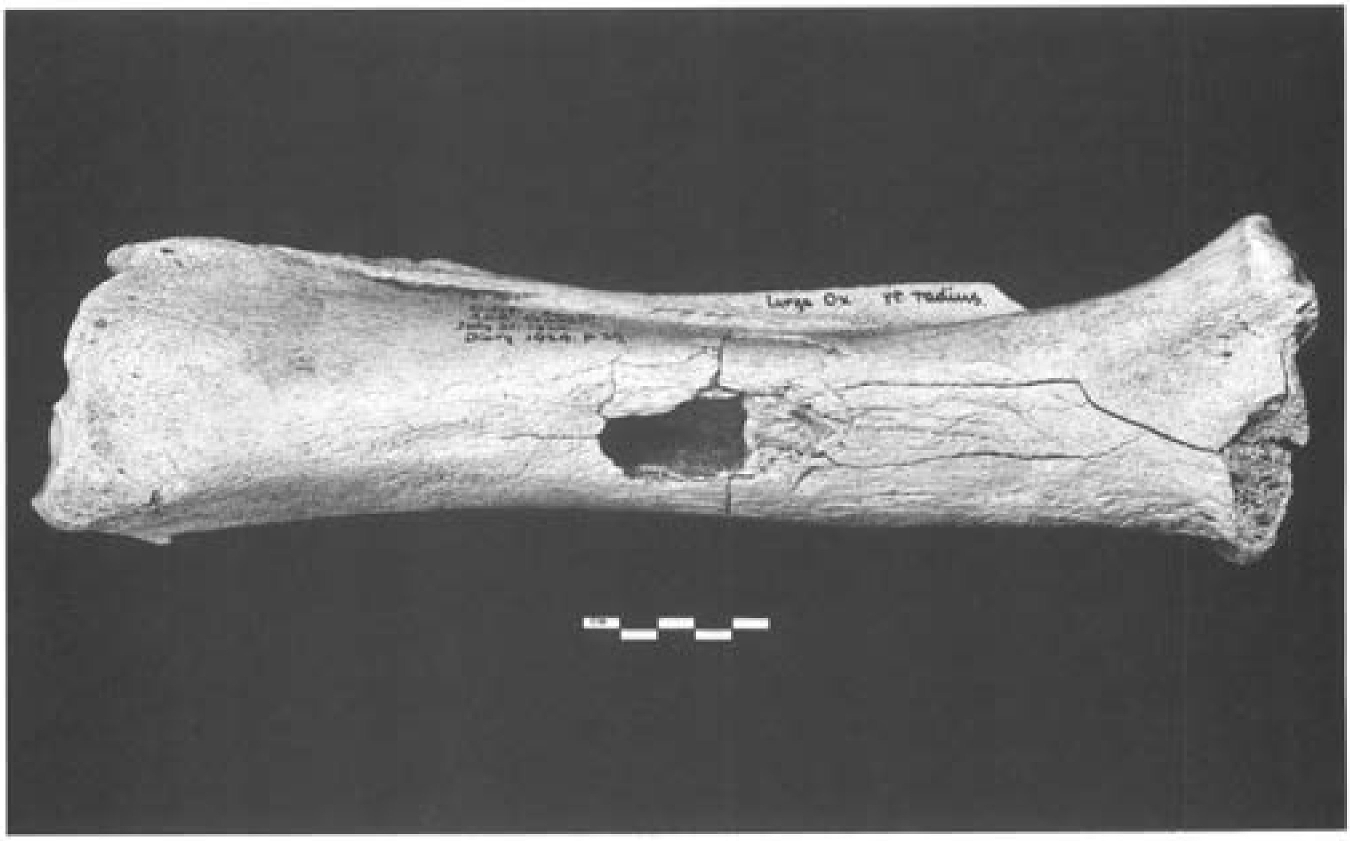



*Fig 248 Cattle radius and ulna (AB123, C26, context 3670, phase 1) probably of domestic bull. The proximal ulna is broken off. The radius has been smashed to expose the marrow cavity, with battering around and particularly above the hole. Exfoliation of the bone surface, extending 80–100mm above the hole, suggests that it was exposed to heat prior to being smashed. The bone has cracked, but not broken, in the ground (Wessex Archaeology)*

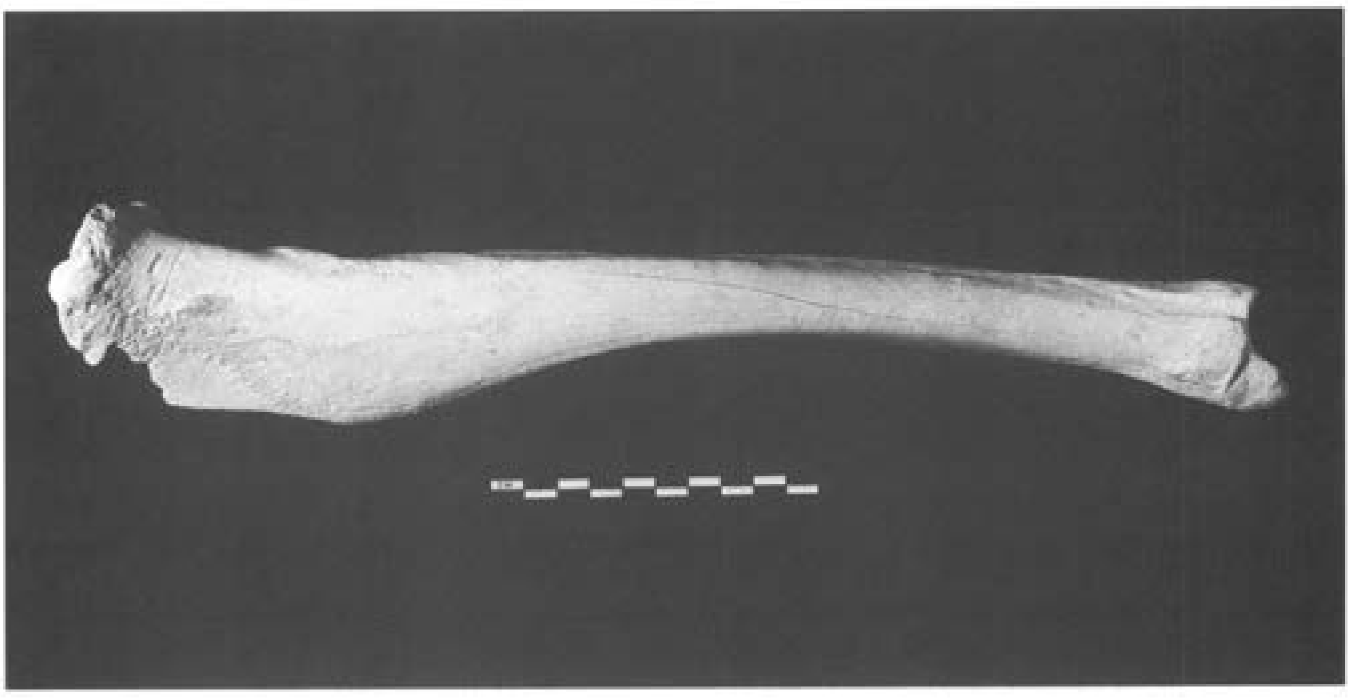


*Fig 249 Right tibia (AB122, C26, context 3928, phase 1) of red deer. The proximal end has shallow grooves from tooth scoring and an irregular edge where the top of the tibial crest has been chewed off by a dog or other carnivore. The line visible on the lateral shaft is a post-depositional crack (Wessex Archaeology)*

right mandible from context 3670 with wear on all cusps of M3 is from an adult, and a maxilla with both canines worn is from an adult female. The maxillary teeth, the part of the skull most likely to survive, are lacking. This could have been part of a skull when deposited, but is unlikely to have been complete.

Two bones of red deer which can be identified as coming from the base of the Ditch are in the Salisbury Museum collection. A substantially complete adult left pelvis from C25, context 2934 (AB121) has cutmarks on the ilium from filleting the muscle from the bone, and is gnawed. The right tibia (AB122) of a large adult red deer was recovered from the base of the Ditch in C26 (context 3928). It is unbutchered, but the proximal end has been attacked by a dog or other carnivore, which has chewed off the tibial crest (Fig 249). It produced a radiocarbon date of 3500–3040 cal BC (OxA–4833, 4550±60 BP).

There is one dog bone, a left ulna (C20, context 2801; AB996) from which the proximal end has been gnawed off by a dog or other large carnivore and the distal end broken off. There are no traces of butchery to show conclusively that the dog was eaten, but the bone must have been exposed and accessible to carnivore gnawing at some point before burial.

The bones from C42, the segment excavated by Atkinson *et al*, include only one identifiable bone, the metacarpal of a large adult pig. The 17 unidentifiable fragments include some probably from a skull. These small fragments among the bones recovered by Atkinson are a good example of the class of fragments which were not kept after the Hawley excavations, as discussed above.

***Phase 2***

All but four of the bones from phase 2 are from undifferentiated or secondary Ditch fill. The four are fragments of unidentified rib from context 1884 (C13, a posthole between Stones 8 and 9). The first group (phase 2 or earlier) are from earlier or undifferentiated Ditch fill. It is possible that some belong to the primary Ditch fill, but this cannot be confidently established from the records. The later groups are from secondary Ditch fill (phases 2a and 2b).

**Phase 2 or earlier (2-):** All but four of the 90 bones assigned to these Ditch fills are from excavations by Hawley of C18–29 (contexts 1385, 2811, 3922, 1549, 3811, 2927, 3809, 2942, 3801, and 2939). The remainder are from C41, excavated by Atkinson *et al*, all unidentified fragments.

**Table 51 Phase 2 or earlier (2-): summary of species and anatomical elements**

| *Element* | *Cattle* | *Pig* | *Sheep* | *Fox* | *Wolf* | *Red deer* | *Roe deer* | *Bird* | *Cattle size* | *Sheep/ pig size* | *Unidentified* | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Skull* | 3 | – | – | – | – | – | – | – | – | – | 1 | 4 |
| *Upper tooth* | 5 | – | – | – | – | – | – | – | – | – | – | 5 |
| *Mandible* | 6 | 3 | – | 2 | – | 1 | – | – | – | – | – | 12 |
| *Lower tooth* | 7 | 2 | – | – | – | – | – | – | – | – | – | 9 |
| *Atlas* | 3 | – | – | – | 1 | – | – | – | – | – | – | 4 |
| *Axis* | 2 | – | – | – | – | – | – | – | – | – | – | 2 |
| *Cervical vertebra* | 5 | – | – | – | – | – | – | – | – | – | – | 5 |
| *Thoracic vertebra* | 2 | 1 | – | – | – | – | – | – | – | – | – | 3 |
| *Lumbar vertebra* | 3 | – | – | – | – | – | – | – | 1 | – | – | 4 |
| *Scapula* | 3 | 1 | – | – | – | – | – | – | – | – | – | 4 |
| *Humerus* | 1 | 4 | 1 | – | – | – | 1 | – | – | – | – | 7 |
| *Radius* | 4 | 2 | – | 1 | – | 1 | – | – | – | – | – | 8 |
| *Ulna* | – | 1 | – | – | – | – | – | 1 | – | – | – | 2 |
| *Metacarpal* | – | – | – | – | – | 1 | – | – | – | – | – | 1 |
| *Femur* | 1 | – | – | 2 | – | – | – | – | – | – | – | 3 |
| *Tibia* | 2 | 1 | – | 1 | – | 2 | – | 1 | – | 1 | – | 8 |
| *Calcaneum* | 2 | – | – | – | – | – | – | – | – | – | – | 2 |
| *Metatarsal* | 2 | – | – | – | – | 1 | – | – | – | – | – | 3 |
| *Phalanx 1* | 2 | – | – | – | – | – | – | – | – | – | – | 2 |
| *Limb splinter* | – | – | – | – | – | – | – | – | – | 2 | – | 2 |
| *Total* | 53 | 15 | 1 | 6 | 1 | 6 | 1 | 2 | 1 | 3 | 1 | 90 |

*Two of the pig bones, a humerus (AB95, C23, context 2811) and a mandible (AB96–7, C23, context 2811) are wild pig* Sus scrofa
*A cattle scapula (AB1049–51, context 2942) and a molar tooth (AB101, C24, context 3922) are identified as* Bos primigenius
*The bird ulna (AB1016–8, C21, context 1385) is raven* Corvus corax

The bones are from cattle, pig, sheep, fox, wolf, red and roe deer (Table 51). The cattle bones include an isolated lower third molar (AB101) from C24 (3922) and the glenoid from a scapula (AB1049–51, context 2942) from aurochs. The pig bones include two of wild pig: a humerus (AB95) and a mandible (AB96–7) from C23 (2811). A distal humerus from C28, context 3809 (AB133–50), was labelled 'sheep', presumably by Jackson, but the relative proportions of the distal trochlea are closer to those of roe deer. A second distal humerus (C26, context 3810) is the only sheep bone from phases 1 or 2. The wolf bone discussed above was also found with this group, which is not closely provenanced. The bird bones include the only identified bird bone, the ulna of a raven, *Corvus corax* (C21, context 1385).

Three incomplete skulls and five upper teeth, which may originally have been in skulls, have survived. The cattle skull from C25, context 1549 (AB115), is sufficiently well preserved to suggest that it was placed in the Ditch complete. It is within the size range of domestic cattle, and the horn core, which is small and oval in cross-section, identifies it as from a cow. A second (AB103) is from C24, context 3922. Occipital condyles of cattle came from C21, context 1385 and upper teeth from C28, context 2811 and C21, context 1385.

Part of the skeleton of an immature fox was recovered from C21 (context 1385), and a part skeleton of very young pig with an erupting lower first molar is from the same context. Two fox bones from C25 are also probably from the same animal. Some bones appear to have been found in articulation: three cervical vertebrae of cattle in C24 (context 3922), which have fused zygopophyses and are therefore from an unusually old animal, and two thoracic vertebrae in C26 (context 2927). The remaining bones are disarticulated.

The six red deer bones are all limb bones, apart from an incomplete mandible with a broken and worn second permanent molar. The mandible and all the bones are from fully adult animals, compatible with the age suggested by the antlers from slaughtered deer.

Cattle is the most common species, and pig, red deer, and fox are also common.

**Phase 2a:** There are 90 bones from phase 2a surviving, 47 from Hawley's excavations and 43 from those of Atkinson *et al* (Table 52).

The species retained from the excavation of the various cuttings excavated by Hawley are cattle, pig, including at least two wild boar, red deer, and dog. The cattle bones include at least two of *Bos primigenius*, a first phalanx from C18, context 1267, and a horn core from C20, context 1291. A massive mandibular hinge from the same context could be from the same animal. One of the two dog jaws, which has lost all teeth before burial, has a mandibular conformation which reflects that of a sturdy but not massive head. As an illustration, two modern breeds, a Jack Russell x Stafford Bull Terrier (JRxBT) and a Standard Poodle (SP), produce very similar morphology (Table 53).

Part of the post-cranial skeleton of a piglet was kept from C20 (context 1291: AB49, 50, and probably 51,

**Table 52 Phase 2a: summary of species and anatomical elements**

| *Element* | *Cattle* | *Pig* | *Red deer* | *Dog* | *Bird* | *Cattle size* | *Unidentified* | *Total* |
|---|---|---|---|---|---|---|---|---|
| *Skull* | 2 | 1 | – | – | – | – | 1 | 4 |
| *Mandible* | 2 | 2 | – | 3 | – | – | – | 7 |
| *Tooth* | 4 | – | – | – | – | – | – | 4 |
| *Cervical vertebra* | 1 | – | – | – | – | – | – | 1 |
| *Thoracic vertebra* | – | 1 | – | – | – | – | 1 | 2 |
| *Lumbar vertebra* | 3 | – | – | – | – | – | – | 3 |
| *Scapula* | 2 | 2 | – | – | – | – | – | 4 |
| *Humerus* | 2 | 9 | – | – | 1 | – | – | 12 |
| *Radius* | – | 4 | – | – | – | – | – | 4 |
| *Ulna* | – | 3 | – | – | – | – | – | 3 |
| *Metacarpal* | – | 4 | – | 1 | – | – | – | 5 |
| *Pelvis* | 1 | – | 1 | – | – | – | – | 2 |
| *Femur* | 2 | – | – | – | – | – | – | 2 |
| *Tibia* | 3 | 6 | – | – | – | – | – | 9 |
| *Astragalus* | – | 1 | – | – | – | – | – | 1 |
| *Calcaneum* | 1 | – | – | – | – | – | – | 1 |
| *Metatarsal* | 2 | 1 | 2 | 1 | – | – | – | 6 |
| *Phalanx 1* | 4 | – | – | 1 | – | – | – | 5 |
| *Limb splinter* | – | 3 | – | – | 1 | 1 | – | 5 |
| *Unidentified* | – | – | – | – | – | – | 10 | 10 |
| *Total* | 29 | 37 | 3 | 6 | 2 | 1 | 12 | 90 |

**Table 53 Comparison between mandibular conformation of dog jaw (AB88) with modern breeds**

| | *JRxBT* | *SP* | *AB88* |
|---|---|---|---|
| *L Carnassial alveolus* | 20.4 | 20.4 | 20.5 |
| *L premolar row* | 38.8 | 37.6 | 37.1 |
| *Premolar P2–P4* | 34.4 | 33.3 | 33.0 |
| *Mandible height between P2/P3* | 18.1 | 17.5 | 19.1 |

*JRxJB = Jack Russell x Bull Terrier; SP = Standard Poodle*

53, and 58). All epiphyses are unfused, including the distal scapulae, one of the earliest bones to fuse. This fuses before 12 months in modern wild boar (Bull and Payne 1982), which suggests that the piglet was less than one year old at death, and, judging from the porosity of the bones, possibly some months younger.

The cattle horn core from context C20, context 1291 may have been part of a more complete skull. In C19 (context 1283) was an unbutchered and almost complete pelvis of an adult red deer and three cattle teeth, originally from the same jaw, possibly complete when deposited. The light wear on M1 shows that this animal was in its first year. The relatively complete nature of the pelvis suggests it may have been deliberately deposited.

The remaining bones are disarticulated and incomplete limb bones of cattle and pig, some showing evidence of butchery and carnivore gnawing. A cattle tibia shaft fragment is smashed and the exfoliation on the bone surface suggests that heat was applied.

Bones excavated by Atkinson *et al* from the secondary fill of the Ditch (C41, context 3893 and C42, context 3899) have been ascribed to phase 2a. Four unidentified fragments were recovered from C49 (context 3242).

The species which were present in this area of the Ditch, to the north of the main entranceway, are cattle, pig, dog, fox, and an unidentified bird bone. The dog metapodials and phalanges (C41, context 3893) are part of an articulated paw. Two piglet bones from C42, 3899, a mandible and a very immature scapula, appear to be part of a piglet skeleton. The mandible, with a slightly worn DPM4 and a half erupted M1, is from a piglet of about four weeks, compatible with the age of the rest of the other bones. There is evidence for one cattle skull from this group (S54.86). The surviving parts of the skull are the left occipital bone, the basioccipital, and part of the temporal bone.

**Table 54 Phase 2b: summary of species and anatomical elements**

| *Element* | *Cattle* | *Pig** | *Dog* | *Fox* | *Bird* | *Pig size* | *Cattle size* | *Unidentified* | *Total* |
|---|---|---|---|---|---|---|---|---|---|
| *Skull* | – | 1 | – | – | – | – | – | – | 1 |
| *Mandible* | – | 1 | – | – | – | – | – | – | 1 |
| *Atlas* | – | – | – | – | – | – | – | 1 | 1 |
| *Axis* | 1 | – | – | – | – | – | – | – | 1 |
| *Cervical vertebra* | 1 | – | – | – | – | – | – | – | 1 |
| *Lumbar vertebra* | 2 | – | – | – | – | – | – | – | 2 |
| *Humerus* | – | – | – | – | – | – | – | – | 2 |
| *Radius* | – | 1 | – | 1 | 1 | – | – | – | 2 |
| *Ulna* | – | 1 | 1 | – | – | – | – | – | 1 |
| *Pelvis* | – | 2 | – | – | – | – | – | – | 2 |
| *Femur* | 1 | 2 | – | – | – | – | – | – | 3 |
| *Tibia* | – | 2 | – | 1 | – | – | – | – | 3 |
| *Fibula* | – | 2 | – | – | – | – | – | – | 2 |
| *Astragalus* | – | 2 | – | – | – | – | – | – | 2 |
| *Calcaneus* | – | 2 | – | – | – | – | – | – | 2 |
| *Navicular cuboid* | – | 1 | – | – | – | – | – | – | 1 |
| *Metatarsal* | – | 4 | – | – | – | – | – | – | 4 |
| *Metapodial* | – | 4 | 1 | – | – | – | – | – | 5 |
| *Phalanx 1* | – | 2 | – | – | – | – | – | – | 2 |
| *Phalanx 2* | – | 2 | – | – | – | – | – | – | 2 |
| *Penis bone* | – | – | 1 | – | – | – | – | – | 1 |
| *Limb splinter* | – | – | – | – | – | 1 | – | – | 1 |
| *Rib* | 1 | 3 | – | – | – | – | – | 1 | 5 |
| *Unidentified* | – | – | – | – | – | – | 2 | – | 2 |
| *Total* | 6 | 32 | 3 | 1 | 1 | 1 | 2 | 2 | 49 |

* *All pig bones, except one, are from a piglet skeleton*

The limb-bones of cattle, red deer, and pig are broken and butchered, and as well as larger butchered bones, fragments of butchered bones were recovered.

**Phase 2b:** The bones (Table 54) excavated by Atkinson *et al* from the upper fills of C42 (context 3898) include a rodent skeleton and amphibian bones. These last could have entered the deposits at any time, and need have no connection with the human use of the site.

Most (31 out of 49 bones) are from a piglet skeleton. All bones including the acetabulum are unfused. The skeleton bears no evidence for butchery and was probably complete when deposited. The only signs of damage, other than breaks in the ground and excavation damage, are small puncture marks on two metapodials, made by a carnivore smaller than a dog, possibly a fox. Part of a mandible from an older pig, with an erupting permanent premolar, was also recovered.

As in other groups from the ditch fill, bones of canids, here fox and dog, were recovered. A humerus and tibia are possibly from the same animal. Measurements confirm the identification as fox rather than small dog. The humerus has a cutmark down the length of the bone shaft showing that the fox was defleshed, although whether or not this was a preliminary to consumption cannot be established. Domestic dog remains are a radius, a metapodial, and a fragment of what most closely resembles the penis bone of a carnivore. The radius is from a dog with an estimated shoulder height of 54cm, based on Harcourt's factor ((GL x 3.18) + 19.51 = estimated shoulder height). This is in the upper range of Harcourt's data on the stature of Neolithic dogs. The length and robusticity of the specimen is comparable to modern Labradors, German Shepherds, and Boxers.

The six cattle bones include a complete axis, a cervical and two lumbar vertebrae, a splinter of a femur, probably chopped, and the distal end of a rib with six heavy cutmarks at right-angles to the bone.

The only bird bone is a humerus shaft fragment which could not be identified to species.

#### *Palisade Ditch*

Eighteen bones were recovered from the section of the Palisade Ditch (C81) (Table 55). Most important are the three bones of red deer, a humerus, radius, and ulna from context 9799. These articulate, and have no traces of butchery or gnawing. They must have been deposited while still in articulation; the absence of cutmarks suggests that meat was still attached, though this cannot be demonstrated. If so, the joint must have been quickly covered and protected from disturbance by carnivores. This is the only find of an articulated limb of a large animal among the material studied from Stonehenge.

Four elements of cattle were also recovered, including a radius, an ulna, and two upper molar teeth. The radius has not been butchered, but the distal end is chewed off. The teeth, all upper molars, are from two different beasts, one immature and one adult.

**Table 55 Palisade Ditch: summary of species and anatomical elements**

| *Element* | *Cattle* | *Red deer* | *S/G* | *C size* | *P/S size* | *Un-ident* | *Total* |
|---|---|---|---|---|---|---|---|
| *Upper tooth* | 2 | – | – | – | – | – | 2 |
| *Humerus* | – | 1 | – | – | – | – | 1 |
| *Radius* | 1 | 1 | – | – | – | – | 2 |
| *Ulna* | 1 | 1 | – | – | – | – | 2 |
| *Metatarsal* | – | – | 1 | – | – | – | 1 |
| *Limb splinter* | – | – | – | 1 | 2 | – | 3 |
| *Unident* | – | – | – | – | – | – | 7 |
| *Total* | 4 | 3 | 1 | 1 | 2 | 7 | 18 |

*S/G = sheep/goat; C = cattle; P/S = pig/sheep*

A limb-bone shaft fragment from context 9794 was identified as part of the metatarsal of an immature sheep or goat. Sheep are otherwise rare (and goat absent) among the earlier material from Stonehenge. The balance are unidentifiable limb-bone splinters.

#### *Phase 3*

In this period the number of bones which could be securely associated with features is small, and consequently the animal bones cannot contribute much to the interpretation of activities in this period. There are altogether 21 bones from stonehole fills, 6 from the North Barrow, and 12 from the Avenue ditches (Table 48).

**Phase 3 or earlier:** A worn upper canine from a female pig and four unidentifiable fragments were recovered from context 2387, C13.

**Phase 3i:** The broken shaft of a right pig humerus, in poor condition (Atkinson cat no S64.4), is from a Q Hole; it is not certain from which of the Q Holes it comes and it has therefore been assigned to general context 3813.

**Phase 3iv:** An ulna fragment of sheep, goat, or roe deer was recovered from context 2427 (C7) of the Bluestone Circle.

**Phase 3v:** One unidentifiable fragment was recorded from each of contexts 3153 and 3909 (C45).

**Phase 3b:** Six unidentifiable fragments come from the North Barrow (context 3253, C50).

#### *The Avenue*

Twelve bones (Table 56), of which six could be identified to species, were recovered from the Avenue ditches in C86. All identified bones are from cattle. A scapula from near the base of the north ditch (context 9718) was

**Table 56 Avenue Ditches (C86): summary of species and anatomical elements**

| *Element* | *Cattle* | *Cattle size* | *Pig/sheep size* | *Total* |
|---|---|---|---|---|
| *Cervical vertebra* | – | 1 | – | 1 |
| *Scapula* | 2 | – | – | 2 |
| *Humerus* | 1 | – | – | 1 |
| *Pelvis* | 1 | 1 | – | 2 |
| *Calcaneum* | 1 | – | – | 1 |
| *Metatarsal* | 1 | – | – | 1 |
| *Limb splinter* | – | 3 | 1 | 4 |
| *Total* | 6 | 5 | 1 | 12 |

destroyed for radiocarbon dating (I–3216, a date now rejected; *see Chapter 7 and Appendix 2 for details*) but could be identified from excavation photographs. There is no record of whether it was damaged or butchered. A further piece of a cattle scapula blade in a very eroded condition was recovered from the southern Avenue ditch in context 9714. A cattle pelvis, chopped through the ischium, occurred close to the scapula in the northern ditch, but in a primary position. It produced a radiocarbon date of 2470–2200 cal BC (OxA–4905, 3865±40 BC). The remaining bones are fragmentary and eroded; most are limb-bones splinters.

***Post-Bronze Age use***

The Stonehenge Layer and later features contain material from many periods, as the pottery and other finds confirm. The bones too are clearly mixed in character. Those from the Stonehenge Layer, from later features, and from Gowland's excavations were assessed. This demonstrated their mixed and undatable character, and they were not recorded in detail. Bones from post-monument layers were recorded on the archive database only where there was a possibility that the context might eventually be capable of closer dating.

The bones from Gowland's excavations (C64) were scanned and assessed at Salisbury Museum. They are mostly very fragmentary, suggesting that all fragments recovered were kept. Nearly all are stained and eroded. This in itself suggests that all or most are from layers close to the surface or from shallow features. A high proportion of the mammal remains are isolated teeth, an indication of pre- and post-depositional destruction (Serjeantson forthcoming). Only two bones are comparable to finds from the Ditch, and so may belong to an early phase, both distal tibias of cattle, both chopped through the shaft. These are labelled 'F' and 'V 7AM'. Otherwise, the range of species from these excavations and from the Stonehenge layer and later tends to confirm that the contexts contain mixed and reworked material.

Five samples from Gowland's excavations contain rabbit bones, undoubtedly intrusive, as Stonehenge was used as a rabbit warren in the nineteenth century and has suffered from rabbit burrowing since. Domestic fowl bones were present in the Gowland material and in the Stonehenge Layer. The chicken was introduced to Britain in the Late Iron Age, but those from the Gowland excavations are unlikely to date from before the nineteenth century AD, as they are large and immature, similar to the bones of domestic chicken today. There are a number of horse bones in the Stonehenge and later layers, a species absent from the primary and secondary fill of the Ditch. Jackson (Kennard and Jackson 1935) noted that horse was present in the 'humus' layers, though absent from the 'lower layer'. There is a higher proportion of sheep and bones of sheep or goat.

**Discussion of the phase 1 and 2 assemblages**

There can be little doubt that the cattle skull and the two mandibles were deliberately placed on the base of the Ditch (*see Chapter 5*), just as skulls were placed on the base of the ditches of earlier Neolithic monuments such as causewayed enclosures, for instance at Windmill Hill (Jope 1965). As discussed above, the dates of the skull and pair of mandibles strongly suggest that these had been deliberately curated (*see Chapters 5, 6, and Appendix 2*). It is likely that some if not all of the remainder of the bones were also deliberately placed. The distribution of significant bones in the Ditch, where their exact position is recorded, is shown in the relevant segment illustrations in Chapter 5.

Whereas the skull and jaws were more or less complete when deposited, the limb-bones from phase 1 contexts are incomplete, having been chopped or broken. If these were selected for deliberate deposition, it was after they had formed part of a meal or feast. The gnawing traces show that dogs had also had access to the bones. There are no articulated bones or part skeletons among the material from phase 1.

The predominance of cattle bones, rather than pig, and the presence of deer and dog, suggest closer similarities with earlier Neolithic sites such as causewayed enclosures and long barrows, rather than with the larger henges such as Durrington Walls (Harcourt 1971) and pit groups with Grooved Ware associations, in which pig bones are more common than cattle bones. The small number of identified bones, and the possibility that some originally present were not retained, makes any generalisation about the bones in the primary fill of the Ditch of doubtful value.

The accounts of the finds and the small number of surviving bones suggest that though there was bone in the secondary fill of the Ditch and other features it was not dense. 'Objects in the silt, hitherto so scarce, began to increase and were chiefly bone fragments, usually occurring singly but sometimes in small groups' (Hawley 1924, 31). Certainly the quantity of surviving bone from the considerable volume of cut features excavated in the 1920s is small. The original Ditch contents included small fragments of bone, as retained by Atkinson, as well as the larger fragments kept from Hawley's campaigns.

***Selection of species***

The species from phase 2 contexts include both wild and domestic animals. Domestic cattle, pigs, and dogs are most common, and only a single bone of sheep has survived. The wild mammals are cattle, pig, red deer, roe deer, fox, and wolf. Bird bones, though not common, are also present, the only identified species being the raven. The proportion of wild animals is high in the material examined from the secondary Ditch fills, and it is in this aspect of the material that Stonehenge presents a strong contrast to other Neolithic sites, such as Windmill Hill (Jope 1965), Durrington Walls (Harcourt 1971), and Runnymede (Done 1978, Serjeantson forthcoming). At Runnymede wild animals are few in the small Neolithic assemblages analysed and in the much larger assemblage from the site as a whole.

Overall cattle bones are most numerous, as in phase 1. As discussed, if the interpretation of the metrical data is valid then there are both female and male domestic cattle among the remains, at least four elements from aurochs, and at least one, a horn core, probably from an aurochs cow. Aurochs remains are very few in the large Neolithic domestic assemblage from Runnymede being studied by the author. At Durrington Walls, the minimum number of individuals identified by Harcourt is 3 out of 88 cattle, a significantly lower proportion than Stonehenge.

More interesting are the large dimensions of many bones compared to Windmill Hill, Etton, and Hambledon Hill. If the identification of more robust bones as bulls is correct, and if the bones classed as 'intermediate' in size between aurochs and domestic bulls are included with the bulls, the proportion is high enough to suggest deliberate choice of bulls for bone deposition in the secondary ditch fills. This is significant in view of the conclusion of Legge (1981) that most of the adult cattle from the causewayed enclosures are cows. The metatarsals from Hambledon Hill include only about 5% interpreted as bulls. The choice of bulls for slaughter at Stonehenge in phase 2 would be fully in keeping with the ritual nature of the site. There is, however, the possibility that the larger bones were preferentially kept, so this can be regarded as no more than a hypothesis which can be tested only if the reburied material is re-examined in the future.

The pig remains also include a higher proportion of wild pigs than is common on other contemporaneous sites. This is most strikingly apparent if the contrast is made with Durrington Walls, where the proportion is less than 5% overall (Albarella and Payne, *op cit*). On later Neolithic Grooved Ware sites the proportion of domestic pig bones is typically higher than at Stonehenge.

The red deer bones are nearly all from animals of the age which provided the antlers, but the quantities are far below what would be expected if all the slain deer which provided the antler had been eaten at the site. No antler from roe deer was found, and a single bone was identified. Though both sheep and goat are found in small numbers on middle Neolithic sites, evidence for either in phase 2 is confined to a single bone.

The number of dog bones in phase 2, 16 in total, is relatively high, and the fact that this is not biased by retention of selected bones is confirmed by the finds from C42. Dogs have been human companions since their first domestication at the end of the last glaciation, but in the Neolithic it is unclear whether their primary role was to protect the herds, to assist in driving herds, to assist in hunting, to guard the settlement, or as pets. There is every likelihood that they combined all roles. Some bones are from articulated skeletons but most are disarticulated. Though the limb-bones have not been opened for marrow, as have those of cattle and pig, their disarticulated condition suggests they may have been eaten. Dogs were kept for other reasons than provision of food, so it is likely that if the meat from dogs was consumed at Stonehenge, this had a greater ritual quality than consumption of the meat of cattle and pigs. This is reinforced by comparison with other sites where dogs are common. A high proportion was also found at Windmill Hill, but at Runnymede, by contrast, remains are comparatively rare. It appears that dog remains are associated with sites where ritual activities were carried on, such as the causewayed enclosures, and Stonehenge itself. Some of these included funerary rituals, to judge from the finds of disarticulated human bones in the causewayed enclosures and in the Ditch at Stonehenge. Part of the ritual appears to have been deposition of dog remains, after consumption of the meat. Are these animals accorded a place at sites where the human dead are also found, because they were seen as individual animals in a way the main food animals may not have been? In this case it may also be necessary to consider whether a dog was slaughtered when its human master died, as appears to have been the case in Anglo-Saxon England and western Europe.

Wild carnivores, fox, and wolf, are not uncommon on earlier Neolithic sites. The cutmarks on two of the fox bones show that these may also have formed part of food consumption, whether or not ritual in character. Fox bones were also found in at least three Grooved Ware pits and other collections surveyed by Wainwright and Longworth (1971).

Fragments of five bird bones have survived, of which the only example complete enough for identification is from a raven. The association of ravens with prehistoric human activity in Britain is best seen in an Iron Age setting at the hillfort of Danebury, Hampshire (Serjeantson 1991b), where it is the most common bird species, but bones have also been reported in pits with Grooved Ware. In view of the very small numbers of bird bones found on most prehistoric sites in Britain, even the few found here are of importance.

Without re-examination of the reburied material it is impossible to know if bones of wild animals and only the larger bones of cattle and pigs were preferentially kept from Hawley's excavations, but as the finds from C41/C42 also include wild animals, the high proportion appears to be a real phenomenon of the activities at Stonehenge.

***Selection of parts of the skeleton***

There are indications that some articulated or partly articulated skeletons were deposited within the secondary Ditch fill. Three are piglets, at least one of fox, and another from a dog. Sets of articulating cattle vertebrae were also found. Though Hawley may have kept such groups preferentially, it is notable that groups of articulated bones were also recovered by Atkinson *et al.*

There are at least four skulls from the phase 2 Ditch fill. This is few compared with Windmill Hill (Jope 1965). It is closer to the assemblage from Durrington Walls (Harcourt 1971), where cattle skulls were also scarce.

Otherwise is no pattern of selection of elements which cannot be accounted for by selective retention of diagnostic material from Hawley's excavations. The finds from C41/C42 confirm that all parts of the carcass are present.

***Activities which generated the material***

Few of the bones are complete, even those which appear to have been deliberately placed. The reasons for this vary.

The skulls which survive are damaged, so the condition at the time of deposition is hard to establish. All have lost some teeth prior to deposition. It has been pointed out (Davis and Payne 1993) that the molar teeth of cattle are firmly rooted in the bone, and do not become loose enough to fall out of the maxilla or mandible for some years after it has become dry. They also survive relatively well in the ground. Where they are absent from an excavated skull or mandible, the presumption therefore is that they were not within the bone at the time of deposition. It follows that the skull or jaw in this condition is not from a recently slaughtered animal, but has been kept around the settlement for a time, within a house or sheltered outside it, as a trophy or heirloom which only later was buried as part of some funerary or other rite.

Some butchery on individual bones has been described. Other bones, now broken, are also likely to have been chopped. This was done to expose the marrow within the bone. Traces of chewing on 11 bones shows that, after the meat and marrow had been eaten, dogs were given the bones or permitted to scavenge (Serjeantson 1991), and it was only after this that bones were deposited in the ditches. The tiny punctures seen on piglet bones are from a carnivore smaller than a dog and imply that a smaller carnivore also had access to the bones.

There is no reason to assume that all the activity which generated the bones in the phase 2 Ditch silts took place within the monument at the time of deposition. The evidence for the treatment of human remains at long barrows and causewayed enclosures shows that human bones were regarded as objects to be carried and deposited in different places as appropriate. The immense number of cattle skulls which were heaped within the Irthlingborough barrow (Davis and Payne 1993) shows that the skulls at least of cattle were sometimes treated in the same fashion. This allows for the possibility that not only skulls but also other animal bones were brought to the site for use and deposition as bones rather than as parts of carcasses. However, most of the remains of the larger mammals, both wild and domestic, appear to have been part of meals or feasts before deposition.

**Conclusion**

The loss of detailed context information and the selective retention of material from Hawley's excavations has caused problems for all categories of finds at Stonehenge, but these have probably been most severe with the animal bones, as interpretation of any collection of bones is dependent on the information on context and date provided by other classes of material. The disparate nature of the bones which survive from the Stonehenge excavations has severely restricted what it is possible to conclude about the animals and the site activities in all periods except period 2 and it has unfortunately meant that only the most general of comparisons have been possible between phases.

## Human bone

*by Jacqueline I Mckinley*

The retention of excavated material from pre-1954 contexts and the difficulties with identification of contexts from the excavations of both Hawley and Atkinson *et al* are discussed in detail elsewhere in this volume (*above and Chapter 2*). Where human bone is involved, specific reference to difficulties of analysis and interpretation resulting from contextual problems have been made in this report.

For the pre-1954 contexts, cremated bone from 3 contexts, and inhumed bone from 19 contexts was available for analysis. A further 35 individually numbered bags of cremated bone and 9 of inhumed bone from the 1954–56 excavations were also examined, together with the inhumation burial recovered from the underpass (C81) in 1967.

**The dataset: problems of discard**

The site was used as a cemetery area for cremation and inhumation burials. Although there are records of some 52 cremation deposits/burials, including material from two possible graves, only one complete deposit and small parts of two others were available for examination. From Hawley's Diaries and Newall's plans and sections it is clear that the majority of cremated remains came from the Aubrey Holes, the Ditch and the back of the Bank. Where information is available, this material seems to have been from the upper rather than primary fills (*see discussions in Chapters 5–8*). Many of the cremation burials are known to have been reburied in Aubrey Hole 7 (*see above*) where presumably they remain. Table 57 lists

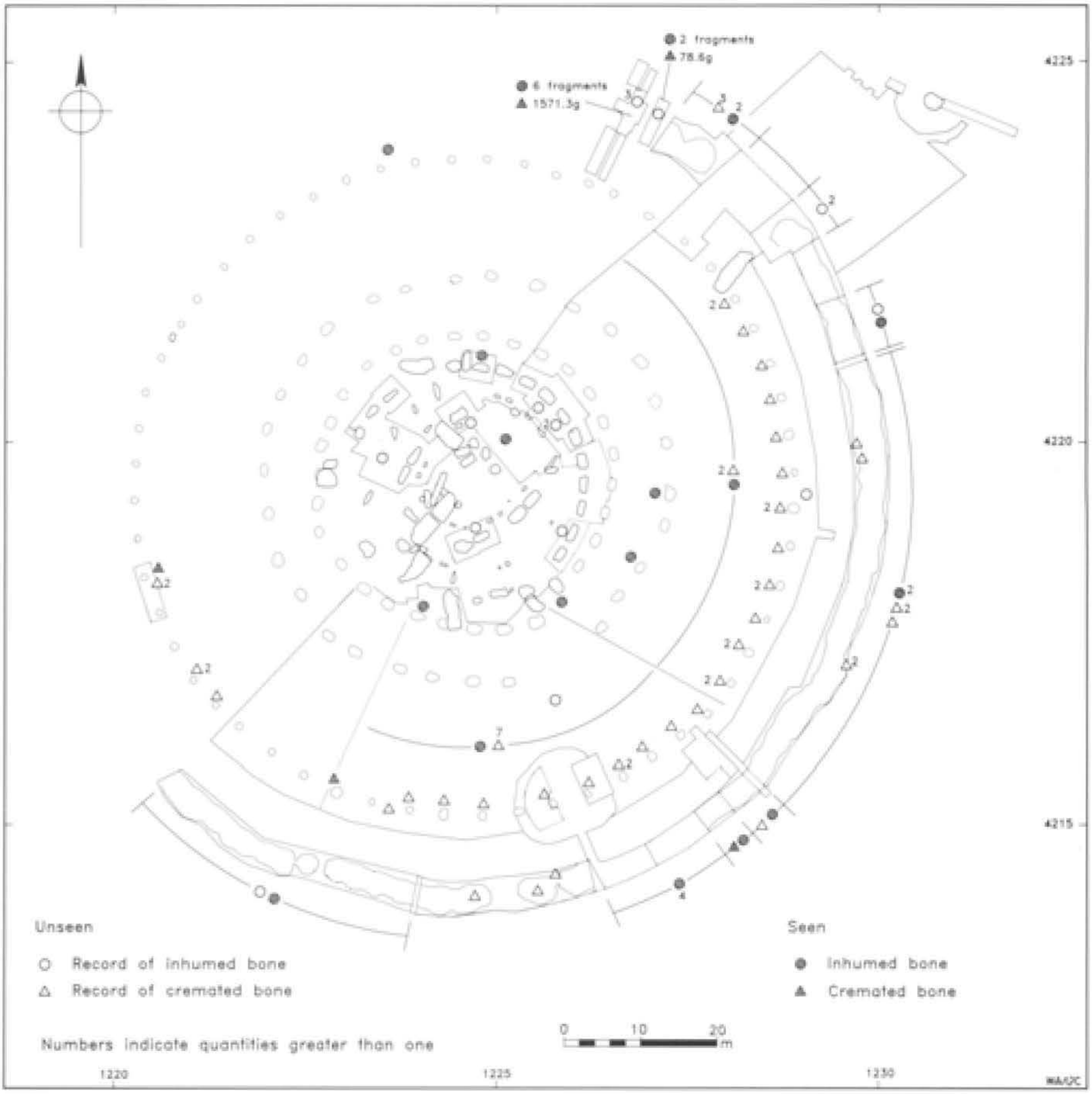



*Fig 250 Distribution of human bone*

all recorded occurrences of human bone as compiled by Berridge. Comparison between this and Table 58 shows how little of the human bone survives for examination.

Comparison of material recovered by Atkinson from Ditch cuttings C41 and C42 with that recovered by Hawley from the south-eastern half of the Ditch (Table 57; entries assigned WA context numbers only) suggests not only that the latter did not retain known cremation burials, but also that scattered bone from the Ditch was probably either reburied or otherwise disposed of subsequent to the excavations. Newall's plan (1956) shows 16 cremation burials situated in the Ditch fill excavated by Hawley but none of these burials remains for examination (Table 57). The cremation burial in C42, context 3898 (Atkinson cat no 54/821), represents a similarly situated burial excavated by Atkinson. Atkinson's cuttings C41 and C42 were relatively narrow, covering a ditch section of only *c* 5m between them, yet from this small area more scattered cremated bone survives than from the whole area of the south-eastern half of the Ditch excavated by Hawley. In addition, the same small area produced a quantity equal to almost half the amount of inhumed bone which now survives from the Hawley Ditch excavations. Although the apparently greater con-

**Table 57 Records of human bone (from Berridge's archive catalogue) no longer available for study**

| *Context* | *Phase/ group* | *Berridge no* | *Original cat no* | *Deposit* | *Comment* | *Provenance* |
|---|---|---|---|---|---|---|
| 3013 | 1/03 | HC33 | – | c | In hollow scooped into chalk | AH 32 |
| 1207 | 1/03 | HC73 | – | c | Outer side of hole, with flint fabricator | AH 16 |
| 1552 | 296 | HC37/8 | – | c | Mass of cremated bone inc teeth but no ash | C25 Ditch |
| 1475 | 2/04 | HB28 | – | i | A few bones ('of child' (5/11/1922)) | C5, Stonehole 2 |
| 1392 | 2-/18 | HC30 | – | c | 14 pieces of bone NW of centre | AH 28 |
| ?1395 | 2-/18 | HC76 | – | c | Many isolated pieces throughout fill | AH 29 |
| 3007 | 2-/18 | HC77 | – | c | A few scraps | AH 32 |
| 1198 | 2-/34 | HC18 | – | c | Very small amount of bone, inner side, 29in BGL | AH 13 |
| 1170 | 2-/35 | HC8 | – | c | Cremation mixed with a little wood ash, recut of primary fill | AH 6 |
| 1188 | 2-/35 | HC71 | – | c | Scattered bone | AH 11 |
| 1206 | 2-/35 | HC21 | – | c | Large cremation with much ash below 19in BGL | AH 16 |
| 1235/6 | 2-/35 | HC28/9 | – | c | large cremation, 24in BGL to bottom & some in bowl-shaped recess. With skewer pin fragments and chalk ball (11/3/1920) | AH12 |
| 1173/4 | 2-/36 | HC9 | – | c | Scattered from immediately below turf down SE side to bottom. 'probably of a child' or 'young adult' (5/3/1920) | AH 7 |
| 1177 | 2-/36 | HC10 | – | c | – | AH 8 |
| 1184 | 2-/36 | HC12 | – | c | 21–24in BGL. 'Quite fresh and uncrushed' (24/3/1920) | AH 10 |
| 1192 | 2-/36 | HC72 | – | c | Mixed with wood ash, in cup-shaped recess (*see also HC14–17*) | AH 12 |
| 1218 | 2-/36 | HC74/5 | – | c | Three concentrations of bone, throughout fill | AH 21 |
| 1563 | 2-/96 | HC40 | – | c | Handful of bone | as HC7/8 |
| 3893 | 2-/00 | – | S54.68 | i | 'Finger or toe bones' | C41, Ditch |
| 3898 | 2a/00 | – | S54/822 | i | 'Ulna' | C42, Ditch |
| 2663 | 2a/17 | HB22 | – | i | Skull fragment | C29, Ditch |
| 3899 | 2a/17 | – | S54/818 | i | 'Tibia or ulna' | C42, Ditch |
| 2542 | 2b/97 | HC59 | – | c | 'Very white and clean with hardly a sign of burnt ash', inserted into Ditch | C28 |
| 1269 | 2b/24 | HC34 | – | c | Cremation in bowl-shaped hollow, stag pelvis above | C18, Ditch |
| 1284 | 2b/24 | HC36 | – | c | 'Thoroughly calcined to whiteness', inc a few teeth. Shallow scoop cut in ditch silts | C25 |
| 2538 | 2b/24 | HC65 | – | c | Few bones, very blackened. Scoop cut in Ditch | C28 |
| 2580 | 2b/24 | HC61/2 | – | c | 'Complete' cremation, but Hawley reckoned there was also an infant because 'parts of the skull are thinner than parts of, probably, another.' Cut into Counterscarp | C28 |
| 2601 | 2b/24 | HC64 | – | c | Very small group. Scoop cut into Ditch | C28 |
| 2819 | 2b/24 | HC60 | – | c | 'Complete'. Cut in Counterscarp (17–19/6/1925) | C28 |
| 3903 | 2b/24 | HC56 | – | c | 'Entire cremation' but 'head had been mostly consumed'. Sieved through 2 sieves & pottery recovered | C26 |
| 3905 | 2b/24 | HC57/8 | – | c | Associated with skewer pin. In contiguous cists | as HC56 |
| 1431 | 2+/107 | HB11/12 | – | i | Small vertebra & other small bones inc ribs & 2 femurs | C24, Ditch |
| 1430/1 | 2+/107 | HB13 | – | i | A few bones inc skull & jaw with ox skull & vertebrae | as HB11/12 |
| 1151 | 3+/37 | HC2 | – | c | Very few bones scattered just under the turf to 25in BGL | AH 2 |
| 1155 | 3+/37 | HC3 | – | c | Just below turf, ?mixed with animal bone | AH 3 |
| 1159–1160 | 3+/37 | HC4/5 | – | c | To 24in BGL. Hawley reckoned more than one individual but not clear if discrete deposits. Some may have been outside the hole | AH 4 |
| 1166 | 3+/37 | HC6/7 | – | c | Scattered, 10–27in BGL accompanied by 2 skewer pins. Hawley reckoned 2 individuals | AH 5 |
| 1172 | 3+/37 | HC67/8 | – | c | Section shows 3 groups of bones, one with AH (HC9) & 2 opposite each other at top of hole | AH 7 |
| 1187 | 3+/37 | HC13 | – | c | Scattered throughout fill (see also HC42) | AH 11 |
| 1566 | 3+/37 | HC24 | – | c | Scattered throughout fill below 13in BGL & mixed with bluestone 'clearly disturbed' (10/7/1922) ?animal bone | AH 18 |
| 1150 | 3+/104 | HC1 | – | c | 1 small piece of bone | AH 1 |

**Table 57 (cont)**

| *Context* | *Phase/ group* | *Berridge no* | *Original cat no* | *Deposit* | *Comment* | *Provenance* |
|---|---|---|---|---|---|---|
| 1202 | 3+/104 | HC19 | – | c | On side of hole, 19–38in BGL | AH 14 |
| 2780 | 3+/104 | HC22/3 | – | c | On inner side. Hawley reckoned 2 individuals | AH 17 |
| 9827 | 79/9827 | – | PUP57 | i | 'Skull fragment' | Palisade Ditch C81 |
| 1399 | 80/00 | HB8 | – | i | Inhumation, poor condition & much missing inc most of leg & arm bones*. In grave cut | C22, Ditch |
| 1074 | 87/00 | HB5 | – | ?i | 1 human tooth apparently associated with '22 sherds of BA pottery. could be part of ... cremation' (29/6/1920) | C2 |
| 1050–1055 | 87/00 | HB1 | – | i | Fragments 'perhaps human cranium' (5/2/1920) | C1, Stonehole 6 |
| 1678 | 87/00 | HB18 | – | i | Most of skeleton of an adult in shallow grave between YH 9 and 10 but below Stonehenge Layer | C9 |
| 3509 | 88/115 | – | S64.51 | i | '8 finger or toe bones, 3 skull fragments + 1 misc'. Note on record card says 'not human' | C56 |
| 1182 | 89/00 | HC11 | – | c | Diffuse throughout fill & mixed with wood ash; section shows 3 distinct concentrations (*see HC69/70*) | AH 9 |
| 1182 | 89/00 | HC69/70 | – | c | *See above* | AH 9 |
| 1191 | 89/00 | HC14–17 | – | c | 'Probably 4 cremations' (23/3/1920); section suggests discrete groups, 3 within hole & 1 outside, mixed with ash | AH 12 |
| 1203 | 89/00 | HC20 | – | c | Scattered throughout hole below 18in BGL, piece of bluestone present at top of bone | AH 15 |
| 1216 | 89/00 | HC32 | – | c | Scattered | AH 20 |
| 1217 | 89/00 | HC25 | – | c | Section shows 3 concentrations, 15–30in BGL | AH 21 |
| 1222–1231 | 89/00 | HC26/7 | – | c | Confusion in Diary & appended list in Hawley (1923): same entry for both records, in each case one entry says no bone, the other a little. Sections show no bone for either Aubrey Hole | AH 22/3 |
| ?1395 | 89/00 | HC31 | – | c | A few bones in recess on SW edge at 18in BGL, appears in appendix of Hawley 1922, not in Diary | AH 29 |
| 1830 | 89/00 | HC42 | – | c | 'Small cremation' immediately below turf (21/9/1923) | C7, nr AH 11 |
| 1832 | 89/00 | HC43 | – | c | 'Small cremation ... on or near rampart' (25/9/1923) | C7 |
| 2010 | 89/00 | HC45 | – | c | 'An occasional fragment of cremated human bone but no sign of an actual cremation' (17/5/1924) | C10 |
| 2125 | 89/00 | HC80 | – | c | '6 or 8 pieces of calcined bones ... could perhaps be human cremation though could just be burnt animal bone' (26/6/1924) | C10 |
| 2465 | 89/00 | HC54/5 | – | c | Two small patches of cremated human bone 'without cist' in humus (17/7/1924) | C26 |
| 2787 | 89/00 | HB25 | – | i | 2 pieces of 'human cranium' (9/3/1920) | C2, posthole close to Stone 2 |
| 3866 | 89/00 | – | S58/6 | i | 'Finger or toe' bones. Note on record card says 'not human' | C52 |
| 3896 | 89/00 | – | S54/912.2 | i | 'Phalange'. Over Ditch | C42 |
| 1307 | 90/00 | HB2 | – | i | 'Remains of 2 ulna bones of a child and 2 phalanges of a hand' found whilst removing wire fence ?nr Aubrey Hole 7 (5/3/1920) | C31 |
| 2724 | 91/00 | HB24 | – | i | Quantity of bones 'in a disordered mass and had evidently been thrown there without ceremony' (25/8/1926). No details. Very disturbed context with material of BA–modern date mixed with bone | C12, N of Stone 59 |
| 1774 | 91/29 | HC41 | – | c | Small patch of cremated bone close to surface of rampart slope | C7 |
| 2007 | 91/29 | HC44 | – | c | 'Vein' of cremated bone 'about 1inch or possibly 1½ inches thick ... and the width of the patch was 10 inches' (16/5/1924). Immediately below turf with lump of sarsen & a number of large natural flints very close and above, ?possibly a cairn | C10 |

**Table 57 (cont)**

| *Context* | *Phase/ group* | *Berridge no* | *Original cat no* | *Deposit* | *Comment* | *Provenance* |
|---|---|---|---|---|---|---|
| 2013 | 91/29 | HC46/7 | – | c | 2 small patches of cremated bones | C10 |
| 2014 | 91/29 | HC48 | – | c | Small amount of cremated bone associated with polished macehead in 'small depression of cist scraped 2 inches deep in the solid chalk which only partly held the remains ... the protruding mass was covered with 3 inches of rubble' (26/5/1924) | C10 |
| 2020/22 | 91/29 | HC49–52 | – | c | 'Four cremated interments. 2 side by side ... 1 mass joining the other [HC51/2] ... other 2 very insignificant [HC49/50]'. In slight hollow depressions beneath HC51/2 'but bones were mostly on top of these'. Other 2 were 0.6m apart (21/5/1924) | C10 |
| 2042 | 91/29 | HC53 | – | c | In small, shallow recess in rubble. Bones mostly 'in the sod of turf above the place' (27/5/1924) | C10 |
| 2817 | 91/29 | HC63 | – | c | In 'cyst [*sic*] ... cut in the solid chalk of the counterscarp from above and fortunately ... near the edge of the ditch' (23/7/1925) | C28 |
| 1557 | 91/103 | HC39 | – | c | Small group of cremated bone in 'a small bowl shaped recess rather larger than a finger bowl' cut into Ditch (12/10/1922) | C25 |

*Entries are taken from Berridge's notes, based on Hawley's Diaries and Atkinson's notes. Comments in quotation marks are taken directly from the Diaries or are Atkinson's identifications which cannot now be checked*
* *see Chapter 7, unphased features, for a description of this burial*

centration of scattered human bone in C41 and C42 may conceivably be genuine (these cuttings are close to the Ditch terminal), there is a strong implication, particularly since there are known to have been cremation burials in the Ditch, that Hawley either did not retain all the scattered bone from the fill, or that it was reburied. An indication of this is provided in Hawley's published reports; that of 1924, for example, states that odd fragments of inhumed and cremated human bone were recovered from the ditch fills of the Avenue terminals, yet all but a few fragments of these bones are now missing.

Of the cremated bone recovered from pre-1954 contexts, one (context 1236) was from an Aubrey Hole (AH24) and that from context 1280 was from the Stonehenge Layer over the Ditch in C19 and probably represents redeposited bone. Newall's plan (1956) shows 24 of the Aubrey Holes as containing 'Cremations' (Aubrey Hole 31 did not in fact contain any cremated bone), with a further 11 burials adjacent to the holes within the confines of the Bank. With the exception of a few fragments from Aubrey Hole 24 (context 1236) and from context 3008 (AH32) excavated by Atkinson *et al*, the cremated bone from all these contexts was apparently reburied in Aubrey Hole 7, presumably along with the other 18 cremation burials shown on the plan (Newall 1956) from the Ditch fill and Bank.

Of the four inhumation burials known to have existed, one, from the grave close to Y Hole 9 (WA 1678) (Hawley 1925; *see Chapter 7*), and the partial inhumation from the Ditch in C22 (19/3/1922) are no longer available. The Beaker-age burial excavated by Evans *et al* close to the terminal of the main Ditch was published in 1984 (Evans 1984), and the 1967 inhumation (Vatcher and Vatcher 1968) is reported here. No bone survives from the 'grave' close to Stone 48 (*see Chapter 7*).

### Phased human bone

Unlike most of the artefacts reported on above, the majority of the surviving human bone fragments are from phased contexts. The distribution of the examined bone by context and phase is given in Table 58 and the known distribution of all recorded bone is presented in Figure 250.

#### *?Phase 1*

Approximately 150g of cremated bone survives from a scoop described as having been cut into the base of Aubrey Hole 32. It seems probable, however, that the scoop was cut from a higher level, through the primary silt, and that the cremated bone should be considered to be intrusive (*see Chapter 6*).

#### *Phase 2*

Most of what survives is from phase 2 contexts in the Ditch (C41 and C 42), with a single rib fragment from a posthole situated between Stones 8 and 9 (C8, context 1885).

#### *Phase 3*

A very small amount of cremated bone (1.5g) survives from a phase 3 or earlier context in the upper fill of

Aubrey Hole 24. A ?talus survives from a phase 3b context in the ditch of the South Barrow (context 3253) and upper limb and skull fragments from a young adult male were recovered from a scoop cut into the upper ditch silts (C24, context 1401) of phase 3 or later date.

**Dating and associations**

Although comparatively little of the bone survives, it is known that bone skewer pins were associated with cremation burials in the Aubrey Holes (*above*). As such, most of the cremation burials are likely to belong to phase 2 (*see Chapters 5 and 6*).

The adult male burial recovered from near the terminal of the Ditch (Evans 1984) was not accompanied by pottery, but the presence of three barbed and tanged arrowheads (with at least one of which the individual seems to have been shot in the back) and a stone wristguard leave no doubt as to its Beaker-period associations, which accord with the radiocarbon dates (*see Chapter 7 and Appendix 2*). It is possible that the tarsals and metatarsals recorded from disturbed levels in C42 (WA context nos 3891, 3896 (Atkinson cat nos 54/09.6 and 54/902.2)) form part of the 'missing' feet of this skeleton as recorded by Evans (1984).

The tightly flexed inhumation recovered from the Palisade Ditch (C81, context 9470, cat no PUP69) by the Vatchers in 1967 had no associated artefacts. A radiocarbon determination was obtained which calibrates to 780–410 cal BC (UB–3820, 2468±27 BP) placing this burial firmly in the Iron Age, a somewhat unexpected result.

**Methods**

Cremated bone from each context was passed through a sieves stack of 10, 5, and 2mm mesh size. The weight of bone from each fraction and maximum fragment sizes for skull and long-bone are used to illustrate the degree of bone fragmentation.

Identifiable bone was separated for further examination, being divided into categories of skull, axial skeleton, upper and lower limb. Much of the bone in a cremation burial is unidentifiable other than as fragments of long-bone or spongy bone, and only those fragments which could be closely identified were subject to further examination.

Age was assessed from the stage of tooth development and eruption (van Beek 1983) and epiphyseal bone fusion (McMinn and Hutchings 1985; Webb and Suchey 1985), the pattern of degenerative changes in the pubic symphyses (Brooks 1955), tooth wear patterns (Brothwell 1972), and the general degree of cranial suture fusion and degenerative changes to the bone. Sex was assessed from the sexually dimorphic traits of the skeleton (Bass 1987), including, for cremated bone, the maximum cranial vault thickness '1a' taken according to Gejvall (1981). Cranial, Platymeric, and Platycnemic indices were calculated (Metrical Data Sheet in archive), cranial measures were taken according to Brothwell (1972), post-cranial measures according to Bass (1986). Stature estimations were made using Trotter and Gleser's regression equations (1952; 1958). Pathological lesions and morphological variations/non-metric traits were recorded, and diagnoses suggested where appropriate. Anatomical terminology used is according to Gray (1977) and McMinn and Hutchings (1985).

WA context numbers are used throughout this bone report, supplemented by Atkinson catalogue numbers where more than one collection of bone originates from a single context. In one instance it was not possible to ascertain the context from which bone originated and it has been assigned to general context 3813.

Details of analysis may be found in the archive including, for cremated bone, a list of all identified bone, any variation in colour from the normal buff/white for individual bones, coloured staining to bones, any adhering substances, and bone measurements; for inhumed bone, Skeletal Record Sheets of identified bones, and Metrical Data Sheets with dental attrition charts are included. Detailed descriptions of pathological lesions and non-metric traits are also presented. A summary of the distribution of human bone is contained in the finds database.

**Results**

A summary of the results is presented in Table 59.

Most of the bone was in good condition. Cremated bone from only one context (C34.32, context 3008) appeared weathered/worn; bone from several contexts, (including context 3898, Atkinson cat no 54/821) had a covering of chalky material accumulated during burial. This latter condition was noted by Hawley during excavation of at least one cremation burial (1928). Several fragments of inhumed bone were heavily root-marked and worn (C28, context 2589; C28, context 2597, cat no HB21; C41, context 3893, Atkinson cat no 54/74; C41/2, context 3891, Atkinson cat no 54/106.1; C42, context 3896, cat no Atkinson 54/902.2); most were from upper levels/topsoil.

Two individuals were positively identified in analysis, a young adult female *c* 25 yr from a cremation burial in context C41, 3893 (Atkinson cat no 54/821), and a younger mature adult male (25–30yr) from the inhumation burial in context 9470 (the Iron Age burial at the Palisade Ditch terminal, C81). The loss of so much material from the database renders meaningless any discussion of estimated minimum numbers from the rest of the bone.

The 1.5g of tooth root from context 1236 is all that remains of the cremation burial recovered from Aubrey Hole 24. In his interim report of 1921 Hawley reported 'A large cremation [burial] was found in this hole' (erroneously numbered 21 in the report). Clearly, most of this burial was amongst those reburied without osteological examination, these few fragments being all

**Table 59 Summary of analysed human bone by phase**

| *Context* | *Phase/ group* | *Berridge no* | *Original cat no* | *Deposit* | *C = weight i = element* | *Age* | *Sex* | *Provenance* |
|---|---|---|---|---|---|---|---|---|
| 3008 | 1/03 | ?HC78/9 | S50/? | c | 150.7g | A | – | AH 32 |
| 1560 | 2/96 | HB14 | – | i | vault | s/a | ??f | C25, Ditch fill |
| 3893 | 2-/00 | – | 54/13 | c | 6.4g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/15 | c | 1.9g | ?human | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/30 | i | vault | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/32 | c | 1.9g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/33 | c | 2.5g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/35 | c | 7.7g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/36 | c | 4.7g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/40 | c | 3.9g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/41 | c | 5.8g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/43 | c | 11.1g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/44 | c | 8.0g | y.mA | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/45 | c | 12.6g | ?bird | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/52 | c | 2.6g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/53 | c | 1.5g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/54 | c | 2.6g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/55 | c | 0.4g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/59 | c | 0.8g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/66 | c | 0.9g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/69 | c | 1.2g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/73 | c | 0.5g | ?human or ?animal | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/74 | c | 0.4g | s/A | – | C41, Ditch fill |
| 3893 | 2-/00 | – | 54/75 | i | long-bone | ?human | – | C41, Ditch fill |
| 3898 | 2-/00 | – | 54/820 | c | 0.8g | A | – | C41, Ditch fill |
| 3898 | 2-/00 | – | 54/821 | c | 1546.6g | y/ymA | f | C42, Ditch fill |
| 3898 | 2-/00 | – | 54/841 | c | 4.4g | s/A | – | C42, Ditch fill |
| 3898 | 2-/00 | – | 54/843 | i | cuboid | A | – | C42, Ditch fill |
| 3898 | 2-/00 | – | 54/848 | i | phalanx | y/mA | – | C42, Ditch fill |
| 1885 | 2-/13 | – | * | i | rib | s/A | – | C8, posthole |
| 2559 | 2a/17 | HB26 | – | i | tooth | os/yA | – | C10 over Ditch |
| 1562 | 2a/17 | HB15 | – | i | vault | s/A | – | C25, Ditch fill |
| 1260 | 2a/17 | HB3 | – | i | tibia | A | – | C18, Ditch fill |
| 1282 | 2a/17 | HB27 | – | i | vault | A | ??m | C19, Ditch fill |
| 1291 | 2a/17 | HB6 | – | i | fibula | A | – | C20, Ditch fill |
| 2589 | 2a/17 | HB20 | – | i | vault | om/oA | – | C28, Ditch fill |
| 3899 | 2a/17 | – | 54/801 | fossil | | – | – | C42, upperDitch fill |
| 3899 | 2a/17 | – | 54/802 | animal bone | | – | – | C42, upper Ditch fill |
| 3899 | 2a/17 | – | 54/803 | c | 1.8g | s/A | – | C42, upper Ditch fill |
| 3899 | 2a/17 | – | 54/805 | i | rib | ?human | – | C42, upper Ditch fill |
| 3899 | 2a/17 | – | 54/805 | c | 0.4g | s/A | – | C42, upper Ditch fill |
| 3899 | 2a/17 | – | 54/812 | c | 1.1g | s/A | – | C42, upper Ditch fill |
| 3899 | 2a/17 | – | 54/813 | c | 1.8g | s/A | – | C42, upper Ditch fill |
| 3899 | 2a/17 | – | 54/816 | c | 5.6g | s/A | – | C42, upper Ditch fill |
| 1236 | 3-/35 | HC28 | – | c | 1.5g | om/oA | ??f | AH 24 |
| 3253 | 3b/46 | – | 56/89 | i | ?talus | ? | – | C50, S Barrow ditch |
| 1401 | 3+/100 | HB9/10 | – | i | skull, upper limb | y/mA | – | C22, feature cut into Ditch |
| 9490 | 00/77 | – | PUP69 | i | skull, axial, upper limb, lower limb | ym/A | m | C81, Palisade Ditch, grave cut |
| 1944 | 60/42 | HB30 | – | i | tooth | <yinf | – | ZH 13 |
| 2886 | 87/00 | HB29 | – | i | skull | os/A | – | C29, Ditch fill |

**Table 59 (cont)**

| *Context* | *Phase/ group* | *Berridge no* | *Original cat no* | *Deposit* | *C = weight i = element* | *Age* | *Sex* | *Provenance* |
|---|---|---|---|---|---|---|---|---|
| 1280 | 88/00 | HC35 | – | c | 10.8g | s/A | – | C19, over Ditch |
| 1290 | 88/00 | HB6 | – | i | tibia | A | – | C20, over Ditch |
| 1384 | 88/00 | ?HB7 | | i | ulna + frag upper limb | A | – | C21 |
| 1815 | 88/00 | HB29 | | i | tooth | y/ymA | – | C7 |
| 2674 | 88/00 | | S56/21 | i | tooth | oj/yA | – | C12 |
| 3543 | 88/00 | | 64/35 | i | tooth | s/yA | – | C58, Stonehole 27 |
| 3892 | 88/00 | | 54/21 | c | 0.5g | s/A | – | C41, Ditch fill |
| 1628 | 89/00 | HB17 | | i | animal | | – | YH 6 |
| 2597 | 89/00 | HB21 | | i | skull | y/mA | – | C28, top of Ditch |
| 3852 | 89/00 | HB16 | | i | teeth | A | – | YH 4 |
| 3891 | 89/00 | | 54/106.1 | c | 0.7g | s/A | – | C41, Ditch upper fill |
| 3891 | 89/00 | | 54/109.6 | i | tarsals | s/A | – | C42, topsoil |
| 3896 | 89/00 | | 54/902.2 | i | vault | s/A | – | C42, topsoil |
| 3896 | 89/00 | | 54/902.2 | i | metatarsal | A | – | C42, topsoil |
| 3896 | 89/00 | | 54/909.2 | c | 1.2g | s/A | – | C42, topsoil |
| 3896 | 89/00 | | 54/909.6 | i | ?animal | | – | C42, topsoil |
| 3896 | 89/00 | | 54/907.5 | c | 1.5g | s/A | – | C42, topsoil |
| 3896 | 89/00 | | 54/909.6 | c | 0.5g | s/A | – | C42, topsoil |
| 3897 | 89/00 | | 54/910.17 | c | 3.3g | s/A | – | C42, Ditch upper fill |
| 3897 | 89/00 | | 54/913.8 | c | 4.1g | s/A | – | C42, topsoil |
| 3813 | 00/00 | | | i | skull, axial, upper limb | 2xom/oA | – | unstratified |

*Key: c = cremated; i = inhumed*

*Age: inf = infant; oj = older juvenile; s = subadult; os = older subadult; y = young; ym = younger mature; m = mature; om = older mature; o = older; A = adult;*

*Sex: ? = probable ?? = possible; f = female; m = male*

* *Hawley mentions only animal bone from this context*

that were kept. The retention of tooth roots in preference to other cremated bone fragments was not uncommon in early excavations, the belief being that these were the only identifiable fragments or the only ones of any 'interest'. Bone from context 3008 was from a shallow scoop at the base of Aubrey Hole 32. Charcoal associated with a cremation in AH 32 produced a radiocarbon date of 3798±275 BP (C-602), which because it can only be calibrated to 3020–1520 cal BC is not very helpful *(see Appendix 2)*. Other 'scoops' were described by Hawley (1921; 1922) as being cut into the upper edges of several Aubrey Holes *(see Chapter 5)*. These features apparently contained small amounts of cremated bone in addition to burials contained within the main body of the hole: both may have been products of the same cremation. Atkinson *et al* (1952) recovered a few scattered fragments of cremated bone from the disturbed main fill of Aubrey Hole 32, but this bone was not present for examination. The relatively small amount of bone in context 3008 (150.7g: maximum 15% expected bone weight; McKinley 1993), may represent only part of the whole cremation burial. Had the contents of the main fills and the scoops been available for examination, it might have been possible to ascertain whether they represented the same burial.

Cremated bone was recovered from Ditch cuttings C41 and C42. Most represents scatters of small groups or individual bones from the Ditch silts, fills, or topsoil. From C41 a total of 8.3g was collected from the upper ditch silt, 69.6g from the Ditch fill and 0.7g from the upper ditch fill (Table 58). Ditch C42 presents a similar situation with a total of 7.3g of bone from the topsoil, 3.3g from the upper fill, 10.7g from the upper silt, and 5.2g from the Ditch fill. There was also a single discrete deposit in the Ditch fill (context 3898, Atkinson cat no 54/821) of 1546.6g of well cremated bone, clearly representing a burial. The scattered cremated bone could possibly originate from this burial; there are no duplicated bone fragments, all fragments suggest a subadult/adult age range and where closer ageing was possible, a young/mature adult range was given, which would not be incompatible with 54/821. Alternatively, the scattered bone may represent another disturbed cremation burial or fragments of bone not collected from the pyre for burial (McKinley 1989). The quantities of wood ash and burnt chalk rubble (ie pyre debris) reportedly recovered with at least some of the cremation burials within the Aubrey Holes suggest that the pyre sites were probably relatively close to the place of burial (Hawley 1921; Atkinson *et al* 1952). Hawley also noted deposits of wood ash in the Ditch (1922), though none was found with cremation burials recorded from the Ditch fill (1922) or base (1921).

**Pyre technology and ritual**

As cat no 54/821 (C42, context 3898) is the only full cremation burial available for examination, comment on pyre technology and ritual is largely limited to this context. The bone was well cremated (oxidised) being almost universally buff/white in colour. A large amount of bone had been collected for burial (1546.6g), a minimum of 45% of the expected bone weight and possibly most – though not quite all – of the recoverable bone (McKinley 1989; 1993). The majority of the bone, *c* 74%, was recovered from the 10mm fraction, with a maximum fragment size of 122mm. There is no indication of any deliberate fragmentation of bone prior to burial (McKinley 1993; 1994), or any deliberate selection of certain skeletal elements. A fragment of cremated antler burr and burnt flint flakes were also recovered from the context. Blue/green spot staining was noted on a lumbar vertebra, which may indicate the original presence of copper alloy (though none was recovered ). No pyre debris was found with the burial although it was with several of the others reported by Hawley (*above*). Some considerable time must have been expended in collecting this much of the bone for burial.

The degree of cremation and the large quantity of bone collected for burial have close parallels with primary, central barrow Bronze Age cremation burials from elsewhere in England, such as Field Farm, Dorset (McKinley 1988), Alpington, Norfolk (McKinley 1990), and Guiting Power, Gloucestershire (McKinley forthcoming). These primary burials are noticeably different from 'satellites', particularly in respect of the quantity of bone, and it would appear that the time expended on the cremation process, including collection of remains for burial, may have been connected to the 'status' (however that was measured) of the deceased. It is unfortunate that only one of the cremation burials from Stonehenge is available for examination; had analyses of others been possible, it could have been ascertained whether this high level of bone recovery for burial was standard or if there were variations, as noted in the cremation cemeteries of other periods. According to Hawley's accounts, many of the cremation burials included large amounts of bone (1926; 1928), whereas others consisted of only *c* 141g of bone (1926). Hawley's comments are, however, subjective; in one instance only was a weight of bone presented (1926) and bone fragment sizes were not measured. Some of the smaller collections may have represented the remains of immature individuals, but since they were not examined by a bone specialist prior to reburial, speculation should be avoided.

All the other cremated bone was well oxidised, with the radius fragment from cat no 54/841 (context 3898) being slightly grey. In context 3008, although representing only part of a burial, *c* 84% of the bone fragments were in excess of 10mm with a maximum fragment of 60mm. The humerus shaft fragment from C41, context 3893 (Atkinson cat no 54/41) had blue/green spot staining. Cat no 54/45 (context 3893) included fragments of cremated bird bone. The inclusion of animal bone in cremation burials of this period, although not frequent, is not unusual.

**Inhumed bone**

With the exception of the inhumation burial in the Palisade Ditch (C81, context 9470), the inhumed bone comprises scatters of single bone fragments or a few fragments of disarticulated bones recovered together. Almost all bones were present only as fragments, with skeletal elements from the skull, axial skeleton, upper, and lower limbs. Fragments from pre-1954 contexts were scattered throughout the excavated length of the ditch. A minimum of two other inhumed individuals were indicated, both adults.

**Demography**

Demographic comment based on such scanty evidence, particularly where over 53 discrete cremation burials are known to be absent and other evidence in the form of scattered bone fragments is missing, is not appropriate and would be misleading.

**Pathology**

A summary of pathological lesions is presented in Table 59 with full details in archive. Pathological lesions were noted in bone from five contexts, and morphological variations in bone from six contexts. Description and comment on pathology is severely limited in consequence of the nature (mostly scattered material) and the small amount of human bone remaining for examination.

Calculus (calcified plaque; Hillson 1986), was noted in two dentitions, deposits being slight in both cases. Enamel hypoplasia, resulting from disturbances in enamel formation and evident as bands, grooves, or pits in the enamel surface, may have a number of causes (Hillson 1986). Two individuals showed a few shallow, horizontal grooves in the enamel of several teeth.

Osteophytes are irregular growths of new bone which may proliferate around the margins of a joint, they may occur alone or in association with other lesions such as eburnation and pitting in the joint surface. Seen alone the lesion may simply be age-related, though there may be other predisposing factors; in association with other lesions it may be indicative of diseases such as osteoarthritis or degenerative disc disease (Rogers *et al* 1987). Mild lesions were noted in the thoracic and lumbar vertebral bodies of the unprovenanced bone (context 3813) and in the lumbar vertebra of inhumation 9470 where they were associated with surface pitting. Mild osteoarthritic lesions were noted in the thoracic dorsal intervertebral facets from context 3813 and Schmorl's nodes were observed in a lumbar vertebral body. Schmorl's nodes are destructive lesions formed in response to the rupture of the intervertebral

**Table 59 Summary of pathology and morphological variation in human bone**

| *Context* | *Phase/ group* | *Berridge/ original cat no* | *c/i* | *Age* | *Sex* | *Pathology/morphological variation (mv)* |
|---|---|---|---|---|---|---|
| 1944 | 60/42 | HB30 | i | <y inf | – | hypoplasia |
| 2597 | 89/00 | HB21 | i | y/mA | – | ?osteoarthritis — mandible; mv — bipartite canine root, mandibular M1 accessory root |
| 2674 | 88/00 | S56/21 | i | oj/yA | – | calculus; mv — maxillary incisor shovel-form |
| 2886 | 87/00 | HB29 | i | os/A | – | mv — canine rotated |
| 3543 | 88/00 | 64/35 | i | s/yA | – | mv — maxillary rP2 accessory cusp |
| 3813 | 90/00 | – | i | om/oA | – | osteophytes — thoracic lumbar; osteoarthritis — thoracic; Schmorl's nodes — lumbar |
| 3898 | 2-/00 | S54/821 | c | yA | f | mv — metopic suture |
| 9470 | 00/77 | PUP69 | i | ymA | m | calculus; hypoplasia; trauma — healed fracture right ulna; periostitis — right ulna; right fibula; exostoses — right ulna (trauma); vertebral body collapse — C3 & 4, T4; destructive lesion — C3; pitting — lumbar bodies, C4, T4; depressions — C3 & 4; surface new bone — C4; pseudo-facets — T1–4 (spinal curvature); erosive lesion — T3; osteophytes lumbar; mv — squatting facets, calcaneal double facets |

*Key: c = cremated; i = inhumed*
*Age: y = young; inf = infant; j = juvenile; s = subadult; m = mature; A = adult; o = older*

disc allowing the nucleus pulposus to protrude into the body of the adjacent vertebra.

Indications of a well healed fracture and associated lesions were seen in the right forearm of the younger mature adult male from the Palisade Ditch (context 9470). The right ulna has a pronounced angle in the medial direction (distal end rotated medially) with slight thickening of the shaft 86–124mm from the proximal end. This bony callusing is matched in the right radius by a slight longitudinal bony 'ridge' in the adjacent proximal shaft, 67–87mm from the head. Such a fracture to the ulna may result from a direct blow ('parry' fracture) or from indirect force (Adams 1987). Callusing in the radius indicates rupture of the attachments between the bones. There is a small area (12 x 7mm) of slight periosteal new bone 130–140mm from the proximal end of the ulna which may be associated with the same traumatic event.

The bodies of the third and fourth cervical vertebrae from inhumation 9470 show wedge-shaped anterior collapse. A destructive lesion (7.5 x 3.0mm, *c* 5mm deep) is present in the dorsal centre of the third cervical superior body surface, and the anterior of the inferior body surface has a depression with a destructive lesion 15 x 5mm, 3mm deep. The superior body surface of the fourth cervical vertebra has mild pitting with apparent reactive surface new bone, and the inferior surface has a 14 x 7mm, *c* 2mm deep depression similar to that in the third, with mild pitting. There are mild-medium osteophytes on the anterior margins of both superior surfaces. X-ray shows no sclerosis and slight rareification of the internal spongiosa.

The first to fourth thoracic vertebrae from inhumation 9470 have pseudo-facets on the spinal processes developed in response to a kyphosis of the thoracic spine, probably in consequence of the collapse of the fourth vertebral body. The pseudo-facets range from the tip of the spinal process on the first thoracic vertebra to the superior portion of the spinal process on the fourth. There is some disruption to the inferior body surface of the third vertebra, with slight bone resorption on the anterior edge of the surface. The fourth thoracic body has a maximum depth of 13mm, with a minimum of 6mm on the anterior right side. Both body surfaces have depressions, with no exposure of the spongiosa, on the anterior of the inferior surface and the anterior and dorsal corners of the superior surface. There is mild pitting in the superior surface. The fusion of the epiphyseal plates appears to have been affected. An X-ray taken of the vertebra revealed reduced internal bone density in the anterior portion with a destructive lesion, *c* 4.3mm diameter, close to the anterior right side of the body.

Morphological variations are 'normal' variations within the skeletal morphology, some of which may be indicative of genetic relationships (Berry and Berry 1967; Finnegan 1978). There is some discussion as to the nature of 'squatting facets' on the anterior margins of the tibiae distal articular surfaces, some specialists believing them to develop in response to the use of a squatting posture rather than being a natural variation. Incomplete skeletal recovery and retention renders further discussion of these traits inappropriate.

**Skeletal indices: Iron Age inhumation 9470**

The cranial index indicated a dolichocrany type. Platymeric and platycnemic indices indicated eurymeric and mesocnemic types. Estimated stature of this individual was 1.78m (*c* 5ft 10in). Both cranial type and estimated stature correspond with the similarly aged male excavated by Evans *et al* in 1978 (C61) (Evans 1984), though the correspondence may be of no significance.

The ?adult male skeleton excavated by Hawley (1925) from the grave adjacent to Y Hole 9, also, apparently, had a dolichocrany skull type. (There does not appear to have been a full osteological report for this skeleton (Smith in Hawley 1925, 25) and it is no longer available for examination.)

### Conclusion

Comments on age and sex of the cremated remains by Hawley in his excavation reports should be treated with extreme caution, since these 'identifications' were not supplied by a human bone specialist. The disarticulated fragments of human bone he recovered from the Ditch fill and elsewhere are clearly not all available for examination. However, the fragments of both cremated and inhumed bone which are available do not suggest any deliberate 'ritual' deposition, over and above that implied by the acts of cremation and/or burial, as reflected, for example, in the skeletal elements present.

Hawley commented in his 1928 report that all the Aubrey Holes had been disturbed subsequent to deposition of the cremation burials. The scatters of bone have the appearance of disturbed material. Had some of the cremations been carried out in the vicinity of the burials, as is suggested by the presence of pyre debris – particularly in the Aubrey Holes (Hawley 1928) – bone not included in the burial after cremation (McKinley 1989) may have later found its way into the Ditch, either accidentally or during clearing of pyre sites.

The lack of evidence for disturbed inhumation graves leaves the origin of the inhumed bone open to question. There is no apparent evidence for ditch recuts which may have disturbed burials made there, and although Hawley notes disturbance to the cremation burials in the Aubrey Holes, he does not mention disturbance of those in the Ditch.

There is the possibility of the inhumed bone being the remains of exposed cadavers, the disarticulated remains of which either ceremoniously or otherwise found their way into the Ditch. Substantiation of such a theory would be difficult, however. What changes would one expect to see on the bone? There is no obvious sign of gnawing, for instance (as there is on some of the animal bone; *see above*), and other than the normal weathering of some bone, it does not appear different from the bone recovered from the graves.

## Botanical remains

As described in the introductory comments to this section the botanical material and land snails from previous excavations are limited to the hand-collected sample and a few fragments. These are reported upon below.

### Charcoal

*by Rowena Gale*

Only a few small fragments of charcoal survive from the excavations. Charcoal recovered by Gowland from a rabbit hole in C64 (context 1003) was identified as *Pinus* sp (Pine, *sylvestris* group), and charcoal from topsoil (context 3859) in Hawley's excavation of Stones 5 and 6 (C1) as *Prunus* sp (cherry or blackthorn). Two small twiggy fragments from Aubrey Hole 16 (probably context 1206; phase 2 or earlier) were also identified as *Prunus* sp. Other hand-recovered charcoal from the upper fills of the Palisade Ditch (C81, probably context 9458) above the skeleton was identified as *Pinus* sp (*sylvestris* group).

The significance of the identification of *Pinus* (*sylvestris* group) on the chalk downland is discussed in relation to the secure and dated pine charcoal from the Mesolithic pits and from pollen records elsewhere (*Chapter 10, below*). However, the presence of pine charcoal, a species not thought to have grown extensively on the downlands since the Boreal period (*c* 6000 cal BC) may indicate that the Mesolithic activity in the car park was much more widespread or that pine was specifically selected at later dates and used in relation to the construction or use of the monument itself. Pine charcoals were not recovered from any excavated contexts during the Stonehenge Environs Project (Gale 1990), nor were any Mesolithic contexts investigated.

### Charred tuber of *Arrhenatherum elatius* var *bulbosum* (Willd) St Amans (onion couch grass) from Aubrey Hole 5

*by Alan J Clapham*

A single well preserved charred tuber of *Arrhenatherum elatius* var *bulbosum* (Willd) St Amans was identified from Aubrey Hole 5 (context 1166, phase 3 or later, group 37) associated with scattered cremated bone which Hawley suggested belonged to one or two cremations, two burnt skewer pins, and also some Romano-British pottery (31/3/1920). It is a slightly compressed sphere 5mm in length and 6mm in diameter, showing the characteristic abscission scars at the top and base and the ribs running the length of the swollen internode.

*Arrhenatherum elatius* is a tall, tussock-forming, perennial grass of widespread distribution in Britain. In the variety *bulbosum* (Willd) St Amans, the lowest stem internodes are swollen and form 'bulbs' (Pfitzenmeyer 1962, 235). Varying degrees of 'bulb' size are shown and the absence of 'bulbs' represents only one extreme of the range of variation shown by the species. It is a native grass and can be found growing in a wide variety of habitats such as coarse grassy places, waysides, hedgerows, maritime sand and shingle, and rough and waste ground (Stace 1991). The swollen internodes ('bulbs') of the bulbosus variety are effective propagules in arable land.

Robinson (1988) states that *A elatius* is a species of a particular category of ungrazed grassland, *Arrhenatherum elatius* grassland or Arrhenatheretum. This type of grassland grows on circum-neutral and calcareous soils, being best developed on well structured, free-draining circum-neutral loams. Regular grazing is capable of controlling or removing this species from grassland, but it is a ready invader of abandoned arable land and can be difficult to eradicate once it has become established.

There are now a large number of archaeological records of finds of *Arrenatherum elatius* var *bulbosus* tubers, many occurring in pre-Iron Age contexts, especially the Bronze Age, although a number have now been recorded from Neolithic sites. More significantly, many are associated with human cremation burials. From the area surrounding Stonehenge two tubers of onion couch have been identified by Carruthers from a later Neolithic pit at King Barrow Ridge along with a single find in a sample from the ditch of Coneybury Henge (Carruthers 1990). Other Neolithic finds include those identified by Straker from the long cairn at Hazelton, Gloucestershire (Straker 1990) and by van der Veen (1985, 207) at Whitton Hill, Northumberland.

There has been much speculation about the significance of onion couch tubers from archaeological contexts. Carruthers (1990) believes it may be an indicator of abandoned arable land and Godwin (1975, 480) suggested that the onion couch tubers were collected for food. Robinson (1988, 102) questions the possibility of the tuber being used as a food source, as much preparation would probably be necessary in order to extract anything edible from such coarse material. He notes that many onion couch tubers are found with cremation burials and offers the suggestion that *A elatius* was used as kindling for the funeral pyre. The dry dead stems of this grass remain upstanding for much of the year and can be readily gathered by pulling, resulting in many cases in the live internodes of the bases being uprooted; if these are then used as kindling for the pyre, the fresh tubers would be more likely to survive after burning.

Although the onion couch tuber in this case is a single find, the fact that it comes from the same context as a cremation in one of the Aubrey Holes makes the interpretation of its use as kindling for the funeral pyre a possibility.

### Charred seeds from the Avenue

*by R G Scaife*

During the Vatcher's excavation of the Avenue (C86) seven small (<160g) soil samples were taken. These were processed by Wessex Archaeology and found to contain no charred plant remains (in archive). During their excavations the Vatchers noted and collected small charred fragments (Table 60). In both the primary and secondary fills of one of their ditch sections (contexts 9708 and 9709. Some charred plant remains were recovered. Small (<1mm) fragments of 'coal' were, however, also found in the samples. These may be a result either of road construction (A303) or possibly of steam ploughing of this landscape in the later nineteenth or early twentieth centuries.

**Table 60 Plant macrofossils from the Avenue ditches (C86)**

| *Context* | *Provenance* | *Vatcher description* | *Identification* | *No* |
|---|---|---|---|---|
| *Northern ditch* | | | | |
| 9708 | Primary | *black material* | *Galium aparine* | 4 |
| | | | charred cf caryopsis | 1 |
| 9708 | Primary | *carbonized grain? on base of ditch* | *Vicia/ Lathyrus* | 1 |
| 9718 | Primary | *charcoal fragments from base* | charcoal | + |
| 9725 | Primary | *pieces of carbon? on base of ditch* | – | |
| 9709 | Secondary | *seeds in chalk silt near base* | *Vicia/ Lathyrus* indet | 1 |
| | | | charcoal | |
| *Southern ditch* | | | | |
| 9723 | Secondary | *charcoal silt in ditch earth just above primary silt* | charcoal | + |
| *Ditch (unknown)* | | | | |
| 9728 | Primary | *fragments of black material off base of ditch* | *Galium aparine* | 5 |

The primary fills contained *Vicia/Lathyrus* (legume) and one charred cereal grain possibly indicating cultivation and/or crop processing in the vicinity when the ditch was constructed. However, *Vicia/Lathyrus* is also common is hedgreows and shrubs, habitats favoured by *Galium aparine* (cleavers), although it is also a species common on disturbed ground and grassland. The secondary fills also contained one *Vicia/Lathyrus.*

Because of the paucity of identifiable charred seeds, little can be said from this evidence about the environment. However, a single charred cereal grain (if not intrusive) may be indicative of arable cultivation. This would support molluscan evidence elsewhere in the ditch (Thomas in Smith 1973) and confirm the hypothesis presented by Allen *et al* (1990, fig 155d).

## Other environmental material

### Hand-picked land Mollusca and marine Mollusca

Six land mollusc shells survive. These are all from the general unascribed fills of Aubrey Hole 10 (context 1186, phase 89). They are *Helicella itala* (1); *Trichia hispida* (1), and *Cepaea* sp (4), all species that could live in open country. *H itala* is xerophile and uncommon in long grass or shady conditions. The soil and microscopic flecks of charcoal in their interstices indicate that they are derived from the feature and not topsoil. Hawley records snail shells including *Cepaea* spp (probably *C hortensis*), from the Aubrey Holes (Hawley 1922, 14). His general descriptions are totally in keeping with the shells recorded here.

Four marine shells were found amongst the collections, none from phased contexts. These consisted of three examples of Periwinkle (*Littorina* sp) one each from C7, context 1735 (Hawley cat no 689, phase 87), C7, context 1731 (Hawley cat no 645, phase 88), and C13, context 2949 (Hawley cat no 389, phase 89), and one oyster shell (*Ostrea edulis*; C7, context 1736, phase 87). These are all considered to be of medieval or post-medieval date.

**Ash waste**

A lump of cemented or fused ashy waste was discovered in the archive. It came from Atkinson's 1953 excavations of the Heelstone (C36) at the 'foot of the stone', though it has not been possible to assign it to context. A note with the material described it as 'decayed wood'.

The object consists of a small tabular block of very pale yellow (2.5YR 7/4) dusty calcareous material 80 x 51 x 19mm. It is light (24.2g) and not dense, containing up to 15% small and very small vesicular pores. It seems to be composed in part of calcium carbonate, possibly calcium phosphate pseudomorphs.

The origin of the this material was not determined but is likely to be fused 'grass' ashy waste and its high porosity is perhaps attributable to vesicular pores formed during fusion. Dr M Robinson agreed that it was likely to be ashy but he was not able to observe any obvious cereal or other seed waste in a rapid examination by the naked eye (Robinson pers comm). Disaggregation to recover plant material was deemed not to be useful in answering questions of its origin, and the possibility of undertaking thin section examination was not possible during the timescale of this report.

# Part 4: Discussion

## 10 Stonehenge in its landscape

*by Rosamund M J Cleal and Michael J Allen*

### Introduction

The area around Stonehenge has been the subject of intense archaeological activity and speculation for many years, and this shows no signs of abating. In the last 15 years, since the publication of *Stonehenge and its Environs* (RCHM(E) 1979), it has been the subject of the extensive Stonehenge Environs Project (Richards 1990), and within the last three years has been a major element in at least two academic studies (Thomas 1991; Barrett 1994), as well as featuring in many other works. If we are ever to be able to approach an understanding of any area of Neolithic and Bronze Age Britain it should surely be here.

For many years the great problem in elucidating the prehistory of the Stonehenge area was the 'black hole' which lay at its centre. The developmental history of that monument, which is always regarded as lying at the heart of the landscape, was too vaguely defined to be equated with developments in the landscape around it. Although it seemed reasonably certain that its inception lay in the later Neolithic, its later history, and particularly the end of the active use of the site as a monument, seemed too uncertain to have any reliance placed on it. To many people the idea of the Avenue ending perhaps somewhere around King Barrow Ridge for most of the life of the monument and only reaching completion in the Late Bronze Age, seemed unlikely. Richard Bradley, for example, could state recently that he was not convinced that the Avenue was built over a very long period (1993, 52), and that view is certainly now vindicated. With the excavations at the monument now published, and a much sounder chronology provided by the new radiocarbon dates, it is possible to bring together the monument and its surroundings into a more coherent whole, and to see Stonehenge take its place fully within its landscape.

The previous chapters have discussed the earthwork and stone monuments in considerable detail and, in so doing, this has inevitably dislocated the monument from its landscape setting, just as previous accounts have done (Atkinson 1956 *et seq*). The *Stonehenge Environs Project* redressed some of the historic imbalance, in that it considered the area around the monument in great depth, and Richards did attempt to relate some of his broader evidence to the constructional phases of the monument as then understood (Richards 1990, 273). The consideration of monument and landscape presented in this present study takes the story a step furtherby utilising both the detailed and dated landscape and artefact surveys presented in Richards 1990 and the chronological data for the phases of the monument provided by the detailed reanalysis of the excavation records and rigorous radiocarbon dating programme. In discussing the monument as an integral part of the surrounding archaeological landscape we can firmly place Stonehenge in the context within which we believe it existed. This is paramount in understanding its role within the wider archaeological framework, rather than just the details of its construction and development. It is not, however, our intention to reinterpret the Neolithic and Bronze Ages of southern England, and the assimilation of the monument into the much wider fields of social and political organisation are left for both the present and other authors to contemplate.

Central to this discussion, and to any interpretation of the monument within the landscape, is the interpretation offered here for those details of construction and development which constitute the new evidence to be added to the existing picture. Because Stonehenge is unarguably a site of primary importance in the understanding of the Neolithic and Bronze Age in this part of the world, and because the re-evaluation of its place in the landscape is dependent on the reliability of the developmental sequence presented in this study, the rephasing is discussed here in detail. This makes explicit those processes of analysis which although almost universally applied in dealing with a complex archaeological site are more usually, and perhaps understandably, shrouded in mystery as far as the published account is concerned. In this case it was felt justified and necessary to make plain the influences and considerations involved in this process, and because the overall interpretation is dependent on them they are presented here, preceding that overall interpretation.

### Revision of the phasing

*by Rosamund M J Cleal*

#### General principles

It is important to make clear the principles and assumptions which have influenced the revision of the phasing. No analysis of an archaeological site takes place in an intellectual vacuum, and with Stonehenge more than most sites there is a heavy weight of previous analysis and interpretation to be borne by anyone who attempts reinterpretation.

The guiding principle, followed throughout the project from the outset and in all its aspects, was that, as far as possible, the site would be interpreted on the basis of the primary site record. This principle could not, however, be followed to the letter; it was indeed followed 'as far as possible', but in many instances that was not very far, and reliance had to be placed on excavators' interpretations. Two other assumptions, although not general principles underlying the project, have certainly influenced the writer, who is principally responsible for the revised phasing. First it was not assumed that there need necessarily be a 'phasing' in the conventional sense at all. The desire to discern order in a site's development is understandable, but there is no logical reason why a prehistoric ceremonial or ritual site should have developed in a way analogous to, for instance, a medieval castle, or demand the conceptual tools required to interpret a complex urban site. A possibility which had to be countenanced from the outset was that the development of the monument – after the initial decision to utilise the site – was a more or less organic process which did not occur in clearly defined and organised 'phases', but in which relatively small changes in plan were made by succeeding generations. (This, in effect, is what the revised phasing does suggest for phase 3.) The second assumption made by the writer was that although the site should be approached from first principles, the current phasing (as most recently presented in Atkinson 1979) should not be rejected out of hand. The phasing presented in *Stonehenge* is familiar both nationally and internationally and it was felt that the advantages of this meant it should not be replaced unless absolutely necessary. In practice, however, both these assumptions came to be rejected: the monument could not be seen as entirely the product of a seamless process of small-scale change and development, and the well established previous phasing could not be justified and has not been retained.

An interpretation of the monument's development as essentially part of a single process was rejected because it was felt that points could be discerned at which the whole character of the monument changed. In reality these 'points' probably extended over quite long periods in the history of the site, but it is difficult to define them in terms of years and they have to be regarded in terms of the archaeology as 'points' of change. The history of the monument site is 'phased' only for that period during which it seems to have functioned as a ceremonial or ritual site, and this period is bracketed by two of these points of change. The beginning of phase 1 is marked by the decision to create an enclosure on the site, and the end of phase 3 is marked by the end of the last adjustment to the plan of the monument, and its subsequent abandonment. This also highlights the difference between an 'event' and a 'phase', a distinction which has proved useful in formulating the radiocarbon dating programme, discussed below. The construction of the Ditch is clearly an 'event' which took place within a fairly restricted period of time and it is this 'event' which can be taken to mark the inception of phase 1. It is not, however, *equivalent to* phase 1, which consists not only of the construction of the Ditch but also of those activities which were intended to take place there by the builders of the enclosure and were essentially part of the original plan (as it seems reasonable to assume that the enclosure was created for some preconceived purpose). It is unlikely that this included the backfilling of the feature and so it was felt reasonable to interpret the introduction of deliberate backfilling as marking the inception of a period of rather different use of the monument. Again, that action – the backfilling of some parts of the Ditch – can be seen as an 'event' marking the inception of a phase, but is not itself the equivalent of a phase. This was the guiding principle throughout.

The process of 'phasing' the monument was therefore undertaken in the hope that what was being identified was a reflection, albeit crude and unsatisfactory, of real changes in the way the monument was used. Moreover, it was hoped that these could be related to changes discernible in the world outside the monument, and that the exercise of 'phasing' would add to our understanding of how the builders and users of the monument also used the surrounding landscape, rather than simply producing a neat but sterile series of box-like constructional phases.

## Rejection of the previous (Atkinson) phasing

As explained above, the rejection of the existing phasing was not undertaken lightly, but it was eventually considered to be necessary. It was undertaken principally because it was felt that since the publication of the phasing in 1956 sufficient new evidence had been uncovered to suggest that it could not be correct. In particular, the information from the 1978 excavations materially contradicted the existing phasing, but there had obviously not been enough time for a re-evaluation of it before the 1979 edition of *Stonehenge* went to press. Professor Atkinson published the discovery of the Beaker-period grave in an appendix (II) in that volume, but was not able to undertake the complete revision of the phasing which was required in that context. The discovery that the only bluestone fragment from deep in the Ditch had been within a later intrusion clearly demanded a radical revision of the position of the introduction of the Bluestones within the sequence. This in itself would have been sufficient to justify a revision of the phasing, but the environmental evidence recovered during the 1978 excavations also suggested that the history of the monument did not fit easily into the Atkinson phasing.

The major difference between the Atkinson phasing and the present phasing, arising largely from the 1978 evidence, is dependent on the relationship between the Avenue and the monument, with the backfilling of the Ditch and the construction of the Avenue not now considered to be part of the same plan. The arguments for this may be summarised as follows:

- Much of the backfilling appears to have taken place almost directly on top of the primary fill ie *at a time*

*when the secondary fill had not yet formed.* Therefore most of the secondary filling of the Ditch must have taken place after the backfilling occurred (assuming that the backfilling did not occur within a recut within the secondary fill, which seems an overly complex explanation and is not supported by the section drawings). This contradicts Atkinson's interpretation of the evidence in which he sees the backfilling as taking place during the secondary filling and at a time when bluestone was present. The fragment of bluestone on which he based his argument was shown by the 1978 excavations to have lain within a Beaker-period grave cut through the secondary filling. The secondary filling of the Ditch contains no bluestone fragments (except in the very uppermost fill and then possibly in intrusions), nor does the chalk backfilling, which suggests that the secondary filling and the backfilling did not take place when there were Bluestones on the site (as approximately half the length of the circuit has been excavated). The Avenue is later than the appearance of bluestone, as its bank overlies the Heelstone Ditch which contains a bluestone fragment. It therefore seems reasonable to see the Avenue as being later than the formation of the secondary silts of the main Ditch, and therefore later than the first backfilling episode (or episodes; ie those onto primary filling).
- The backfilling of the Ditch can be seen to be a much more complex series of events than the simple operation described in *Stonehenge*, and is not directly equatable with the construction of the Avenue in the manner presented in that volume.

Atkinson's argument for the Avenue belonging to his Phase II rather than III is also difficult to uphold. He argued that two sarsen mauls resting on top of the chalky rainwash in the Ditch (ie on the secondary fill) are the same type as those in the stoneholes of his Phase IIIa. His argument is as follows:

- the deliberate backfilling of the enclosure Ditch took place earlier – on stratigraphic evidence – than the time at which the sarsen mauls entered it;
- the mauls are phase IIIa, therefore the backfilling is pre-IIIa; and
- the deliberate backfilling was intended to match the main Ditch to the Avenue, therefore it is Phase II (given that he considered that it could not be Phase I on the grounds of the timing of the backfilling.)

The main criticism of this, in terms of Atkinson's own phasing, is that it assumes that the sarsen mauls are of Phase IIIa and that they arrived in their present position soon after they had been used to dress the Sarsens of IIIa. In fact, they could have been in use much later, for instance during the dressing of the Bluestones, or have reached their present position by an indirect route. Their position on top of the 'chalky rainwash' indicates only that they are later than the Ditch filling, not by how much they are later. If, for example, they dated to Atkinson's Phase IIIb (dressed Bluestone setting) the backfilling might well be of his Period IIIa rather than II. However, these arguments are in any case now redundant, given the evidence from the 1978 excavations for the position of the bluestone in the Ditch.

The contribution made by the molluscan analysis carried out by Evans (1984) was to indicate that there was a period of relative inactivity, at least as far as the Ditch was concerned, during the period in which the lower secondary fill formed. Although the nature of this deposit has now, in this volume, been questioned on the grounds of the archaeological evidence (ie on the formation of the layers sampled, rather than through a reinterpretation of the molluscan data), it is still the case that there is no firm evidence for a long unitary period of use such as Atkinson's Phase I implies was the case prior to the change in the site characterised as Phase II (see Figure 251 for Atkinson's latest phasing summarised).

## The new phasing

The new phasing is summarised and compared with the Atkinson phasing in Figure 251. Full details of the new phasing are in Appendix 8.

### Method

An initial phasing was carried out on the basis of the major elements of the monument, and all contexts were then assigned to Groups which consisted of related contexts which were unlikely to be assigned to different phases. These are listed in Appendix 8 (Tables 66 and 67) and included elements such as cut and primary fill of the Sarsen Circle Stoneholes, cut and primary fill of the Ditch, and so on. These were then assigned to phase, with the advantage that in the rare cases where it subsequently became apparent that elements would have to be rephased, whole Groups could be reassigned from one phase to another. In the site databases, and in the text, these Groups are referred to by two-digit numbers, and the phases by alpha-numeric codes. Only the period during which Stonehenge can be assumed to have functioned as a monument was phased, so pre-monument activity on the monument site is not phased, nor is the apparently casual use of the monument in the Middle to Late Bronze Age or later. A summary of the main elements of the site matrix is presented in Table 61.

### Discussion

Any phasing of the monument must be highly subjective, as there are so few stratigraphic relationships on which to draw, and even with the increased number of radiocarbon dates now available there are still relatively few fixed points in the monument's development. Table 68 (Appendix 8) attempts to summarise the factors influencing the phasing, and to express the differing degrees of reliance which can be placed on various elements of

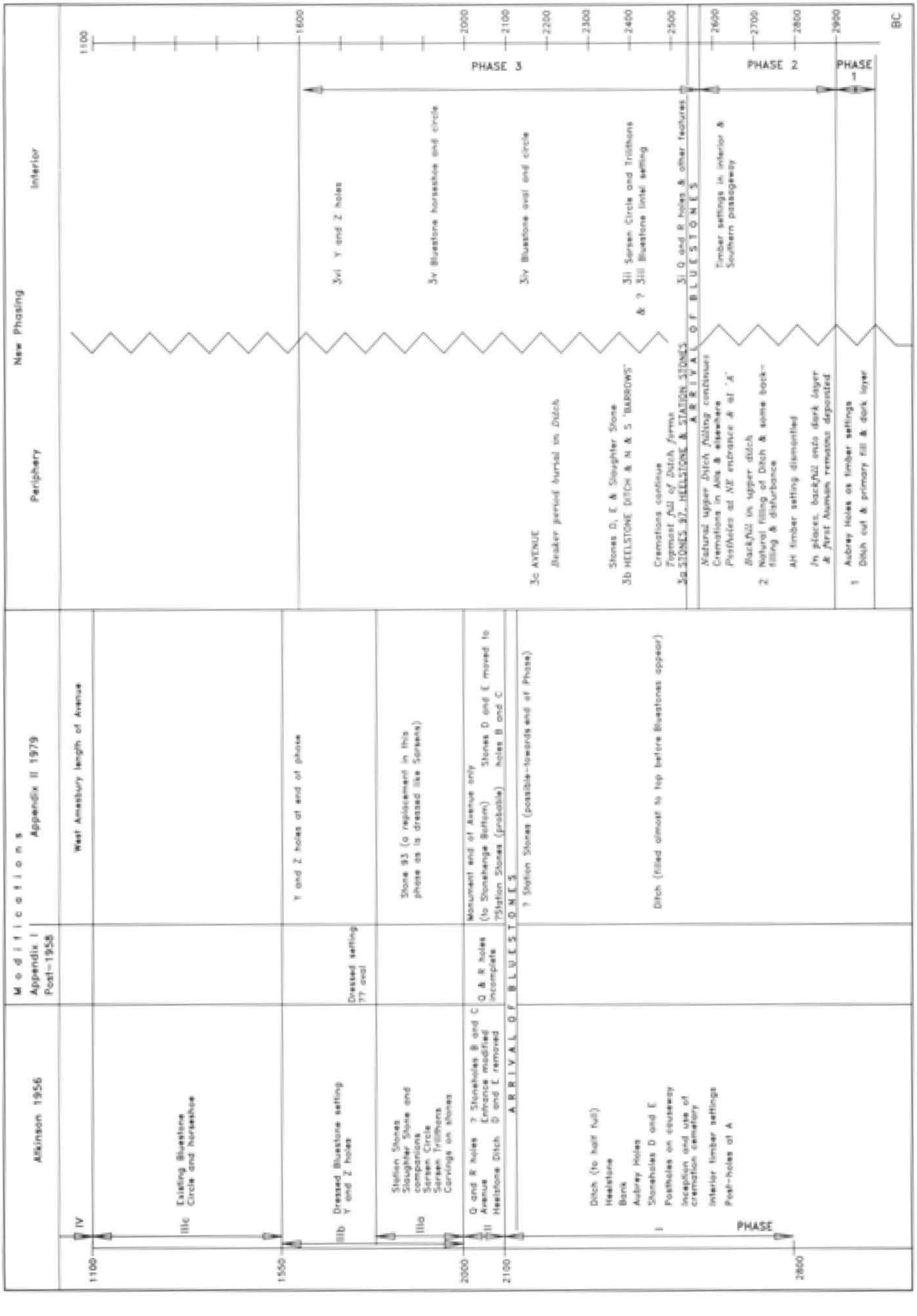
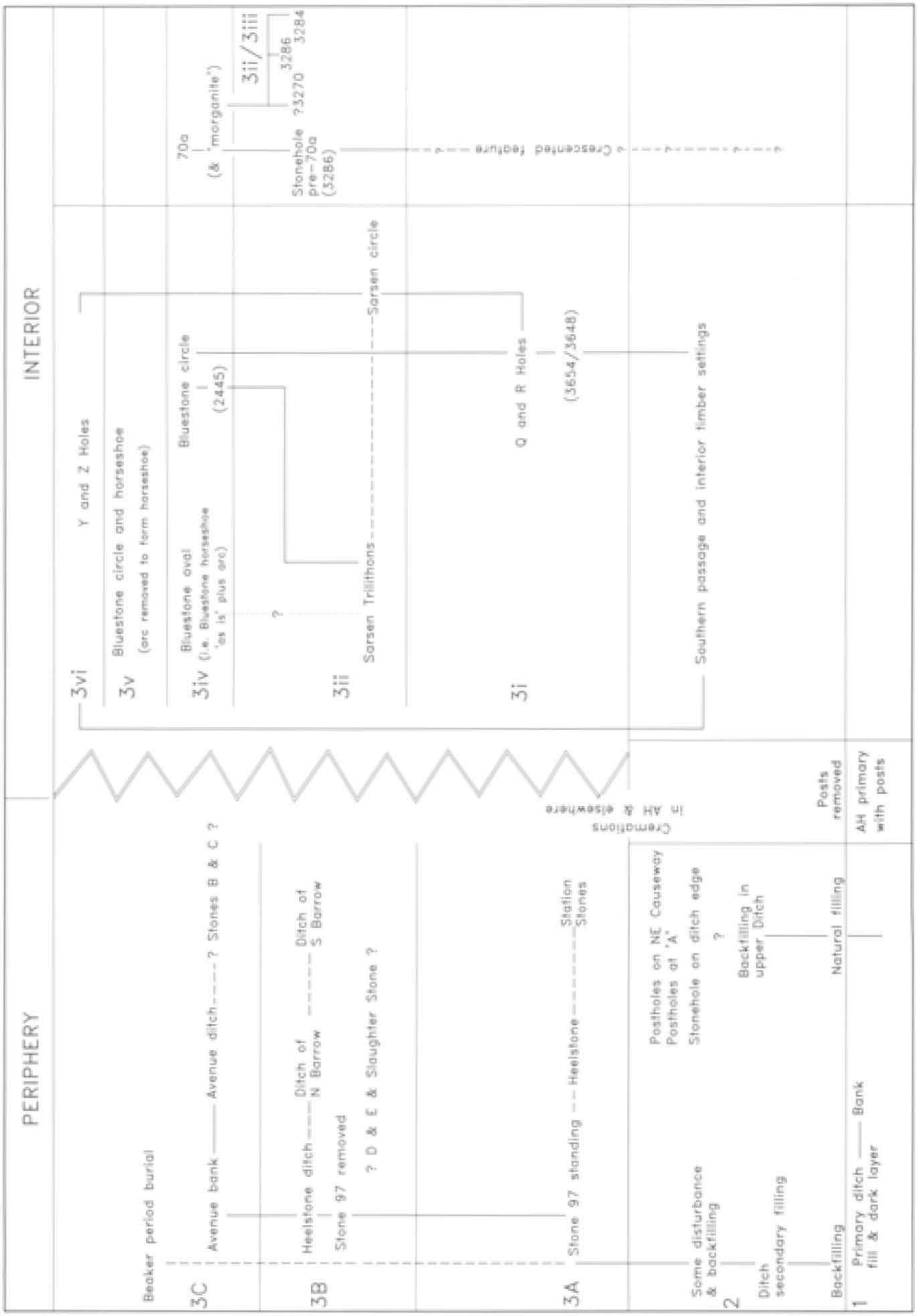


*Fig 251 Correlation of the Atkinson and new phasing*

Table 61 Stonehenge summary site matrix



the phasing. In this case, although the sub-phases are shown, the strength of the attachment to phase is shown only for the overall phase, not the sub-phase (eg whether the Bluestone Circle belongs to phase 3, not whether it belongs to sub-phase 3iv).

There are two main elements of the revised phasing which require some special explanation. One of these is the reliance placed on the appearance of bluestone fragments as a marker for phase 3. Clearly it is possible that there was a period, perhaps a long one, in which Bluestones were present, but during which they were not broken, or dressed, and no fragments became incorporated into archaeological deposits. This is particularly arguable if it is accepted that the Q and R setting was not the *dressed* Bluestone setting. If the fragments in the Q and R Holes became detached only on the dismantling of the setting then there could have been a long period, (ie the period during which the stones stood), during which no bluestone fragments were in circulation and therefore were not available to enter the Ditch during its secondary filling. This does not, however, invalidate the phasing by indicating that there must have been an early (contemporary with the Ditch filling) Bluestone setting, as it is difficult to see any possible setting in which the Bluestones could have stood before the Q and R Holes, and that setting was dismantled no earlier than the currency of Beakers (attested by the Beaker sherds in the backfill of Q5). The first sub-phase at the periphery to include bluestone is 3b (which has Bluestone in the Heelstone Ditch, the North Barrow bank, and the South Barrow ditch) and the phasing does not equate that sub-phase with the Q and R setting in the interior. Indeed, a sub-phase of phase 3 (3a) is suggested at the periphery which does not include Bluestone, and may well have been largely contemporary with the Q and R setting.

The other element of phasing which is linked to this problem of the bluestones and the dissemination of bluestone fragments is that the date of the end of phase 2 and inception of phase 3 cannot be established with certainty, and here it is necessary to outline the problem of the natural Ditch filling, the deliberate backfilling, and the radiocarbon dating of the phases. There are two main problems with the Ditch filling. The backfilling is clearly not a unitary phenomenon. It includes localised episodes of backfilling in at least three different stages in the filling. The second problem is that the evidence of the radiocarbon dates demonstrates that phase 2, for which dates could only be obtained from the Ditch, and phase 3 overlap. The upper 'phase 2' filling of the Ditch was forming when some of the phase 3 elements in the interior were already in position. Clearly we have defined the individual phases on different criteria. Phase 2 was defined as the time during which the secondary infill of the Ditch formed above the 'dark layer'. Phase 3 is defined archaeologically by the appearance of the stone settings. The radiocarbon dates indicate that the uppermost secondary filling in the Ditch belongs to phase 3 and is contemporary with the earliest Bluestone setting in the interior, that is, the Q and R setting. Therefore, although the secondary (phase 2) Ditch fills continued to form during the period in which at least some of the stone settings were erected, it does not necessarily follow that the archaeological events in phase 2, and particularly the timber settings, continued into phase 3 and indeed the two phases are unlikely to overlap on the basis of the conflicting ground plans of the phase 2 timber settings and the Q and R Holes. From the outset it was accepted that it was unlikely that the secondary filling of the Ditch, as a largely natural process, had conveniently ceased at a time which was meaningful in terms of the human use of the monument, but it was nonetheless the only archaeologically visible point at which it was possible to draw a clear line between phases 2 and 3. The uppermost part of the filling is not visibly different from the remainder, and this must include the archaeologically invisible phase of Bluestone presence, with the unaltered Bluestones standing in the Q and R Holes.

The Ditch filling is, however, even more complex than this. As described above, there are at least three episodes, or groups of episodes, of backfilling at different times. These may be distinguished as:

(i) backfilling of clean chalk rubble onto the dark layer of phase 1 fill;
(ii) small episodes of backfilling within the secondary filling, usually ascribed by Hawley to the construction of the Aubrey Holes; and
(iii) backfilling of clean chalk rubble, some at least perhaps put in as puddled chalk, high in the Ditch, on top of some secondary filling, and usually (perhaps always) filling the Ditch to the top.

Ignoring the small (ii) type episodes, which here are not assumed to be from the Aubrey Holes, but which could be from occasional disturbance, or even from burrowing animals, there are two main sequences within the Ditch in which backfill of types (i) and (iii) occur:

| (A) | (B) |
|---|---|
| Chalk rubble etc above Ditch (phase 3 & later) | Chalk rubble etc above Ditch (phase 3 & later) |
| Secondary filling (phase 2–phase 3) | *Appearance of Bluestones & Q/R setting* |
| Secondary filling (phase 2) | *Timber settings constructed* |
| Secondary filling (phase 2) | Chalk backfill (iii) (phase 2) |
| Chalk backfilling (i) (phase 2) | Secondary filling (phase 2) |
| Dark layer (where present) (phase 1) | Dark layer (where present) (phase 1) |
| Primary chalk (phase 1) | Primary chalk (phase 1) |

These two sequences also indicate the stage at which it has been argued that the timber settings of Phase 2 were constructed and the way in which the history of the monument is represented in these two types of ditch filling. An example of the (A) type sequence is given in Section E–F of Segment 98 excavated in 1954. This shows the clean chalk rubble backfill, followed by natural secondary filling ('rainwash'); within the secondary filling there are no discernible changes in its nature through time, except for the possible disturbances noted in Chapter 6. This filling, however, must be contemporary in its later stages with the backfilling and post-backfilling (ie post-Ditch fill) stages of the (B) sequence as indicated above. There are no section drawings of a (B) sequence filling, but such a sequence is clearly present in some photographs (eg Fig 61, in Segment 2). In summary, then, in those lengths of the Ditch in which the backfilling was late, the Ditch was full (ie had been backfilled) to the top of the cut by the time the timber structures were erected, and it is assumed here, as argued above (Chapter 6), that the postholes of the north-eastern entrance were cut through such a length. Following construction of the timber structures and while they were still in place, the remaining Ditch continued to fill naturally, and by this stage that filling process would have been very slow, unaided as it was by ploughing or other disturbance of soil in the vicinity. On the basis of the radiocarbon dates it seems that the Sarsen Circle at least had been erected before the natural filling of the Ditch had ceased, which implies that in archaeological terms phase 2 had ended and that 3i and 3ii occurred before that time. As it is almost impossible, in plan, to envisage the Q and R holes standing with the timber settings it is necessary therefore to assume that the timber settings were dismantled before the Q/R stones were erected.

This leaves the problem of the cremations, as already discussed in Chapter 6. The cremations cannot be dated in absolute terms, nor do they show stratigraphic relationships which allow them to be assigned to phase with any certainty. It seems that deposition of human bone began early in phase 2, at least in Segments 99 and 100, and the artefactual associations of some of the cremations suggest a date in the Late Neolithic rather than the full Early Bronze Age. There are some comments from Hawley, however, which indicate that most of the cremations in the Ditch were cut into the Ditch filling from above. Although on some occasions Hawley's observations must be regarded as unreliable, and he admitted in print to difficulties in identifying the cuts of cremations, this does seem to exclude a phase 2 date for these cremations at least. But it must be remembered that the majority of cremations are without any sort of stratigraphic relationship or associated artefacts. It is suggested here that some were deposited within phase 2, probably late in the phase, and others in the early part of phase 3.

## Stonehenge in its landscape: chronology and development

With the phasing of Stonehenge established, there follows a summary of the development of the monument in tandem with the environmental and archaeological evidence for its surrounding landscape. Chapters 5–7 have described in detail the stage by stage development of the monument, and the security of that phasing has been discussed. It remains here to take the long-term view and assess that development in terms of change within the monument and outside it over the broader period which is available to us. The overwhelming problem outlined in the introduction, above, can now be approached: that of putting the monument back into the landscape in which it belongs.

Radiocarbon determinations from the Stonehenge environs have tended to give us dates for some specific archaeological events, such as the construction of monuments, or specific activities. However, much of the key evidence for landscape use within the Stonehenge area is from molluscan sequences obtained from ditch fills, which provide information on landscape use over centuries, if not millennia, and are not single dated events. The precise chronology of our environmental landscape data is therefore weak because it is rarely derived wholly from dated contexts, but relies on sequences for which the start date is known but in which there are a few chronological reference points. Unlike the archaeological evidence the chronological framework used in the past for discussing these environmental sequences (cf Allen *et al* 1990) is no longer satisfactory for comparison with the high resolution dates we now have for the phases of Stonehenge.

Although we can still describe the history of landscape use to accompany the phases of archaeological activity defined at Stonehenge, it must be accepted that we cannot always be as precise as we might wish with some of the environmental evidence; in some cases, such as the major molluscan sequence from the ditch at Coneybury (Bell and Jones 1990), we are not sure at what date the secondary fills accumulated, and therefore we cannot be certain to exactly which stage in the development of Stonehenge and its landscape this environmental evidence relates.

### Before Stonehenge: Mesolithic human activity in a wildwood landscape

*by Michael J Allen*

The monument of Stonehenge is not Mesolithic, nor has any one suggested that it might be. So to discuss the (albeit new) Mesolithic evidence from the immediate vicinity of the monument (Chapter 4), might seem irrelevant. There is very little other Mesolithic evidence in the Stonehenge environs (Richards 1990; RCHM(E) 1979), and obviously any Mesolithic communities in the area existed several millennia before the first phase of Stonehenge was conceived, let alone constructed. Nevertheless, evidence for Mesolithic activity not only adds to the rich, diverse, and exceptionally long history of the use of the Stonehenge area, but may also, perhaps, give us some clue about why this location in particular was chosen for this unique, focal monument.

The Mesolithic features excavated in the car park were dug in the early Mesolithic (between *8500–7650* cal BC and *7500–6700* cal BC *(see Appendix 2)*) and they provide an important series of archaeological 'points' as well as a rare environmental sequence for the Boreal to Atlantic periods. The presence of both land snails and pollen provides important corroborative lines of evidence rarely found together on chalkland sites (cf Dimbleby and Evans 1974) and makes a significant addition to our knowledge of the nature of the Boreal woodland on the chalk of southern England. Not only is this one of the first pollen sequences of the Mesolithic (Boreal) woodland on the chalk, as opposed to those from adjacent lithologies (eg Scaife 1980; Waton 1982), it is significant because it is one of the few instances where we have conclusive evidence of the species composition and nature of the early post-glacial woodland (cf Dimbleby 1984) which is assumed to have been almost ubiquitous on the chalk (Tansley 1939). In some areas (eg Dorchester, Dorset) we have surprisingly little evidence that the chalkland was ever wooded (Allen forthcoming c). At Stonehenge, however, that evidence is indisputable and the pollen data is corroborated by evidence from both charcoals and molluscs.

This evidence also gives us a hint of the human impact within that environment and an indication of the potential natural plant resources available for foraging; we may also be able to suggest the range of animals that lived in the woodland and which may have been hunted (*see below*). The evidence for Mesolithic activity is equally significant, especially when the four (possibly five, *see Chapter 4*) postpits are reviewed together. They were all relatively large, about 1.3m deep and *c* 1.5–2m in diameter (Table 3). Unfortunately none of them produced any Mesolithic artefacts, but then very few were recovered during the Stonehenge Environs Project (Richards 1990) or were previously known from the area. The only possible Mesolithic artefact from the immediate vicinity is a tranchet adze recovered from the car park by Young (WA obj no 818; Fig 203). However, this example bears characteristics more in common with Neolithic examples (*see Harding, Chapter 9*) and it may be wishful thinking to assign it to the Mesolithic in the absence of any other lithic evidence.

The pollen and land snail evidence indicate that the postpits were dug when this part of Salisbury Plain at least was covered with a typical Boreal woodland, an open one of mixed pine and hazel which we assume was cleared locally prior to, and perhaps for, this activity. We interpret the woodland as open because hazel, one of its main constituents, requires sunlight in order to flower. The open nature of this woodland floor and understorey is also indicated by the composition of the mollusc assemblages. The clearing is reflected in the assemblages (both pollen and snails) in the base of the shallow 'recut' pit (Fig 28). A clearance within this woodland for the excavation of the four postpits must have been large enough to enable a new mollusc fauna to start to become established. This indicates that there were open country environments in the vicinity from which this fauna migrated, although it is possible that the open nature and relict grassland (Tundra) glades within the woodland itself could have provided such habitats.

There is a major hiatus in the environmental sequence. Both the snails and pollen from postpit 9580 indicate a Boreal woodland (confirmed by radiocarbon dates), but both spectra from the tertiary fills are consistent with a sub-Boreal (ie Late Neolithic to Bronze Age) environment. Nowhere in this sequence is the Atlantic (Late Mesolithic and earlier Neolithic) represented. At this much later date open, well established, and probably grazed grassland was created, consisting of herbs, bracken, and plantains. This dramatic change in the local environment is represented by the environmental information from the tertiary fills of postpit 9580 and we argue that it relates to the period of dressing of the Bluestones and construction of the stone monument (phase 3; 2550–1600 cal BC) on the basis of both molluscan and pollen spectra as well as the presence of a rhyolite fragment. (Further pieces of both bluestone and sarsen, including several mauls, were recovered from the car park by Young in 1935; see Chapter 9 and archive database.) This environment generally equates with Evans's interpretation from the Ditch (zone F) at Stonehenge (Evans 1984).

In palaeo-environmental terms, the importance of this sequence is in the preservation of both land snails and pollen from a dry chalkland site which provides evidence of the environment and flora in the Boreal period. Interpretation of the chalkland environment is generally inferred from deep alluvial sequences obtained from areas adjacent to the chalk. Here we can be sure, because of the corroborative nature of the land snails, pollen, charcoal, and radiocarbon evidence, that the Stonehenge downland supported a typical Boreal woodland, and that pine was an important component of that woodland, as argued elsewhere (Allen 1988; Allen forthcoming b; Scaife and Allen in prep).

**Mesolithic activity at Stonehenge**

Physical evidence for Mesolithic activity on the chalklands of southern England, other than limited flint scatters which are generally associated with the clay-with-flints (Gardiner 1988), is sparse, and the Stonehenge environs are no exception. Very few possible Mesolithic artefacts are recorded from Julian Richards's extensive survey and John Wymer (1977) recorded a maximum of 30 artefacts from the area. The predominant tool types are the large artefacts such as axes, maceheads, and picks and these are widely spread from Amesbury to Bulford, Durrington, and Wilsford. This low density of flint artefacts indicates the presence on the chalkland of Mesolithic communities, but does little to help us determine what these communities were doing, nor does it provide any evidence for their food economy. Very few definite features have been seen associated with the Mesolithic assemblages on, or immediately adjacent to, the chalk, one exception being a ditch at Strawberry Hill, Wiltshire (Allen 1992; 1994).

The unprecedented recovery, within the car park, of four large pits cut well into the chalk and probably holding upright pine posts does more than just indicate a passing acquaintance with this area. They were dug in the early Mesolithic as a series of postpits in an area locally cleared of woodland. One of these (WA 9580) was dug but partially backfilled, possibly after the removal of the post, leaving a broad shallow pit to infill and weather naturally. A large fragment (60mm) of charcoal from the primary fills of this weathering, and samples from the postpipes of the other pits, suggest the burning of pine timbers, possibly associated with the pits, which could have been procured from the open mixed pine and hazel woodland.

The absence of evidence for Mesolithic domestic structures or activity in the vicinity of Stonehenge is not considered a problem. The Boreal climate was a relatively warm and dry, pre-temperate one (Simmons *et al* 1981) which would not necessarily require the erection of major structures, and as the soils may have been up to 1m thick only substantial structural elements are likely to have made any impression on the chalk and be preserved as features which could be recorded in archaeological excavation. Furthermore, we have no indication that the location of the posts need necessarily be within, or next to, any domestic settlement area. Without other artefacts or structural evidence, the pollen, snails, and pits provide us with only a glimpse of the Mesolithic activities which may have occurred.

Unfortunately the variance of the radiocarbon dates (Table 64) does not allow us to define very precisely the time or duration of the Mesolithic activity. The dates are all consistently Early Mesolithic but they span more than a millennium (*8500–7650* cal BC to *7500–6700* cal BC *(see Appendix 2)*) and the most that we can say is that the activity occurred over a period of *300–1600 years*. We know from the pollen and molluscan sequences (Chapter 4) that open pine and hazel woodland existed, an environment ideally suited for a large number of 'game' animals and for the understorey growth of fruit and berries. This provided an ideal environment for the sophisticated economic strategies employed by Mesolithic communities, as recently demonstrated by Zvelebil in his seminal discussion (1994). Communities with such organised food procurement strategies must have had a level of social and economic organisation not often appreciated (*ibid*), within which the ability to erect large pine posts cannot be seen as surprising. Other hunter-gathering communities are also known to erect such posts bearing totems or symbols which presumably served an important ceremonial role within the complex ideology of these technologically simple communities. Archaeological parallels for Mesolithic timber posts are uncommon but can be seen at a number of sites in Scandinavia. An unusual grave with cremated human bone and a huge wooden post was found in the Late Mesolithic (Ertebølle culture) cemetery of Skateholm in southern Sweden (Larsson 1989) and some 15 posts were preserved, spread around the slope of the small 'island' of Mesolithic activity at Vænget Nord, Denmark (Brinch Peterson 1989, 328). The latter did not belong to any definable structure and were scattered across the slopes of the site. The Skateholm posthole was more than 1m deep and the post (Grave 20) is considered to have been a marker or totem-pole (Larsson pers comm). Such evidence is therefore culturally acceptable but is so far unusual in a British, especially chalkland, context.

The belief that Mesolithic populations did not excavate features on the chalk in England is dispelled by both the Stonehenge pits and by the ditch at Strawberry Hill (Allen 1994). More significant, however, is the fact that the pits at Stonehenge demonstrate a level of planning, decision-making, and community effort rarely visible archaeologically for such populations, at least in the British Isles. If we can accept that pits were dug and pine posts erected by Mesolithic communities, then this is significant in itself. Even as simple pits their occurrence in a Mesolithic context is remarkable, but as a group of four or five their location is unlikely to be purely fortuitous.

It is clear that the pits contained individual uprights and it is perhaps possible to suggest that these may have been akin to the totem-poles of hunter-gather communities of the north-west Pacific Coast of America and Canada. Poles of this kind may last centuries. A more significant question, unfortunately unanswerable, is whether they stood as poles together or whether they were erected consecutively over a span of several generations. The radiocarbon dates do not resolve this question. In either case repeated visitation to the site is indicated. If, however we assume, on the basis of morphology, plan, and setting, that two or more of the posts stood together at any one time (in the absence or unlikelihood of such rare events recurring by chance in the same location), then this suggests a Mesolithic site with some communal function (considering the criteria applied to later monuments). The poles could represent some formal display such as a series of totem-poles, or symbolic or ceremonial posts, as seen in both African and Aboriginal cultures. If so, it is significant that no parallels can immediately be drawn from north-west Europe.

A comparison with totem-poles may be contentious and it is also possible to suggest that together they may represent array of poles such as those seen at some native North American sites, where rows of poles were set to act as a facade or large herding structure towards which herds of deer were driven and then channelled into corrals for culling (for a general summary see La Farge 1962). Although it is possible that they formed part of a larger planned pattern of upright posts, there is no direct evidence to indicate this. This perhaps further reinforces the argument that they represent an array of individual posts sited together.

Whatever their function, it is probable that these features represent either a formalised display or large structure (or a part thereof) for which the authors have no direct British Mesolithic parallels. Although the absence of artefacts from the postpits themselves is not unexpected, the paucity of other finds in the area is perhaps more surprising. Without wishing to push any comparison with native Americans too far, it is interesting to note that their totem-poles were usually of pine and represented heraldic signatures (often animals) and insignia erected as a mark of respect for past chiefs. Their locations were an arena for ritual and dance, rather than a focus for settlement, and have left little trace in the archaeological record.

Although any Mesolithic activity cannot be seen to be a cultural antecedent to the construction of the monument itself, it is possible that these actions inadvertently left a mark, or scar, on the landscape which was exploited several millennia later. Mesolithic activity and clearance at the monument site (Chapter 4) instigated an irreversible change in the local vegetation history. Unfortunately we cannot be sure just how large an area was cleared, or how long it remained so, but this would have left a permanent or at least long-term visible difference in the local vegetation pattern which was, in any case, not static but subject to gradual change in response to wider climatic changes. Could this have been one of the reasons for choosing to site the monument here? A less dense woodland vegetation, possibly a large open woodland or even grassy area, might have been one of the attractions of this location. An area of more open vegetation like this would certainly be visible from the higher ground. We can only speculate.

In conclusion, we have little idea of what the Mesolithic communities in the vicinity of Stonehenge were doing and can only speculate on what the postpits represent. However, with our current state of knowledge of such communities in southern England, the presence of these features alone and the important picture provided of the contemporaneous Boreal chalkland vegetation is of considerable significance.

## The pre-Stonehenge, Neolithic, landscape

### Taming of the wildwood

*by Michael J Allen*

Despite our relatively detailed, but highly localised, snapshot of the landscape at some time in the Mesolithic, our knowledge of the broader landscape use during the earlier Neolithic, at which time there are a number of archaeological monuments in the area, is pitifully sparse (*see Chapter 4*). The character of the woodland which we assume to have been relatively widespread changed as areas were clear-felled locally, and subsequently allowed to regenerate. This created a complex mosaic of vegetation types, with areas of ancient denser woodland, light open mixed oak and hazel woodland, and clear-felled areas with shrubs and grassland providing evidence for occupation. Limited cultivation, and animal husbandry. The biodiversity and mosaic of vegetation types allowed a great diversity in the economy of the local population; limited farming would have encouraged more permanent foci of activity; the woodlands enabled hunting as well as pannage and collection as well as cultivation of plants (cf Moffett *et al* 1989). Unfortunately the environmental data are only points in the Stonehenge landscape and we cannot indicate, in landuse terms, the distribution of areas of any specific vegetation type. Moreover, this mosaic of vegetation types was not static; it was continually changing, by natural regeneration and localised exploitation, so that whereas the overall pattern may have remained generally constant, the details of any chosen area may have been quite specific. Continued small-scale and probably not wholly sedentary human activity contributed to this localised diversity. It is unfortunate therefore that we cannot correlate the broader archaeological picture of the artefact distributions gained from the fieldwalking programme (Richards 1990) with any similar broad sweep of environmental evidence for landscape use. We can ask, however, whether diversity in the ecosystem and this patchwork of vegetation across the landscape are reflected in the location and types of activities visible within the archaeological and artefactual evidence for the area.

### The archaeology of the Early to Middle Neolithic landscape

*by Rosamund M J Cleal*

It may seem perverse to begin a review of the Neolithic of the Stonehenge area by suggesting that it is necessary first to ignore the monument entirely, but there is a period of at least a thousand years during which the landscape was inhabited and yet in which there was no monument at the site. Even later, during Stonehenge phases 1 and 2, it may be quite wrong to envisage the monument as dominating the landscape. It does now, of course, to us, and must have done so in the past once the stones were in place, but we cannot assume that in its first or second phases it was any more remarkable or extraordinary than other monumental sites in the area. This does not mean that it was inconspicuous in these phases, but simply that it would not have possessed that dominant and unique quality we find in it today. Even in its timber phase it may not have appeared impressive to anything approaching the same degree as Durrington Walls, although on present evidence it is not possible to establish the exact chronological relationships of the timber settings at Stonehenge and those of Durrington Walls.

Allowing that future research may elucidate the later Mesolithic and the Mesolithic–Neolithic transition in the area (and perhaps ought to be positively directed towards that end) we can take the earliest visible Neolithic activity as a reasonable starting point for the later history of the landscape (Fig 252). The Stonehenge area does not seem to be one in which any elucidation of the nature and reality of the Mesolithic–Neolithic transition can be attempted on the evidence at present available,

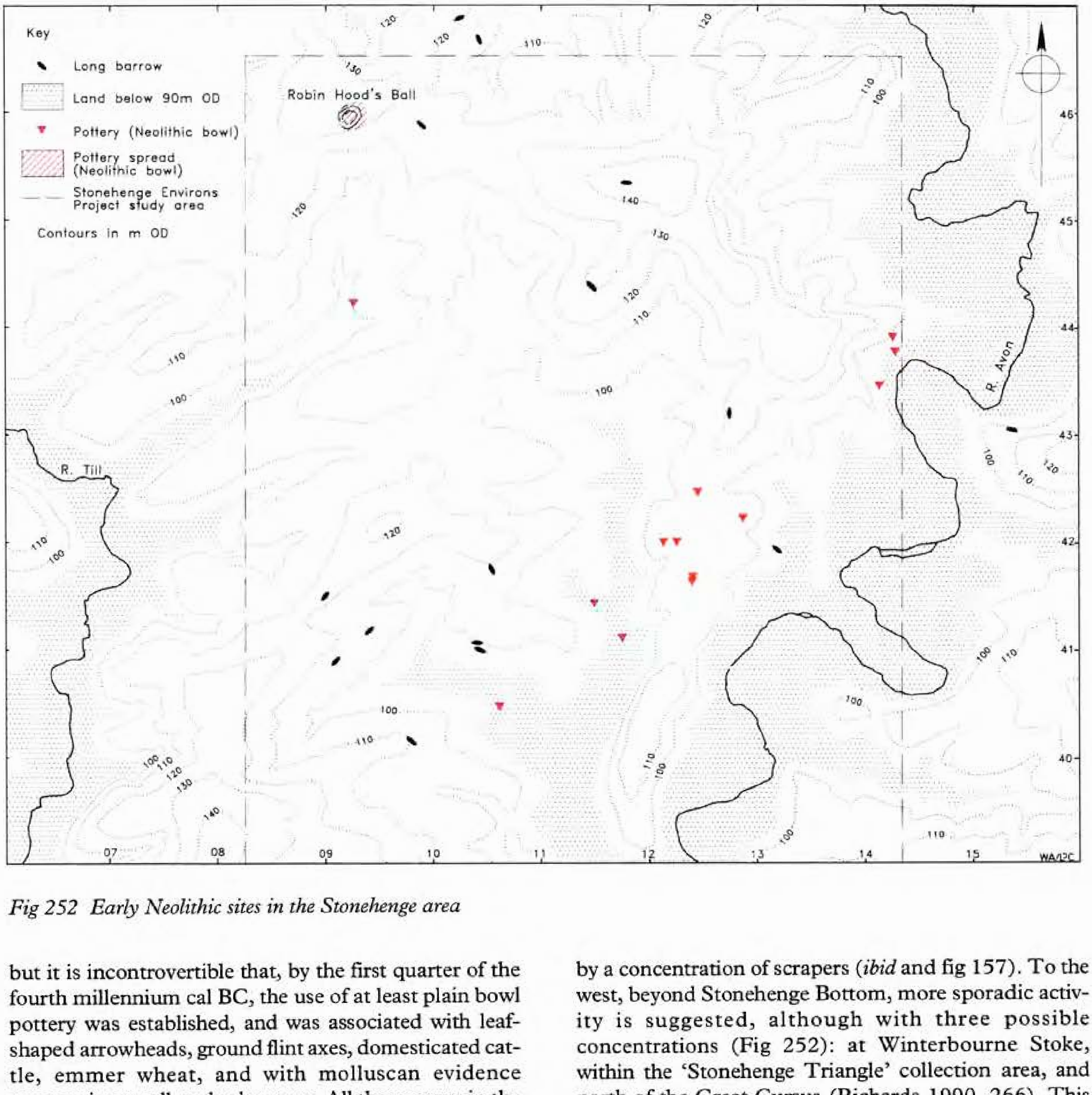



*Fig 252 Early Neolithic sites in the Stonehenge area*

but it is incontrovertible that, by the first quarter of the fourth millennium cal BC, the use of at least plain bowl pottery was established, and was associated with leaf-shaped arrowheads, ground flint axes, domesticated cattle, emmer wheat, and with molluscan evidence repesenting small-scale clearance. All these occur in the extraordinary pit at Coneybury Anomaly, 1km east of Stonehenge (Richards 1990), and a neater summary of the elements traditionally taken to characterise the Neolithic could hardly have been achieved if an archaeologist had been sent out to create a time-capsule representing the period.

Richards, first in his 1984 article on the Stonehenge landscape and later, with only slight modifications, in *The Stonehenge Environs Project*, presented an interpretation of the area which divided it into 'zones' of activity, divided by the dry valley of Stonehenge Bottom (Richards 1990, 265). To the east, on King Barrow Ridge, was 'the most positive evidence of extensive earlier Neolithic activity, here in the form of ground flint axes', mainly concentrated in the northern part of the Ridge, but continued south towards Coneybury largely by a concentration of scrapers (*ibid* and fig 157). To the west, beyond Stonehenge Bottom, more sporadic activity is suggested, although with three possible concentrations (Fig 252): at Winterbourne Stoke, within the 'Stonehenge Triangle' collection area, and north of the Great Cursus (Richards 1990, 266). This approach has been followed, but with different results, first by Thomas (1991) and more recently by Bradley (1993).

Thomas's zones are separated by the two cursus monuments. North of these monuments is a zone dominated by the causewayed enclosure of Robin Hood's Ball which Thomas sees as having associations 'with the exotic, the distant and the marginal'. On the other hand, to the south of the cursus monuments, is a zone of domestic activity. Both zones have concentrations of long barrows, the one to the north closely associated with Robin Hood's Ball (Thomas 1991, 146). Bradley, however, follows Richards's division into east and west, with a zone of funerary monuments to the west, and of domestic activity to the east (Bradley 1993, illus 28). The fact that the same landscape is susceptible to such varying interpretations, although based on the same evidence, is enough to suggest that none of these is particularly well supported by the evidence. It is salutory, perhaps, to return to that evidence.

In Thomas's northern and southern zones, and Richards's east and west zones, the long barrows which are a feature of them both are in fact widely scattered across the landscape, and Bradley's 'settlement' area abuts, and arguably includes, the unexcavated long barrow near Vespasian's Camp (G140). Thomas's argument that the long barrows in his 'southern' 'settlement' group began early and developed over a long period of time while the group near Robin Hood's Ball developed later (1991, 145) is not supported by the date for the Netheravon Bake barrow in the middle part of the fourth millennium (3780–3350 cal BC; OxA–1407, 4760±90 BP). The greatest flaw in both Thomas's and Bradley's arguments, however, is the nature of the non-monumental material in the area. When Richards published his 1984 article, analysis of the Stonehenge Environs Project (SEP) was not complete, and it is perhaps worth drawing attention to the contrast between that paper and the full publication of the project in 1990. In 1984 Richards suggests, as does Thomas later, two zones, north and south separated by the two cursus monuments. Each has a 'major focal enclosure' at the edge of the group: Robin Hood's Ball and early Stonehenge (Richards 1984, 178–80). After analysis of the SEP surface collection finds Richards' interpretation dwells more on the *scale* of activity, rather than suggesting 'zones' differing markedly in *nature;* in particular, as described above, earlier Neolithic activity is suggested as being concentrated to the east of Stonehenge Bottom, with more sporadic use of the area to the west.

The impression of 'sporadic' settlement may, however, be illusory. Richards suggests, on the basis of the surface collection material, that within this sporadic settlement there are concentrations of material, of which Wilsford Down is one. That this is the case is also clear from the pre-barrow material excavated from the Wilsford Down barrows G51, G52, and G54, where 322 sherds, probably representing at least 18 vessels (Smith 1991, 34–8), were recovered. This is a not inconsiderable quantity, and must be viewed in relation to the evidence for Neolithic activity recovered by SEP some 400m to the south-west (the area around Wilsford G51–G54 not having been investigated by SEP). The barrows lie towards the edge of, and the collected material within, Bradley's funerary zone. Clearly the 'funerary' zone was not entirely funerary, and although it is not necessary to argue that it was exclusive in order for such a designation to hold some meaning, it is more difficult to uphold divisions within the landscape when they are defined by differences of scale rather than nature, particularly when that scale is so much influenced by the extent of recovery and archaeological visibility. The Wilsford area clearly has more long barrows than the King Barrow Ridge area but both have long barrows, and both have evidence of a kind usually interpreted as indicating settlement. Similarly, the widely spread long barrows north of the great Cursus are difficult to envisage as one group at all, *contra* Thomas, and his interpretation is also heavily influenced by the short chronology (ie of radiocarbon years) he uses. Many of the long barrows in the area, including Netheravon Bake, are likely to be earlier than the Stonehenge Cursus, which provides the great division across the landscape cited by Thomas. It could be argued that the Cursus was placed in an already liminal zone between the two areas, but this is not supported either by the existence of a long barrow within that zone (Amesbury 42) or by the scatters of earlier Neolithic material which lie north of the Cursus, and may continue across it and south of it, in areas not within the surface collection areas of SEP.

The problem of determining the scale of activities when their visibility in archaeological terms varies is one which must be recognised in any attempt to interpret the Stonehenge, or indeed any, landscape. In the Early Neolithic, and to some degree even later, it is easy to recognise monuments but difficult to recognise other manifestations of use of the area. Many areas have never been subject to surface collection, and excavation has occurred in very small areas and been principally directed towards barrows; even within collected areas the bias of collection towards lithics and against ceramics is well established, and lithics are not, as yet, susceptible to fine chronological division. Within the Stonehenge Environs Project a cautious approach was taken to assigning surface flint to periods within the Neolithic, and only a small proportion of the collected material was assigned to period (compare Richards 1990, figs 10 and 157). This is likely greatly to underestimate the evidence for occupation, and if the distribution of diagnostic earlier Neolithic material is viewed in this light (Richards 1990, fig 157) other interpretations are possible.

The observation by Richards, that in the area west of King Barrow Ridge earlier Neolithic activity may have been more sporadic than on the Ridge, can be seen to be heavily influenced by the very minimal view of the earlier Neolithic provided by the flint distributions. The occurrence of six long barrows in the Wilsford Down/Winterbourne Stoke area, which Richards does cite, seems hardly compatible with 'sporadic' activity, even if they were constructed over several centuries. Considering that there has been less archaeological work in the Wilsford Down area than on King Barrow Ridge it has produced a considerable amount of early material, including ceramics.

For the other two areas described by Richards, the 'Stonehenge Triangle' and the area north of the cursus, the argument here is much the same. Richards is correct in singling them out, but underplays their potential to be important places in the landscape. The Stonehenge Down area is particularly interesting, as even the barrows have hardly been subject to excavation in recent times, and the Neolithic bowl sherd from Stonehenge

(P1), and the bone with an early fourth millennium radiocarbon date (4360–3990 cal BC; OxA-4902, 5350±80 BP), also from Stonehenge, suggest the possibility of some earlier Neolithic activity. Even south of the monument a single Neolithic bowl sherd suggests the possibility of Neolithic features facing King Barrow Ridge across Stonehenge Bottom.

In summary, it can be suggested that it is misleading to visualise the early Neolithic landscape in terms of 'zones' of activities which differed in nature. Instead, the argument put forward here is that the landscape was much more densely inhabited and that rather than there being only sporadic activity west of King Barrow Ridge there were important concentrations on Wilsford Down and Stonehenge Down at least. The picture presented in SEP might appear entirely different if areas within those concentrations were investigated in the way in which King Barrow Ridge has been or if they had been subject over many years to the non-archaeological interventions such as modern road building and trenching which have revealed features on King Barrow Ridge.

It is not necessary to envisage these areas as 'static' settlements, however; the concept of 'zones' is essentially static, and now that this concept has been rejected it is possible to view the landscape as reflecting repeated patterns of behaviour over long time periods, and it is necessary to reflect on the degree of mobility of its users. Barrett's recent discussion of 'long-fallow' and 'short-fallow' regimes, in which he postulates that until the second millennium BC the much more flexible long-fallow regime was dominant, accords well with what we know of the Stonehenge landscape (Barrett 1994, 143–4). A high degree of mobility, coupled with known and recognisable locations in the landscape which were returned to over and over again, would fit well with what we see in the Stonehenge environs. It is even arguable that the slender evidence for small-scale cultivation at Coneybury Anomaly (*see above*) agrees with this interpretation.

In this interpretation we can see Robin Hood's Ball, which Thomas envisages as 'exotic, distant and marginal' as more fundamental to the way the landscape was used. It is possible in this scenario, for instance, to envisage as likely the sort of contacts between the users of Fussell's Lodge, King Barrow Ridge, Windmill Hill, and possibly even Stonehenge (pre-monument) which would lead to the occurrence at those sites of a particular idiosyncratic form and decoration of pottery (Cleal this vol).

This writer has touched elsewhere on the question of whether some of the features of earlier Neolithic ceramics are indications more of networks of contract over wide areas than of clearly defined regional ceramic styles (Cleal 1992), and it is perhaps not too far-fetched to suggest that this does really mean *people* moving long distances, albeit perhaps within regular patterns of movement. In Barrett's use of Ingold's terminology this would constitute 'tenure' over 'places' and 'paths' but not over 'ground surface' (Barrett 1994, 137; Ingold 1980). Barrett uses this terminology in relation to mortuary monuments, but it may be that there were other places, invisible now and stripped of any clues to the meanings held in the past, which were as significant as mortuary monuments, among which locations such as King Barrow Ridge or Wilsford Down, or even Stonehenge Down, are perhaps to be counted.

## The first monument: development and landscape of the Middle and Late Neolithic

### The siting of the monument in the landscape

*by Michael J Allen*

The choice of siting the monument adjacent to Stonehenge Bottom may have been influenced either by immediate antecedent activity, or by long-past activity which left some mark, perhaps in the form of a locally changed vegetation, as discussed above, rather than any physical monument. If the reason for choosing this location was immediate antecedent archaeological activity in the Middle Neolithic then this would probably have had to have been within living memory, ie within three generations or about 75 years. There is no evidence for such activity and it is unlikely that material would be available for radiometric dating, or that the resolution would be sufficiently tight for such activity to be identifiable. The curated bone in the southern Ditch terminals was collected over a period of *30–390* years before the construction of the Ditch, but this does not necessarily allow us to infer activity in this location. Previous activity may have manifested itself in changes in the vegetation which left a visual 'scar', a changed landscape, a different ecological regime with its own floral and faunal characteristics which would have marked out the area from its surroundings. This may have made the site immediately or superficially more attractive. As discussed above, we cannot be sure of the area of the Mesolithic clear-fell, but as there is also evidence of some activity at 4360–3990 cal BC (OxA-4902, 5350±80 BP) we can assume that further, unrecorded, modifications of the local vegetation occurred.

The visibility study (Chapter 2 and see below) provides very clear evidence that phase 3 Stonehenge formed part of a recognisable pattern of monument location involving many of the Early Bronze Age monuments of the area. The picture is less clear at the inception of the earthwork enclosure though three points stand out. First, the chalk of the newly dug Bank and Ditch would have appeared gleaming white against the gentle bowl of the immediate landscape and would have been visible for a considerable distance around. Secondly, the Bank was probably high enough to make it difficult to see beyond the earthworks from the inside of the monument. The suggestion is therefore that the monument was positioned so as to be viewed from a distance. It is extremely difficult to discuss the possible articulation of the monument with other sites in the area at this time although, as discussed in Chapter 3 and below, it is clear that one important monument in the near vicinity (the Cursus) is barely intervisible with Stonehenge, despite its size and proximity (*see below*).

### The immediate pre-monument environment

*by Michael J Allen*

The site of the Stonehenge triangle at least was an open and well established calcareous downland turf (Scaife, Chapter 4) when the phase 1 enclosure Ditch was dug and the earthen and chalk Bank cast up within it. We do not know when this area was cleared and this episode should not be confused with the arguments for localised clearance in this area during the Mesolithic. Elsewhere, the general diverse mosaic of vegetation types described above existed, but many of the clearings had become both larger and more permanent by the Middle to Late Neolithic (cf Allen *et al* 1990). The molluscan evidence from the ditch fills of the Cursus (Entwistle in Richards; Allen unpublished data) indicate the establishment of permanent grazed downland. Such an open downland also existed around the King Barrow Ridge (Allen and Wyles 1994) and in the Durrington/Woodhenge area. We cannot, however, assume that this grassland was continuous, and this is re-enforced by the evidence from Coneybury, where Bell and Jones (1990) argue that the woodland clearing in which the henge was constructed did not become established grassland, but was allowed to become overgrown. The picture of the landscape provided by Allen *et al* (1990, fig 155b) is salutary in as much as it shows how sparse our overall evidence is when compared with the detailed information we have from individual locations such as Coneybury.

### The Middle Neolithic and the first Stonehenge

*by Rosamund M J Cleal*

If in the early to mid fourth millennium BC the Stonehenge landscape may be envisaged as being made up of important places linked by patterns of recurrent movement which may have extended for long distances outside it, this pattern appears to have changed radically in the mid to late fourth millennium, with the construction of the Lesser Cursus and probably also that of the Stonehenge Cursus (Fig 253). The latter is dated by a single antler found by Stone (1947), and in the light of the late radiocarbon date (2910–2460 cal BC; OxA–1403, 4130±105 BP) this is thought to be from a later intrusion (Richards 1990, 96). The Lesser Cursus has three dates (3630–2920 cal BC; OxA–1404, 4550±120 BP for phase 1; 3640–3040 cal BC; OxA–1405, 4640±100 BP for phase 2, and 2890–2140 cal BC; OxA–1406, 4000±90 BP for the destruction phase). The impact of the Lesser Cursus on the landscape may not have been great, but that of the Stonehenge Cursus must have been enormous. As Barrett points out, if cursus monuments are fairly obviously paths or avenues, they are not open-ended, and movement between areas on either side of them must have involved crossing their banks and ditches (1994, 137–8), a point also made by Bradley (1993, 59). It is unfortunate that the Stonehenge Cursus date cannot be regarded with confidence, but it seems reasonable to see it as no later in construction than the turn of the fourth millennium and it could be much earlier, given that dates for cursus monuments extend back to the early fourth millennium (Gibson 1994, fig 28).

Here, however, it is presumed to have been constructed within the later fourth millennium BC, and, with the Lesser Cursus, to pre-date Stonehenge phase 1. It is therefore against this background that the construction of the Stonehenge enclosure must be viewed and the question of why it was placed there rather than elsewhere must be faced.

Although the monument site itself appears to have had fairly little previous use (and the evidence for earlier use is slight despite excavations on a fairly large scale) there are two slender pieces of evidence already cited which show that there was some earlier activity in the vicinity. The most interesting, and unexpected, is the clearly redeposited bone fragment in Stonehole 27 of the Sarsen Circle (OxA–4902, 5380±80 BP) which dates from that little understood period, the fifth millennium BC (4360–3990 cal BC), and must indicate some sort of very early Neolithic or even transitional Mesolithic-Neolithic activity. This, combined with the Neolithic bowl rim sherd from the monument (Fig 193, P1), and the evidence cited above of some earlier Neolithic activity on Stonehenge Down, indicates that the monument was not inserted into an empty space in the landscape. Of more immediate relevance, in chronological terms, is the Peterborough Ware scatter from Stonehenge Down (Cleal 1990, fig 154B). This at least is likely to be contemporary with Stonehenge phase 1, as are the other Peterborough concentrations on King Barrow Ridge, Wilsford Down, and north of the Cursus running south. The last may in fact be the archaeologically visible part of a general concentration which extended as far south as the Stonehenge Down concentration (*ibid*).

Bradley's assertion that the Stonehenge Cursus may form a link between areas of the living and one of the dead (1993, 53) is difficult to uphold in view of the similarity of the two areas it runs between, if the surface material is taken into account. Both King Barrow Ridge and the Fargo/Stonehenge Down 'ridge', which lie at either end of the Cursus, have produced extensive evidence of use by the users of Peterborough Ware, as well as of earlier and later periods (see Cleal and Allen 1993 for King Barrow Ridge; Richards 1990, 279, and 194–208 for Fargo area). The form of that use is not clear, but it seems incontrovertible that both areas were of importance to their users and were revisited and used over considerable time periods.

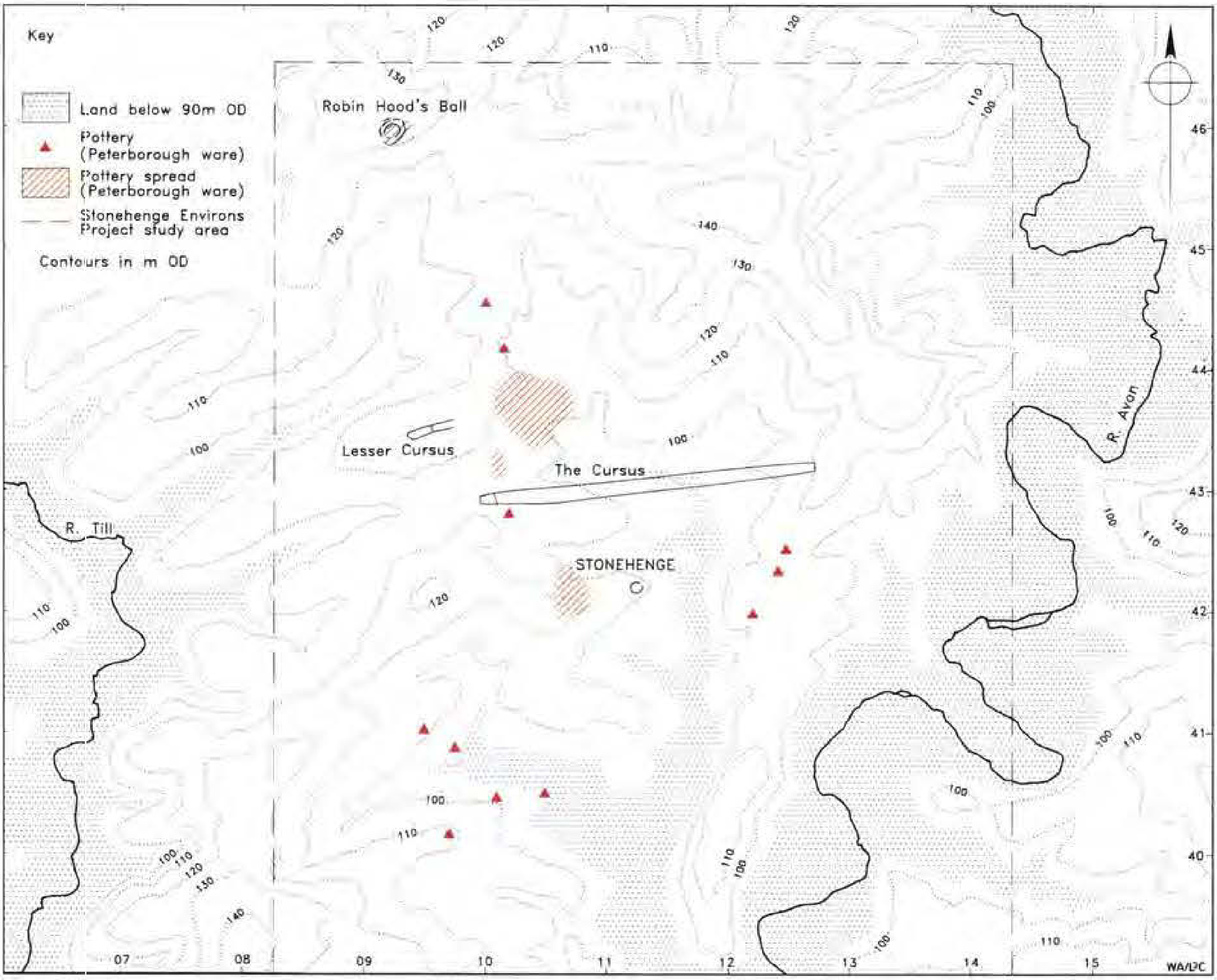



*Fig 253 Middle Neolithic sites in the Stonehenge area*

It is perhaps relevant that the Stonehenge enclosure was built in a location from which both the Fargo 'ridge' and King Barrow Ridge were visible, but from which the cursus was hardly visible at all. It is not possible to be certain of that feature's visibility, given that the original height of the banks and the high visibility of fresh chalk can only be imagined, but it is clear that at most there would have been only glimpses of it for most of its length, and activities inside would certainly have been obscured. On plan it appears to dominate the landscape; on the ground it could not have done so from the point of view of Stonehenge, but certainly would have done from the ridges close to either of its ends. It is also important to note that from each ridge the other is a notable feature of the landscape, and that the Cursus runs up onto both Fargo 'ridge' and King Barrow Ridge.

It is in this setting, then, that the ditched enclosure of phase 1 Stonehenge was constructed, its main entrance facing north-east, the direction of the eastern end of the Cursus. This, at least, must have been visible, as it rose onto King Barrow Ridge, although whether it was then, at around 3000 cal BC, newly constructed or already well-established or even ancient is impossible to determine on present evidence. The references of the ditch element of the enclosure all seem to be backwards in time, as discussed in Chapter 4. The segmented ditch (Fig 256), the multiple entrances, and the deliberate deposition of at least the ox jaws and skull all seem to hark back to a much older tradition, that of causewayed enclosures, and some of the pieces of bone were in themselves already ancient objects when deposited.

There are also clear differences, however, the greatest being that what was going on in phase 1 Stonehenge must have been of a different nature to the activities at most causewayed enclosures because it has left much less trace in the form of artefacts. A very minimalist view has been taken here of the degree of deliberate deposition in the Ditch at Stonehenge (*see Chapter 4 and Serjeantson, Chapter 9*) and even if a higher proportion of the artefactual assemblage was to be interpreted as deposited in a deliberately structured way the site would still not compare with either causewayed enclosures or with the Wessex henges, such as those at Durrington Walls and Woodhenge, either in the scale of artefact deposition or in its degree of formality.

It is possible that there was some activity on Coneybury Hill at this time, at the site of the henge monument, but only two radiocarbon dates are available. The henge seems likely to be contemporary with phase 2 at Stonehenge, and the only other radiocarbon date, for a pit in the interior, is 3340–2700 cal BC (OxA-1409, 4370±90 BP), and could date to either a pre-henge period or be contemporary with the henge. It is considered here as unlikely to be contemporary with phase 1 Stonehenge. Elsewhere in the landscape it is difficult to pinpoint any other certain foci of intense activity at this time, apart from the areas already singled out in the discussion of the 'pre-Stonehenge' activity.

If it is correct to assume that Coneybury Hill was not the scene of major activity at this time, then the Ditch and Bank of phase 1 Stonehenge must have made a considerable impact in the landscape. South of the Cursus there were no large-scale features in the landscape, apart from the several long barrows scattered across it. This impact must have been all the greater if, as is suggested here, the Aubrey Holes were dug within this phase and held substantial posts. The arguments for this have been discussed at length in Chapter 4, and as it seems impossible on present evidence to reach a definitive conclusion, it is important to formulate a hypothesis which could be refuted or proved if further information were ever to be made available by future excavation.

The development of timber circles has recently been reviewed by Gibson (1994) and his work demonstrates that it is not impossible that there should have been a timber circle at Stonehenge at around 3000–2900 cal BC, although a date of that order does place it near the beginning of the long tradition of timber circles. Gibson does not include the Aubrey Holes as a timber circle, concentrating instead on the timber settings in the interior, but he does comment that multiple circles tend to be later rather than earlier in the sequence. The Aubrey Hole setting, as a single circle, would therefore not be out of place early in the development of timber circles. Overall, Gibson notes that on the basis of radiocarbon dates in direct association timber circles may be dated to the period *c* 2800–1500 cal BC, and that by including indirectly associated dates this may be extended to *c* 3000–1400 cal BC (Gibson 1994, 191–207, table 38). The arguments for the Aubrey Holes pre-dating phase 2 are entirely on the basis of symmetry and the problems of laying out the circle; their attribution to phase 1 is weak (*see also Appendix 8*), but on present evidence there is no certain reason for attributing them to phase 2. Gibson's invaluable synthesis of the data demonstrates that a date of around 3000 cal BC for the Aubrey Holes is not impossibly early for a timber circle, only that a slightly later date would be marginally more consistent with the other evidence.

It is impossible to define any other features or activities within the enclosure bounded by the Stonehenge phase 1 Ditch as belonging to this phase, although a number of chalk objects from the interior are more likely to belong either to this phase or to phase 2 rather than to phase 3. The purpose of the enclosure and the nature of the activities inside it are similarly obscure, to a greater degree even than those at causewayed enclosures or henge monuments. It is only possible to suggest with any confidence activities which do not appear to have played a significant part in the life of the enclosure, on the evidence available. Unlike causewayed enclosures and henge monuments, there is no evidence for feasting or other large-scale consumption of food. As the radiocarbon dates demonstrate, the ox bones at least are likely to have been deposited as ancient bones (the skull from C29 additionally showed evidence of having been chewed by carnivores and one of the two mandibles from the ditch terminals at the southern entrance had been defleshed), as may the deer tibia which has also produced an early date and had been chewed (Serjeantson, Chapter 9). In contrast to causewayed enclosures there are no human remains at early Stonehenge. The overall paucity of artefacts at this stage, although unlike causewayed enclosures and very different to the nearby major Wessex henges of Durrington Walls and Woodhenge, is a feature shared by some henges (eg Wainwright 1989; Cleal 1984; Pryor 1985). Overall, however, it must be stressed again that phase 1 Stonehenge cannot be slotted neatly into either the tradition of causewayed enclosures or that of henge monuments, as discussed at length in Chapter 4. It is likely that the construction and first use of the enclosure at Stonehenge owed something to the long tradition of the use of causewayed enclosures, but in phase 2 the use of the site certainly comes to reflect the developing tradition of henge monuments in what may have been a process of gradual adaptation to new circumstances rather than a radical, sudden revision of the way the monument was used.

## A change of emphasis: phase 2 (2900–2550 cal BC)

### Landscape change or continuity?

*by Michael J Allen*

The development of the monument can be seen either as a series of changes from earthwork (phase 1) to wooden structures (phase 2), and finally to stone settings (phase 3), with each of these stages of development being individually significant (Atkinson 1979), or as a history of developmental continuity (Bradley 1991). Regardless of which view one subscribes to, it is evident that the landscape within which the development or changes to the monument occurred was itself also developing and changing. Changes in human landuse are

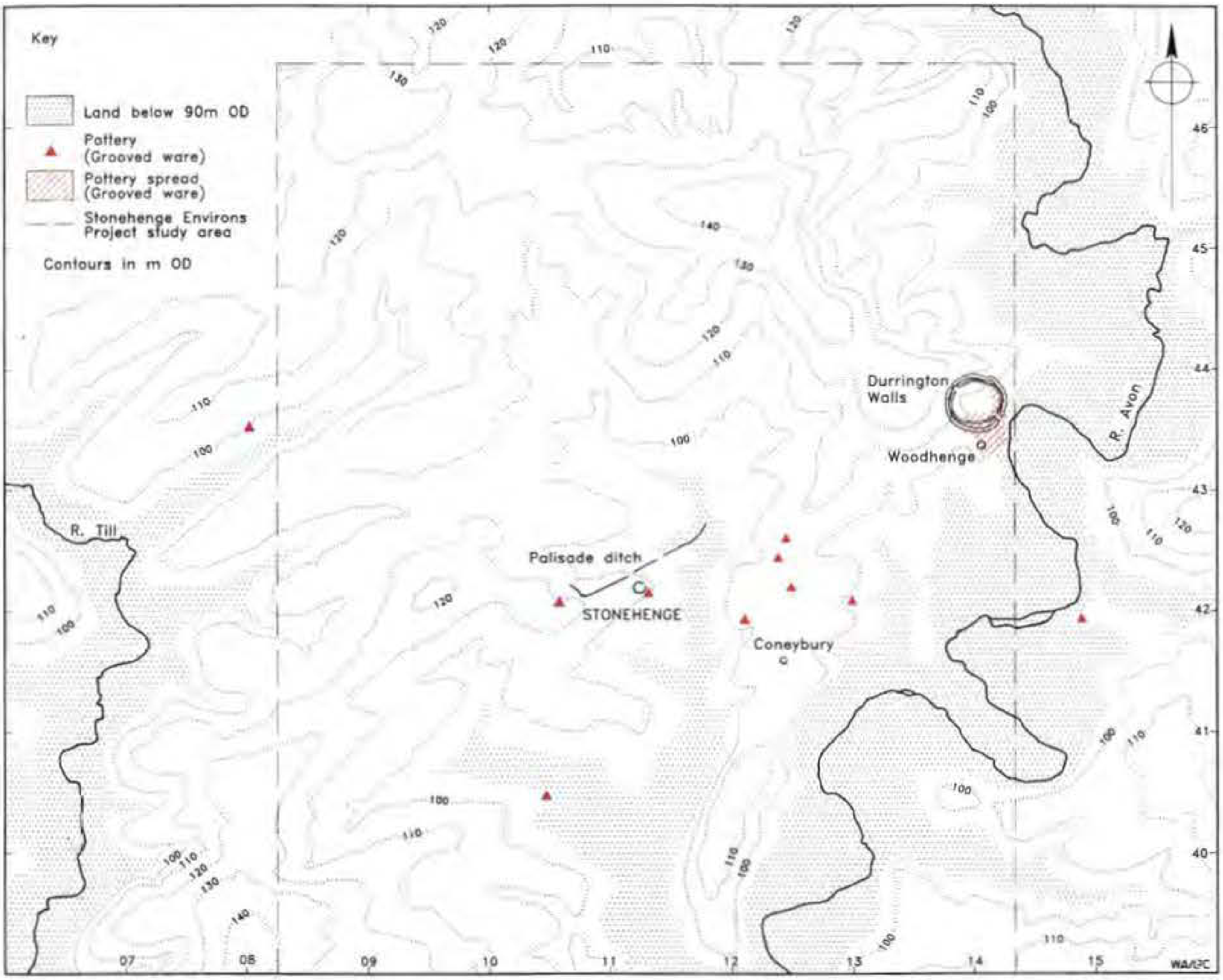



*Fig 254 Late Neolithic sites in the Stonehenge area*

more pertinent than general changes in the overall picture of the landscape. A question that needs to be addressed is whether massive changes are detectable in landuse, as Bradley sees with the cultural landscape (1991, 217), or whether the changes in landuse can be seen as a general progression. If definable changes in the economic food procurement strategies, and thus changes in the use of this landscape for this purpose, can be inferred, we need to ask if those changes coincide with, or even reflect, developmental changes seen in the monument itself. In other words, are changes in the food procurement or farming strategies related to major building and remodelling phases of the monument, as has been tentatively explored in Chapter 7.

In terms of the environmental, as opposed to cultural, landscape the pattern of landuse has been summarised in Chapters 4–8. Changes of emphasis within the monument have also been discussed in these chapters and these changes are relatively easy to recognise because each phase, or event, is defined by the changes in the physical form, and presumably use, of the monument. Unfortunately changes of emphasis within the food procurement or farming strategies do not present themselves as obvious physical evidence, and in many ways what we are trying to detect are actually changes in the general farming philosophy of the communities who built the monument, and who we assume lived and farmed round about. We are, therefore, trying to correlate major physical developments of the monument with perceived changes in the philosophy of the farming economy of those populations. Examination of direct economic evidence, that is plant remains and faunal assemblages, is difficult because of the impoverished assemblages from sites where they do exist and the paucity of well dated excavated sites from this area. However, by examining the broader landscape changes rather than specific changes in crops and livestock, perhaps we may be able to correlate any changes of emphasis in the 'landscape' with the development of the monument.

As we have comparatively little knowledge of landuse and economy of the Stonehenge area in the second half of the fourth millennium, it is impossible to map the economic development which accompanies phase 1 in any detail. Nevertheless, prior to the construction of the main enclosure Ditch, there is a greater emphasis upon open grazed downland pasture than is apparent earlier, with cultivated cereals occurring as regular, but not necessarily significant, components of the farming economy. Although cultivation need not imply total sedentism, it does indicate a restriction of mobility and a tie to this area for those communities. This *inter alia* provides a local workforce for the digging of the enclosure Ditch, but it does not give us the reasons for its construction, or even contribute to this line of enquiry, for which we have to rely solely on the traditional cultural archaeological evidence.

The shift of emphasis within the monument away from a simple enclosed area begins at about 2900 cal BC. This is a period for which we have slightly more environmental evidence. An expansion of the used and farmed landscape seems evident and much of this seems to be for a farming regime in which a greater emphasis is placed upon the cultivation of cereals. Nevertheless both grazed downland and woodlands for pannage were important elements in this economy. Therefore, rather as Cleal has argued for the monument itself, there is a shift in emphasis rather than a sudden change in the farming economy and the overall picture of the landscape.

### The period of Stonehenge phase 2

*by Rosamund M J Cleal*

In the early centuries of the third millennium BC there certainly was substantial change within the Stonehenge landscape, and not just within the monument itself (Fig 254), although those places in the landscape which were clearly important to preceding generations appear largely to have retained their importance. This seems certainly to be true of King Barrow Ridge and Wilsford Down, and may also be true of Stonehenge Down. It is almost certainly not true, however, of the Stonehenge Cursus and the Lesser Cursus. The late date for the Stonehenge Cursus, which falls within this period (2910–2460 cal BC; OxA–1403, 4100±90 BP) has already been rejected (*see above*) on the grounds that it is much later than other dates for cursus monuments, as recently summarised by Gibson (1994), and that it is a single date from an old excavation. The Lesser Cursus may actually have been deliberately backfilled during this period, as fragments of antler from a layer of chalk rubble dumped in the upper ditch fill have produced a date of 2890–2140 cal BC (OxA–1406, 4000±120 BP; Richards 1990, 80). Although this activity could, on the basis of the radiocarbon date, have been contemporary with phase 3 Stonehenge, the fact that backfilling of the Stonehenge Ditch took place in the first half of the third millennium BC hints at the activity belonging to the earlier centuries of the third millennium BC rather than to the later. The backfill in the Lesser Cursus was, as it was in some parts of the Stonehenge Ditch, directly on top of the primary fill, which also indicates a date in the earlier end of the range, as the date from the main construction phase of the Lesser Cursus (ie phase 2) gives a range of 3640–3040 cal BC (OxA–1405, 4640±100 BP).

By the time that the primary Ditch fill of Stonehenge had formed, the activities which had taken place within it were beginning to be scaled down and the secondary fill allowed to form. The monument would, however, have survived as probably the most dominant feature of the landscape around it. With the two cursus monuments now out of use, and their banks probably grassed over or, for at least part of the Lesser Cursus, pushed back into the ditch, Stonehenge may have been the dominant focal point of the landscape. This would have been particularly true if there were still posts in the Aubrey Holes at this time, but, as frequently commented upon, the dating of the Aubrey Holes, their nature, and their position in the sequence are uncertain. However, the practice of backfilling of earlier features seems to be represented in the Aubrey Holes (*see Chapter 6*).

It is very clear, however, that both at the monument and in the landscape around it there were major changes from around 2900 cal BC, and it seems increasingly that this is true of southern central England as a whole. These changes are most clearly demonstrated by the development of henges, of timber circles, and by the appearance of Grooved Ware.

The appearance of Grooved Ware is in many ways more obscure and inexplicable than that of Beakers, and yet the impact of this new ceramic and both the tangible and the intangible associations which came with it appear to have had an impact as great as that of Beakers and all that came with them, and perhaps greater. The changes in society, and particularly in ritual practices, which appear to have been associated with Grooved Ware lasted for most of the third millennium BC. But although these changes were radical, and appear to have permeated society, it is important also not to lose sight of the fact that the appearance of Grooved Ware, of henges, and of timber circles, did not form a complete break with the past.

Within the Stonehenge landscape Grooved Ware appears early, but its appearance is in just one of those areas which had already been a focus of activity for perhaps a thousand years. In a recent review of Grooved Ware radiocarbon dates Garwood (forthcoming) suggests a span of Grooved Ware use in southern Britain of 3000– or 2900–2100 cal BC. The early end of the range is provided largely by the two radiocarbon dates from Chalk Plaque Pit on King Barrow Ridge (3040–2610 cal BC; OxA–3316, 4250±80 BP and 2910–2480 cal BC; OxA–3317, 4130±80 BP; Cleal *et al* 1994) which are contemporary with the estimated span of phase 2 Stonehenge. It is at this time, too, that Grooved Ware probably first appeared at the monument, although unfortunately not in contexts which can be directly dated. So in both these cases, Stonehenge and Chalk Plaque Pit (King Barrow Ridge), Grooved Ware is entering an area already marked out by the use made of it by preceding generations. It may mark a change in the ways those areas were used, but it does not mark a complete break with the past.

Our understanding of both the monument and the landscape around it in this period are still handicapped by an insufficiently detailed chronology. Within the visible landscape the two dates from Chalk Plaque Pit and two from Coneybury are the only fixed points, and those from Coneybury do not form a coherent or useful picture.

The ditch of the henge monument on Coneybury Hill is dated by a single determination on bone in the primary fill of the ditch opposite the entrance, of 3080–2490 cal BC (OxA–1408, 4200±110 BP; Richards 1990, fig 100, 129). The other date, of 3340–2700 cal BC (OxA–1409, 4370±90 BP) from pit 1601 in the interior of the monument, could be taken to suggest earlier activity. Six sherds of Grooved Ware were recovered from the upper filling of 1601 (and were therefore probably not in direct association with the dated animal bone, although this is not clear from the report; Richards 1990, 137), and one sherd of Grooved Ware was found within primary chalk rubble towards the base of the ditch terminal (ie not in the cutting from which OxA–1408 was derived; *ibid*, 129). It seems reasonable, therefore, to assume that the henge monument at Coneybury was constructed during phase 2 Stonehenge and was associated with Grooved Ware, but that there may have been earlier activity on the site which is very unlikely to have been associated with that ceramic type.

There remains one other as yet undated feature of the landscape which, if it does date to this period, is likely to alter fundamentally our perception of the setting in which Stonehenge stood and the ways in which the area around the monument was used. This feature is the Palisade Ditch, a length of which was excavated by Mrs Vatcher and is reported on in this volume. As explained in Chapter 5, it was hoped to produce a *terminus ante quem* in the Early Bronze Age for this feature by the radiocarbon dating of an inhumation cut into its secondary filling, but this date proved unexpectedly late (ie Iron Age, *see Chapter 8*).

When first published as a note, it was suggested that the feature was later Bronze Age in date (Vatcher and Vatcher 1968, 108), but there is no positive evidence for this and the later Bronze Age pottery is in the upper fill only. The aerial photographic evidence also indicates that it does not form a coherent part of the field system on Stonehenge Down, towards which its western end runs (RCHM(E) 1979). Although the field systems on Stonehenge Down have not been investigated by excavation, the density of later Bronze Age pottery in that area strongly suggests that they are principally of Middle to Late Bronze Age date (Cleal with Raymond 1990b, 36).

The only periods to which a feature such as the Palisade Ditch is likely to date are the Middle to Late Bronze Age, and the later Neolithic or Early Bronze Age. As it appears to run towards an area which is clearly important during the currency of Peterborough Ware and probably Grooved Ware, it is considered more likely to be contemporary with phase 2 Stonehenge than with phase 3. The association with Grooved Ware is admittedly slight, and rests on only one sherd (Cleal with Raymond 1990b, fig 22, P311, 36), but as Stonehenge Down was subject only to surface collection and not to excavation, it is remarkable that any Grooved Ware was recovered at all, as it is not a ceramic type which survives well in ploughsoil. The Late Neolithic date of the activity in this area is also highlighted by the more durable lithic finds. This collection area was notable for the number of transverse arrowheads recovered: six oblique types and four chisel (Richards 1990, fig 159). As oblique forms show an association with Grooved Ware (Pitts 1978; Green 1984; Gardiner 1988) this strengthens the probability of Grooved Ware-associated use of Stonehenge Down, hinted at by the single sherd P311.

One other argument may be marshalled in favour of the Palisade Ditch being contemporary with phase 2 Stonehenge rather than phase 3. Its line across the landscape, running north-east from Stonehenge Down to a point within Stonehenge Bottom, reflects that of the Stonehenge Avenue, and it seems unlikely therefore to have been constructed when the Avenue was already in existence. Unlike the Avenue it is difficult to envisage the Palisade Ditch as channelling people towards the monument; rather, it seems likely to have acted as a screen, screening those 'outside' from seeing the monument, and perhaps equally, preventing those inside from being able to see out in a particular direction. The entrance, one terminal of which was excavated, is difficult to imagine as not forming part of a plan which involved the monument, which at least indicates that a pre-monument date is very unlikely.

The stronger evidence for the feature holding a palisade is here, around the entrance, and is much weaker where it was excavated in Stonehenge Bottom. This combination of façade, of posts increasing in size near an entrance, and of restricted access, is typical of some phases of a number of henge monuments, in particular of the first phase of the Southern Circle at Durrington Walls, and of the second phase of the Northern Circle at the same site, only 2km away (Wainwright and Longworth 1971). There are no satisfactory radiocarbon dates for phase 1 Southern Circle at Durrington Walls (ie there is only a bulked sample), and none for the Northern Circle, but as phase 2 dates for the Southern Circle place it in the mid to late third millennium BC it seems reasonable to postulate that phase 1 at least may be contemporary with phase 2 Stonehenge.

Whatever the date of the Palisade Ditch it is at least possible to provide a hypothesis that could be proved or refuted at a later date: it is suggested here, then, on the grounds argued above, that it is contemporary with phase 2 Stonehenge, and is related to an important focus of Middle to Late Neolithic activity on Stonehenge Down. Both these assertions would be capable of solution given targeted excavations on Stonehenge Down. If true this would significantly alter our perception of the Stonehenge landscape. Rather than being an unrestricted landscape, perhaps less restricted in phase 2 than when the Cursus was newly constructed, it would be a very restricted one, in which east to west movement in particular was carefully controlled. It is not clear which was 'inside' and which 'outside' in terms of the Palisade. On the one hand it seems logical to see the monument as 'inside', but on the other the layout of the Palisade, particularly if the 'northern' branch running towards Fargo from Stonehenge Down is really part of the same feature, suggests that the north-west side is 'inside'. Furthermore, it is not even certain that the line of the Palisade Ditch, as currently understood, is complete, and it would be interesting to test the possibility of it being part of a large enclosure (Bradley pers comm).

The obvious emphasis on restriction and control of access is also apparent within the monument itself (Fig 256). As discussed in Chapter 5 there are powerful arguments for placing the timber features of the interior, the southern 'passageway' and the north-eastern entrance, within phase 2 (ie 2900–2550 cal BC). These arguments, based on the monument alone, are supported by evidence from elsewhere that such features are exactly what would be expected at that period. It is interesting to note the indirect way in which the southern 'passageway' approaches the settings of the interior, reminiscent perhaps of other later Neolithic structures, such as House 2 at Barnhouse, Orkney (Richards 1994, 159) where part of the interior is shielded from view from the entrance.

The posthole settings in the interior certainly have readily recognisable parallels of a general nature with the settings inside the classic henges such as Durrington Walls, Marden, and Mount Pleasant (Wainwright and Longworth 1971; Wainwright 1971; 1979; 1989), although it is also apparent that the setting in the central area of the interior was not as complex as, for example, phase 2 of the Southern Circle at Durrington Walls, or site IV at Mount Pleasant. The details of the setting and its parallels are discussed at length in Chapter 5, but the main point must be that, given the similarity to these monuments, the timber monument at Stonehenge is more likely to have been constructed towards the middle centuries of the third millennium cal BC than in the first one or two, and is therefore almost certainly not contemporary with the Ditch.

The dates for phase 2 of the Southern Circle at Durrington Walls, for instance, although with large ranges (2860–2140 cal BC (BM-398, 3927±90 BP and BM-395, 3900±90 BP); 2870–2140 cal BC (BM-396, 3950±90 BP)), do not suggest the contemporaneity of this type of site with the construction of the Stonehenge ditched enclosure. Gibson's recent review, referred to above, also concludes that the more complex types of timber circles developed towards the middle of the third millennium BC.

It seems reasonable to accept that during the early centuries of the third millennium BC the monument at Stonehenge, which had started life at around 3000–2900 BC as an enclosure which belonged essentially to a much older tradition, was adapted to incorporate elements which are readily recognisable to us as among the classic components of henge monuments. These new elements comprised the construction of a timber structure and the use of Grooved Ware. Elements which could have been introduced but were not include a remodelling of the Ditch and Bank into the classic henge form, and deposition of artefacts on a large scale in and around the timber monument. An external bank could have been created by clearing out the existing Ditch filling and placing it on the external side, but unless the nugatory Counterscarp Bank does represent an attempt at this, it was not done. Similarly, some artefact deposition does occur, but not on the scale of Durrington Walls or Woodhenge. It is true that there are many henge monuments at which artefact deposition did not take place on a large scale (eg Avebury; Smith 1965; Wainwright 1989), and some which appear almost clean (eg Maxey; Pryor 1985), but Stonehenge lies within the area of the rich Wessex henges, and so close to Durrington Walls and Woodhenge, it would seem reasonable to have expected a greater emphasis on artefact deposition than there is.

The question of how closely even the phase 2 use of Stonehenge can be equated with that of classic henge monuments raises the question of the other major use of the monument, as a cremation cemetery, which must also be considered likely to have begun in this period. The problems of dating this activity, and of the parallels for this type of use, have been discussed in detail in Chapter 5. Some at least of the parallels, and the evidence of the artefactual associations of some of the cremations, indicate an association with the Grooved Ware tradition and all that goes with it, but it seems that the site continued to be used for cremation burials after the introduction of the Bluestones which is taken to mark the beginning of the next phase. This is suggested most strongly by the cremations in the upper fills of the Aubrey Holes, some of which may be in association with bluestone fragments, although the evidence is admittedly poor and difficult to interpret. This raises the question of the nature of the transition between phases

2 and 3, and the nature of the monument in its final, long, phase.

## The time of the Stone settings: phase 3 (2550–1600 cal BC)

### An economy to support the stones?

*by Michael J Allen*

The trend towards an economy more reliant upon farming with permanent pasture and arable cultivation, and thus sedentism, is demonstrable by the time of the inception of phase 3. Although we cannot see formal 'Celtic' field systems of Middle to Late Bronze Age and Iron Age type yet, many of the Bronze Age barrows seal soil horizons containing environmental evidence of earlier periods and their ditch fills span the period of the erection of the stones at Stonehenge. Few barrows in the immediate vicinity of Stonehenge have been excavated in recent times, enabling the acquisition of environmental data such as land snails, but others within the broader landscape have been investigated. It is not the individual instances but the combined evidence from a number of barrows and other sites that indicates extensive areas of long-term and established short-grazed grassland.

Within the Stonehenge landscape (Fig 255) the soils from beneath Winterbourne Stoke G45, just north of the Lesser Cursus, indicate a grassland (Evans in Christie 1970), and established short-grazed grassland is evidenced by mollusc sequences from the buried soils, turf mounds, and ditches of barrows at Durrington G3 (Allen *et al* nd), on the King Barrow Ridge, and Luxenborough plantation (Allen and Wyles 1994), and confirmed by the limited pollen spectra (Scaife in Cleal and Allen 1994) and the Beaker earthwork at North Kite (Allen in Richards 1990, 191–2). Further afield short-grazed grassland is apparent beneath Amesbury G70 (Kerney in Christie 1964), and under barrow Amesbury 71 not only does the mollusc evidence indicate very open dry short and broken grassland (Kerney in Christie 1967) but there is also physical evidence of pre-barrow ploughing or rip-arding in the form of parallel scores on the chalk (Christie 1967, 347).

Further evidence from Entwistle's analysis of ditch fills of the Lesser Cursus within the SEP project indicates an intensification of landuse (Entwistle in Richard 1990, 92–3). Cultivation from the Beaker period onwards is indicated by the ditch fills of the Amesbury 42 long barrow (*op cit*, 105–9). Most of the evidence points towards a farmed landscape, either as pasture or arable. The apparent lack of formalised field systems presumably reflects a lack of necessity at this stage to delineate and define land, which is seen later in the Bronze Age, for instance both on Salisbury Plain (Bradley *et al* 1994) and in the Dorchester area (Allen forthcoming d). Even if a few smaller field systems did exist, they may not be distinguishable from the wealth of later systems (see Chapter 8) and may have been subsumed by and possibly lie underneath some of those later more formal field systems. Although it has been argued for elsewhere in elsewhere in southern Britain that so-called 'Celtic' field systems had their origins in the Middle, if not Early, Bronze Age (Bradley 1978; Allen 1988; 1992) we have no evidence of this on the Salisbury Plain.

The general picture is therefore one of a greater emphasis on pastoral than arable farming. Unfortunately there is a paucity of faunal remains to corroborate and emphasise this (Maltby 1990). In other chalkland areas more extensive arable farming has been inferred from the presence of colluvium in dry valleys. For instance, in East Sussex hillwash in the valleys of Kiln Combe and Itford Bottom dates to the Beaker period (Bell 1983) and other hillslope deposits at Grey Pit, Southerham, Lewes are of similar date (Allen forthcoming b). This pattern of early intensive cultivation and resulting hillwash deposits is also seen in the Dorchester environs, Dorset, from the analysis of molluscan sequences from both archaeological sites and dated colluvium (Allen forthcoming c; forthcoming d), and also possibly on the Isle of Wight (Allen 1994). Bronze Age colluvium occurs at Figheldean (Allen and Wyles 1993) and Durrington Walls (Wainwright 1971) in the Avon Valley, as well as elsewhere on the Salisbury Plain, Wiltshire (Allen 1992). The evidence from the Stonehenge area does not necessarily indicate a more localised, or a lesser degree, of farming activity than these other areas, rather that there might have been a greater emphasis upon livestock on the chalk here and that fields were not necessarily continually tilled, resulting in the erosion seen elsewhere. If so, this might in part explain the notable absence of hillwash in the dry valleys in this area and especially from Stonehenge Bottom itself (Chapter 3), which has puzzled a number of writers (cf Bell 1986; Richards 1990, 210–11, Allen 1991, 51–4; 1994, 268–70). The Stonehenge landscape was heavily farmed and fields were certainly tilled, but perhaps most of it was under permanent pasture, or a more sensitive rotational farming regime with periods of fallow/pasture.

If, therefore, we can accept that farming populations were becoming well established in this area in the earlier to mid Bronze Age there is the likelihood of the establishment of more permanent settlement and occupation. With the onset of a mixed farming economy, perhaps backed up by some hunting, we can also see potential for both 'wealth' and available labour during agriculturally slack periods of the year. These slack periods are between land preparation and sowing and the harvest, during which the community can utilise the available labour for communal gain. It is perhaps no surprise that this is when the stone construction of the monument begins, the phase of development which required both a large available labour force, and the planning and forethought to use and empower that labour to maximum effect. Within the Stonehenge landscape we would therefore expect to see more evidence for semi-permanent occupation to accompany the change in economy to one which was more, but not totally, reliant on farming the land and the herding of domestic animals.

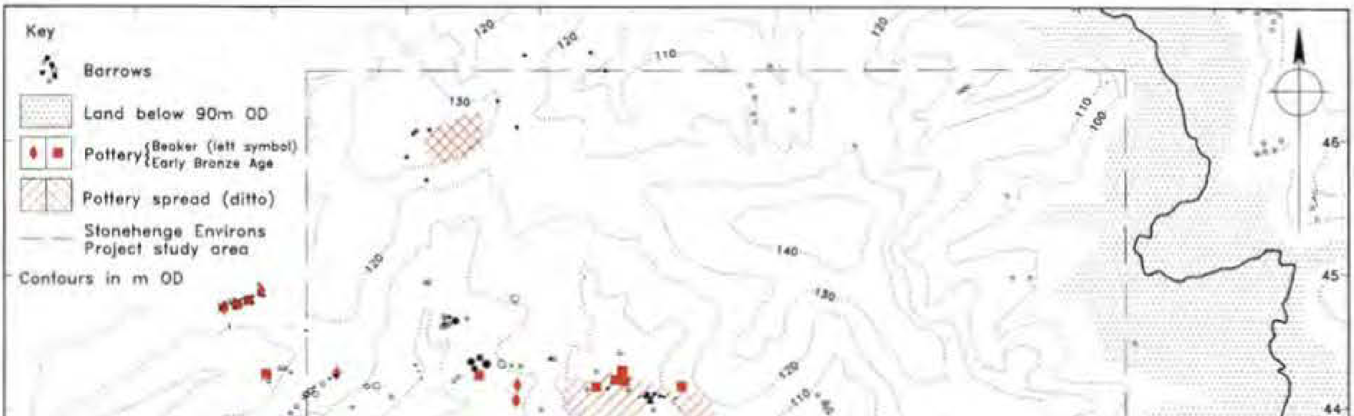



*Fig 255 Early Bronze Age sites in the Stonehenge area*

**The period of Stonehenge phase 3**

*by Rosamund M J Cleal*

Now that a clearer picture of the monument before the stone settings has emerged it is possible to discern a number of features which hint at a considerable degree of continuity in the way the site was used in phase 3, in contrast to the strikingly different media in which that use was expressed. These features can be summarised:

- the timber settings with two entrance 'corridors' at the north-eastern entrance can now be seen to almost certainly have been replaced by a stone setting (ie Stones D, E, and the Slaughter Stone) which continued the double entrance;
- the control over access suggested by the timber 'passageway' and facades to the south (and perhaps by the Palisade Ditch) may be perpetuated by the construction of the Avenue, to the north-east; and
- the memory of the southern entrance may have been perpetuated by Stone 33e of the Bluestone Circle which is turned at right-angles to the line of the Circle and may have formed a very narrow entrance in through the closely spaced stones of the Bluestone Circle. The same area may have also been distinguished earlier, as it has a large pre-Sarsen Circle feature (WA 2321), and a gap between two of the Q Holes. It is also perhaps more than coincidence that it is in this area of their circuits that the lines of the Y and Z Holes become irregular, even allowing for the possibility of ZH8 being in place. It is also possible that the two graves (WA 1676 and 2724) are Bronze Age and are related to the two entrances. The latter grave, in C12, lies across the axis and entrance to the phase 3 monument, and that to the south lies close to the southern passage and entrance. In neither case is there dating evidence for the inhumations, but there is no positive evidence that either is late. There are a number of sherds of a single fine Beaker in C12, which could be seen as deriving from a Beaker-accompanied burial but this is entirely speculation, although the occurrence of Beaker-period burials close to stones of standing

monuments is not of course unknown (eg Avebury, Smith 1965).

- The radiocarbon dates for the Sarsen Circle (and by implication for the Trilithons) indicate a much earlier date than previously supposed for a use of stone which has always been perceived as reflecting techniques and forms which are essentially those of carpentry. Continuity from a timber setting can now be seen as perhaps occurring in the mid third millennium or early second half of the third millennium cal BC, at a time when the complex timber settings at Durrington Walls were also under construction or had perhaps been constructed within living memory. It would also seem reasonable, as suggested here, and not incompatible with the little stratigraphy and dating evidence available, to see the Bluestone setting with lintels as also occurring this early in the sequence.

Although a considerable degree of continuity now seems incontrovertible, however, it is still important to recognise that there are at least two major changes to the use of monument: the introduction of the Bluestones and the introduction of Beaker pottery, the latter at least from the point at which the Q/R setting was dismantled. The monument then goes on to be altered in plan, and perhaps used in varying ways, but seems nonetheless to remain essentially unaltered except in detail until the abandonment of the Y and Z Holes during the first half of the second millennium cal BC. The sub-phases of phase 3, showing the principal elements of the monument, are summarised in Figures 256 and 257.

The idea of Stonehenge emphasising continuity has relatively recently been aired by Bradley (1991), who traces its development from causewayed enclosure to a possible arc of ritual pits (the Y and Z Holes). Although the form of the monument changes 'The fascinating feature is that the changes that we recognise at Stonehenge itself are less abrupt than those in the world around it, as if those broader developments had to be interpreted and assimilated in relation to established practice' (*op cit*, 217). This is the point made above, that although there are changes in the monument, its story remains essentially the same.

Because of the essential continuity that is argued here and by Bradley, it is valuable to consider the monument both in terms of what it might tell us about what it was like to use the monument during its stone phases, which we can still see, and for the glimpse it gives into a past that we have much more difficulty seeing, the past of the timber settings which lie inside henge monuments. Although we cannot observe with anything other than twentieth-century eyes, there are some observations which we can make which may be valid. In particular it seems reasonable to assume that our physical perceptions of what it is like to move around a monument are essentially the same as those experienced in the past. Colin Richards, in a recent discussion of the passage grave at Maes Howe, Orkney, vividly describes the approach to the central chamber, with its difficulties of access and gently rising ground; he then extrapolates from the purely physical to suggest that the experience of approaching the central chamber was intended to produce the impression that the use of the chamber was restrictive and secretive and to increase the feeling of ascent towards it (Richards 1994, 151–2). Given the nature of the physical approach this seems a reasonable interpretation.

A similar analysis of Stonehenge can also offer some insight into the situation in the past. To the present-day visitor first entering the interior of the standing stone monument the overwhelming impression gained is that the space is so enclosed, even in its ruined form, that it feels like a building. This feeling has been expressed more elegantly by the nineteenth-century diarist Francis Kilvert 'It is a solemn awful place. As I entered the charmed circle of the sombre Stones I instinctively uncovered my head. It was like entering a great Cathedral church' (Kilvert 1992, 235). The present-day visitor is more likely to encounter the monument from outside, and that too has its effect; it is very difficult to discern the pattern of the interior from the outside, say, at the distance of the Ditch from the stones, and it must have been almost impossible to see into the interior when the monument was complete, particularly after the Bluestone Circle had been constructed. Taken together these observations strongly suggest that the inner settings of the monument were intended to exclude those outside, and extrapolating from this it is possible to suggest that in terms of the 'view in' and the 'view out' described in Chapter 3 (and see Figs 22 and 23) it was the former, the view of the stone monument from *outside*, that was more important; that is, that it was the fact that it could be seen from areas that had for many generations been visited or inhabited that was paramount (Plate 3).

In turning to the landscape outside the monument, it is necessary to bear in mind that much of that landscape would have been obscured from view in the innermost part of the stone settings. From the area between the Bluestone Circle and the Sarsen Circle, however, vistas are glimpsed between the sarsen uprights by those moving around the circle in that area, and there is no reason to suppose that this part of the monument was not used. If, indeed, there was no stone next to the stone turned at 90° to the circle (ie Stone 33e) then this might suggest additional access into and from this peripheral area of the stone settings. Before the Bluestone Circle and Oval were in place the interior would have been even more open, and outside the stone settings the view would, in phase 3 (and for the first time since the construction of the enclosure), have been much as it is now, with the main Bank denuded, no timbers in the Aubrey Holes, and the Palisade also almost certainly dismantled by this time. That there is activity at this time around the area of the enclosure, outside the stone settings, is attested by the Beaker pottery above the Ditch filling (*see Chapter 7*), and the burial with Beaker-period artefacts cut into the Ditch west of the main entrance. Gibson has recently drawn attention to the possibility of this burial being the ultimate in structured deposition, that of an individual deliberately killed and deposited (1994, 187), and whether or not this is accepted as a sacrifice, it seems reasonable to conclude from the evidence available that little or nothing was done in the vicinity of the monument in a casual manner, and the placing of this burial would seem to indicate that the periphery of the site remained important, even with the Ditch largely filled. The fact that the enclosure was still regarded as part of the monument even at this late stage, several hundred years after its construction, is also indicated by the fact that the Avenue runs up only as far as the enclosure, and does not continue within it. The enclosure, then, was still 'inside' the monument, and from there the view was almost as unrestricted as it is today, the only marked difference being in the entrance area where stones D, E, and the Slaughter Stone stood, perhaps lintelled as the distances between them do not exclude this possibility.

Despite the exclusion of much of the view from the innermost part of the phase 3 monument it is valid to consider the landscape view as a whole as it could be seen in its entirety from the interior of the enclosure, but here there are considerable problems in relating the archaeological evidence from outside the monument to the developmental stages within it. Whereas phase 1 may have lasted perhaps 50 years at most, and phase 2 400–500 years, phase 3 appears to have lasted 1000 years, or in the region of 40 generations. Not only is this a long time period by any standards, but this particular 1000 years saw enormous changes in almost every aspect of life, encompassing the change from Grooved Ware and its associated artefact complex, through Beakers and the Beaker 'package', the early stages of metal artefacts and metalworking, and the 'Wessex Culture'. The changes of the Late Neolithic/Early Bronze Age are outside the scope of this discussion, but the great contrast between these changes and the apparent continuity of Stonehenge has been highlighted by Bradley: 'The sequence at Stonehenge presents an appearance of massive continuity, but it does so against a background of drastic change. Each of those changes is represented at this site, but the relationship is sometimes indirect' (1991, 217). The difficulty is in correlating the changes in the outside world with those inside the monument, even in simple chronological terms, and this is apparent even in examining the changes in the immediate landscape, the area of the 'view out'.

Within the area around Stonehenge many of the changes of the Late Neolithic–Early Bronze Age are represented. Henge monuments go out of use (Coneybury); Grooved Ware and its associated complex of artefacts are replaced by Beakers and associated goods; cremation burial is replaced by inhumation, and then becomes again a common method of burial; metalwork and other 'fancy' goods appear, culminating in the extravagant burials of the 'Wessex Culture'; Collared Urns, miniature vessels, and Food Vessels appear; there are changes in the farming regime, as already discussed; and, most apparent in the Stonehenge landscape, burials are made in round barrows, eventually including the whole range of Early Bronze Age 'fancy' forms. These changes are too poorly dated everywhere, however, and certainly too poorly dated within the Stonehenge environs, to fit easily the likely development of the monument. Although the dating of the sequence in the monument is still lacking in fine detail, because of the lack of datable material from good contexts, it is now considerably more detailed than that outside. If the area within the 'near horizon' is considered, only four radiocarbon dates which fall within this area are listed in the SEP volume, those from Coneybury henge primary ditch fill (OxA–1408; 4200±110 BP, 3080–2490 cal BC), the Stonehenge Cursus (OxA–1403; 4100±90 BP, 2910–2460 cal BC), barrow Amesbury G51 of the Cursus Barrows group (BM–287; 3738±55 BP, 2330–1980 cal BC), and Amesbury 39, on the western slope of King Barrow Ridge (HAR–1237; 3620±90 BP, 2280–1750 cal BC) (Richards 1990, 260–1). Of these four the Coneybury date only encroaches on this period at the youngest end of its 2-sigma range, and the same is true of the Cursus date, which has already been dismissed as doubtful as it is derived from old excavated material. This leaves only two dates, one for a Beaker burial (BM–287) and one for a Wessex Culture cremation burial (HAR–1237), although in both cases it is possible that the dates are too old, in the first case because it was from an oak board which could have been already old for the context when deposited (Ashbee 1975–6, 24), and in the latter because it was from burning beneath the mound which may have included residual as well as pyre material.

In absolute terms, then, there is little dating evidence from the area, but in more general terms some patterns may be discerned. In particular, it seems fairly clear from the results of the British Museum's Beaker dating programme that the currency of Beakers is likely to have been over by *c* 1800 cal BC (Kinnes *et al* 1991). The Wessex Culture is much less well dated, as the few radiocarbon dates available do not offer the degree of resolution necessary to distinguish Wessex I from Wessex II adequately , or to give a firm date to the beginning or end of the phenomenon, although it is difficult to envisage it as continuing beyond *c* 1400 cal BC, a date with which the Hove, Sussex and Earl's Barton, Northamptonshire, radiocarbon dates appear largely in agreement (BM–682, 3189±46 BP, 1600–1400 cal BC and BM–680, 3169±51 BP, 1530–1320 cal BC; BM–681, 3214±64 BP, 1670–1400 cal BC respectively; Burgess 1974, 228 and 392). It is not possible to establish whether Stonehenge as a monument ceased to develop before or during the currency of Wessex II, but it at least seems likely that the change in use suggested by the abandonment of the Y and Z Holes took place during the period in which 'Wessex Culture' burials were deposited.

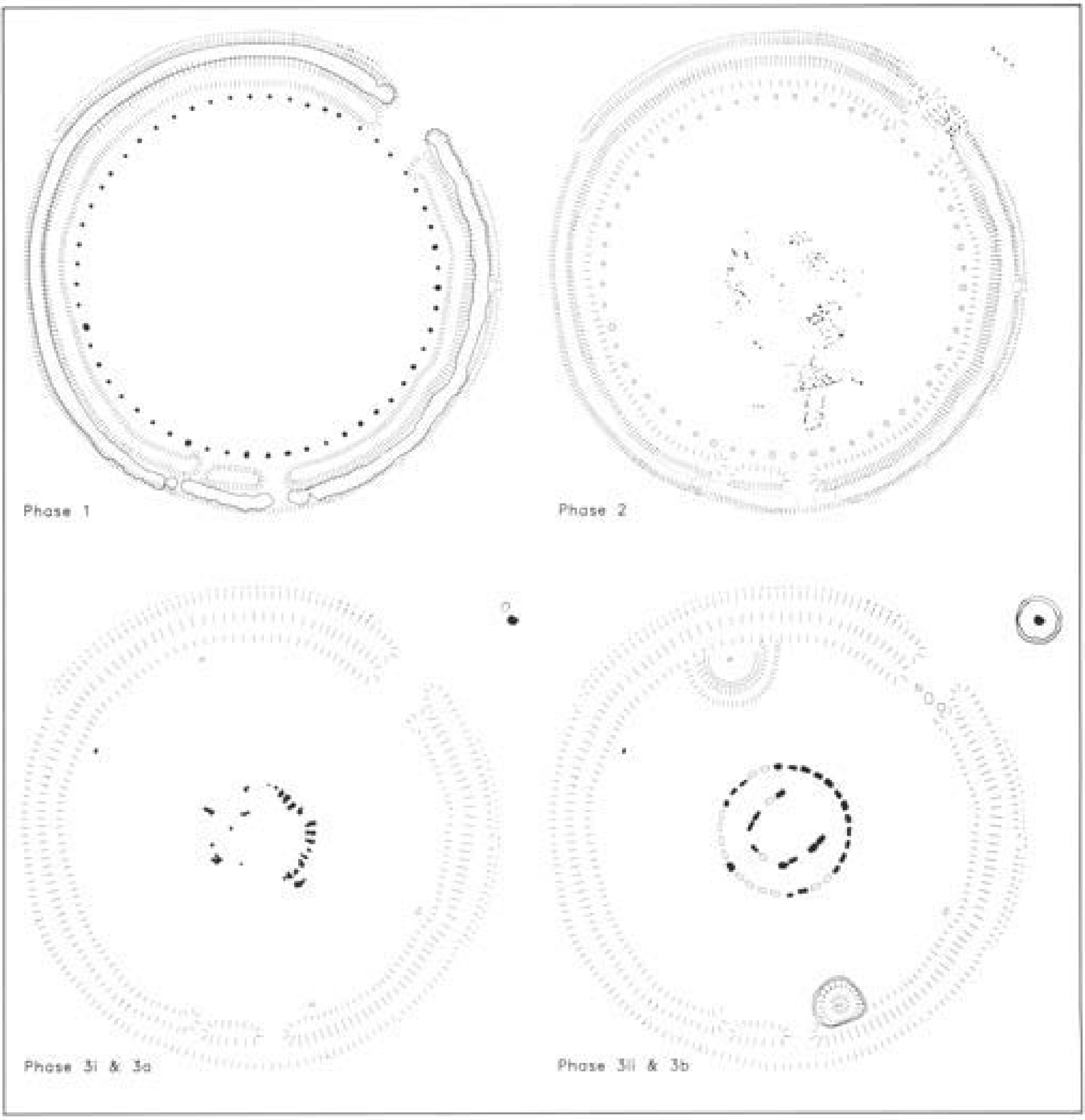



*Fig 256 Summary phase plans: phases 1, 2, 3i/3a, and 3ii/3b*

With allowances made for this lack of chronological definition outside the monument, however, it is still possible to comment on the relationship between developments inside and outside the monument. There are clearly patterns of use and abandonment which assist in charting the change in the area from one of ancient places marked by settlement, through the setting aside of large areas for funerary use, to the eventual emergence of a strikingly different, post-monument landscape in the later stages of the Bronze Age.

Within the Stonehenge Environs Project area, around Stonehenge, it is clear that some places which had been important places at earlier periods continued in use, but others seem to have lost their importance. On King Barrow Ridge in particular there is very little evidence of Beaker-associated activity and the barrows are unexcavated. Beaker pottery does occur but in small quantities, and the flint scatters, first described by Laidler and Young (1938) and then by the Stonehenge Environs Project (Richards 1990, fig 159) does not

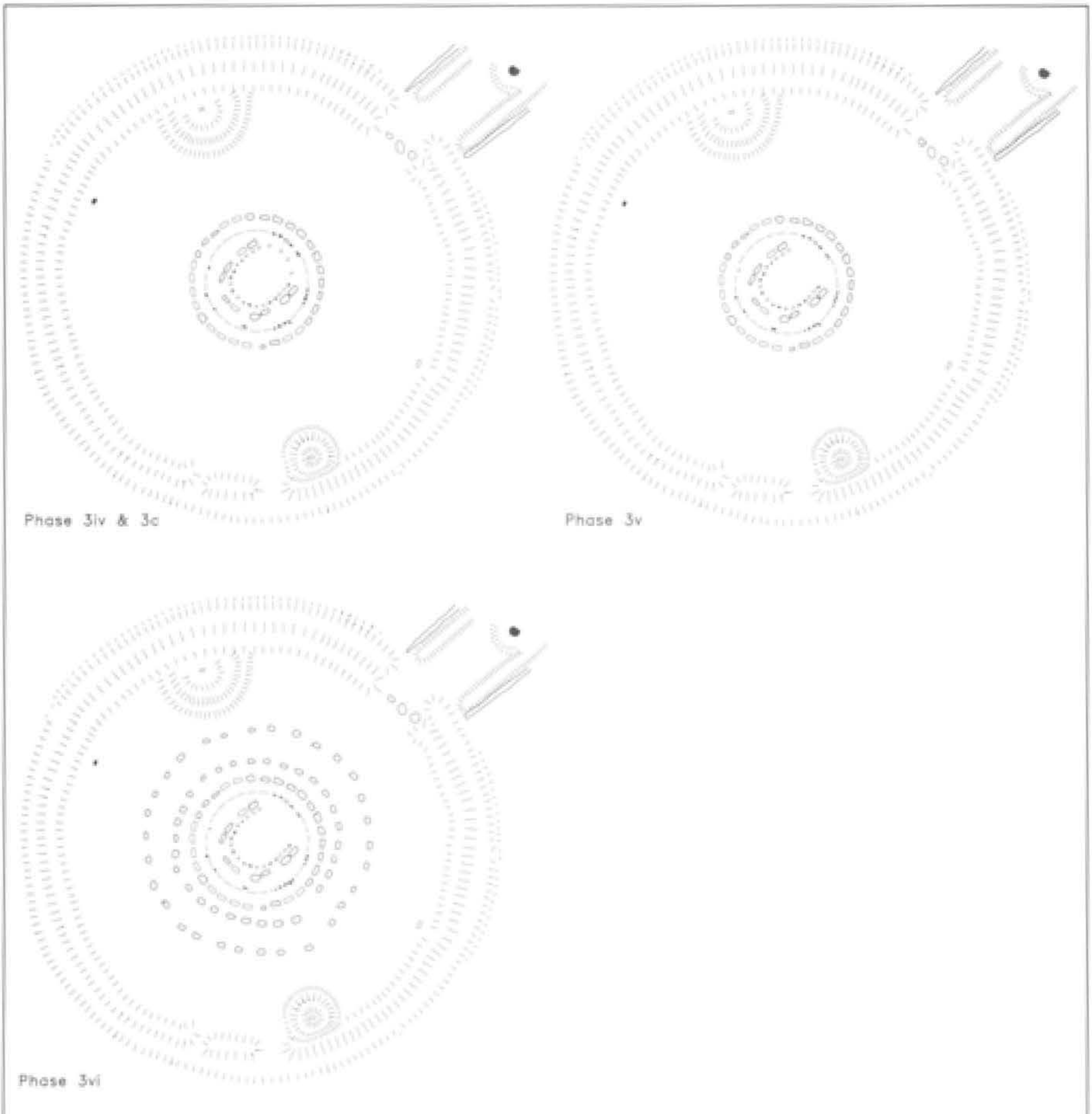



*Fig 257 Summary phase plans: phases 3iv/3c, 3v, and 3vi*

indicate concentrated use of the area in the Beaker period. The bowl and bell barrows of the New King Barrows occur in an area which appears to have even fewer finds of this date than the area immediately to the north, but allowance has to be made for the disruption of the pattern of distribution by the large-scale stripping of turf and topsoil which must have occurred to create some of the considerable turf and soil mounds of the barrows. Even in the cases of the few barrows investigated as the result of storm damage in 1990 the size of the soil cores and the existence of at least one mound (Amesbury G30) completely of turf and topsoil suggests a volume of soil greater than could have been derived from the area of each barrow alone (Cleal and Allen 1994).

To the north, the Cursus Barrows, so clearly skylined on the 'near horizon' (Fig 21), clearly have their origins in the Beaker period. Amesbury G51, a bowl barrow with several successive burials with Beakers, has produced a radiocarbon date (BM–287, quoted above), and was clearly used over some time, perhaps in the last quarter of the third millennium BC. The mound contained bluestone fragments (*ibid*, 25) and these have also been reported from the general area of the western end of the Cursus (Stone 1948, 16–19). The fact that they were in a Beaker-period context in the G51 mound indicates that even at this date bluestone was circulating in fragmentary form, and was presumably already in place at the monument, perhaps in the Bluestone settings of 3iv, from where the fragments could well have been derived.

To the east, however, along the line so clear on the near horizon, the barrows are probably later, with Wessex Culture burials in at least G44 and G48 (Annable and Simpson 1964, 399–405; Ashbee 1975/6, 26; G44 excavated by Stukeley (Grinsell 1957, 313)). The area of the Fargo Plantation 'ridge', however, unlike King Barrow Ridge, shows a considerable spread of Beaker pottery, with other grog-tempered pottery, Beaker-associated scraper types, and other tools likely to be of Early Bronze Age date (Richards 1990, figs 154 and 159). This is also seen to the west of Stonehenge, on Stonehenge Down, where the area of Middle to Late Neolithic activity seems to continue in use (*ibid*). Here the barrows are set off the summit of Stonehenge Down, on the slope facing Stonehenge and only about 200m from the monument. It is difficult to envisage the placing of these barrows as anything other than related to their visibility from the monument: the barrows are close to the monument here because that in terms of the view out, would have put them in an analogous position to those on the near horizon elsewhere.

The view to the south-west is difficult to determine today, and it seems possible that G1–3 and the removed G107–111 were not intended to be visible from the monument. Barrow Amesbury G15, a large, isolated bell barrow, is visible towards the limits of the view in that direction. The lost vessel is described as a 'drinking cup', a description which usually implys a Beaker, but the surviving dagger suggests that this was not the case (Annable and Simpson 1964, 351). The now excavated barrow Wilsford G1 (unpublished), with several Beaker-accompanied burials, was probably not visible, and even if it could have been glimpsed from the monument it is difficult to see it as located where it is because of the monument, whereas that is feasible in the case of G15. Again it seems that visibility was more important in the case of the Wessex barrows than the Beaker.

Directly to the south, the Normanton Down barrow cemetery seems unarguably sited with reference to the monument, and in the area of the cemetery there is no evidence of earlier use of any sort. This area, excluding only the barrow cemetery itself, was included in the area of the Stonehenge Environs Project, and it appears as a blank in the distribution of flint tools of all dates, as well as in prehistoric pottery of all styles, despite the presence nearby of the Normanton Down Long Mortuary Enclosure. There is no obvious reason for this (eg landuse or masking by colluvium), and it seems therefore to have been an unused or little-used area when it was put aside for the construction of barrows, and those barrows are also largely of Wessex Culture and associated date. It is worth noting that Bush Barrow (Wilsford G5), containing the well known rich Wessex I burial, is sited at a very slightly higher elevation to the majority of barrows in the cemetery, and from a point at which it is both easily visible from the monument, and from which a viewer can see the monument.

To the south-east, barrows in and around Luxenborough are highly visible from the monument, and there is also evidence of Early Bronze Age use of the area at Coneybury henge, where Beaker and Early Bronze Age pottery occurs in the upper fill of the henge ditch and elsewhere (Richards 1990).

The barrow cemeteries which emerge in these areas of former use and in 'blank' areas, and which may have continued beyond the life of the monument, must have held a wealth of associations for the users of the monument in phase 3. The details of the burials and even of the people buried there would almost certainly have been known, directly, as events within living memory, and indirectly, as myth or folklore, by the users of the monument. It is this which Figure 21 attempts to convey, but it must be remembered that this applies only to phase 3 of the monument. It is worth reiterating too that the barrows which most clearly occupy prominent positions around the near horizon skyline are those apparently dominated by Wessex Culture burials. The Beaker burials towards the western end of the Cursus Barrows are not as obvious as the probably mainly Wessex Culture burials of the more prominent, eastern end, and on Normanton Down the prominent, skylined cemetery is also mainly Wessex Culture, with the Beaker barrow Wilsford G1 not noticeably sited with reference to the monument.

The development of the Stonehenge landscape and the monument can be seen in relation to the development of similar areas elsewhere. It is, for example, similar in some respects to the area around Balfarg (Barclay and Russell-White 1993), which has been the subject of large-scale excavation, or to that around Avebury. The discussion here has concentrated on Stonehenge in its immediate landscape but it is is arguable, even without drawing on wider comparisons, that it is mistaken to describe the landscape as an entirely ritual one. The monument and its surroundings show repeated use of the area over many generations (56 at 4 to a century), for a range of activites including those of ritual, but not excluding other more secular ones represented by, for instance, clear evidence for increasing dependence on farming and especially on the keeping of herds. To term the Stonehenge landscape a ritual one, as has sometimes been done, is to suggest that elsewhere there are 'secular' landscapes, which seems as unlikely as it would be difficult to prove. It is also important to remember that one only has to attempt to delimit the outer edge of the Stonehenge 'ritual landscape' to realise that the concentration of barrow cemeteries is much greater than that in the immediate environs of the monument and extends over many kilometres.

Overall, and in any consideration of the monument and its landscape, the overwhelming impression of Stonehenge is its unique quality. In its first phase it appears to have few parallels, although its antecedents are fairly clear. In the second phase, although it most nearly approaches the classic henge it is unusual in its combination of relatively large size (eg in comparison with the Oxford area cremation cemeteries), complex timber settings, and in the beginnings of the cremation cemetery. In its phase of 'lithicisation' it is unique. Other monuments show a phase of lithicisation but at Stonehenge it was of unusual complexity and length. In its stone phase Stonehenge remained relevant through the transition from a society using Grooved Ware and its associated artefacts, to the use of the Beaker-associated complex of artefacts and practices and the developments which produced the Wessex Culture burials, at least of Wessex I. Throughout this it harks back, through its Sarsen settings, to a much older tradition, that of the timber settings within henge monuments. To have continued to function as a monument for well over a thousand years, as a large-scale communal undertaking in a world much changed from that in which it was first constructed, and to have largely retained its associations of power and authority to such an extent that it influenced the siting of burials of those highly visible individuals of the Wessex Culture, is an achievement which indicates the adaptability of its creators and users. Their other great achievement was in creating a monument which has survived three and half thousand years of varied treatment to exist now as an expression of their beliefs and as a visual reminder of the many generations of men, women, and children who lived in and used the Stonehenge landscape over the millennium and a half of the life of the monument. It is a unique and extraordinary achievement.

## Later use: away from Stonehenge and back

The history of later use of Stonehenge is more one of use of the surrounding landscape than of the monument itself (Chapter 8). Although the monument was a focus of activities for nearly one and half millennia following its final stage and completion about 1600 BC there is little evidence for its continued use on any scale.

The Middle to Late Bronze Age was a period of widespread and far-reaching change in southern England generally, the principal elements of which are well-rehearsed throughout the literature. It was a period during which a wide range of metal tools, ornaments, and weapons came into common use and metalworking became widely established. In many areas there is evidence for the incorporation of large blocks of land into formalised field systems and for increasing intensity of both arable and pastoral farming. Enclosed settlements appear for the first time; there are major changes in the form and style of pottery and in many other aspects of material culture; and established traditions of burial and monument building were abandoned. The large-scale nature of these developments, and their implications for major changes in social structure and organisation are reflected in the area around Stonehenge and most obviously in the abandonment of the monument itself as a main focus of ritual activity.

Within the Stonehenge landscape (Fig 187) formalised field systems were in place by the later Bronze Age, the cultivation of which led to silt being blown into the Y Holes from the fields in the summers. A range of environmental data from the Wilsford Shaft (Ashbee *et al* 1989) suggested that the well was situated in extensive, open, short-turfed downland. However, plant remains from the shaft provide not only evidence for cultivation, in the form of charred grain and chaff, but both the charred and waterlogged remains also contained many seeds of disturbed ground indicating that cultivated fields were close by (Robinson in Ashbee *et al* 1989). There was clearly a radical reorganisation of landuse and settlement pattern, and in the location and form of burials, which, though it probably occurred over a number of generations, appears as a major point of change in the archaeological record. Though Stonehenge no doubt remained a place of some veneration and mystery, it no longer played an important role in the articulation of the surrounding landscape.

In the Roman period, much of the open downland was still presumably farmed, as it was in medieval times, and in the post-medieval period it was largely laid to long-term pasture for sheep grazing, some of which remains.

Only sporadic and occasional activity occurred from the Iron Age to the medieval period. Stonehenge was no longer used as a monument with any specific meaning, but seems to have been considered a suitable location for the occasional burial (Iron Age, burial in the Palisade Ditch) and certainly a place to visit (Roman to seventeenth century, graffiti on the stones and debris in the Stonehenge Layer). Most of the activity was concentrated in the landscape which became increasing farmed.

Stonehenge the monument has enjoyed a renewed surge of interest in the later centuries of the second millennium AD. Interest ranges from simple curiosity to the purely academic, but in the late twentieth century, Stonehenge is again a place of pilgrimage and wonder on a massive scale. The excavations of this century have revealed many clues to the sequence and nature of this unique monument in its various phases of construction and use; the foregoing pages of this volume have presented the results of those excavations and suggested a coherent interpretation. It is, nevertheless, reassuring to know that there are many questions still to be answered and that our most famous archaeological monument should remain as evocative, if not quite as mysterious, as it has to so many generations before us.

## Future directions

*by G J Wainwright, Andrew J Lawson, and Julie Gardiner*

The publication of the twentieth-century excavations at Stonehenge has been long awaited and with this volume has at last been concluded. This report has presented a thorough review of what has been done and has attempted to define our current state of knowledge, but this is not the end of the story. The production of a coherent archive and this comprehensive excavation report provide the necessary firm foundation on which to build future theories and to construct new research designs, for as with any archaeological site, the project has raised questions which will require an answer in the future.

The difficulties encountered with, and inadequacies of, the various site archives have made themselves very apparent in the report and there remain many frustrating gaps in our knowledge of this complex monument. We have learned a great deal but many questions are unanswered and problems unresolved. Individual aspects of the stratigraphy, composition, and artefact assemblages of Stonehenge will engage the minds of scholars for generations to come and may be tackled from the existing archives, but the answers to many of the outstanding questions undoubtedly lie in a new field programme.

There is scope for further research at the monument itself. Specific questions can be formulated on the basis of this report which require only limited, carefully planned, excavation at the site, and some which do not require any spade to be put to the earth. It is part of English Heritage's plan for the future of the monument that scientific research should continue at a level which is appropriate to the needs of academic inquiry but which is also compatible with the requirements of conservation and the long-term management of Stonehenge.

A number of key issues have therefore been identified which may be addressed by either non-intrusive or small-scale intrusive excavation at the monument, or which relate to its management. With the possible exception of these management issues, all the proposals set out below will form part of a long-term research strategy. Stonehenge is a unique monument, but as this report has been at pains to point out, it did not and still does not stand in isolation and there are wider issues to consider than the individual relationships of one feature or setting to another within the site itself. Any long-term research design for the Stonehenge will also look beyond the stones, both literally and metaphorically, and aim towards a much better understanding of the monument within its landscape and its relationship with other sites which form part of that landscape.

The key issues are presented in bare outline only but it is our intention that the immediate future for Stonehenge should include the preparation of a detailed programme of investigation based upon these issues which will take our understanding of this World Heritage Site into the next century.

### 1 Understanding the archaeological record

1.1 Ensure accessibility of the archive.

1.2 Re-excavate and analyse previously excavated materials lodged by Hawley in the so-called 'graves' for comparison with the surviving assemblages.

1.3 Re-excavate Aubrey Hole 7 to recover the human remains known to have been deposited within it. Assess the potential of the remains and analyse them at an appropriate level of detail.

1.4 Establish the extent of pre-twentieth-century investigations at the centre of the monument. Not only will this lead to a greater knowledge of the survival of deposits within the monument, but it will enable the stratigraphy to be recorded and central features to be planned.

### 2 Recording the monument above the ground

2.1 A physical survey and description of Stonehenge to comprise a topographical survey of the monument in its immediate context, a detailed survey of the monument itself, and detailed drawings of the stones with elevations, sections, and photographs.

2.2 A detailed study of all carvings, graffiti, and stoneworking techniques using photogrammetry, casts, and other appropriate high-resolution techniques.

2.3 A detailed petrological description of each stone and the identification of its source (including examination of the collections of worked stone from the site).

### 3 Investigating the monument

3.1 A detailed geophysical survey of the Ditch and Bank to establish the occurrence of further causeways or structures.

3.2 To refine our understanding of the structure and sequence of the Bank, Ditch, and Counterscarp, more investigation is called for, not least because of the possibilities of associated postholes.

3.3 Investigate undisturbed Aubrey Holes to re-evaluate the results of earlier work and attempt to resolve questions of date, function, internal sequence, and relationship with the Bank.

3.4 Examine the evidence for internal timber structures, particularly in the southern part of the interior of the enclosure.

3.5 Currently the pattern of excavations within the monument does not reflect the symmetry of the monument. In order to balance information from comparable areas of the monument, it is desirable to examine the area to the north or north-west of the centre to investigate the sequence of stone structures, with particular reference to the Q and R Holes.

3.6 Establish the presence or absence of Z Hole 8, but also the investigation of undisturbed Y and Z Holes to re-examine evidence of earlier work.

## 4 Broadening the scope beyond the circumference

4.1 A fresh investigation of the Avenue, to include geophysical and topographical surveys and limited excavation, to examine its structure, relationship with adjacent monuments, flint scatters, and in particular with its junction with the river Avon.

4.2 An investigation of the zone immediately outside the Ditch, especially that part related to the axis of the monument at midsummer sunrise and midwinter sunset.

4.3 Because of the imprecise comprehension of timber and, possibly, stone structures related to the entrances, the areas outside the entrances should be examined.

## 5 The context of the monument

5.1 An investigation of the Palisade Ditch north and west of Stonehenge, in particular on Stonehenge Down and close to the 'elbow' of the Avenue, which should include geophysical and topographical surveys and sampling by excavation.

5.2 Because of the reported occurrence of bluestone fragments within neighbouring round barrows, the probability of the contemporaneity of these funerary monuments with Stonehenge and their unquestionable, albeit undefined relationship with the monument, investigation of the barrows immediately adjacent to Stonehenge is desirable.

5.3 Investigate the place of Stonehenge in its landscape and establish the relationship of each monument within that landscape to the other.

## 6 Contemporary environments

6.1 Every investigation proposed for Stonehenge or its neighbouring monuments should embrace the full range of scientific techniques available, especially those which will further our understanding of chronology and contemporary environments.

6.2 Programmes of limited intervention must sample the contexts of all available pre-monument, contemporary, and appropriate later land surfaces.

## 7 Consolidation

7.1 The last stone to fall did so not very many years ago, in 1963. The time has come to undertake a risk assessment of the stability of the monument and the archaeological work contingent upon that programme.

# Concluding remarks

*by G J Wainwright*

This report has been concerned with combining the archaeological and environmental evidence from Stonehenge and its surrounding area to produce a coherent story of the development and use of both monument and landscape from the earliest activity on the site, to the present day. In the past there has been much speculation as to the true 'meaning' of Stonehenge, a concept deliberately avoided in the foregoing pages. It is left for others to make use of the information provided here in the elucidation of their own theories and formulation of hypotheses.

This report does not attempt to 'explain' Stonehenge in global terms, but if we wish to view the monument against changing patterns of large-scale social and political organisation during the Late Neolithic and Bronze Ages then we can suggest some acceptable scenarios.

As a result of advances in knowledge that have been made over the past decade, it is possible to suggest why hard-pressed Neolithic farmers in Wessex thought it necessary to divert resources into the building of Stonehenge, an expensive and, to us, apparently impractical edifice. The first Stonehenge is a product of a period of change, of competition and land-hunger as suggested for many areas of lowland Britain. The area had been extensively, and locally intensively, cleared of woodland and occupied for hundreds of years before the earthwork enclosure was constructed. The longevity of communities in the area is perhaps most obviously indicated by the long-term curation of ox skulls and jaws which were deliberately placed on the bottom of the newly dug Ditch. We might go further and suggest that it was a monument built deliberately to assist in binding the community into a coherent body at a time of social stress as a means of reinforcing the communal will.

The later phases of Stonehenge, on the other hand, involved a far greater investment of manpower even than that needed for the earlier monument. The relationship between Stonehenge and the surrounding monuments apparent from the visibility study, and the construction of the immense processional Avenue, are clear indications of its pre-eminence in the landscape. The monument surely ensured control of ritual and ceremony and thus the manipulation of those forces thought necessary to enhance standing with the supernatural powers that held sway over the weather, crops, fertility, and health – subjects of crucial importance to a people at the mercy of otherwise ungovernable natural forces. Those who controlled Stonehenge may be seen to have been their people's intermediaries with the supernatural, but despite its elaborateness and the control of space apparent both within the monument and in the area around it, the farming communities whom it served were not excluded from its vicinity but shared its landscape.

Wessex was pre-eminent in prehistoric times because of its rich agricultural land, its sources of flint, and its position on trade routes for axes, pottery, and other goods. Stonehenge must have been an overt instrument in both winning and exercising control over these resources. In its later stages, the rebuilding of Stonehenge signalled the emergence of a new, outward-looking and expansive social order.

In its design and structural history, Stonehenge reflects social and economic change in prehistoric central southern England over a period of more than a millennium. During this long period there were phases of insecurity or economic recession interspersed with rapid change. In response, society made a significant investment in the building of Stonehenge. Its use would have involved public rituals, for Stonehenge belongs to an era when power was exercised through ceremony and validated directly by reference to the supernatural. The building of Stonehenge was a political act and its massive physical presence must have invested it with a key role in legitimising power structures and, with the passage of time, in protecting traditional values from challenge by epitomising past achievements. It remained a symbol of authority for some 1500 years – a timespan which even our great Norman cathedrals have not yet approached – and established a link with the past which survives in greater part to the present day.

# Appendix 1: Geophysical surveys at Stonehenge, 1993–4

*by Andrew Payne*

## Summary

Despite the publication of two major survey projects in the Stonehenge Environs, Stonehenge in its immediate landscape setting has never been subject to any detailed non-invasive investigation. This report describes geophysical exploration of the Stonehenge Triangle undertaken in 1993–4 by the Ancient Monuments Laboratory. The surveys were carried out on behalf of English Heritage in collaboration with Wessex Archaeology as part of the research programme which has resulted in the publication of this volume. They consisted of a magnetometer survey of the whole Triangle and a detailed resistivity survey of the monument. The magnetometer results provide new information on monuments and features in the Triangle, some already documented but not previously subject to detailed study or survey. The resistivity data enhances the existing body of excavation and survey evidence for the arrangement and structure of the monument in its various phases. Both surveys make a significant contribution to further understanding the history of an area at the heart of a landscape of outstanding archaeological importance.

## Introduction

This appendix is a summary of the full report prepared for English Heritage by the Ancient Monuments Laboratory (Payne 1994), copies of which are held by English Heritage and in the Stonehenge archive.

'Geophysical examination of an area outside the Stonehenge earthwork in order to identify the presence of any buried structures' was recommended in a survey of Stonehenge and its environs published by RCHM(E) in 1979. Since then, with the exception of the survey over the Avenue immediately north of Stonehenge (Bartlett and David 1982), no published geophysical survey has taken place adjacent to or within the monument, a remarkable situation given the wide use of geophysical techniques on archaeological sites in this country for over 30 years. The preparation of a full report on the hitherto unpublished excavations at Stonehenge presented an obvious opportunity to rectify this omission and to fill the unresearched gap between Stonehenge and its wider environs (Richards 1990).

Excavations by Atkinson *et al* in the 1950s and 60s were, as discussed elsewhere in this volume (*Chapter 2*), intended to answer specific outstanding questions that earlier excavation records were unable to resolve. However, although this work was clearly intended to be definitive, it was nevertheless a further sample of only parts of the monument. Consequently Atkinson's interpretation of the development of the monument was in part based on extrapolation of patterns of features (such as the Q and R Holes) backed up by probing and supposition. Work by Pitts in 1980 subsequently proved that new discoveries were still possible (Pitts 1982). As well as recording the evidence for former excavations at the site, a prerequisite of further research was to assess the reliability of judgements based on the previously excavated sample without resort to further destructive intervention. The Ancient Monuments Laboratory (AML) was thus commissioned to undertake the first full geophysical exploration of Stonehenge and its immediate landscape setting. The survey was carried out during 1993 and 1994 with the following objectives:

1. To supplement the excavation record from the monument by attempting to map the full distribution of features partly known from excavation and by locating any possible previously unrecognised elements.
2. To help set the excavations in the wider context of the immediate surroundings of the monument, an area not previously the subject of detailed study.
3. To provide information on the recent history of landuse in the area and show the impact of modern activities on the site, thus assisting the description of the development of the monument up to the present day.

The surveys were carried out within Stonehenge Triangle defined by National Grid coordinates SU 1180 4186, 1201 4235, and 1267 4208, bounded on the north by the A344 and to the south by the A303 (*see Figs 1 and 258*). Apart from Stonehenge itself, the only archaeological features visible on the ground in the Triangle are barrows. With the exception of a large well preserved bell barrow (Amesbury 11) adjacent to the A344 and just to the east of Stonehenge, the barrows are all in a very degraded state and form a scattered group (Amesbury 4–10) west of Stonehenge on Stonehenge Down. The majority are recorded by Grinsell (1957) as being of simple bowl form.

## Previous geophysical survey work near Stonehenge

Atkinson speculated that the Station Stones and Stoneholes 92 and 94, when taken together with other holes (F, G, and H; Atkinson 1979, fig 1) discovered by Hawley just outside the circle of the Aubrey Holes, might once have formed part of a circle of widely spaced sarsens immediately inside the Bank and Ditch. A search was therefore made for further holes that could be identified as this hypothetical early sarsen circle and an electrical resistivity survey (*ibid*, 79) was used to test for an additional stonehole between Aubrey Holes 4 and 5, but with negative results. In addition to this first documented use of geophysical techniques at Stonehenge, a trial fluxgate magnetometer survey was carried out around the monument in 1988 by D Jordan of the AML (AML archive).

Parts of the landscape surrounding Stonehenge were surveyed in the 1980s in support of the Stonehenge Environs Project (Richards 1990). This work included a survey of part of the Cursus (Gater 1987), Coneybury Hill, the Lesser Cursus, and flint scatters identified during fieldwalking at Wilsford Down, Fargo Wood, and King Barrow Ridge (Bartlett 1988a; b).

More recently, magnetic surveys of very large tracts of land have been carried out by contract organisations in advance of proposed road construction options and the development of new visitor facilities, though the results are not yet available. Additionally, a full survey of the Lesser Cursus has been completed (Bartlett 1993). Also, the AML has carried out surveys of the interior of Durrington Walls (AML Archive), the eastern end of the Cursus, Amesbury 42 long barrow (Payne and White 1988), and over the elbow of the Avenue. Results from the latter have been integrated within the following account (*see Montague, Chapter 7*).

# Method

The first phase of the geophysical survey programme consisted of a fluxgate gradiometer survey of the entire Stonehenge Triangle. The speed of ground coverage of this survey method combined with the ability of magnetic survey to detect a wide range of buried archaeological features dictated that it was the only practical method to employ for the whole Triangle. The main target of this work was to assess the area around Stonehenge for traces of associated settlement, and funerary or other activity, in the absence of fieldwalking and excavation evidence, and to define and confirm previously documented features (such as barrows).

The monument itself was also included in the survey in spite of the anticipated modern disturbance. This work was undertaken by Mark Cole, Peter Cottrell, Andrew Payne, and Tom Williams in December 1993. The magnetometer survey was followed, in May 1994, by a detailed resistivity survey of the monument by Mark Cole, Neil Linford, and Andrew Payne, in order to supplement existing excavation and survey results.

Resistivity survey is potentially capable of identifying the presence of further unidentified stoneholes or stumps (as at Avebury; Ucko *et al* 1991). In addition it was hoped that the resistivity data would corroborate the location and extent of some of the past excavations. In addition to the survey of the monument itself, resistivity survey was also carried out over two barrows to the south-west, on Stonehenge Down (*see below*).

## Magnetometry

The survey area was divided into a grid of 30m squares set out and measured into the monument and field boundaries using a total station theodolite (Fig 258, inset). Each square was surveyed using Geoscan FM36 fluxgate gradiometers with traverses 1m apart. The gradient of the Earth's magnetic field was measured at 0.1 nanotesla (nT) sensitivity at 0.25m intervals along each traverse. Traverses were orientated north-south. The data were recorded in the internal memory of the FM36 and periodically transferred in the field to diskette on a portable micro-computer for storage and verification.

The resulting dataset was subsequently recombined in the laboratory using in-house software installed on a graphics workstation facility and presented as a series of interpolated greyscale or half-tone plots. In this type of display each reading is represented by a block, which is allotted a shade of grey (using arrangements of dots or half-tones) between black and white, depending on the value. High readings are represented by lighter tones and low values by darker tones. Interpolation was used to simulate a more closely spaced interval between each reading block in the input data (by averaging between neighbouring values) to produce a smoother finish in the output data before final printing (Scollar *et al* 1986). The greyscales allocated to the data range are of two types: linear for the magnetometer data and non-linear for the resistivity data. The latter is used to increase contrast in the plot. X–Y traceplots were also produced. This method of display consists of a series of stacked graphs, each representing the line of a traverse of readings (Y) plotted against distance (X) along the ground.

The total survey is presented in Figure 258 in the form of a greyscale plot of the raw data at 1:2050 scale in locational context. Owing to the detailed sampling interval and the considerable size of the survey coverage, the resulting dataset is very substantial. To enable display at an acceptable scale for detailed interpretation, the data was also plotted (after enhancement by a 1m Gaussian low-pass filter (Scollar 1990)) in two halves at 1:1250 as greyscale images and also as a set of four 1:1000 traceplots of the raw data (all plots included in archive).

## Resistivity

The grid used previously for the magnetometer survey was reinstated over the monument (Fig 260 inset) and surveyed using a Geoscan RM15 resistance meter connected in the Twin Electrode configuration with a mobile probe separation of 0.5m. The survey was carried out with a reading interval of 0.5m along successive parallel traverses 30m long and 0.5m apart to increase the ability to detect features less than 1m across. The data were recorded in the internal memory of the RM15 and was perodically transferred during fieldwork to a portable Toshiba T2000 computer for storage and verification. The raw data from each grid square were subsequently reconstructed as for the magnetic data (*see above*). The resulting plots illustrate the lateral variation in resistance of the near-surface up to a depth approaching 1m. The plot of the initial data (after slight noise reduction using a Gaussian low pass filter of 1m radius) is presented in Figure 260. An X–Y traceplot of the raw data is also supplied (Fig 261) for comparison with the greyscale plot.

In order to improve the recognition of archaeologically significant anomalies, the initial data was enhanced using a 3m Gaussian high pass filter to remove broad trends and highlight features less than 3m in width (Fig 262). This process proved extremely helpful in identifying small features such as the Y and Z Holes in areas of lower than average background resistance. In addition, the data were processed with a Wallis algorithm to enhance the generally high resistance area around the stone settings (archive).

Directional edge-emphasising filters were also applied to produce a shadow or relief effect, which can provide similar detail to aerial photographs taken in snow or low light. The various resulting plots are included with the archive.

## Results of the magnetometer survey

Numbers in italics refer to those on the interpretation plan (Fig 259).

### The monument

The area within the monument is characterised by massive magnetic disturbance resulting from the presence of near-surface iron. The possibility that a thermoremanent magnetic effect from the igneous bluestones could have contributed to the magnetic disturbance should also be considered. Modern disturbance can be attributed at least to the following factors.

1 Metal underpinning around the stones from 1920s and 1950s restoration (*1*) (*Chapter 8, above*; Chippindale 1983, 179).
2 Clinker used to backfill Atkinson's excavations in 1963 (*1*) (*Chapter 2 above*).
3 The cables of an underground security listening system installed *c* 1967 (Chippindale 1983, 255) (not numbered on plan).
4 Buried cables and inspection covers for a former floodlighting system (*2*).
5 Disturbance associated with the modern visitor access paths and footpath erosion control (*3*).

Despite such modern disruption the survey shows that, as expected, the fill of the Ditch remains intact on the north and west sides of the earthwork as indicated by a stronger and more uniform magnetic response in this area (*4*). A contrasting weaker magnetic signal over the remaining parts of the Ditch circuit indicates where it was emptied and refilled during the various excavations reported in this volume. The magnetometer data does not support the existence of numerous causeways across the Ditch (although this is not conclusive, as responses to iron often interrupt the signal derived from the buried ditchfill).

### Aubrey Holes

Because of the extent of modern disturbance the only other features of the monument detected are the Aubrey Holes, two excavated stoneholes (E in the entrance causeway and 92 on the South Barrow), and the parallel ditches of the Avenue (*5*). The majority of the circle of 56 Aubrey Holes have been detected (Fig 259, inset) but large-scale disturbance and the modern path have prevented detection of 15 out of the 56. The response to the Aubrey Holes varies: in the case of those which have been excavated the response is to ferrous material in the backfill, either incidental or deliberate contamination. The anomalies from the unexcavated arc of the circuit are generally weaker as would be expected from undisturbed prehistoric fills and agree well with the positions identified by probing.

It is possible that parts of the circuit of Y Holes have been detected on the south-west and north-east sides of the stone settings, but these features are resolved more clearly in the resistivity data.

### Linear feature: the Palisade Ditch

Outside the monument a long straight linear anomaly was detected running across the north-west corner of the Triangle on a south-west to north-east alignment (*6*). This feature, which generated a magnetic anomaly in the range of 6–10 nT, is interpreted as a continuation of the Palisade Ditch excavated at SU 1217 4228 in 1967 by Vatcher and Vatcher (1968, C91) and discussed in Chapter 6, above. The ditch is probably of later Neolithic date and disappears among cropmarks of field systems which are visible on aerial photographs to the west on Stonehenge Down and have produced surface finds of later Neolithic–Late Bronze Age date (Richards 1990, 279).

Geophysical survey evidence (obtained in a previous survey in 1990) confirmed the continuation of this ditch to the north-east where it almost converges with the Avenue at the elbow, before curving away to the north-west where it is lost in ploughed and disturbed ground in Stonehenge Bottom (Fig 265, *below*). Further magnetometer survey may be worth attempting to follow its course northwards from the Avenue bend. The relationship between this ditch, the Avenue, and other features at the elbow is discussed in detail by Montague in Chapter 7, above. The results of previous survey work at the elbow are provided below.

### Ring ditches and barrows

The survey has detected the ditches defining the round barrows of group Amesbury 4–10 (Grinsell 1957) on Stonehenge Down, mostly documented as having been excavated by Sir Richard Colt Hoare in the early nineteenth century. The reference number of each barrow is provided (in italics) on the interpretation diagram (Fig 259). The barrow ditches show considerable diversity of shape, size, and structure. The ditches of barrows 4 and 5 appear to be circles 29.5m and 39m in diameter respectively; barrow 6, the best preserved in the group, has a double ring ditch. Barrow 10 is slightly oval in form and may be a twin-disk barrow; the remaining barrows, 7–9, are smaller and more irregular with segmented ditches and may represent a different burial tradition or even mini-hengiform structures (*cf* Fargo Wood, Stone 1938; Richards 1991). Modern ferrous contamination has interfered considerably with the response to the ring ditches and it is therefore difficult to identify with any confidence anomalies compatible with burials within or around the barrows. Magnetic disturbance at the centre of barrow 6 might represent a central primary burial pit but might equally well have resulted from later digging. The existence of a central feature in this barrow was, however, confirmed by subsequent resistivity survey.

### Long barrow: Amesbury 10a

Although the existence of all the round barrows identified on OS maps has been confirmed, the survey does bring into question the existence of a slight elongated mound at SU 1194 4217 described by Colt Hoare (1810, 128) as a long barrow and excavated by him without result. This feature is scarcely visible on the ground today and numerous aerial photographs have failed to reveal evidence of side ditches, even when the adjacent round barrows have produced conspicuous cropmarks (RCHM(E) 1979). The magnetometer survey also failed to find any such features and the presence of a barrow is, therefore, now extremely doubtful. It is a distinct possibility, given Colt Hoare's lack of finds and his enthusiasm for barrow excavation, that he mistook a natural mound already very low in his day for a barrow, an error perpetuated on modern maps. Two areas of magnetic disturbance coincide with the position of the long barrow as marked on OS maps (*7*), and may represent Colt Hoare's own trenches.

### Miscellaneous anomalies

In addition to the main anomalies discussed above, occasional isolated and dispersed examples can be interpreted cautiously as representing evidence of features such as pits and hearths. The presence of the Mesolithic postpits in the car park (*see Chapter 4*) indicates that other features may lie within the area. Although some isolated anomalies may be genuine archaeological features they do not form clusters suggestive of occupation areas. Other anomalies could be muted responses to iron objects or responses to naturally infilled depressions in the chalk subsoil (Bartlett 1988b; Richards 1990). Perhaps of more significance is a faint curvilinear anomaly (*8*) west of barrow 11 which may represent a silted ditch or gully, though this could be fairly modern in view of known former structures in this corner of the Triangle.

### 'Hawley's Graves'

Several substantial regions of very strong magnetic disturbance coincide with the general area where Lt-Col Hawley's site huts were situated as shown on contemporary photographs (eg Fig 11 above and RCHM(E) 1979, plate 1). As discussed elsewhere in this volume (*see Chapters 2 and 9*), it is known that Hawley reburied a quantity of his excavation finds in a series of pits along the trackway which led beside his huts and it is possible that an anomaly on the line of the old track is the response to one of these, and others (*9*) to the hut foundations.

### Modern activity (excluding that within the monument)

As in the area north of the Cursus (RCHM(E) 1979), the influence of modern activity is widespread throughout the area surveyed. Much of this can be attributed to the period of the 1914–18 war when a new fenced road (*10*) and an airfield (*11*) were constructed west of Stonehenge (*Lawson, Chapter 8*; Chippindale 1983, 175, 193, illus 154; RCHM(E) 1979, pl 1). Although long since removed or covered over these former structures have left behind quantities of magnetic metal and building materials which have affected the magnetometer response over large parts of the survey. Magnetic disturbance also occurs over the site of custodians' cottages (*12*) that formerly stood near the eastern point of the Stonehenge Triangle between the First World War and the 1930s. In addition to the sites of former buildings, several ferrous pipelines, recognisable by a fluctuating positive and negative signal, intrude into the survey area (*13*). The pipe to the south and east of the monument is associated with livestock watering troughs. Scarring of the ground surface by former tracks which once crossed through the western half of the monument has been detected north of the A303 (*14*), as has the influence of former ploughing to the west of the former road at (*15*). Although the sources of some of the modern disturbance can be identified from photographic records, much of the remaining more general disturbance is apparently random, and of cumulative and unknown origin.

## Resistivity survey of the monument

As discussed elsewhere in this volume, the monument has altered much since it came into public ownership, as a result of the need to manage visitor access. Excavation has been carried out in tandem with restoration and consolidation to render the stones safe and various approach paths have come and gone. It is clear that in addition to providing information of a purely archaeological nature the results of the resistivity survey also reflect much of the recent history of the monument. Letters in italics refer to features indicated on the plot in Figure 260.

### The earthworks

The circular earthworks of the phase 1 enclosure have been detected as a series of high and low resistance anomalies which confirm that they consist of the Ditch

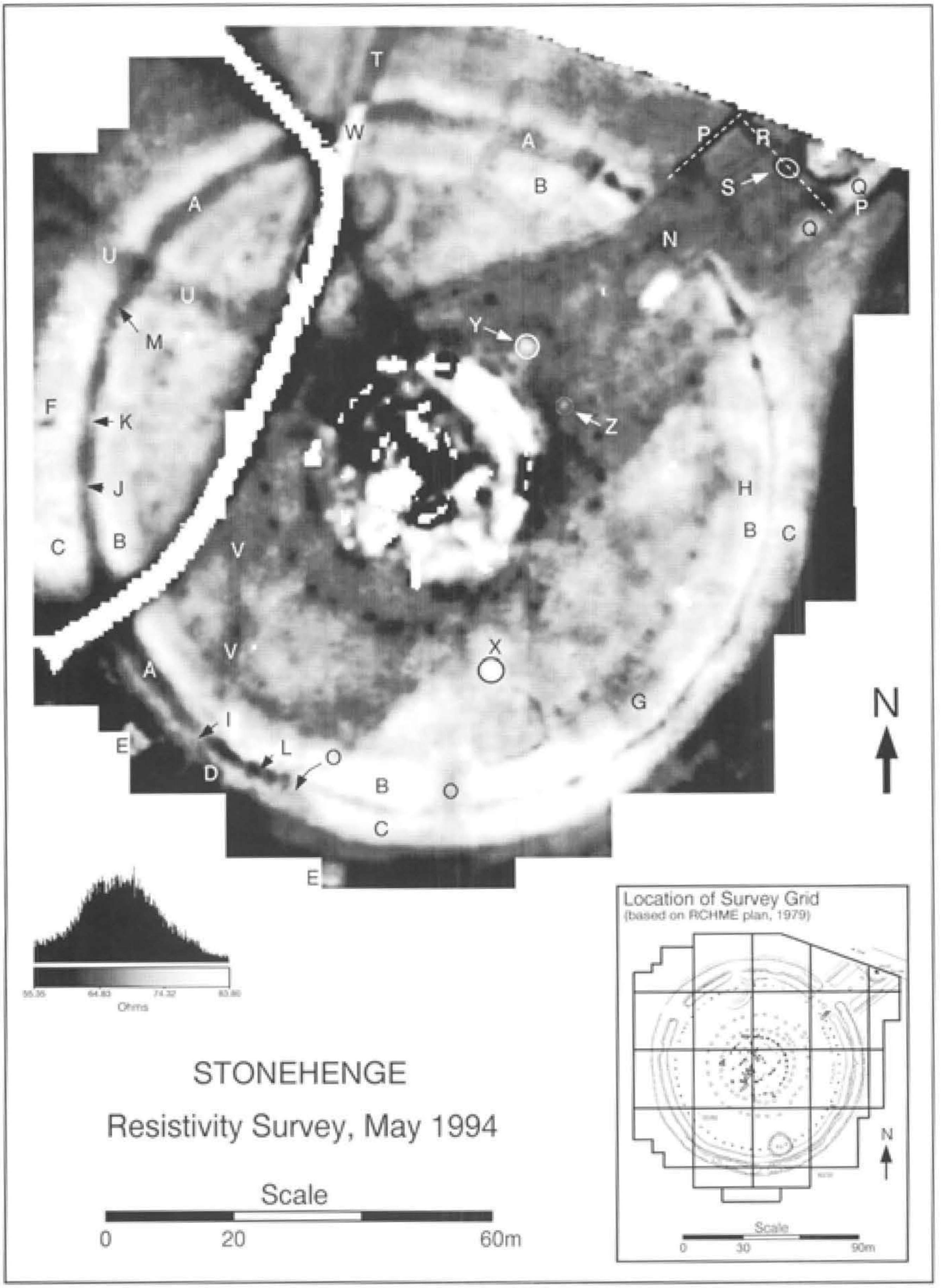



*Fig 260 Greyscale plot of resistivity survey of the monument*

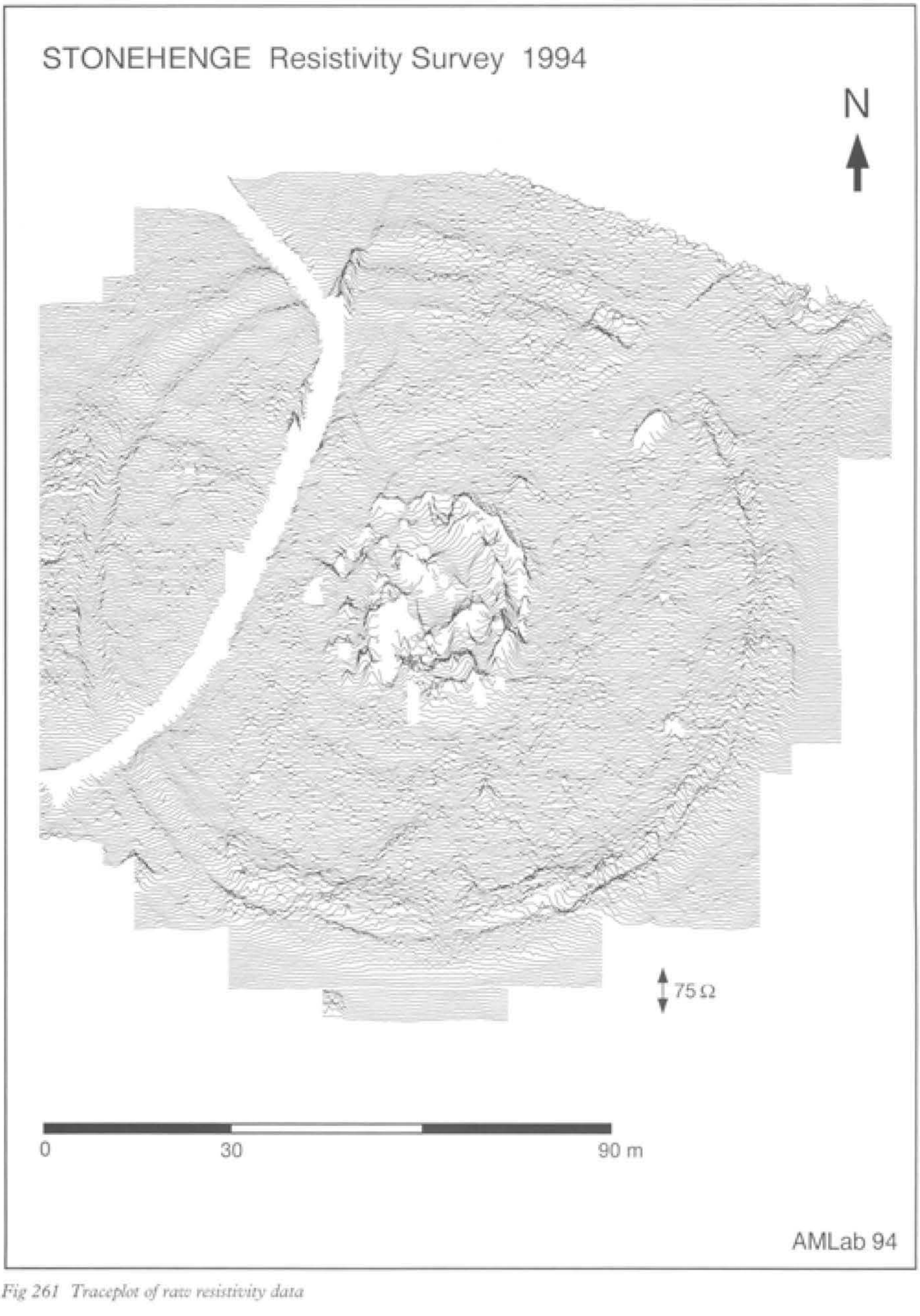



*Fig 261 Traceplot of raw resistivity data*

(*A*) up to 3.0m in width bounded by the internal Bank *c* 7m wide (*B*), and a Counterscarp Bank on the outside (*C*). Although the outer bank now survives only as a slight intermittent earthwork and has therefore often been overlooked, it is shown by the survey to be almost as wide as the main Bank. Many previously published surveys of the monument omit this feature or show it only in part. The resistivity survey shows that it extends all the way around (apart from where it is broken by the north-eastern entrance). The response to the outer bank has been affected in the south-west part of the survey by artificial grass matting laid down on the visitor route around the perimeter of the earthwork to prevent erosion (*D*). This material, which retains water, is characterised by very low resistance readings. Two previous trial plots of artificial turf show up in this area as anomalous resistance (*E*).

Hawley's Diaries (Atkinson 1979, 28; *above, Chapter 5, Chapter 9 and archive*) mention that a number of cremation burials were found deposited in the Bank, and at one point in the Counterscarp Bank the otherwise uniformly high resistance is interrupted by a localised low resistance anomaly (*F*). It was considered possible that this might represent a further burial deposit or, alternatively, a pit or hole of unknown purpose and date. Augering by Wessex Archaeology in August 1994 identified the chalk rubble of the Counterscarp Bank in this position but could find no explanation for the anomaly (Wessex Archaeology 1994a). Disturbance is also apparent in areas of the south-eastern arc of the inner Bank, as shown by a fall-off in the resistance, and are likely to mark the positions of sections cut by Hawley (*G* (C44) and *H* (Cutting unnumbered but part of C7)).

The lengths of the Ditch excavated by Hawley on the north-east, east, and south sides of the monument appear as narrower and slightly lower resistance anomalies compared to the undisturbed sections to the north and west. The response to the unexcavated parts of the Ditch is compatible with observations of the uneven structure of the Ditch elsewhere.

Possible discontinuities in the Ditch are indicated by readings at *I*, *J*, and *K* and irregularities of its sides at *L* and *M*. Of these, *I* and *L* lie within excavated Ditch Segments 28 and 25 respectively. Segment 28 was formerly crossed by a trackway which may account for this anomaly; little detail is available for Segment 25 (*see caption to Fig 47, above*).

The response to the Ditch and Bank is interrupted on the north-eastern side of the monument by the main entrance causeway. The positions of the two stoneholes (D and E) in the entrance next to the Slaughter Stone have not clearly been recovered by the survey (*see Chapter 7, above*). However, there is a discernible lowering of resistance (*N*) in the centre of the entrance causeway displaced slightly to the north-east from the position of the relevant holes as marked on plans. It is possible that the stoneholes were backfilled with chalk, thus explaining the poor response. Stonehole E was marked by an area of ferrous disturbance in the magnetometer data.

The Ditch terminals on either side of the southern causeway and the corresponding breach in the bank (*O*) have been detected quite clearly as has the unusually rounded Ditch segment (Segment 22) and associated blocked south-western entrance (*O*).

## Avenue terminal

The ditches of the Avenue have both been detected as low resistance anomalies (*P*). The bank inside the ditch on the eastern side of the Avenue is apparent as a slight linear anomaly (*Q*), but a similar response is lacking over the bank on the opposite side. This is because the latter has been eroded away by a cart-track in use until the early part of this century, as seen on early photographs (eg Chippindale 1983, 177). The survey has also detected a low resistance anomaly (*R*) which corresponds well with the first trench excavated by Hawley in C6. Within this area a further oval low resistance anomaly (*S*) 2m wide can be discerned with the aid of filtering (Fig 262). This probably represents the position of a stone-socket (B) for one of the two stones (B and C; *see Chapter 7*) aligned on the central axis of the Avenue south of the Heelstone. Stonehole C has apparently not been detected. The excavated Heelstone Ditch is clearly visible in the filtered data as a semi-circular low resistance anomaly with an enlarged north-west terminal.

## Interior of the monument

The background resistance in the area enclosed by the Bank and Ditch is generally higher than that outside the monument. This may be due to the accumulation of introduced stony deposits within the monument termed the Stonehenge Layer (*see Chapter 8, above*). Despite this effect, there is an enigmatic sharp drop in the level of background resistance across the middle of the monument from south-west to north-east roughly in line with the Avenue. The explanation for this change is uncertain. It may relate to the Stonehenge Layer itself, the extent of which has not been fully defined by excavation (Atkinson 1979, 129, 213). Alternatively, soil erosion processes around the stones, compaction, or differential evapo-transpiration rates caused by vegetation changes may be responsible. Former trackways seen crossing the monument on aerial photographs taken in the early twentieth century (1904, RCHM(E)) coincide remarkably well with the edges of this low resistance area and it is conceivable that the Stonehenge Layer has been eroded away in these areas due to the proximity of the stone circles and the Heel- and Slaughter Stones and by past tourists keeping within the bounds of the two tracks, particularly if they were once fenced. An aerial photograph taken in 1921 (Chippindale 1983, illus 154) shows less vegetation growth here and that the ground surface has been smoothed away. It is noteworthy that other former paths and cart-tracks that have eroded the earthworks have also been detected as low resistance anomalies at *T*, *U*, and *V*.

An auger transect undertaken across this resistivity 'shadow' in the north-eastern part of the monument (Wessex Archaeology 1994a; *see Plan 1*) was carried well beyond its plotted extent into the area of uniformly higher resistance between it and the ditch of the North Barrow. No significant differences in soil depth, consistency, or composition were observed. This phenomenon cannot yet be satisfactorily explained and may be the result of hydrological processes rather than being of archaeological significance.

The route of the present tarmac path overlies the course of a previous track in use until the 1920s. The course of this track can be seen (*W*) continuing northwards across the main Bank and Ditch. The point at which it crosses the Ditch is marked by a reversal from a low resistance to a high resistance anomaly which probably indicates the presence of an artificial surface or causeway to carry the track across the earlier Ditch.

The eastern half of the monument between the stone settings and the Bank was extensively trenched by Hawley (see Plan 1 and Fig 8) but no substantial features were found. No trace of individual cuttings could be detected, nor did they show from the air as parchmarks in summer 1994 (R Bewley, pers comm) when Plates 6.1–6.3 were taken and Fig 290 plotted).

Perhaps the most significant and controversial finds of the survey are three isolated high resistance anomalies (*X*, *Y*, and *Z*) that are of the right size, shape, and magnitude to represent former positions or buried remnants of previously unrecorded outlying stones. All these anomalies lie within areas stripped by Hawley (X in C10 and Y and Z in C7).

The initial interpretation of these anomalies was necessarily very speculative. Anomaly *X* lies on a line between the Southern and Northern Barrow and anomalies *Y* and *Z* form a pair roughly in line with a projection of the Avenue into the monument. It was felt that the latter may be significant in the light of speculation (eg Castleden 1993, 131) on the possible former existence of parallel stone rows along the line of the Avenue (Pitts 1982, 90–1 *and see Chapter 7 above*).

These anomalies were tested by hand augering (Wessex Archaeology 1994a) where no explanation for anomolies *Y* and *Z* could be accounted for. There was no observable difference between the soil encountered in these auger cores and those elsewhere in the general area of the monument (*see above*) and the samples recovered were clearly excavation backfill. Anomaly *X* lay just outside the ditch of the South Barrow and proved to be in an area very badly disturbed by ongoing rabbit burrowing. The presence of a very large burrow could be the cause of the high resistivity encountered.

## Aubrey Holes

Thirty-six of the 56 Aubrey Holes have been detected or possibly detected, the clearest response coming from the previously excavated examples set inside the south-east arc of the Bank between the South Barrow and the Slaughter Stone. Fourteen, or possibly 15 unexcavated Aubrey Holes were detected as low resistance anomalies (33, 34, 37–42, 44, 48–50, 52, 53 and possibly 54) and 17–19 previously excavated examples were also detected (1, 2 ?3, 4, 5, 8–13, 15, 16, 20, 23, 26, 29, 30, and ?55), leaving the remainder undetected. The generally poor and changeable response to these features is probably a result of the rather mixed and variable nature of the undisturbed fills (*see Chapter 6, above*). It it likely that some of the unexcavated Aubrey Holes also contained cremation burials but this is difficult to assess (*see results of magnetometer survey, above*).

## North and South Barrows

The ditch and bank of the North Barrow have been detected where they have not been obliterated by the track that formerly passed over it. A slight rectangular low resistance anomaly inside the ditch may indicate the hole of former Station Stone 94, recorded on John Aubrey's 1666 sketch plan of the monument (Fowles and Legg 1980, 80; pl 18, Chippindale 1983, 69). In the case of the excavated South Barrow only the ditch has been detected as a slight low resistance anomaly.

## Y and Z Holes

The Y Holes have been detected quite clearly on the north-east and south-west sides of the Sarsen Circle (Fig 262). As well as excavated examples, some unexcavated ones previously identified by probing (YH17–19, YH26–8; Atkinson 1979, 34) have been detected. Two more (YH23 and 24) on the north-west side are visible with the aid of filtering in a region of generally low resistance and three others (YH20–22) are sealed by the modern visitor path. The survey confirms the irregular spacing of these features. Only on the south-east side of the monument, where the holes have been excavated, is their circuit unclear. Unlike the Aubrey Holes, Y and Z Hole fills were more uniform in character, presumably presenting a more detectable moisture contrast.

A similar response was obtained from the Z Holes (Fig 262) but because they are closer together and nearer the the Sarsen Circle their anomalies appear to join up into continuous arcs of low resistance (eg, east of Sarsen Circle, eight holes) or become lost in the general disturbance from the stone settings and excavations. Two unexcavated examples (ZH17 and 18) on the west are particularly clear. Three more are visible in the filtered data north of Stone 19. The Z Holes detected are: 2, 3, 6, 7, 10, 11, 14, 15, 17, 18, 20–23, 29, and 30. An anomaly close to ZH9 might be to one of the large postholes which occurred in this area (*Plan 2 and Fig 66*).

## Stone settings

'Stonehenge is a composite monument with a long history of construction ... during which old work has been torn down to make way for new' (Atkinson 1979,

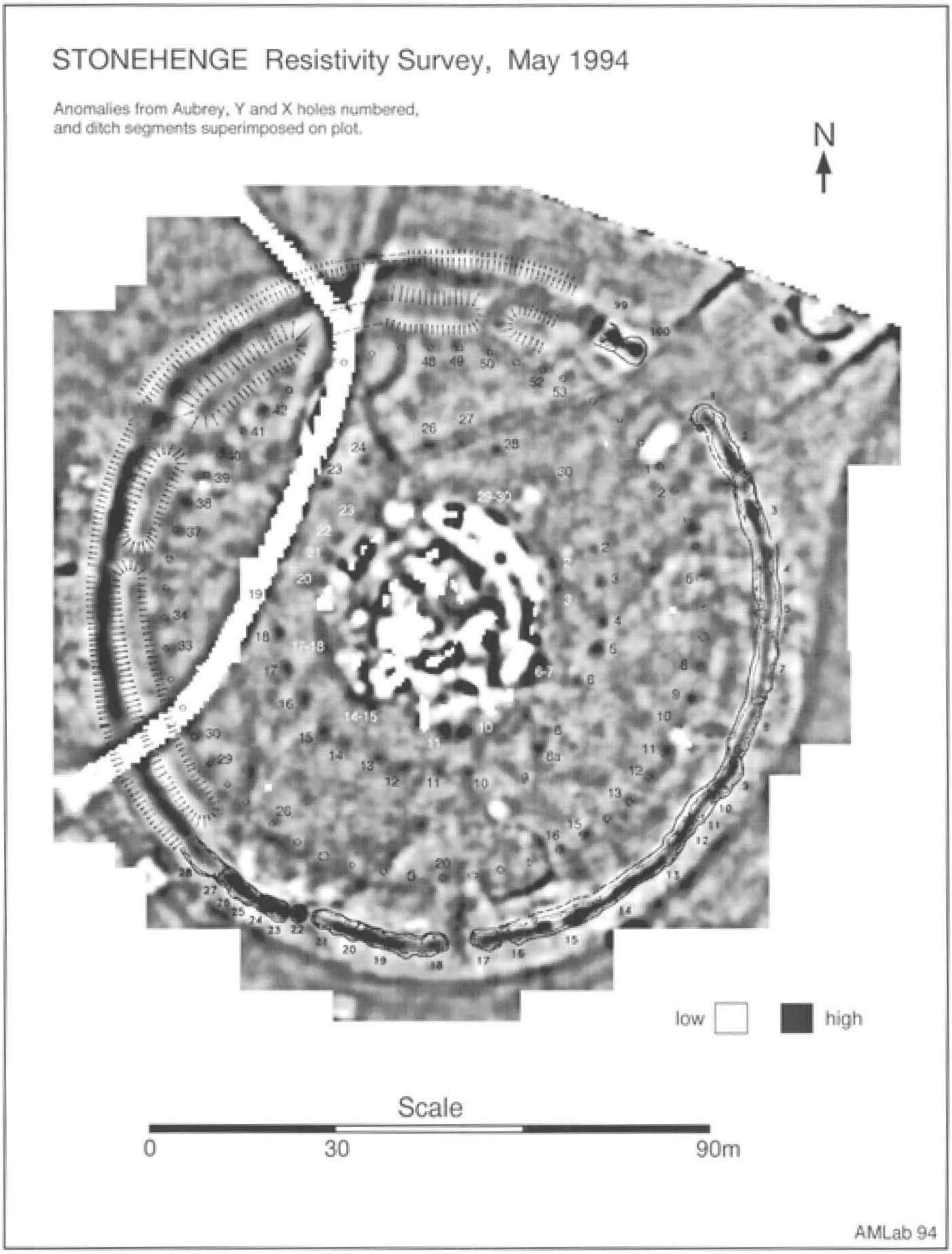



*Fig 262 Plot of resistivity data for the monument enhanced with a 3m Gaussian high pass filter*

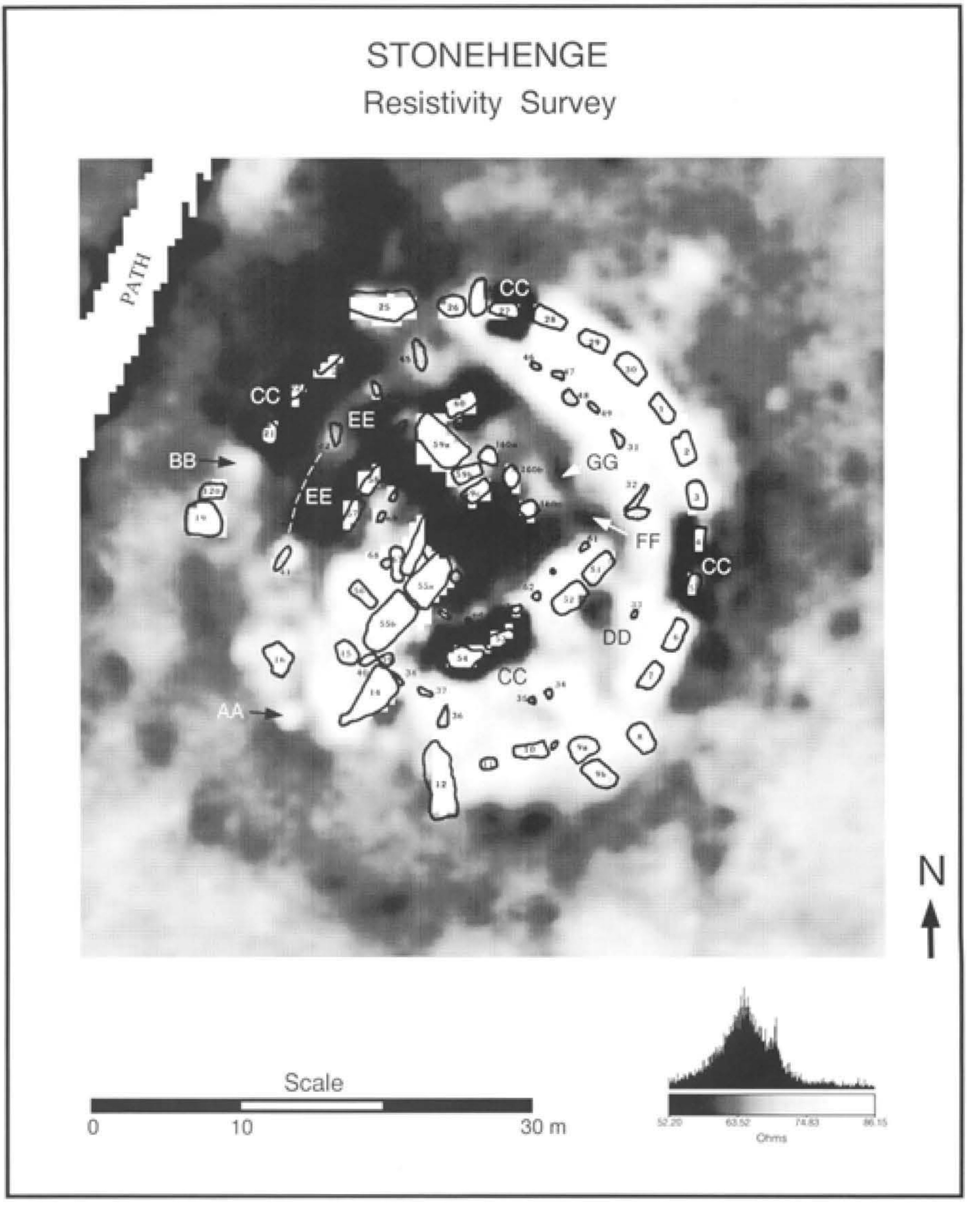



*Fig 263 Detail of the resistivity survey in the area of the stone settings*

68). Such is the complexity of the archaeological remains at the centre of Stonehenge, the cumulative result of this constant remodelling, that it would be unrealistic to expect the survey to resolve detail of discrete features within the stone settings. The complex succession of circles, ellipses, and horseshoes has resulted in a honeycomb of intercutting pits and stone-sockets below ground. This, combined with the influence of past excavation backfill, concrete underpinning of the stones, and the presence of former gravel surfaces, seriously compromises the interpretation of the resistivity results. There is the added complication of the standing stones themselves influencing the data and introducing gaps in the survey coverage. Despite this rather pessimistic picture some information may be gathered from the results. See Figure 263 for numbering of the stones and anomalies referred to in italics.

**Sarsen Circle**

Two high resistance anomalies (*AA* and *BB*) near Stones 16 and 19 coincide with the expected positions of the missing Stones 15 and 20 of the Sarsen Circle. The anomaly observed near Stone 16, however, corresponds rather closely with the position of one of Gowland's test-pits of 1901 (C65). There is no indication of the positions of the four apparently missing sarsen uprights and the positions of known empty Stoneholes 8 and 13 have not been detected. High resistance readings were recorded around the majority of the standing stones in the Sarsen Circle, but notable reversals in resistance occur around Stones 4, 5, 21–23, and 27, corresponding with excavation trenches opened by Atkinson *et al* (C55, 52, 57, and 58).

**Sarsen Trilithons**

Similar trends in the resistance are visible in the areas of the Sarsen Trilithons (*CC*) where excavated (C52, 54, 56). An interesting area of low resistance has been found near Stone 52 (*DD*). There are no records of excavation here but an auger hole (Wessex Archaeology 1994a) positioned in the approximate centre of the anomaly recovered a quantity of clinker, a material brought in especially to backfill old excavation trenches in 1963 (*see Chapter 2, above*) .

**Bluestone Circle**

Many of the Bluestones are now missing. Previous excavation has shown that stumps and sockets of missing Bluestones survive beneath the surface. It is therefore disappointing, but not surprising, that even in unexcavated areas the survey has apparently not been able to discriminate further remains of these settings. Robbed stones would probably not leave sufficiently well defined holes and fragments of stone in the ground would probably be too small to produce appreciable resistivity anomalies. In areas where stone fragments and sockets are known to survive (eg in the area between Stones 32 and 34) resistance values are uniformly high and no individual features can be discerned. The tightly rammed chalk packing of the underlying Q and R Holes (*Chapter 7, above*), if still *in situ*, could have contributed to these high readings as could the modern surfaces laid down in the 1960s. Notably, a contrasting low resistance response was obtained over an unexcavated part of the Bluestone Circle between Stones 41 and 45 (*EE*). Without excavation it is not possible to interpret this anomaly though it is comparable with that for the area west of Stones 57 and 58, which was excavated and contained particular large and deep features. However, except for around the extant stones, no individual anomalies compatible with traces of further buried stones are visible.

**Bluestone Oval/Horseshoe**

No traces of the missing stones of the surviving Horseshoe were detected. Of the possible compnenets of the northern arc of the Oval (see Chapter 7, phase 3iv), Stonehole L (WA 2760) north of Stone 61 (*FF*) (Atkinson 1979, 82; *Fig 116 above*) may have been detected, as may the grave (*GG*) excavated by Hawley east of 160b (Atkinson 1979, 62; WA 2724, Chapter 7).

With the exception of Atkinson's trenches around the sarsen settings, the survey was not very informative on the location and plan of former excavations within the stone monument.

## Conclusions

Stonehenge has never previously been singled out as a target for geophysical survey. Perhaps this is because of a perception that there would be little else of new archaeological significance for the available technologies to discover. Also, and more understandably, such a reluctance acknowledges the deleterious effects of modern disturbances concentrated within and around the monument.

Even less complicated stone circles present problems for archaeological geophysics and it was easy to be pessimistic about the potential of Stonehenge itself for such treatment. However, some optimism arose from results of an earlier programme of survey at Avebury which had shown the value of geophysics for reassessing the archaeological record of megalithic sites (Ucko *et al* 1991). Here, however, the stones were more widely distributed, the targeted features larger, and the development of the monument apparently less complex. Despite much more constrained conditions at Stonehenge, and the above reservations notwithstanding, the recent surveys have managed to obtain valuable information.

The magnetometer survey of the Triangle has mapped a range of archaeological features in the vicinity of Stonehenge including funerary monuments, linear ditches, and a number of outlying miscellaneous and unclassified anomalies. The survey also contains valuable information on the recent history of the area and the considerable impact of early twentieth-century activity on and near the site. By focusing on the land immediately surrounding Stonehenge, the magnetometer survey also complements previous survey records of the wider environs of the monument (RCHM(E) 1979; Richards 1990). The magnetometer data from the monument itself initially appeared to be too disturbed by modern ferrous material to be of any value; however, on closer inspection, most of the Aubrey Holes and the Ditch have been detected.

The resistivity survey has clarified the plan of the earthworks and has accurately mapped for the first time the fuller extent of previously recognised features such as the Counterscarp Bank and the unexcavated Y Holes. The survey also contains information relating to Ditch morphology, the position of the North Barrow, the course of former cart-tracks, previously excavated stoneholes, and excavations around the Sarsen uprights.

Thus, although these results do not contradict existing archaeological evidence about this unique monument, neither do they completely vindicate earlier inhibitions about applying geophysical survey here. As summarised above, significant findings have indeed been documented and can be expected usefully to augment the existing excavation records. Some of the more puzzling anomalies have been investigated subsequently by limited intervention in the form of augering and probing (Wessex Archaeology 1994a). This work has confirmed the nature of some of the anomalies but failed to elucidate the reasons for others, and they remain unresolved and enigmatic. There is scope here for the further application of geophysical techniques, once these become yet more refined.

## Previous geophysical surveys of the Avenue

The Avenue was the subject of geophysical surveys in 1979–80, 1983, 1988, and 1990 but in common with the excavations these surveys were undertaken intermittently over an extended period for a variety of different projects and purposes. The majority of the surveys examined sections of the Avenue nearest to the monument (within Avenue Zones E and F, *see Plans 3 and 4*). Progressing through time, the survey coverage has gradually been extended north-east from the monument along the straight, well preserved final approach of the Avenue to a point (SU 1285 4257) *c* 50m east of the elbow in Stonehenge Bottom. A survey was also carried out in 1983 for the Stonehenge Environs Project over the site of a flint scatter (site W59) near King Barrow Ridge (Bartlett 1988, Richards 1990) which included an area containing the north ditch of the Avenue. Magnetometry was the main technique used (Clark 1990, 64–98) but the surveying systems were continuously evolving during the intervals between fieldwork with the result that data recording methods and instrumentation varied between different surveys. The combined results of all the magnetometer surveys therefore cannot be plotted as a contiguous dataset. The 1979–80 and 1983 surveys were carried out using the then standard analogue recording technique in which magnetometer traverses 1m apart were plotted on a chart recorder. Unfortunately the data from these surveys cannot be converted simply to the superior digital greyscale images used to display the data from 1988 and 1990 which was recorded digitally using more modern magnetometers manufactured by Geoscan Research.

The results of the surveys are briefly described on chronological order.

### 1979–80

The 1979–80 survey was carried out by A David and A Bartlett (Pitts 1982, 90–3). The discovery of a new stonehole (97) adjacent to the Heelstone in 1979 leant weight to speculation that such an arrangement of paired stones could perhaps be repeated at intervals along the line of the Avenue. A geophysical survey was therefore commissioned from the AML to test for traces of pairs of stones or stoneholes along the Avenue. Initially a 45m section of the Avenue, extending north-east from the A344, was surveyed in October 1979 using magnetometry and resistivity.

In October 1980 the magnetometer survey was extended a further 180m to the north-east and a further 90 by 20m area of resistivity survey was also undertaken (Pitts 1982, 91–2, figs 10 and 11). The magnetometer survey detected the Avenue ditches (*c* 21m apart) and a number of other discrete anomalies. Although some of these anomalies could be of archaeological significance, later work for the Stonehenge Environs Project (*see below*) showed that they are not always a reliable indication of archaeological features but can represent periglacial hollows, tree throwholes, or irregularities in the topsoil. One pair of weaker anomalies was centred between the banks but the overall distribution of the anomalies is incompatible with the arrangement of stones suggested by Pitts.

The resistivity data contained two distinct high resistance anomalies approximately on the line of the banks. These anomalies are consistent with features cut into the subsoil and filled with a loose textured soil or stony fill, or possibly foundation sockets containing packing material for supporting standing stones. Excavation is really the only solution to determining the significance of these anomalies, as loosely backfilled holes could equally result from some unrecorded modern activity. Other weak magnetic anomalies were recorded along the line of southern Avenue bank which, in combination with the resistivity anomalies, may form elements of a recurring pattern. Although further geophysical investigation of the Avenue was proposed in the 1982 publication the 1979–80 survey was not extended until 1988.

### 1983

This survey was carried out as part of an evaluation of a surface scatter of Neolithic flint material to the north of the New King Barrows linear round barrow cemetery.

The survey was positioned over the northern arc of the Avenue (Plans 3 and 4, Zone D) *c* 0.75km from the end of the 1990 survey close to where the ploughed-out Avenue begins to curve gradually to the south-east (Richards 1990, 109–23, figs 73–5; Bartlett 1988 and microfiche 1 in Richards 1990).

The survey identified the course of the northern ditch of the Avenue between OS grid points SU 13495/42510 and 13555/42505 and indicated that the course of the Avenue is not accurately plotted on the OS 1:2500 map (sheet SU 1242–1342). The 60m section of the Avenue mapped by the survey does not dip so sharply to the south-east as depicted on the map and it is displaced to the north by 6m at the western boundary of the survey and 18m on the east.

In addition to the Avenue ditch as many as 20 separate anomalies were detected, all except two to the north of the line of the Avenue. A group of these anomalies was subsequently excavated (area J/K) and was found to represent a natural hollow and three substantial pits containing Late Neolithic flint and pottery (Richards *op cit*). This excavation evidence perhaps provides clues to the possible origins of the magnetic anomalies detected elsewhere on and around the Avenue.

## 1988

In 1988 the AML took the opportunity to extend the 1979–80 magnetometer survey of the Avenue (Figs 264 and 265) after surveying at the eastern end of the Cursus (Payne 1989). The survey was carried out with a Geoscan FM36 fluxgate gradiometer and readings of the vertical magnetic field gradient were recorded at 1 nT sensitivity at 0.25m intervals along successive 30m traverses aligned perpendicular to the Avenue ditches. The results are presented here for the first time. A 180m section of the Avenue was surveyed including the point where it is cut by the earthworks of the eighteenth century road (*A* on Fig 264). There was an overlap with the previous (1980) survey of *c* 5m.

The twin parallel ditches of the Avenue (*B*) were once again clearly detected in this survey and are again about 21m apart although they do not appear to be perfectly straight. (The slightly wavy form to the ditches could be a spurious effect induced by the effect of strong winds on survey tracking.) In this survey at least a further ten discrete anomalies occurred within the area between the two ditches. Three anomalies situated in the southern part of the survey form an L-shaped arrangement (*C, D, and E*). The northern pair of anomalies in this group (*D and E*) and another (*F*) 38m to the north are approximately on the centre line of the Avenue. Further north two anomalies (*G and H*) both lie at the same distance of 9m from the northern Avenue ditch (in this stretch it is the western of the two ditches). One well defined anomaly (*I*) lies close to the line of the bank, a feature in common with first survey, but the general scatter of anomalies again appears not to form a single regular pattern. Several weak short arcing anomalies (*J and K*) and linear anomalies diagonal and approximately parallel to the line of the Avenue (*L–O*) are also faintly visible. These linear anomalies may derive from shallow silted gullies or ditches, but their significance is uncertain. The earthworks of the later road which cuts across the Avenue have also been detected (*A*).

## 1990

A fourth magnetometer survey was carried out over the Avenue in 1990 (Figs 264 and 265). The survey was carried out using the same equipment and techniques as employed in 1988 except that a more sensitive instrument setting (0.1 nT resolution) was used to record the data. This survey covered a broader area around the western elbow of the Avenue (Zone E, Plans 3 and 4) where it turns towards the south-west before its final straight approach to Stonehenge. The survey was carried out at the suggestion of Brian Davison (English Heritage, Historic Properties Group) in order to test for the presence of the putative northerly extension or Cursus branch of the Avenue as described by Stukeley (1740, 25) and Colt Hoare (1810, 157–8; *see Montague, Chapter 7*). The survey was also conducted to examine the hypothesis that the Avenue originally terminated at some form of structure in Stonehenge Bottom or turned to avoid a pre-existing obstacle.

The most significant result of this survey is that after the elbow, the distance between the Avenue ditches (*B*) broadens out from *c* 21m to 25m. The ditches actually diverge at the bend then continue parallel after the bend at their new width apart.

The survey found no evidence for the alleged northern branch of the Avenue. However, it did identify an additional ditch (*P*) of similar width to the Avenue ditches that runs parallel to the Avenue for a short distance before the bend, at which point it diverges from the course of the Avenue to the north-west. This feature is probably the 'Gate Ditch', (the extension of the Palisade Ditch; feature 6 on Fig 259) excavated by Atkinson (C37; see Plans 3 and 4, Zone E). Another previously recorded ditch running obliquely across the line of the Avenue where it turns (the 'Oblique Ditch', C38) was not detected by the survey. Former excavation trenches in the area were not detected. There was no evidence for any archaeological structure on a north-east projection of the line of the Avenue from Stonehenge to the elbow.

Up to 17 individual localised anomalies were detected within and around the course of the Avenue. There are five discrete anomalies on the Avenue itself, sufficiently convincing to be interpreted as pit-type features of artificial or natural origin (*Q–U*).

In addition, several other features of interest were also detected in the area between the two Avenue ditches. A possible oblique ditch (*V*) was detected as a weak linear anomaly to the west of the gap in the survey caused by a modern fence. The origin and significance of this feature are uncertain and it may be related to the modern field boundary. Approximately 25m west of this feature

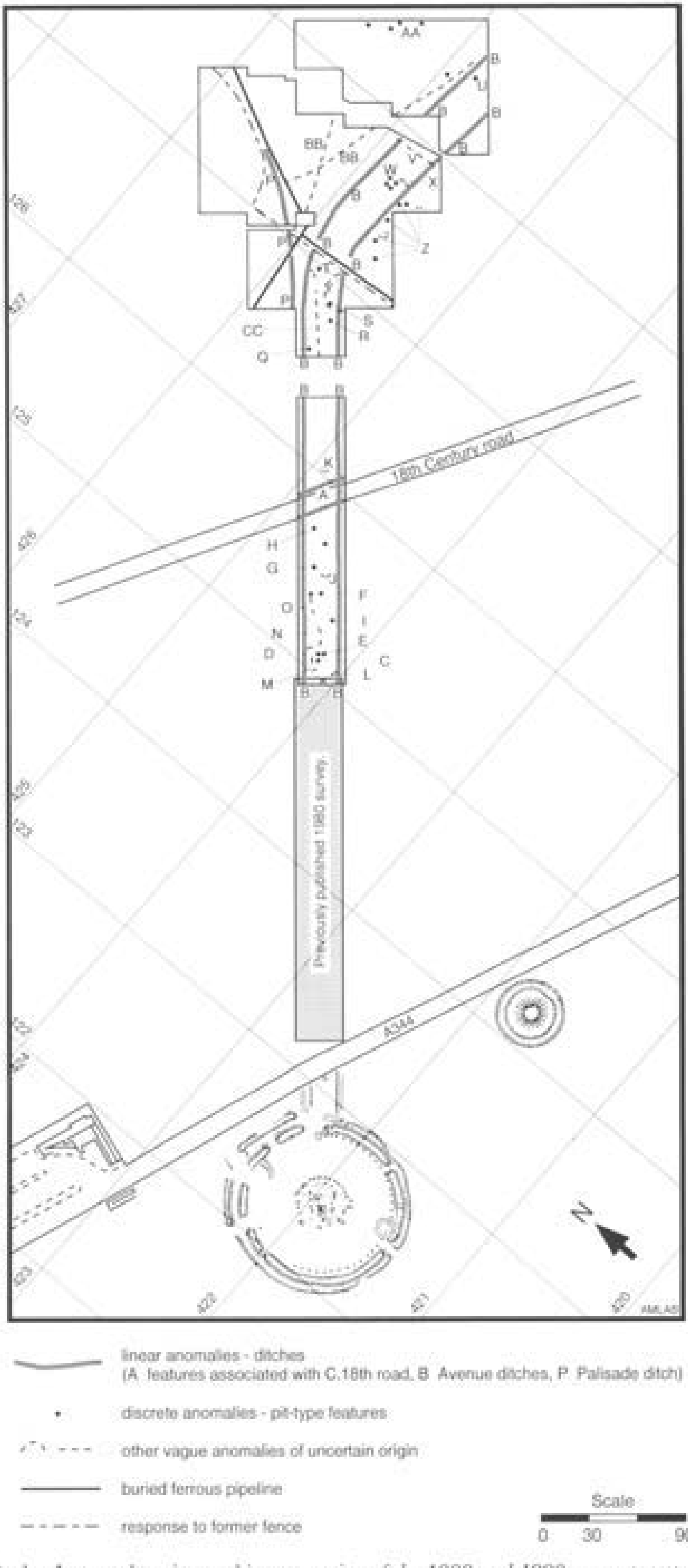



*Fig 264 the Avenue: location and interpretation of the 1988 and 1990 magnetometer surveys*

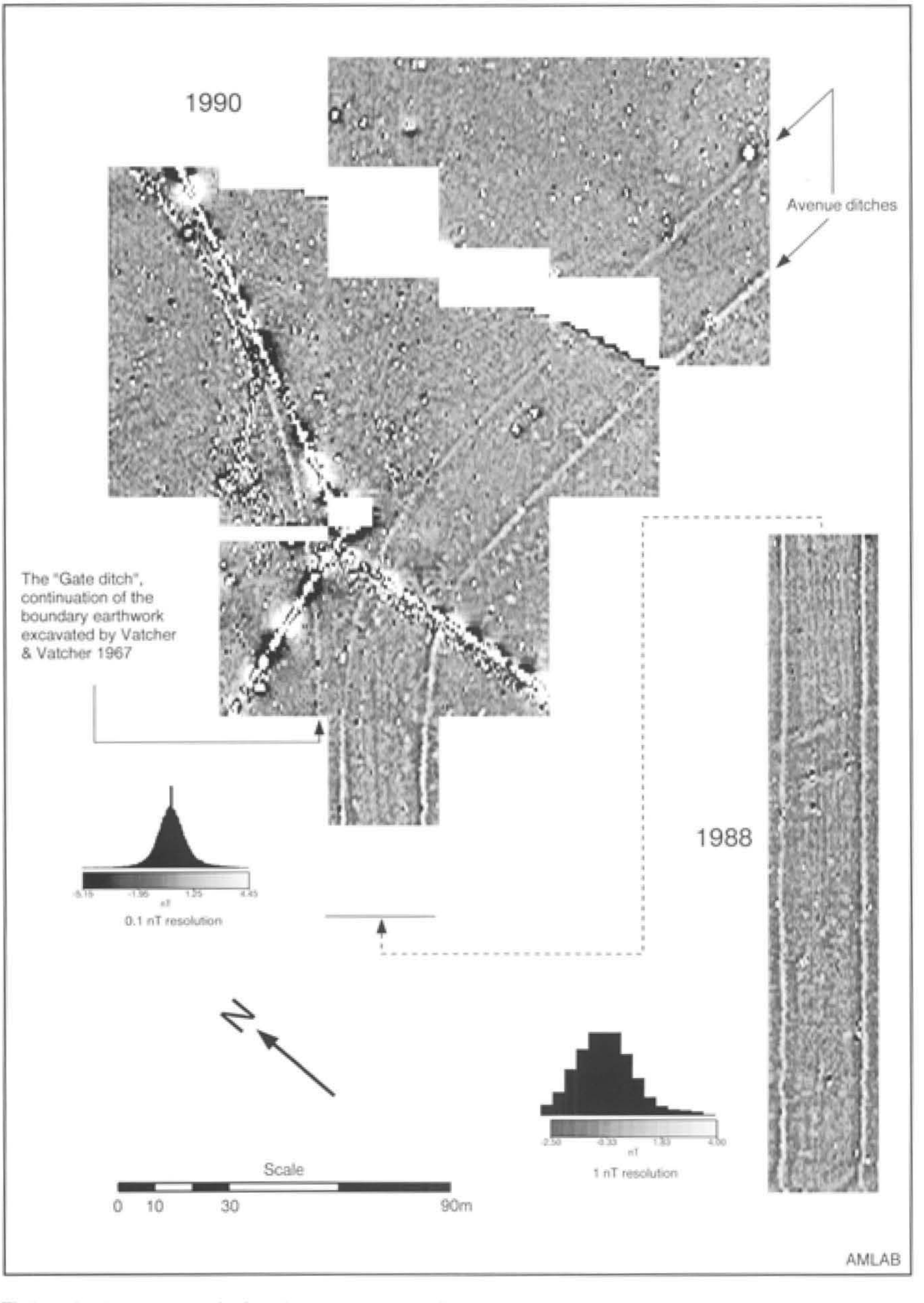



*Fig 265 the Avenue: greyscale plots of raw magnetometer data* was a curious group of four slight positive magnetic anomalies (*W*; possibly small pits) in a sub-circular arrangement *c* 6m in diameter adjacent to a short linear anomaly (*X*; possibly a ditch or gully) about 8m long which joins the southern Avenue ditch at an approximate right-angle. A further enigmatic feature (*Y*) is a vague semi-circular shaped trend in the data adjacent to the southern Avenue ditch immediately before it begins to turn away from Stonehenge. It is possible that this pattern may not represent any genuine archaeological features and could be no more than wishful recognition, but it is worth drawing attention to it as it may be significant.

Beyond the line of the Avenue several other convincing pit-like and short arcing anomalies (*Z*) occur in the area immediately south of the Avenue on the King Barrow Ridge side of the elbow. Most of these are of similar magnitude to the Avenue ditch and are therefore quite likely to be archaeological. Other discrete anomalies recorded near the north-west boundary of the survey area have been marked (*AA*) but are less likely to be archaeologically significant.

In common with the Stonehenge Triangle, the area of the survey has been subject to considerable modern disturbance in the shape of former fencing and pipes feeding a water trough north-west of the Avenue elbow. These features appear in the survey as linear areas of strong magnetic disturbance (contrasting black and white). Rutting of the ground surface by former trackways and agricultural machinery has also given rise in places to vague intermittent linear anomalies (*BB*) in the area to the north-east of the elbow and a slight negative linear anomaly (*CC*) along the line of the Avenue on the Stonehenge side of the bend is consistent with its former use as a roadway.

## Discussion

It is difficult to gauge the archaeological significance of the magnetic anomalies detected within and around the Avenue without recourse to test excavation, ideally accompanied by further survey to ascertain the distribution of anomalies in the surrounding areas. At the present time it is not known if the anomalies are associated particularly with the Avenue or if they extend beyond it into the general locality. In the latter case, any features represented by the anomalies may be unrelated to the construction and use of the Avenue, or may be of natural origin. Until the precise nature of the Avenue anomalies can be determined by sample excavation, any conclusions derived from the geophysical data can be only tentative at best and any theory building on their monumental significance only conjectural.

# Appendix 2 The radiocarbon dating programme

*by Michael J Allen and Alex Bayliss*

Until the present work, only a relatively small number of radiocarbon determinations had been obtained from excavations at Stonehenge itself and from the Avenue (Table 62). Because of the perceived importance of Stonehenge, great weight has been placed on these dates (Atkinson 1956; 1979) and they have become enshrined in the literature. The contextual integrity of some of these samples, however, is not necessarily secure, and most were obtained early in the history of radiometric dating and sample collection. They present a number of problems in both archaeological and radiocarbon terms (see below for a full discussion of the reliability of these measurements). It was decided to undertake a full reassessment of all the existing results and to obtain a new suite of determinations in order to provide a reliable and intercomparable set of dates which archaeologists can be confident in using (Table 64).

## Aims

The principal aim of the radiocarbon dating programme was to date the sequence of construction and prehistoric use of the monument. It was considered that this aim would be fulfilled by the achievement of the following objectives:

1. the provision of a series of high quality absolute dates and the construction of a reliable chronology for each major phase of the monument, as redefined here on purely archaeological grounds, and an estimation of the duration of each phase;
2. the elucidation of the chronology and sequence of major events or sub-phases (eg construction of individual stone settings) within the main phases;
3. where applicable, the assigning of specific features, or groups of features, to a phase by radiocarbon

**Table 62 All previously obtained radiocarbon dates from Stonehenge (includes both reliable and unreliable measurements)**

| *General location of sample* | *Material* | *Lab ref* | *Radiocarbon result BP* | *Calibration (2σ) cal BC* | *Reference* |
|---|---|---|---|---|---|
| ***Mesolithic*** | | | | | |
| *Postpit WA 9580* | *Pinus* charcoal | GU–5109 | 8880±120 | 8090–7580 | This volume |
| *Postpit A* | *Pinus* charcoal | HAR–455 | 9130±180 | 8820–7730 | Vatcher & Vatcher 1973; Pitts 1982 |
| *Postpit B* | *Pinus* charcoal | HAR–456 | 8090±140 | 7480–6590 | Vatcher & Vatcher 1973; Pitts 1982 |
| ***Monument*** | | | | | |
| *Ditch nr W terminal* | Antler | BM–1583 | 4410±60 | 3340–2910 | Burleigh *et al* 1982 |
| *Ditch nr W terminal* | Antler | BM–1617 | 4390±60 | 3330–2910 | Burleight *et al* 1982 |
| *(Ditch nr W terminal)* | (Antler) | (I–2328) | (4130±105) | (2920–2460) | (Atkinson 1967; Buckley *et al* 1968) |
| *Aubrey Hole 32* | Charcoal | C–602 | 3798±275 | 3020–1520 | Atkinson *et al* 1952; Libby 1955 |
| *(Y Hole 30)* | (Antler) | (I–2445) | (3190±105) | (1740–1220) | (Atkinson 1967) |
| *Beaker-age burial* | Human femur | BM–1582 | 3715±70 | 2340–1930 | Burleigh *et al* 1982 |
| *Sarsen Trilithon, Stonehole 56* | Antler | BM–46 | 3670±150 | 2480–1680 | Piggott 1956; Barker & Mackey 1960 |
| *(R Hole)* | (Antler) | (I–2384) | (3570±110) | (2140–1750) | (Atkinson 1967) |
| *(Stone floor, nr Heelstone)* | (Charcoal) | (HAR–4878) | (3400±150) | (2140–1410) | (Pitts 1982) |
| ***Avenue*** | | | | | |
| *S ditch on N side A344* | Antler pick | HAR–2013 | 3720±70 | 2350–1930 | Pitts 1982 |
| *N ditch, Stonehenge terminal* | Antler | BM–1164 | 3678±68 | 2290–1890 | Atkinson *et al* 1976; Burleigh & Hewson 1979 |
| *(N ditch nr Avon terminal)* | (Antler) | (BM–1079) | (3020±180) | (1690–820) | (Burleigh & Hewson 1979) |
| *(Both ditches, nr A303)* | (Antler & bone) | (I–3216) | (2750±100) | (1250–790) | (Atkinson *et al* 1976) |

*Entries in parenthesis have been rejected on technical grounds; see text* dating rather than purely on the basis of plan, symmetry, physical association, morphology, etc; and

4 the dating where appropriate of specific cultural artefacts with intrinsic significance.

The dating programme was structured to establish both the duration of each phase and the sequence of events within it. It was intended that events/features which have no direct stratigraphic relationship with other elements of the monument (eg the Aubrey Holes) should be dated and thus phased within the overall system adopted in this volume.

An 'event' is defined here as an activity of short duration which constitutes either a single act, such as the careful placing of a specific object, or the construction of a composite but clearly unitary element, such as the erection of the Sarsen Trilithons or the Bluestone Circle. In archaeological terms, a 'phase' is defined as a series of events which together constitute a larger and more complex but coherent episode of construction and use of the monument. Thus the construction of each of the stone elements of the monument is seen as an individual event but the construction of the stone monument in its totality constitutes a phase.

These rather generalised objectives were then explicitly defined within a framework of specific chronological questions. These could be mathematically modelled prior to the submission of samples to give an idea of how many samples of what precision would be needed to answer each question. More cautiously, we could also estimate the level of confidence we might achieve in our answers given the limited number of suitable samples that were available.

The methodology used for this preliminary analysis is still under development (Bayliss and Orton 1994) and the answers produced have been treated as approximations. However, the results demonstrated the potential of high-precision measurements for the investigation of specific events at Stonehenge, such as the digging of the main Ditch, and dashed unrealistic hopes of what was achievable, particularly given the very small amount of material available from phase 3. Full details of the archaeological questions which were considered and the methodology and calculations employed can be found in the archive.

## Selection procedures

In order to address these detailed and specific questions of chronology, all samples proposed for submission were scrutinised in order to ensure that:

1 the context in which the sample was found could be securely identified,
2 the sample was directly associated with the event or phase in question,
3 the material was suitable for reliable scientific analysis, and
4 enough similar material remains in the archive to allow future researchers to repeat the dating programme.

These selection procedures were rigorously applied because of the importance that would inevitably be placed on the new suite of radiocarbon dates. Every sample had to meet each of the criteria before it could be selected for submission.

The samples were drawn from the archives held in Salisbury Museum. Although the database of potentially datable material (bone, antler, charcoal) is relatively large, the selection procedures described above substantially reduced the list of possible samples. Many items from previous excavations were not retained and not all of what remains is from securely identified contexts (*see Chapter 9*).

Despite the longevity of the construction and use of the monument, surviving stratigraphic relationships are very limited. The concentric nature of the main elements of the monument leads to a shortage of direct stratigraphic relationships, and the inadequacy of many of the site records prevents confident interpretation of some of the relationships which clearly did exist. Consequently the importance of groups of samples which have relative chronological relationships was recognised and these were selected wherever possible.

## Archaeological integrity and considerations

An inventory was drawn up of the events, (groups of) features, and individual artefacts which it would be necessary to date in order to meet the objectives listed above. This ideal was then compared with the available assemblages in order to identify potential samples. A number of entries on the inventory could immediately be discounted because no suitable material was available. For example, no datable material survives from the R Holes.

The potential samples were then closely scrutinised for contextual information by cross-reference to the context database, to catalogue numbers assigned by Newall and Berridge, and to the Diaries and graphic archive, including photographs. As an example, the position of one antler (Hawley cat no 4736, context 2934) is described on the finds label as 'on the bottom' of the 'crater' of the Ditch on the west side of the north-eastern entrance (C25). The Diary entry for 9 November 1922 records 'at the bottom there were several picks and 2 antlers. 3 picks only could be saved and one antler the rest were hopelessly destroyed by partial burning'. Dale Serjeantson recorded that the antler was charred (Serjeantson, archive). Thus an antler was selected as a potential radiocarbon submission on the grounds that it came from a good context in archaeological terms (ie the base of the Ditch), and also matched the descriptions given by Berridge and in the Diary, giving high confidence in selection.

There were other instances, however, where the contextual information proved to be of dubious reliability, eg antler 4720, context 1554, C25, where the Diary (9/10/1922) records that although much of the Ditch fill was of clean loose chalk, the antler was found in 'a dark collection of earth' and its exact location could not be determined. The sample was therefore rejected from the programme. It is important to stress that no artefact was submitted for dating simply because it presented a 'good sample', nor was any sample whose exact location or context was dubious submitted for dating because it happened to come from a feature which it was particularly desirable to date; all submissions were made on the basis of the stated objectives and to answer specific questions.

In some cases, where specific results were required or where there was some ambiguity in the initial selection, submission, and dating programmes, material which had already been dated was resubmitted. The Beaker-age burial (context 4028, C62) excavated by Evans *et al* in 1978 (Evans 1984) was redated so that a more precise estimate of its age could be obtained than that provided by BM–1582 (2340–1930 cal BC; 3715±70 BP). This was particularly important since the date of this burial constrains the end of phase 2 (*see below*). In only one instance was an artefact (an unusual bone point; WA obj no 24, Fig 228) submitted because of its intrinsic interest.

Having shortened and refined the list of potential samples on the basis of available contextual information, all material selected was then assessed for its potential to achieve the objectives outlined above. It was essential to identify whether date of the carbon in the sample is also the date of deposition of that sample.

For example, a number of antlers (both rakes and picks, eg rake, Hawley cat no 1556c, context 2801, C20) showed evidence of considerable use, and in this particular instance Serjeantson records 'tips of brow and bez worn' (Serjeantson, archive). Consequently it is probable that there is a direct functional relationship between the material which has been dated (the antler rake) and the relevant archaeological event (the digging of the main Ditch). Since an antler pick or rake can only be used for a limited time to dig a ditch in chalk before it wears out and could have become brittle if curated for a substantial time before use (*see Chapter 9*), the age difference between the material and its deposition was probably very small. No evidence was found in the archaeological archive to suggest that this antler could be intrusive (eg there was no record of rabbit disturbance nearby).

The selection procedure for phase 2 material (the secondary filling of the Ditch) was specifically of material that was considered to be fresh and not residual. Either larger objects which were considered less likely to be residual, or smaller bones from Atkinson's excavations for which there was a record of the exact location, were selected in order to minimise the possibility of residuality. However, although the careful selection procedure has minimised this potential problem, the present authors are not willing to make the assumption that it has completely excluded it (*see below*).

## Radiocarbon integrity and suitability for radiocarbon analysis

For contextual reasons none of the surviving charcoal from the monument itself was suitable for submission. Faunal material was restricted to antlers, long-bones, and dense portions of pelvis and skull. Cremated bone was avoided because the cremation process tends to destroy the collagen in bone, making it very difficult to date (Mook and Waterbolk 1985, 41–2). Porous bones such as vertebrae were also avoided wherever possible, since this material is less suitable for radiocarbon dating than more compact bone (Gurfinkel 1987).

Unfortunately the only material from the Aubrey Holes that was considered suitable for dating was a number of bone or antler skewer pins. These originally accompanied human cremation burials (*Chapters 6 and 9*) and most showed obvious signs of burning. Nevertheless four pins which were less obviously calcined were selected for dating in the hope that they would contain enough collagen. The Aubrey Holes, which are a major element of the monument, have no clear stratigraphic relationships with any of the other major elements or any radiocarbon determinations which are useful in the elucidation of their chronology (the large error term of the only previous result (C–602, 3798±275 BP) renders it unhelpful). Consequently it was felt that the submission of these samples was worthwhile even though there was a possibility that they might fail to produce results. The risk was not that they would produce unreliable dates but that they would fail to produce dates at all.

The selection procedure also had to consider those factors which influence whether the carbon measured in the sample dates to the death of the organism from which it derives. The following precautions were taken:

1. The conservation records of Salisbury Museum were checked to ensure that no chemical treatment had been applied since the excavation of the artefact.
2. The possibility of an age offset between the carbon content of the sample and the carbon content of the atmosphere at the time of death of the plant or animal was considered. This problem is most acute for wood or charcoal samples where the rings from the centre of a large tree may be 500 years older than the date of felling (the 'old wood' effect). All charcoal samples submitted from the car park pits were identified as *Pinus* sp, a species which today has a normal life span of *c* 150 years and rarely exceeds 200 years in warm climates (Mitchell 1974). Bone samples also have an inherent age offset of up to 30 years (Bowman 1990, 15), but,

since most of the animals which provided our samples would not have lived for more than *c* 20 years this problem is probably not very significant.

3 Although antler does not have any offset, the possibility of extreme single-year variations in the amounts of radiocarbon in the atmosphere producing anomalous results was considered. This is also likely to be insignificant, since recent work to construct a single-year calibration of the radiocarbon time scale (Stuiver 1993) shows no large variations in radiocarbon levels in the atmosphere which would significantly affect the bi-decadal calibration (Stuiver and Pearson 1993).

## Curatorial concerns

The large quantity of carbon presently required for high-precision radiometric dating (*c* 14g) means destroying large quantities of sample material. Such destruction can be justified because the method provides greater precision than is currently possible for measurement by Accelerator Mass Spectrometry (AMS). Nevertheless selection of material for high-precision dating was restricted to 12 antlers (of which 130–140 examples are known to be extant; *c* 120 in Salisbury Museum and perhaps further 20 distributed amongst other museums). The submitted sample therefore constituted *c* 8% of the (then) surviving antler assemblage. The only other sample to be submitted for radiometric analysis was the right femur of the skeleton from the underpass (context 9470, C81). It was hoped that the additional precision of this measurement would provide a useful *terminus ante quem* for the Palisade Ditch (*Chapter 6*). Queen's University, Belfast was responsible for the high precision dating of these samples.

Most of the material finally selected was submitted to the Oxford Radiocarbon Accelerator Unit, partly because many of the samples were small, but also to ensure that further samples of the same material would be available in the archive for future research. As this was a very real concern it meant that several samples which were both suitable for high-precision radiometric measurement and addressed questions where such precision would have been helpful, were submitted to the accelerator instead. For example, although some bones were identified as constituting structured or placed deposits and the acquisition of high-precision results would have been desirable, it was considered that these bones were archaeologically too important for their destruction to be justified.

The selection of artefacts was carried out at Salisbury Museum with the full cooperation of the Curator, Peter Saunders, and under the supervision and with the assistance of the Keeper of Archaeology, Janet Bell. Record cards were compiled for each sample selected. All antlers submitted to Belfast were photographed. Photographs and publication standard drawings of artefacts submitted to Oxford were also made. Copies of the photographs were attached to the record cards which are retained with the archive; the resultant radiocarbon results have been added to these cards.

The radiocarbon certificates form part of the archive. In addition, an ampoule of carbon dioxide was taken from each of the radiometric samples submitted to Belfast during analysis. These samples of gas are also retained in the archive, enabling repeat measurements by AMS to be acquired in the future, despite the fact that the original object is no longer extant. Pieces of identifiable antler which survived the collagen extraction process (ie the hydroxyapatite) have also been returned to the collection. All AMS measurements could be fully repeated, since most of each sample has been returned to the museum.

## Relationship of the final selection to the stated objectives

After detailed scrutiny of the archive and available material it was evident that some of the overall objectives were not achievable because of a lack of suitable (or even any) datable material. This problem was particularly acute in phase 3, the construction of the stone settings. The paucity of material from the stoneholes meant that the sequence of events of stone building within the phase could not be elucidated with much confidence by radiocarbon dating (*see below*), although the phase as a whole could be dated. Equally significant were the problems with phase 2, a period during which natural silting occurred in the Ditch, cremation burials were placed in the Aubrey Holes, Bank, and Ditch, and timber structures erected in the interior and entrances. As stated above, the only material from the Aubrey Holes suitable for dating was a series of bone or antler skewer pins. Unfortunately all the samples were too burnt to provide results.

It is impossible to be completely certain that the material submitted is not residual, intrusive, curated, or contaminated before submission; even close scrutiny of the archive, context, and physical condition of the sample cannot enable this to be determined with 100% certainty. However, the rigorous procedures for sample selection were essential to ensure that every date would be utilised and could not be rejected subsequently simply because it would not fit current interpretation. In the event of a date falling outside the predicted or expected range, unless a technical problem with the actual dating could be identified or it could be shown that we had not interpreted the archive correctly, it was accepted that the date was correct and that the archaeological interpretation would have to change.

Two dates proved problematic in this respect. One sample was obtained from an ox skull excavated by Hawley in July 1926 which was thought to have come from the base of a feature dug through the primary fills of the Ditch. The resultant date was significantly earlier than expected for the phase in question (phase 2), and in this case the problem was resolved by re-examination of the contextual information, the Diary (July 1926), and the published accounts (Hawley 1928, 163). From these sources it could be seen that a point highlighted in the Diary about the circumstances of recovery had been overlooked. This showed the date to be perfectly acceptable in archaeological terms for phase 1 (*see caption to Figure 46, Ditch Segment 23, for a discussion of this piece*). Indeed, had it not been for the unexpectedly early date that was obtained, this small but important stratigraphic point might have been overlooked. In terms of the radiocarbon programme this incident confirmed the necessity of the thoroughness of the selection procedures and the integrity of the programme. The second date to prove problematic was that obtained for one of the Q Holes, the result of which is discussed below.

## Radiocarbon analysis

*by Gerry McCormac and Rupert Housley*

### Physical and chemical pre-treatment

Radiocarbon ages must never be considered in isolation. The nature of the sample material, its environment and history, as well as the measurement technique, all play a part and need to be carefully evaluated in the interpretation of the ages. The carbonaceous material on which the radiocarbon isotope concentration measurements are made is the final product of photosynthesis of contemporaneous atmospheric carbon dioxide preserved in the sedimentary sequence. In normal circumstances its position allows the relative ages of the stratigraphic units to be assessed. Procedures for sample selection have been described above. The possibility of subsequent disturbance or infiltration by one or more contaminating substances of different age must also be assessed.

In order to obtain a reliable age estimate every radiocarbon sample requires a thorough and appropriate preparation. The techniques employed may have a bearing on the results obtained. The purpose of physical and chemical pre-treatment of samples for radiocarbon age determination is to remove the carbon-containing material in the sample which is believed to be of a different $^{14}C$ age to the carbon that is to be dated. The appropriate chemical treatment has to be selected on the basis of the known or assumed chemical nature and properties of the sample and those of the suspected contaminants. These, in turn, are highly dependent on the nature of the site and the conditions under which the samples came to be buried and preserved. In the case of the Stonehenge samples, the pre-treatment techniques detailed in the following sections were selected.

#### Belfast

**Bone and antler:** All samples were washed in demineralised water to remove any contaminant debris, broken into fragments (10–20mm), and placed in hydrochloric acid (0.5M HCl) for 3–4 days. The HCl was replenished until the pH of the solution remained at approximately 2.0. Collagen in solution at this stage was discarded. The samples were then drained and given two water washes to remove calcium ions that could form humates. The decalcified samples were placed in a HCl solution (pH 2.0) at 90°C for *c* 18 hours. The extracted collagen was filtered and the supernatant reduced in a moisture extraction oven. It was then redissolved in cold distilled water, filtered, and once more dried in the moisture extraction oven.

#### Oxford

**Bone and antler:** Extraction of the protein collagen, followed by purification by means of gelatinisation and ion-exchange (Law and Hedges 1989; Hedges and Law 1989; Hedges *et al* 1989), was the process used to pretreat both the bone and the antler samples. The ion-exchanged gelatin was the specific fraction selected for dating.

**Charcoal:** The two charcoal samples were pretreated with an acid wash (1M HCl) to remove carbonates, followed by an alkali wash (1M NaOH) to remove humic materials, and a further acid wash to expel any absorbed carbon dioxide, before being rinsed in distilled water and dried. The process is more one of purification than a specific extraction for charcoal. The fraction chosen for dating is often referred to as humin.

### Sample preparation and isotopic measurement

#### Belfast

Collagen extracted from the bone and antler was combusted in a stream of zero grade oxygen and nitrogen (McCormac *et al* 1993). The burnt gases were passed through a copper oxide furnace (600°C) which converted carbon monoxide to carbon dioxide and through a silver furnace (400°C) which removed halogens. The gas was then passed through a saturated solution of a strong oxidising agent ($KMnO_4$) and though a drikold trap to remove moisture. The resultant carbon dioxide was sub-sampled after equilibration in a 40 litre volume for $^{13}C$ determination. The carbon dioxide was converted to benzene ($C_6H_6$) following the procedure described by Noakes *et al* (1965). Benzene was taken off the chromium catalyst at 120°C with drikold, while actively pumping to reduce possible radon contamination from the catalyst. Samples were allowed to rest in a freezer for a minimum of 14 days so that any remaining radon frozen into the benzene could decay.

Samples were counted in 20ml low potassium glass vials with special brass caps and indium seals. Most samples achieved the optimum counting volume of 15ml, but those which did not were diluted using AnalaR benzene to the required counting volume. The scintillant used was butyl PBD in the proportions 15.66g/l, and the modern standard NIST oxalic acid II. Two oxalic acid standards were run along with the Stonehenge samples, one having been produced by combustion as described above and one by wet oxidation. The combusted sample was used to determine the dates. The background was determined by counting AnalaR benzene and applying a synthesisation factor (determined by in house experiments) to account for $^{14}C$ added during benzene synthesis. Samples and standards were cycled through the counters at 100 minute intervals.

All samples were counted for between 4300 and 4500 minutes which gave about 300,000 counts per sample or a counting precision of *c* 1.8 per mil (eg ±15 years). The counting errors on the samples were combined with the errors in determining the activity of the modern standard and the background. This combined error was multiplied by an error multiplier which reflects the reproducibility of dates on replicate samples within the laboratory. Counting was carried out in a purpose-built basement laboratory which has a 1.8m concrete ceiling to act as a passive shield. The laboratory temperature and humidity are carefully controlled so that environmental variability does not affect counting efficiency or stability. The counter used for all Stonehenge results is designated by us as 'Q1' and is an LKB Quantulus 1220 liquid scintillation counter which was set up and specially modified as described by McCormac (1992).

### Oxford

Target preparation of the Stonehenge samples involved wrapping the dried pretreated product in tinfoil for flash combustion in a stream of pure oxygen in a Europa Scientific Roboprep/CHN analyzer (Hedges *et al* 1992). A small aliquot of gas was removed for $^{13}C$ measurement in a stable isotope mass spectrometer, and the remainder was collected in ampoules ready for injection into the ion-source. In the case of samples measured to normal precision 1–2mg of carbon was required, and twice this for the double precision measurements.

All samples were measured as $^{14}C/^{13}C$ ratios relative to the NIST oxalic acid II standard (Stuiver 1983) in an AMS system fitted with a carbon dioxide gas ion-source (Bronk and Hedges 1987; 1989; 1990; Hedges *et al* 1992). For a full discussion of operational details see Hedges *et al* (1989; 1992). Uncertainties estimate the total error in the system including the sample chemistry. This includes the statistical precision from the number of $^{14}C$ nuclei detected, the reproducibility of the mass-spectrometric measurements between different targets, and the uncertainty in the estimate of the contamination background. For details of the background, reproducibility, cross-contamination, and accuracy, see Hedges *et al* (1992).

## Laboratory intercomparability and the calibration of results

*by Alex Bayliss, Rupert Housley, and Gerry McCormac*

To ensure that the radiocarbon determinations commissioned for this project can be converted into accurate absolute dates, it is considered necessary to demonstrate that three fundamental requirements of reliability can be met:

1 that the measurements produced by a laboratory are repeatable within the precision quoted (ie given the same material a laboratory always gets the same answer),
2 that the measurements of each laboratory are comparable within the precision quoted (ie given the same material both laboratories will get the same answer), and
3 that the measurements of each laboratory are comparable with the data used for calibration (ie given material from the calibration curve both laboratories would get the same answers as the scientists who produced the calibration data).

This last concern means that the questions of laboratory intercomparability and the calibration of results are intimately related.

### Quality assurance for the new series of determinations

Both the Oxford Radiocarbon Accelerator Unit and the Queen's University of Belfast Radiocarbon Laboratory maintain continual programmes of quality assurance procedures, in addition to participation in international intercomparison studies (Otlet *et al* 1980; International Study Group 1982; Scott *et al* 1990; Rozanski *et al* 1992; Scott *et al* forthcoming). However, in view of the international significance of this series of determinations, it was felt that it was desirable to be rather more explicit about the quality assurance measures taken than is usual in a radiocarbon report.

The recent publication (Stuiver and Pearson 1993; Pearson and Stuiver 1993; Pearson and Qua 1993; Stuiver and Becker 1993) of corrections to the calibration data which were accepted internationally in 1986 (Stuiver and Pearson 1986; Pearson and Stuiver 1986; Mook 1986), and suggestions that there may be problems with this dataset (Stuiver and Pearson 1993, 4; Scott forthcoming), have reinforced the desire to be explicit. The approach to quality assurance adopted here allows the direct comparison of the measurements on the Stonehenge samples with measurements on material which was also dated as part of the 1986 calibration.

A variety of known-age or same-age samples were measured along with those from Stonehenge, the NIST oxalic acid II primary standards (Stuiver 1983), and background (ie $^{14}C$ free) material. Because the techniques of measurement used by the two laboratories are different, the way in which this was done also differed. However, two samples were measured by both laboratories, samples B and D from the Third International Radiocarbon Intercomparison (TIRI)(Scott *et al* forthcoming).

Sample B consists of rings of pine which have been dated by dendrochronology to 3239–3200 BC. This pine was obtained from Garry Bog, Northern Ireland (McCormac *et al* 1994, site 15), which was the source of the oaks used by Pearson *et al* (1986) to produce their calibration data for this period. The TIRI consensus mean for this sample was 4485 BP: the median was 4500 BP. The results produced by Belfast and Oxford on this sample as part of the intercomparison were 4523±17 BP and 4510±35 BP respectively. The mean result from the two bi-decadal measurements of this age published by Pearson *et al* 1986 is 4525±12 BP.

Sample D is of peat of unknown age, although each sample should be of the same age. The TIRI consensus mean for this sample was 3799 BP, and the median was 3805 BP, although it should be noted that the interpretation of the TIRI results from this sample is complicated by questions of homogeneity and sample preparation (Scott *et al* forthcoming). The results produced by Belfast and Oxford on this sample as part of the intercomparison were 3845±22 BP and 3885±35 BP respectively.

### Belfast

Three quality control samples of known-age wood (UB-3773 to UB-3775) were counted immediately before the first set of Stonehenge samples (UB-3787 to UB-3794) and three further control samples were dated (UB-3801 to UB-3803) along with the second set of samples from the site (UB--3820 to UB-3824). The six results are as follows:

| *Sample* | *Known age (AD)* | *Belfast 1994 (BP)* | *Pearson* et al *1986 (BP)* | *Pearson & Stuiver 1986 (BP)* |
|---|---|---|---|---|
| UB-3773 | 760–780 | 1262±20 | 1247±16 | 1255±9 |
| UB-3774 | 780–800 | 1205±20 | 1240±16 | 1209±10 |
| UB-3775 | 800–820 | 1224±20 | 1224±16 | 1201±13 |
| UB-3801 | 380–400 | 1709±17 | 1681±17 | 1671±11 |
| UB-3802 | 620–640 | 1475±16 | 1402±18 | 1433±12 |
| UB-3803 | 480–500 | 1594±17 | 1588±17 | 1565±13 |

Although the samples measured as quality controls are of the same dendrochronological dates as those measured by Gordon Pearson for the 1986 calibration data, the source of the wood is not always identical. For samples UB-3773 to UB-3775 the wood was taken from the same tree used in the 1986 calibration (ie Brabstown Q3691, McCormac *et al* 1994). UB-3801 and UB-3802 are from trees that grew in Co Cork and Co Wexford respectively, whereas the 1986 equivalents came from the opposite end of Ireland in Co Antrim. The material for UB-3803 came from Co Antrim as did its 1986 equivalent, although they were not from the same tree.

### Oxford

The internal quality control procedure followed by the Oxford Radiocarbon Accelerator Unit is run along the lines advocated by Long and Kalin (1990). In addition to the NIST oxalic acid II primary standard, one or more secondary standards are simultaneously measured with the unknown archaeological samples. These secondary standards mostly consist of tree rings (oak and pine from Belfast and bristlecone pine from Arizona) whose age has been determined by dendrochronology. The following samples were run at the same time as the Stonehenge samples:

| *Sample* | *Known age (BC)* | *ORAU 1994 (BP)* | *Pearson* et al *1986 (BP)* |
|---|---|---|---|
| *Wheels 471 & 472: (with OxA-4833 to OxA-4844)* | | | |
| Belfast oak | 1010–990 | 2960±65 | 2856±8[1] (1020–1000BC)<br>2825±12[2] (1000–980BC) |
| Belfast oak | 1110–1090 | 2880±110 | 2861±12[2] (1120–1100BC)<br>2886±12[2] (1100–1080BC) |
| TIRI B | 3239–3200 | 4525±55 | 4525±12[3] |
| TIRI D | Unknown | 3905±40 | |
| *Wheels 476 & 477 : (with OxA-4877 to OxA-4886)* | | | |
| Belfast oak | 1210–1190 | 2935±55 | 2956±16 (1220–1200BC)<br>2942±16 (1200–1180BC) |
| Belfast oak | 1310–1290 | 3005±65 | 3042±17 (1320–1300 BC)<br>3025±17 (1300–1280 BC) |

| *Sample* | *Known age (BC)* | *ORAU 1994 (BP)* | Pearson et al *1986 (BP)* |
|---|---|---|---|
| TIRI B | 3239–3200 | 4500±50 | 4525±12[3] |
| TIRI D | Unknown | 3880±40 | |
| *Wheel 478: (with OxA-4919 & OxA-4920)* | | | |
| Bristlecone pine | | | |
| *Wheel 483: (with OxA-4900 to OxA-4905)* | | | |
| Belfast oak | 1210–1190 | 2920±70 | 2956±16 (1220–1200BC)<br>2942±16 (1200–1180BC) |
| TIRI D | Unknown | 3860±65 | |
| *Wheel 495: (with OxA-5044)* | | | |
| Bristlecone pine | AD 480–490 | 1545±55 | 1588±17[5] (AD480–500) |
| *Wheel 500: (with OxA-5045 & OxA-5046)* | | | |
| Bristlecone pine | AD 280–290 | 1845±65 | 1729±17[5] (AD280–300) |

*1 mean of three measurements*
*2 mean of two measurements*
*3 mean of two bi-decadal measurements*
*4 this is the measurement published by Pearson* et al *(1993), which was carried out on European oak and so may not be the most appropriate comparison for the bristlecone pine measurement (McCormac* et al *forthcoming). Unfortunately the calibration data for the sixth millennium BC are problematic, which makes the use of this result as quality assurance difficult for the Mesolithic determinations from Stonehenge. It is included here in the hope that it will be useful for quality assurance in the future (when the calibration problem has been solved)*
*5 see above (footnote 4) for the comparability of oak and bristlecone pine measurements (McCormac* et al *forthcoming).*

### Calibration

Throughout this report radiocarbon results have been calibrated using the following datasets:

| | |
|---|---|
| AD 1950–500 BC | Stuiver and Pearson 1986 |
| 500–2500 BC | Pearson and Stuiver 1986 |
| 2500–5210 BC | Pearson *et al* 1986 |
| 6550–7890 BC | Pearson *et al* 1993 |
| 7890–9440 BC | Kromer and Becker 1993 |

This means that for results before *c* 7000 BP the calibration dataset provided with CALIB v3.0.3 (INTCAL93.14C) has been used, and for those after that date the data provided with CALIB v2.1 (ATM20.14C) have been used.

The choice was made to use the 1986 data wherever possible for two reasons. Firstly because, unlike the 1993 revision, it has been internationally accepted (Mook 1986), and secondly because most of the samples which we have used for comparison between the laboratories have been of known-age oak, collected from Ireland and used by Gordon Pearson and his colleagues at Belfast for the 1986 calibration. These comparative measurements have produced results which are not significantly different from the 1986 calibration data.

For the Mesolithic samples there is no choice – only one dataset is available. There is no doubt that it is better to calibrate than to use uncalibrated BP results (in the Mesolithic, these results can easily be 1000 years different from the true calendrical date). However, it must be recognised that the extension to the calibration curve before 7890 BC is based on a dendrochronological sequence which is still floating, although a tentative match has been suggested by Becker (1993). This has been accepted by Stuiver and Reimer (1993) and is therefore also accepted here. Other shifts have also been suggested (Stuiver *et al* 1991; Bard *et al* 1993), so this dataset cannot be regarded as more than provisional until a firm dendrochronological match has been established. Even so the suggested shifts are considerably less significant that the 1000 years introduced by not calibrating.

We are fortunate in this case because we have no results which calibrate between 4500 BC and 7000 BC. This has made it possible to change datasets without introducing problems of site interpretation. There are problems in the sixth millennium BC (Stuiver and Reimer 1993; Stuiver and Pearson 1993), where there are systematic differences between the calibration datasets of different laboratories of over 50 years. Although this situation is not ideal and merits further research, its implication for archaeological interpretation should not be over-estimated. For most archaeological uses, a difference of 50 years for a date in the early Neolithic will not engender significant changes of interpretation.

The conventions for the citation of results and calibrated dates are given in detail in Chapter 1. The mathematical methods used for calibration are detailed below.

## A reassessment of the existing determinations

As part of this project a full reassessment of all the existing radiocarbon results from Stonehenge has been attempted. The aim was to assess the archaeological and laboratory quality of these dates in order to provide a list of reliable measurements which can be used with confidence. It also enabled the removal of spurious or inaccurate dates that have entered and are repeatedly quoted in the archaeological literature.

The origin, archaeological context, collection, and submission procedure for each sample were checked as far as the published and archive accounts and correspondence would allow. The laboratories which have produced results from the monument provided information about their determinations. Since many of these measurements were carried out over 20 years ago, and some as many as 40 years ago, this task has been considerable. The authors would like to thank all the laboratories concerned for their help. The effort has been worthwhile; it has enabled us either to demonstrate that a date, although old, is reliable, or to explain why a date should be rejected.

Up to March 1994 16 radiocarbon determinations had been obtained from material from Stonehenge (Table 62). These results have been scrutinised for reliability in exactly the same way that the new samples were selected (*see above*). In addition, as far as possible, the laboratory procedures used when processing them have been examined, and quality assurance obtained. All those determinations that satisfied these strict criteria are included in the main table of radiocarbon dates (Table 64) the reasons for omitting other determinations are given below.

### Rejected determinations

One determination is considered unreliable on purely archaeological grounds. This is I–3216 (2750±100 BP), made on an ox scapula from the northern ditch of the Avenue combined with an ox scapula and an antler tine from the southern Avenue ditch in C86 (Plan 4, Zone C; *Montague above, Chapter 7*). The composition of this sample, including bones from deposits which were over 26m apart and material from different ditches is considered unacceptable simply because they may not all have been of the same date and the ditches may not have been dug at the same time. Thus, even if the radiocarbon age produced is an accurate measurement of the radiocarbon content of the sample, this measurement is probably not an accurate estimate of the date of the ditches.

Four determinations are considered unreliable because of the chemical processing which they received in the laboratory. These are I–2328 (4130±105 BP), I–3216 (2750±100 BP), I–2384 (3570±110 BP), and I–2445 (3190±105 BP). All of these samples received the same treatment; they were measured in the mid-1960s when the preparation of bone and antler samples was a vexed issue. First, the outer surfaces of the samples were abraded and the inner material used for dating. Mineral matter was then removed with hydrochloric acid after crushing the bone or antler (Berger *et al* 1964). The residual organic material was dated by gas proportional counting. Although this treatment would have removed the mineral carbonates introduced by the chalk environment, the humic acids, which are almost insoluble in acid but are mobile in the alkaline environment of the monument (*c* pH 7.3 but ditch fills to *c* pH 8.5), would have remained in the organic residue which was dated (Longin 1970; 1971). The older dates from similar contexts which have been produced as part of the recent dating programme support the suggestion that these results are too young because of humic acid contamination (eg I–2328, 4130±105 BP, and UB–3788, 4381±18 BP). No $^{13}C$ measurements were made for these samples.

Suggestions that all was not well with the analysis of a further two samples have been found in the archives.

These are BM–1079 (3020±180 BP) and HAR–4878 (3400±150 BP). BM–1079 (3020±180 BP) from near the Avon terminal of the Avenue was from a secure context (C87, Smith 1973). Richard Burleigh had reservations about the collagen content, however, and wrote in a letter to Atkinson 'Smith's sample ... was rather a poor specimen and yielded little collagen and I think may have been contaminated by humic material to some extent though we have, of course, tried to remove this. The sample is being measured now but I am not hopeful of getting a good date' (Burleigh to Atkinson 20 June 1974). The result of OxA–4905 (3865±40 BP), also from the river Avon end of the Avenue, is significantly different from that of BM–1079 at a 95% confidence level (Ward and Wilson 1978) and suggests that Burleigh's suspicion of humic acid contamination was correct (*see Montague, Chapter 7, for further discussion)*.

HAR–4878 (3400±150 BP) was also from a secure context (C91, Pitts 1979–80) and consisted of reasonably short-lived material, Rosaceae, sub-family Pomoideae, *Prunus* sp, *Rhamnus catharticus* charcoal (identified by C Keepax), and a charred stone of *Prunus* sp (identified by N Prichard). It was measured in the mini-counter system (Otlet *et al* 1983) at AERE Harwell in 1981, and on 16 July 1982 a preliminary result of 3400±150 BP was produced. A note made at the time by Otlet states that this error term was a 'pure guess'. There is no evidence that a final result was produced.

## Accepted determinations

There is nothing to suggest that the other determinations which were carried out before the present project are unreliable, although measurements which were made many years ago, particularly before the advent of international radiocarbon intercomparisons, must always be treated with caution. These results are all accepted and listed in the 'reliable' series of dates (Table 64), but varying degrees of caution should be exercised when using them (*see below)*.

The only result for which we have been able to obtain full quality assurance data is GU–5109 (8880±120 BP)(C99, Wessex Archaeology 1988), which was measured in January 1991. This was at the time when the samples from the IAEA international intercomparison (Rozanski *et al* 1992) were being measured at the Scottish Universities Research and Reactor Centre. The relevant results in the IAEA intercomparison (submitted to IAEA on 7 November 1990) were:

| *Material* | *SURRC result (pMC±1)* | *IAEA consensus (pMC)* | *Standard error (pMC)* |
|---|---|---|---|
| C2 (Travertine) | 41.22±0.22 | 41.14 | 0.03 |
| C4 (Kauri wood) | 0.18±0.11 | 0.20–0.44 | – |
| C5 (Two Creeks wood) | 23.18±0.18 | 23.05 | 0.02 |

Three measurements from the British Museum Laboratory (BM–1582, 3715±70 BP; BM–1583, 4410±60 BP, and BM–1617, 4390±60 BP) were measured at the time of the Harwell intercomparision, where the British Museum produced results in agreement with the other British laboratories (Otlet *et al* 1980). These measurements were counted six months to a year before the period in which the British Museum recognised an error in their measurements (Bowman *et al* 1990). The error terms of the results were calculated on the basis of the counting statistics of the (two) modern standards and the (two) background standards used, combined with the counting statistics of the samples themselves. The laboratory notes contain no comment on the collagen yields. If these had been poor, this would have been noted.

BM–1079 (3020±180 BP) and BM–1164 (3678±68 BP) were counted within a few months of each other in 1974. The problems with BM–1079 have been discussed above. BM–1164 (C6, Hawley 1923) produced 29.2g of 'collagen' from an initial 430g of antler. Errors on these two samples are quoted purely on counting statistics and so are probably underestimates, although the calculation of corrections to them is not feasible.

These five measurements from the British Museum, as well as HAR–2013 (3720±70 BP) (C83, Vatcher and Vatcher 1968) which was processed at AERE Harwell in 1977, were all performed on 'collagen', the protein fraction surviving cold acid treatment (Haynes 1967).

No quality assurance data have been found which are relevant to the samples measured at AERE Harwell. Although HAR–455 (9130±180 BP) was rather small, there is no suggestion in the experimental notes that either this sample or HAR–456 (8090±140 BP)(C82, Vatcher and Vatcher 1966), both measured in 1974, caused problems. Similarly there is no suggestion that HAR–2013 is in any way unreliable. HAR–455 and HAR–456 were both identified as *Pinus* sp prior to submission, and were pre-treated using the acid-alkali-acid process (Mook and Waterbolk 1985, 36–7).

The remaining two results from Stonehenge were carried out in the pioneering days of radiocarbon dating. BM–46 (3670±150 BP)(C17, Atkinson *et al* 1956) was gas counted by H Barker at the British Museum *c* 1960, using Cambridge oak as a modern standard. The error term includes counting statistics plus ±80 years for fractionation and ±100 years for 'de Vries effects'. It was treated with hydrochloric acid to remove carbonates, and the experimental notes refer to dating 'the organic fraction'. C–602 (3798±275 BP; Aubrey Hole 32, Atkinson *et al* 1950) was measured by W F Libby at the University of Chicago in the screen-wall counter *c* 1952. Methods of preparation and measurement, along with details of the large numbers of known-age samples which were measured at the laboratory at this time, are given in full in Libby (1955). Although the charcoal does not seem to have been identified prior to dating, the very large error term on this determination probably allows

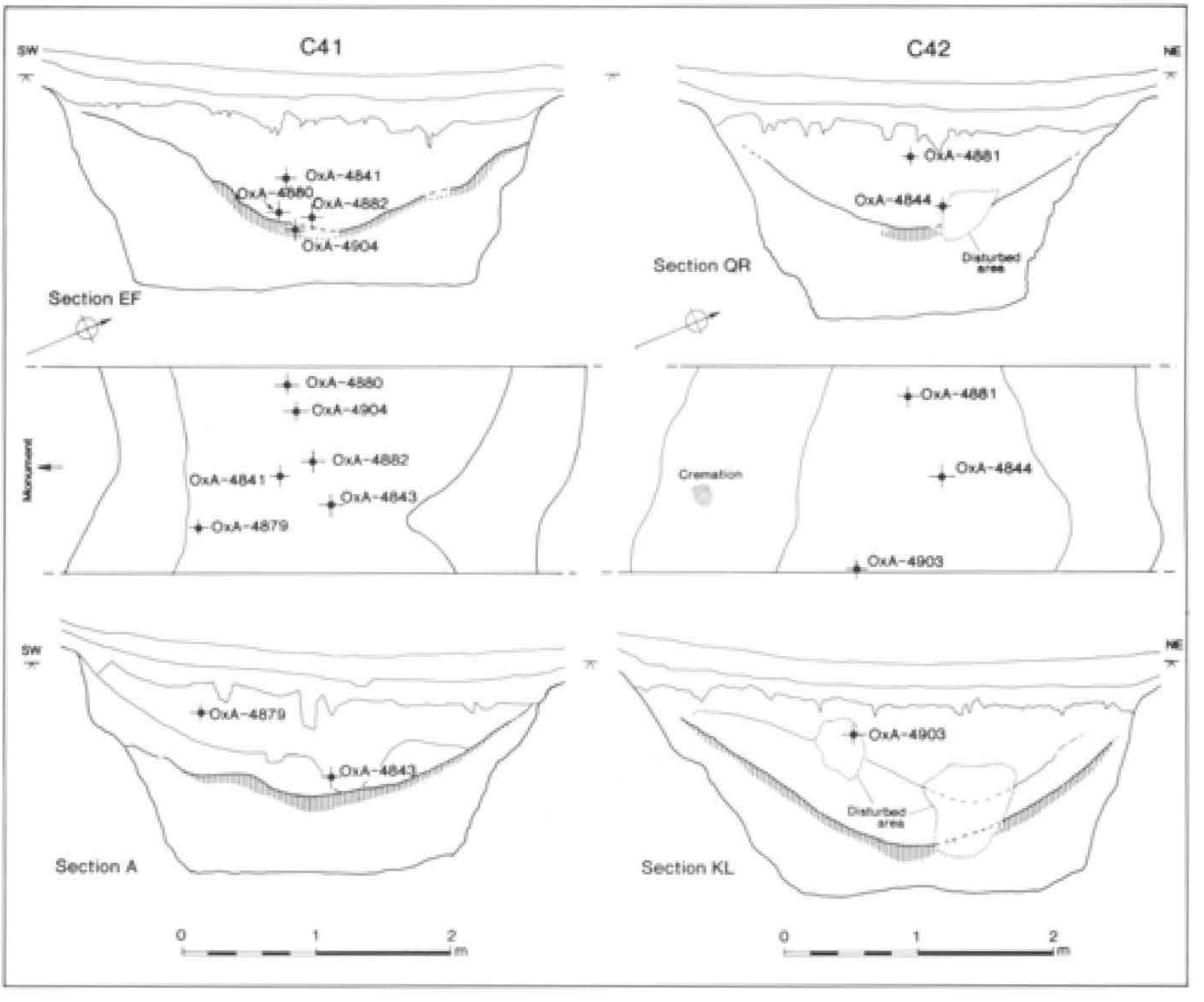



*Fig 266 Sections of the Ditch in Cuttings 41 and 42 with positions of the radiocarbon samples projected*

the unknown offset to be safely ignored. It is difficult to place much reliance on measurements carried out so long ago, but in both cases a great deal of care was taken to ensure accuracy.

## Determinations rejected from the new series

The series of dates from the secondary fill of the Ditch in C41 and C42 was not without its problems. At the time of selection (March 1994) the exact location of all of the samples could not be precisely determined. All finds from the Ditch recovered by Atkinson *et al* had been graphically recorded (by Ehrenberg) by projecting them onto a drawn section, but information on the distance of the objects from the sections was not available, nor were all the field and post-excavation drawings. As this had in some cases involved projecting find locations over several metres, local variation in the fills may be significant (*see Chapters 5 and 6*). Subsequent to submission of material for radiocarbon dating detailed locational information about the three-dimensionally recorded artefacts from Cutting 41 (section AE) and Cutting 42 (section LQ) became available from Atkinson's private archive, following his death in October 1994. This enabled us retrospectively to compare the locations of the artefacts projected onto the section drawings with their actual distances from that section (Fig 266) and to check that the artefacts had previously been plotted onto the appropriate (ie closest) recorded section. The circumstances and contextual location of these finds are detailed in Chapter 6 and, where appropriate, in the captions to the illustrations of the Ditch segments (Figs 37–47, 58–64).

It was possible to establish that three samples were unsatisfactory and may have been intrusive through animal burrows or mixing. Had information on their precise location been available earlier they would not have been selected. These were OxA–4903 (3980±45 BP), OxA–4844 (4220±60 BP), and OxA–4879 (3885±55 BP) (Table 63).

OxA–4903 (C42, section KL) was found to have been almost against the excavated section and definitely within an area of animal disturbance. OxA–4844 was in the centre of C42, but on both sections QR and KL a disturbed area was recorded which may represent a long badger burrow like that which had disturbed the Beaker-age burial (Evans 1984; Chapter 7). In C41, OxA–4879 was recorded from the 'rainwash' (context 3893) and was only 0.33m from section A (Fig 266); it is near the top of the 'rainwash', but where a series of large pockets of 'chalky earth' from the subsoil occur, and we cannot be certain from which of these two contexts it originated.

A fragment of pig humerus (OxA–4901; 3800±45 BP) is recorded in the finds catalogue as having come from a Q Hole and the label confirms that it was 'in fill near top of Hole'. Since the Q Holes were backfilled as a single event (*see Chapter 7*) this material was considered suitable for submission. The specific Q Hole from which the artefact came was not recorded (Atkinson did not number them during his excavations) and could not later be confidently identified. It was felt, however, that Atkinson's attribution should be trusted (*but see below*).

In view of the stratigraphic information that the Q Holes must be earlier than the Sarsen Circle and the Bluestone Circle, this date is difficult to comprehend. If this stratigraphic information is included in the mathematical model of phase 3, then the model is statistically inconsistent at more than 95% confidence. Therefore, either the date obtained from the Q Hole is anomalous, or the three dates from the Sarsen Circle and Bluestone Circle (*see below*) are all from residual material.

Quality assurance of all four determinations is not in question (*see above*) and re-examination of the archive has not produced any additional information relating to the contexts of the samples. In the light of the inconsistency between the stratigraphic and radiocarbon evidence, however, we suggest that the dated item may in fact have come from a feature which was wrongly described as a Q Hole by Atkinson (*see Chapter 7*). Consequently, this result should not be cited. The four rejected determinations from the new series are listed in Table 63.

### Conclusions

The radiocarbon determinations from previous programmes are given above (Table 62). All the results which have satisfied the strict criteria outlined above are included in the main table of radiocarbon determinations (Table 64), and are used throughout this volume. Dates given in parentheses are rejected on the grounds given above and are not considered useful in elucidating the date and chronology of Stonehenge. Consequently we recommend that they should not be quoted in future.

## The radiocarbon dates for Stonehenge: 'a reliable series'

The reassessment of the previous radiocarbon determinations discussed above has resulted in the rejection of 6 measurements and reduced the number of acceptable previous results for Stonehenge to only 10, of which 3 are from Mesolithic pits some four millennia older than the monument, and 2 are from the Avenue. The new submission includes a further 46 radiocarbon determinations; however, 4 of these have also been rejected.

This produces a total of 52 acceptable radiocarbon determinations for the monument and associated features (Table 64), 10 produced before 1992, 13 radiometric measurements from Belfast produced in 1994, and 29 AMS measurements from Oxford also produced in 1994.

All the accepted radiocarbon results have been calibrated using the datasets discussed above and the methods discussed in Chapter 1 and below. These calibrations supersede all previous calibrations, especially those conducted by Atkinson before the publication of high-precision radiocarbon calibration data.

The reliable dates are given in Table 64.

**Table 63 Rejected dates from the new series of determinations from Stonehenge**

| *Phase* | *General location of sample* | *Cutting no & details of location* | *Material* | *Context no* | *Lab ref* | $\delta^{13}C$ (‰) | *Radiocarbon result (BP)* | *Calibrated date range (2σ) cal BC* |
|---|---|---|---|---|---|---|---|---|
| 2a | Ditch, secondary | C42, section L–Q, upper 2ndry fill, from plot (in rabbit disturbance) | Animal bone | 3899 | OxA–4903 | -23.2 | 3980±45 | 2660–2400 |
| 2a | Ditch, secondary | C41, section A–E, upper 2ndry fill, from plot | Animal bone | 3893 | OxA–4879 | -20.4 | 3885±55 | 2570–2150 |
| 2b | Ditch, secondary | C42, section L–Q, upper 2ndry, from plot (?in animal burrow) | Animal bone | 3898 | OxA–4844 | -22.1 | 4220±60 | 2930–2610 |
| 3i | Q Hole | 'In fill nr top of hole' | Animal bone | 3813 | OxA–4901 | -20.7 | 3800±45 | 2460–2040 |

**Table 64 The accepted reliable radiocarbon dates for Stonehenge**

| *Phase* | *General location of sample* | *Cutting no & details of location* | *Material* | *Context no* | *Lab ref* | $\delta^{13}C$(‰) | *Radiocarbon age (BP)* | *Calibrated date range (2σ) cal BC* |
|---|---|---|---|---|---|---|---|---|
| Pre-Phase 1 | | | | | | | | |
| | Sarsen Circle | Stonehole 27, among packing stones | Animal bone | 3547 | OxA-4902 | -21.7 | 5350±80 | 4360–3990 |
| Phase 1 | | | | | | | | |
| | Ditch, structured deposit | S entrance, nr terminal (C26.2) | Red deer tibia | 3928 | OxA-4833 | -22.5 | 4550±60 | 3500–3040 |
| | Ditch, structured deposit | S entrance, nr terminal (C26.7) | Ox right jaw | 2480 | OxA-4835 | -22.4 | 4455±40 | 3340–2920 |
| | Ditch, structured deposit | S entrance, nr terminal (C26.6) | Ox right jaw | 3929 | OxA-4834 | -23.1 | 4460±45 | 3350–2920 |
| | Ditch, structured deposit | S entrance, nr terminal (C29.4) | Ox skull | 3930 | OxA-4842 | -23.8 | 4520±100 | 3510–2920 |
| | Ditch, primary | Bottom of Ditch (C28.10) | Antler | 2804 | UB-3788 | -22.5±0.2 | 4381±18 | 3095–2920 |
| | Ditch, primary | Bottom of Ditch (C20) | Antler | 2801 | UB-3787 | -23.1±0.2 | 4375±19 | 3085–2920 |
| | Ditch, primary | Bottom of Ditch (C22) | Antler | 2800 | UB-3789 | -23.1±0.2 | 4330±18 | 3020–2910 |
| | Ditch, primary | Bottom of Ditch (C22 D–E) | Antler | 2799 | UB-3790 | -23.0±0.2 | 4367±18 | 3040–2915 |
| | Ditch, primary | Bottom of Ditch (C25.2) | Antler | 2935 | UB-3792 | -22.9±0.2 | 4365±18 | 3040–2915 |
| | Ditch, primary | Bottom of Ditch (C25.4) | Antler | 2934 | UB-3793 | -23.4±0.2 | 4393±18 | 3095–2920 |
| | Ditch, primary | Bottom of Ditch (C25.4) | Antler | 2934 | UB-3794 | -23.7±0.2 | 4432±22 | 3305–2925 |
| | Ditch, primary | Primary fill nr W terminal (C41/2) | Antler | 3895/ 3900 | BM-1583 | -22.7 | 4410±60 | 3340–2910 |
| | Ditch, primary | Primary fill nr W terminal (C41/2) | Antler | 3895/ 3900 | BM-1617 | -22.7 | 4390±60 | 3330–2910 |
| Phase 2 | | | | | | | | |
| 2 | Cremation | Aubrey Hole 32, in 2ndry disturbance | Charcoal | 3931 | C-602 | – | 3798±275 | 3020–1520 |
| 2 | Ditch, secondary | Nr ENE causeway (C25.2), cast-in chalk | Antler | 1552 | UB-3791 | -21.5±0.2 | 4397±18 | 3095–2920 |
| 2a | Ditch, secondary | Ditc, A–E (C41), base of 2ndry fill, from plot | Antler | 3893 | OxA-4904 | -22.4 | 4365±55 | 3300–2900 |
| 2a | Ditch, secondary | Ditch L–Q (C42), upper 2ndry fill | Animal bone | 3899 | OxA-4881 | -21.6 | 4300±60 | 3080–2700 |
| 2a | Ditch, secondary | Ditch A–E (C41), upper 2ndry fill, from plot | Animal bone | 3893 | OxA-4841 | -19.6 | 4295±60 | 3040–2700 |
| 2a | Ditch, secondary | Ditch A–E (C41) 2ndry fill, from plot | Animal bone | 3893 | OxA-4882 | -23.2 | 4270±65 | 3040–2660 |
| 2a | Ditch, secondary | Ditch A–E (C41) 2ndry fill, from plot | Animal bone | 3893 | OxA-4880 | -20.7 | 3875±55 | 2560–2140 |

**Table 64 (cont)**

*Lab ref* *Probability distribution*

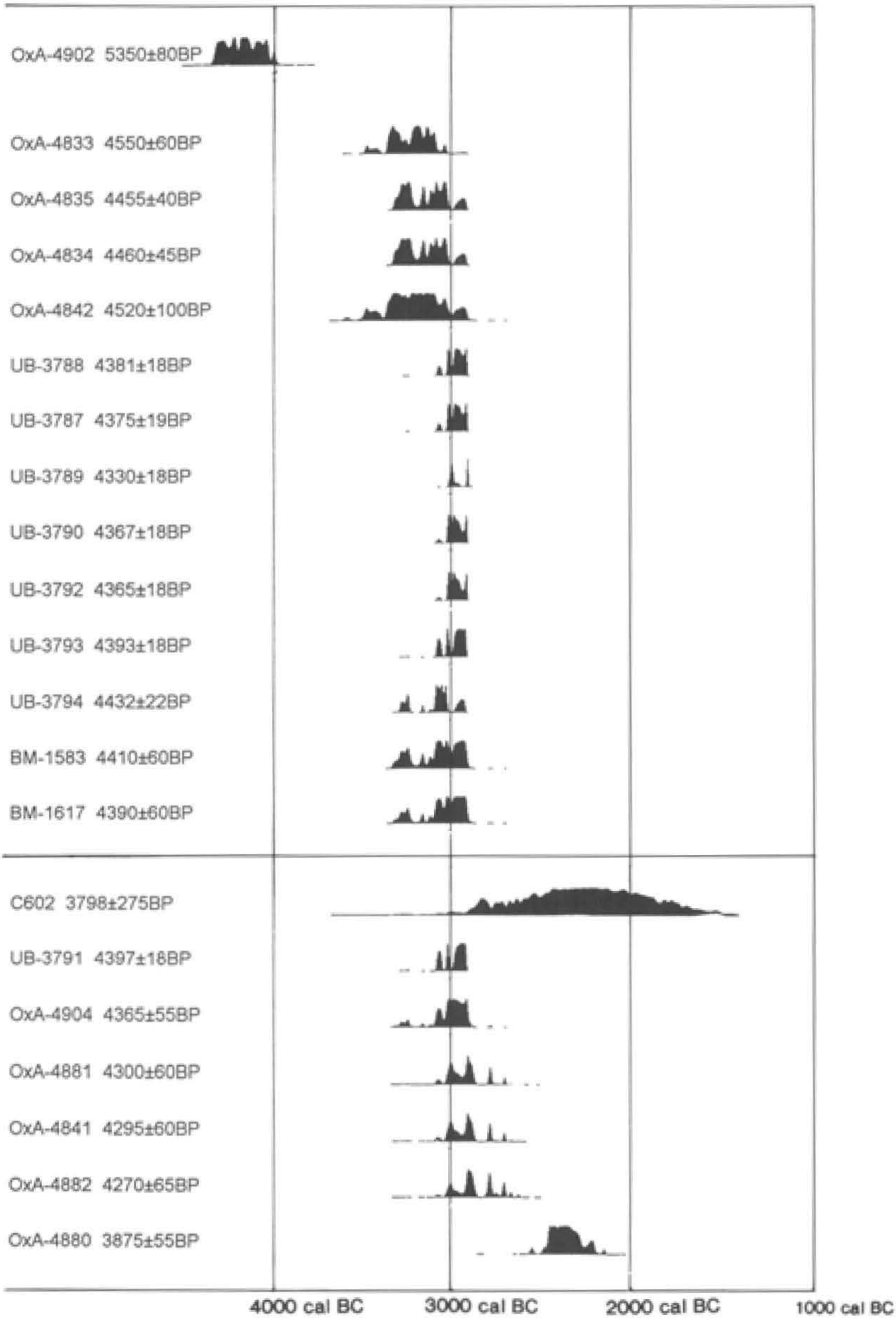


**Table 64 (cont)**

| *Phase* | *General location of sample* | *Cutting no & details of location* | *Material* | *Context no* | *Lab ref* | $\delta^{13}C$(‰) | *Radiocarbon age (BP)* | *Calibrated date range (2σ) cal BC* |
|---|---|---|---|---|---|---|---|---|
| 2a | Ditch, secondary | Ditch A–E (C41) cut within 2ndry fill, from plot | Animal bone | 3893 | OxA–4843 | -22.3 | 4315±60 | 3100–2700 |
| 2b | Ditch, secondary | ?Cut within 2ndry fill (C26.5) | Bone chisel | 2475 | OxA–4883 | -21.4 | 4300±70 | 3100–2700 |
| Phase 3 | | | | | | | | |
| 3ii | Sarsen Circle | Stonehole 1 (C2.1) | Antler | 1093 | UB–3821 | -22.9±0.2 | 4023±21 | 2655–2485 |
| 3ii | Sarsen Trilithon 53/54 | Stonehole 53/54 (C56) chalk rubble at bottom | Antler | 3516 | OxA–4840 | -23.4 | 3985±45 | 2850–2400 |
| 3ii | Sarsen Trilithon 57 | Stonehole 57 (C17), earthy fill, lower 'ramp fill' | Antler | 2452 | OxA–4839 | -21.3 | 3860±40 | 2470–2200 |
| 3ii | Sarsen Trilithon 56 | Stonehole 56 (C17), chalk rubble, erection ramp | Antler | 2449 | BM–46 | – | 3670±150 | 2480–1680 |
| 3iv | Bluestone Circle | Stonehole 40c (C17) | Antler | 2427 | OxA–4900 | -23.1 | 3865±50 | 2480–2140 |
| 3iv | Bluestone Circle | Stonehole 40c (C17) | Animal bone | 2427 | OxA–4878 | -21.8 | 3740±40 | 2290–2030 |
| 3v | Bluestone Horseshoe | Stonehole 63a (C56) | Antler | 3511 | OxA–4877 | -21.3 | 3695±55 | 2280–1940 |
| 3 | Stonehole E | On causeway (C3) | Antler | 1131 | OxA–4838 | -23.9 | 3885±40 | 2490–2200 |
| 3 | Stonehole E | On causeway (C3) | Antler | 1131 | OxA–4837 | -21.2 | 3995±60 | 2860–2350 |
| 3vi* | Y Hole 30 | Stacked on base (C34.30) | Antler | 3927 | UB–3822 | -22.3±0.2 | 3341±22 | 1735–1530 |
| 3vi* | Y Hole 30 | Stacked on base (C34.30) | Antler | 3927 | UB–3823 | -22.5±02 | 3300±19 | 1675–1520 |
| 3vi* | Y Hole 30 | Stacked on base (C34.30) | Antler | 3927 | UB–3824 | -22.6±02 | 3449±24 | 1880–1690 |
| 3vi* | Z Hole 29 | C33.29 | Antler | 3774 | OxA–4836 | -21.2 | 3540±45 | 2030–1740 |
| 3 | Beaker-age burial | Cut into 2ndry fill (C61.1) | Human femur | 4028 | OxA–4886 | -21.2 | 3960±60 | 2860–2310 |
| 3 | Beaker-age burial | Cut into 2ndry fill (C61.1) | Human femur | 4028 | OxA–5044 | -20.7 | 3785±70 | 2460–2030 |
| 3 | Beaker-age burial | Cut into 2ndry fill (C61.1) | Human femur | 4028 | OxA–5045 | -20.6 | 3825±60 | 2470–2040 |
| 3 | Beaker-age burial | Cut into 2ndry fill (C61.1) | Human femur | 4028 | OxA–5046 | -20.6 | 3775±55 | 2460–2030 |
| 3 | Beaker-age burial | Cut into 2ndry fill (C61.1) | Human femur | 4028 | BM–1582 | -21.8 | 3715±70 | 2340–1930 |

**Table 64 (cont)**

| *Lab ref* | *Probability distribution* |
|---|---|

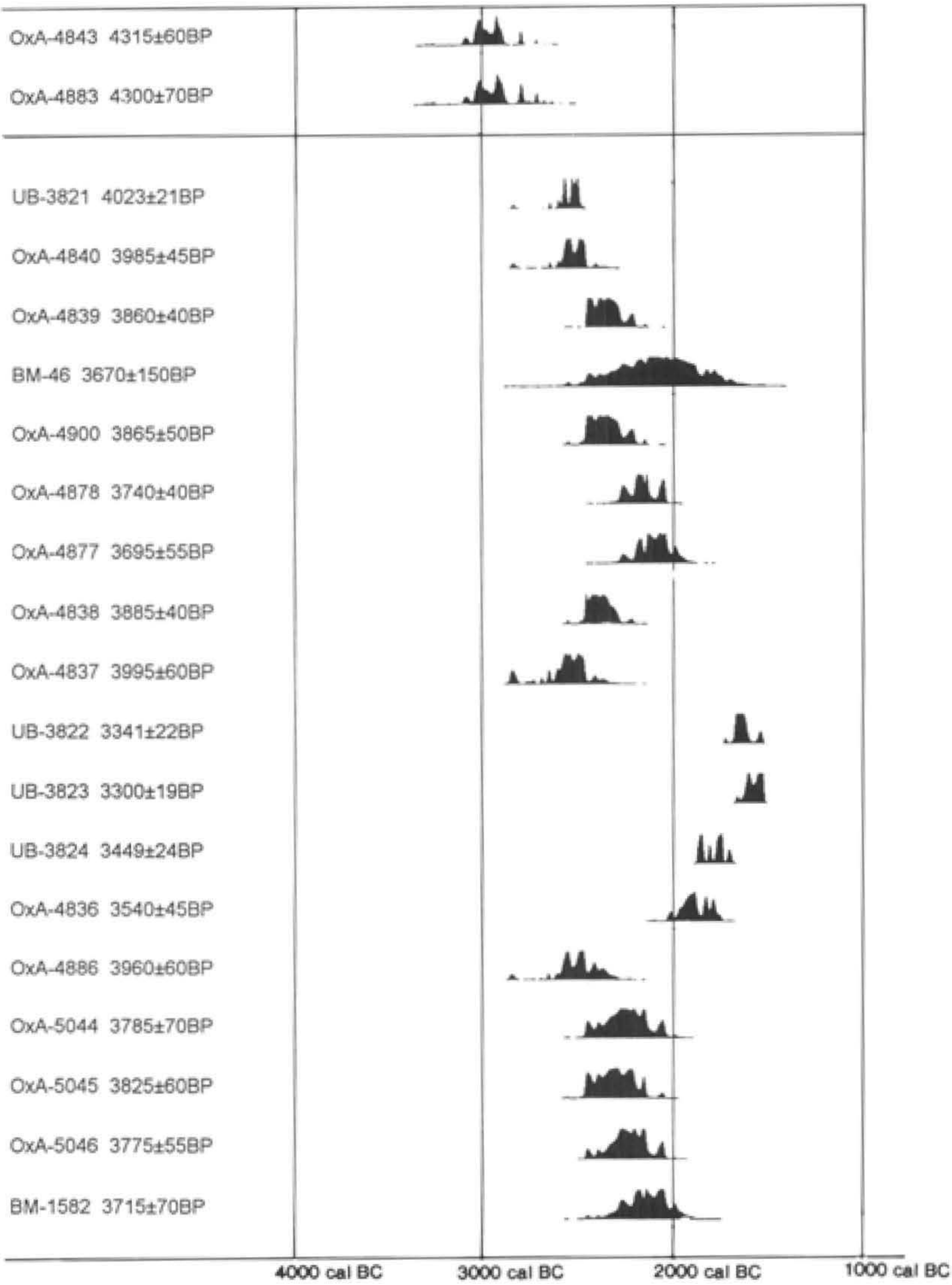


**Table 64 (cont)**

| *Phase* | *General location of sample* | *Cutting no & details of location* | *Material* | *Context no* | *Lab ref* | $\delta^{13}C$(‰) | *Radio-carbon age (BP)* | *Calibrated date range (2σ) cal BC* |
|---|---|---|---|---|---|---|---|---|
| Avenue | | | | | | | | |
| 3 | Northern ditch | Stonehenge terminal (C6) on bottom | Antler | 1912 | OxA-4884 | -20.4 | 3935±50 | 2580–2300 |
| 3 | Northern ditch | Stonehenge terminal (C6) in primary silt | Antler | | BM-1164 | -23.7 | 3678±68 | 2290–1890 |
| 3 | Southern Ditch | 0.9km from Avon terminal (C86), on bottom | Animal bone | 9716 | OxA-4905 | -22.1 | 3865±40 | 2470–2200 |
| 3 | Southern ditch | N side of A344 (C83), primary fill nr bottom | Antler pick | 9718 | HAR-2013 | -23.6 | 3720±70 | 2350–1930 |
| Post-monument | | | | | | | | |
| | Palisade Ditch | Human burial cut into ditch (C81) | Human femur | 9470 | UB-3820 | -21.0±0.2 | 2468±27 | 780–410 |
| | Sarsen Circle | Stonehole 8 (C13), disturbed upper fill | Bone point | 2315 | OxA-4885 | -21.1 | 2840±60 | 1260–840 |
| Mesolithic | | | | | | | | |
| | Postpit 9580, tertiary | (C99) relates to cereal pollen *c* 30cm | *Pinus* charcoal | 9582 | OxA-4920 | -25.1 | 8400±100 | 7580–7090 |
| | Postpit 9580, secondary | (C99) relates to boreal woodland pollen *c* 40 cm | *Pinus* charcoal | 9585 | OxA-4919 | -25.4 | 8520±80 | 7700–7420 |
| | Postpit 9580, secondary | (C99) base of 2ndry recut fill | *Pinus* charcoal | 9585 | GU-5109 | -24.5 | 8880±120 | 8090–7580 |
| | Postpit A | (C82) at 0.76m | *Pinus* charcoal | – | HAR-455 | -24.2 | 9130±180 | 8820–7730 |
| | Postpit B | (C82) at 0.91m | *Pinus* charcoal | – | HAR-456 | -25.4 | 8090±140 | 7480–6590* |

## Analysis of the radiocarbon dates and their archaeological significance

*by C Bronk Ramsey and Michael J Allen*

The 52 accepted radiocarbon measurements (Table 64) enable an attempt to be made to answer many of the questions which have been posed about the chronology, longevity, and sequence of the events and phases of the monument and its associated features. In addition to the radiocarbon results there is relative dating information provided by the stratigraphic sequence. In order to use these two strands of evidence to the greatest effect, they must be analysed as a whole.

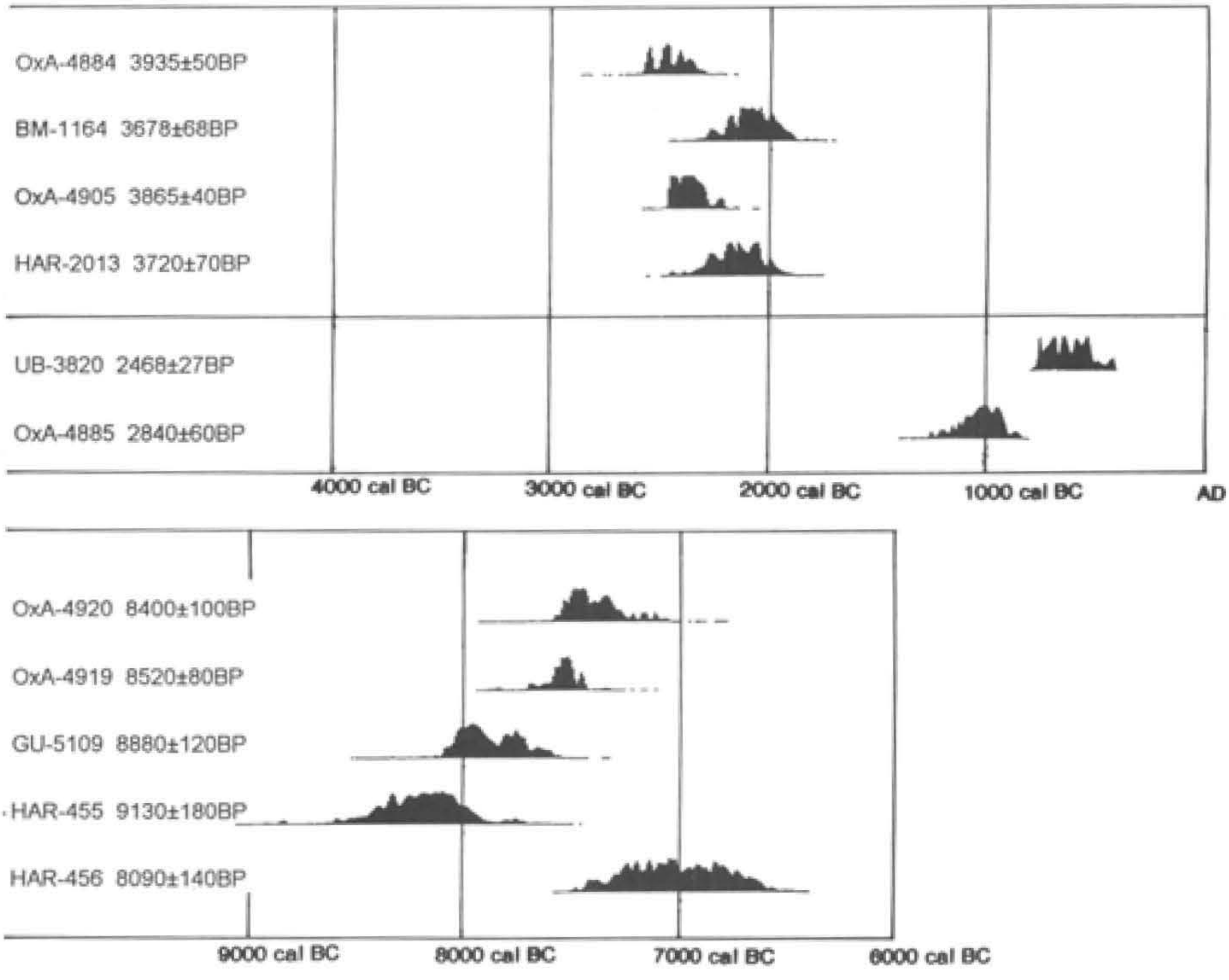
## Methods

The first stage in the analysis is to relate the dating evidence directly to the chronological time-scale by calibrating the radiocarbon results. This compares the radiocarbon measurement with others made on known-age tree rings. The maximum intercept ranges used in this volume are a convenient method of citation, but for more detailed analysis the precision of the probability method of calibration is required. This method is well documented (Stuiver and Reimer 1993; van der Plicht 1993; Dekling and van der Plicht 1993). In calibrating, a probability can be assigned to all possible dates, thereby building up a 'probability distribution'.

Implicit in this method of calibration is the assumption that we have no other information about the date of

**Table 64 (cont)**

*Lab ref* *Probability distribution*




the sample or, in other words, that before calibrating the measurement all dates are equally likely. In many cases this is not true and certainly in the case of Stonehenge there is information which relates to the relative ages of the samples from the recorded stratigraphy. It is possible to adjust the probability distributions after calibration to take into account this extra information, ie to combine information from calibrated radiocarbon determinations with the stratigraphic information.

There are, however, considerable potential dangers in this (Reece 1994), because the relationships between the radiocarbon dates and the physical stratigraphy are complex and understanding these involves all the skills of objective and analytical archaeological interpretation. For this reason two sets of results are presented, the simple calibrated radiocarbon dates (Table 64) which tell us about the objects themselves in isolation, and the results which include the interpretation and constraints provided by the stratigraphy. These constrained results may change as new evidence comes to light, but they give a more accurate view of the chronology based on the evidence currently available. These two sets of results are presented as probability distributions in Figures 267, 269–72, which show the constrained probability distributions in solid black, with the original unconstrained results in outline. This enables the reader to judge the effect of the mathematical modelling. In text all constrained dates are given in italics.

The methods used to incorporate the information from the site stratigraphy and to model the sequence of development of the monument are based on Gibbs Sampling techniques (Buck *et al* 1992; Gelfand and

Smith 1990). The method can be illustrated by considering a single probability distribution. A date is chosen at random, but in such a way that the probability of choosing any one date is the height of the probability distribution at that point. By making a very large number of such choices, a frequency distribution can be built up which approximates to the original distribution. The method can be extended to consider a large number of different distributions by choosing a date from each in the same way, only this time it is also ensured that the relationships between the samples are satisfied. In this way new probability distributions can be found which include the additional information.

These methods have been applied using the program OxCal (v2.16) (Bronk Ramsey forthcoming), which was written specifically for performing this sort of analysis and is based largely on the original mathematical work of Buck *et al*. The mathematical techniques have now been applied to a number of different archaeological sites (Buck *et al* 1991; 1992; 1994). In addition to the Gibbs sampling method itself, OxCal also includes statistical tests to check if the model is consistent with the dating evidence. These tests have been specially devised for the program, the threshold for acceptance being similar to the 5% chi-squared test. The test fails if the Gibbs sampler is forced to choose dates from very low parts of the probability distributions.

In addition to being able to modify the probability distributions in the light of extra information, it is also possible to answer specific questions using the methods outlined above. The most relevant here are those which relate to specific phases or groups of events. In general an event can either be dated directly (such as the growth of an antler) or by inference (such as the digging of a ditch using tools which themselves have been dated). Probability distributions can be built up for the first and last dated events in a phase along with the span of the dated events. Furthermore, if we make the assumption that the dated objects are fairly randomly selected from a phase during which material was deposited at a constant rate, we can use this information to estimate the likely start, end, and duration of the phase as a whole (including undated events). To obtain useful information of this sort a large number of determinations is required.

The stratigraphic sequence of the monument is presented in Chapters 5–7 of this volume. Most of the material dated has been selected because it is considered to be contemporary with the event or phase which it was desirable to date (*see above*), and so it should be possible to use the stratigraphic evidence with some confidence. Subsequently it has become evident that some of the selected material was intrusive or residual. If the dates produced by such material are included in the analysis the model is found to be inconsistent with the stratigraphic evidence. Although there is, inevitably, a certain degree of circularity in this argument, it is desirable to include as much of the evidence as possible in order to produce an internally consistent model. Clearly more than one model is possible: the mathematical techniques employed here are only an aid to archaeological interpretation, but they cannot replace it.

## Mesolithic postpits

Three of the four postpits in the car park (*Chapter 4*) produced radiocarbon dates of Mesolithic age from pine charcoal (Table 64). The recently excavated example (WA 9580) provides some stratigraphic information: the samples dated by OxA–4919 (8520±80 BP) and OxA–4920 (8400±100 BP) overlie that dated by GU–5109 (8880±120 BP). The samples of pine charcoal from WA 9580 were collected from both primary and secondary fills; they are possibly from a single post (*see Chapter 4*), but because they are small comminuted fragments it is not possible to be certain. For this reason this stratigraphic order has not been used to constrain the calibration of these results.

The five dates (Table 64) are assumed to be randomly selected from a uniformly deposited phase. This assumption will weight a short phase more strongly, but given the small number of dates, it will not give a useful estimate for the start or end of the phase. In this way the span of dated events is estimated to lie somewhere between *300 and 1600* years and the events are calculated to occur between *8500–7650 cal BC and 7500–6700 cal BC* (Fig 267).

The pine trees used for the posts themselves are suggested to have been not more than *c* 200 years old, and thus the span of about one millennium indicates the longevity of the Mesolithic activity, possibly consisting of repeated infrequent visits to the site. This indicates the potential importance of the area for human activity at a period over four millennia before the construction of the monument itself, a period for which we have very little other evidence from the area (cf Richards 1990).

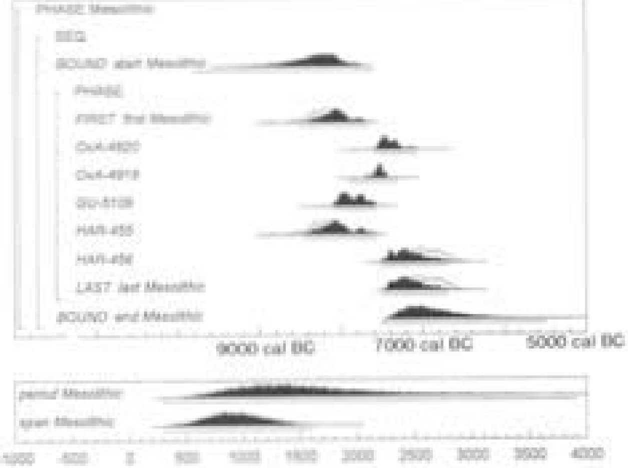



*Fig 267 Radiocarbon distributions of Mesolithic dates from Stonehenge*

## Pre-phase 1

The radiocarbon results were not without their surprises. One was the date from an animal bone (a cow-sized limb-bone) securely stratified in the packing stones of Stonehole 27. This bone was submitted in order to date the construction of the Sarsen Circle. In the event the determination (OxA–4902; 5350±80 BP) provided a date of 4360–3990 cal BC, which is considerably earlier even than the construction of the first phase monument (the digging of the Ditch; Fig 269), and the bone must therefore be residual from an earlier episode of activity. This is significant because we have no other evidence for activity at the monument at this date and relatively little evidence for this period in the vicinity (*Chapter 4*; Richards 1990). The date may provide evidence of human activity in the earlier Neolithic and advances the evidence of continued but sporadic activity before construction of the monument.

## Modelling the chronology of the main monument (phases 1–3)

The main stratigraphic information considered for the analysis of phases 1 and 2 can be summarised as follows:

1 The digging of the main Ditch must precede the placing (but not necessarily the acquisition) of structured deposits which are found in it. The antler picks used to dig the Ditch are likely to be more or less contemporary with the digging (*see above*), whereas other material placed on the bottom of the Ditch might have been collected and kept over a longer period of time before deposition.

2 The structured deposits and the digging of the Ditch must precede the gradual infilling of the main body of the Ditch (secondary fills) which constitutes phase 2. The possibility must be considered that some of the dated material is residual, even though all material was specifically selected for size and freshness in order to minimise this possibility. The analysis of the radiocarbon evidence on its own suggests that there is a probability of more than 95% that the ranges of dates from phase 1 and phase 2 overlap, indicating that some of the dated material in phase 2 is probably residual. Consequently we have not introduced the constraint that all the dated material from phase 1 must be earlier than the dated material from phase 2.

3 The secondary fills of phase 2 are cut by the Beaker-age burial of phase 3 which provides a *terminus ante quem* for this phase. Apart from this, we have no reason to suppose that phase 2 does not overlap with phase 3.

The acquisition of antler picks for the construction of the Ditch and the acquisition of the objects for the structured deposits are modelled as 'phases'. We assume the 13 samples submitted from these 'phases' to be a randomly selected sample from a uniform distribution. This enables us to estimate the endpoints and durations and these 'phases'.

Phase 3 consists of a number of discrete structural elements. The majority of these elements are in the form of concentric circles and so are not generally stratigraphically related. Each of them is considered to have been constructed over a short period of time. There are only a small number of radiocarbon determinations (Table 64) relating to these structural elements. In cases where there is more than one determination the acquisition of objects associated with these elements has been treated as a 'phase' and the distribution for the last dated event has been used as the best estimate of the date of construction. Unlike the 'phases' associated with the acquisition of the structured deposits and the antlers used in the digging of the main Ditch, it has not been assumed that material was uniformly distributed throughout the 'phase' since there are simply not enough reliable dates.

There is very limited stratigraphic information relating to the events within phase 3 and it can be summarised as follows:

1 the Sarsen Trilithons must be contemporary with or earlier than the Bluestone Horseshoe and Bluestone Circle,

2 the Sarsen Circle must be earlier than the Z Holes, and

3 the Q holes must be earlier than the Sarsen Circle and the Bluestone Circle (*but see above*).

All of this information can be summarised by the chronological sequence diagram (Fig 268). This diagram also shows the structural elements which have been treated mathematically as uniformly distributed 'phases', non-uniformly distributed 'phases', and those which have been treated as 'events'.

## The chronology of phase 1

### Curated and placed bone objects

The most significant surprise produced by the radiocarbon dating programme was that the dates of all the structured or placed deposits were earlier than those for the digging of the Ditch. Constraining the structured deposits to be later than the digging of the Ditch leads to a model which is significantly inconsistent (*see archive for details*). This places great importance on these objects and their locations. The four objects were two ox jaws found on the bottom of the Ditch terminals either side of the southern entrance, a red deer tibia from the same location, and an ox skull on the Ditch bottom in C29.4 near the possible third blocked entrance (*see Chapter 5*).

The analysis of these dates indicates that the acquisition of this material took place over an extended period prior to the digging of the Ditch, this period being

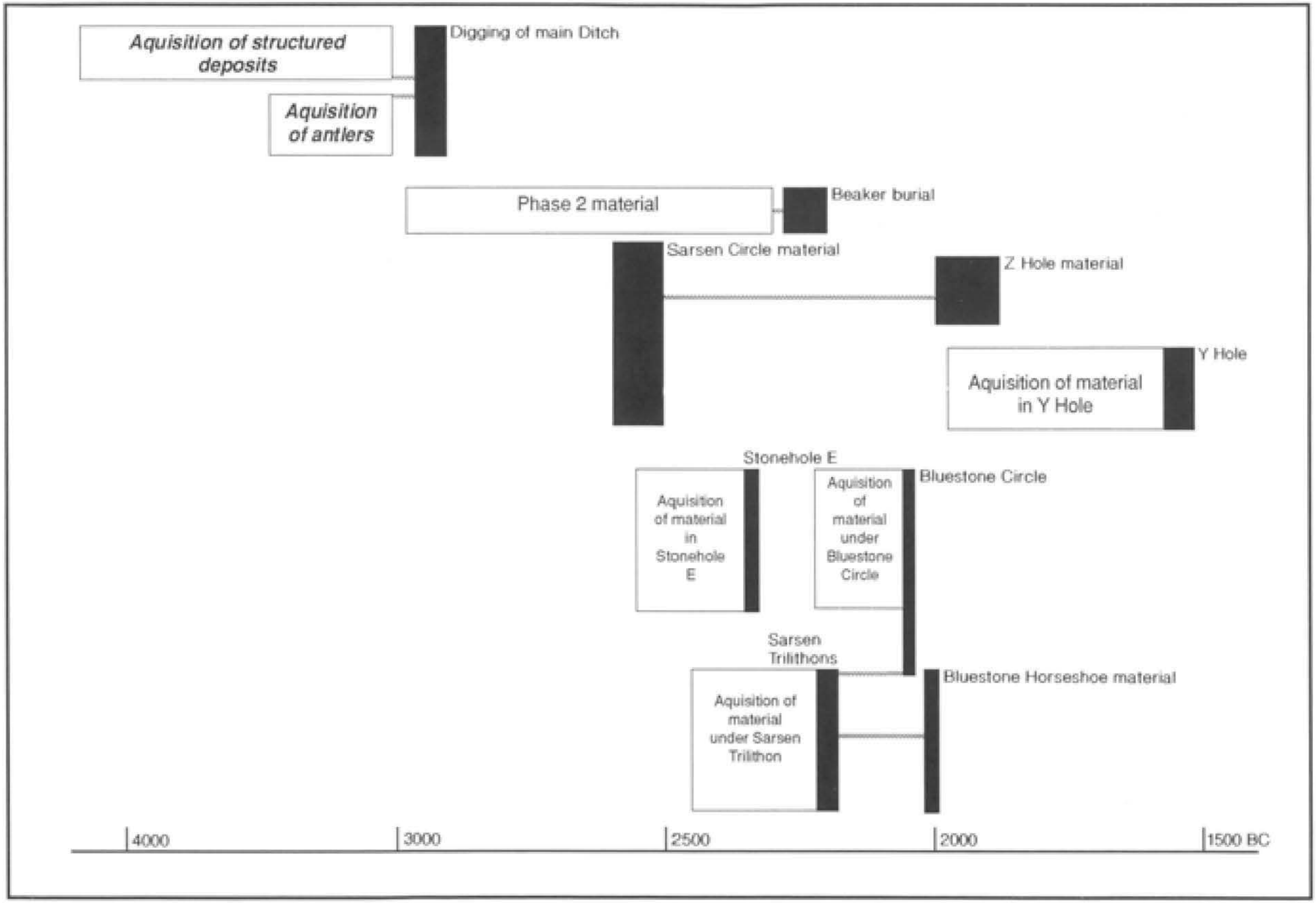



*Fig 268 Summary of the chronological sequence of the principal phases and events. The solid blocks represent events, the open blocks phases (in radiocarbon terms; see text). The horizontal lines indicate stratigraphic relationships and bold lettering indicates a uniform phase (see text)*

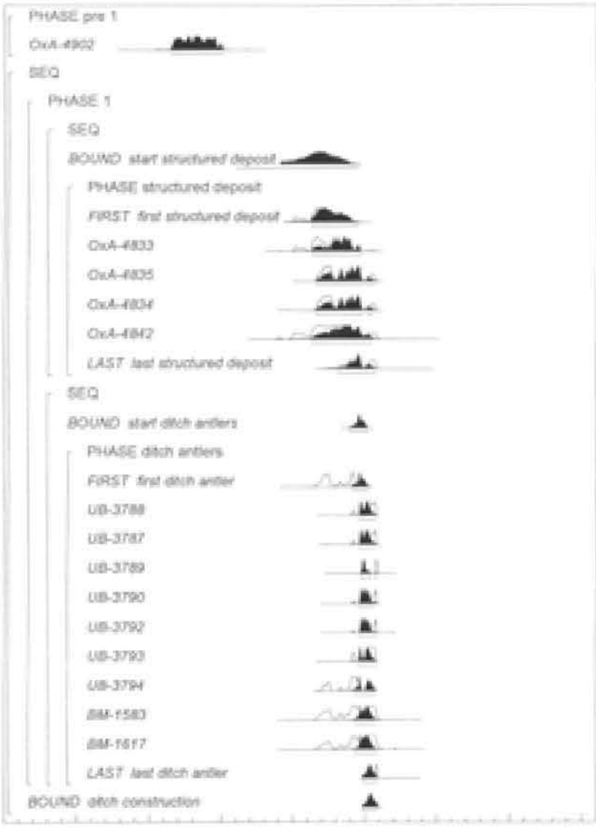



*Fig 269 Radiocarbon distributions of phase 1 dates from Stonehenge*

between *50 and 850* years. This analysis suggests that objects were collected between *3900–3050 cal BC and 3020–2910 cal BC* which provides a strong argument for the curation of these special objects before the deliberate act of placing them at strategic points on the base of the Ditch (*Chapter 5*).

### Enclosure Ditch

The date for the digging of the Ditch has been estimated from nine dates made on antlers from the base of the Ditch and the four dates from the structured deposits. Strictly speaking, these are the dates of the acquisition of those items and provide a *terminus post quem* for the digging of the Ditch. It is considered that the antlers would not have been kept for any length of time prior to their use in digging the Ditch (*see Chapter 9*) and the structured deposits were placed in the Ditch very soon after its digging, since there was no primary silt beneath them. Consequently the date of the Ditch construction must be very close to the date in which the last of this material was collected.

The analysis of the radiocarbon evidence shows that these antler picks were gathered over a period of *20–160* years and that the Ditch was dug, the antlers discarded, and the structured deposits placed, between *3020 and 2910 cal BC* (Fig 269).

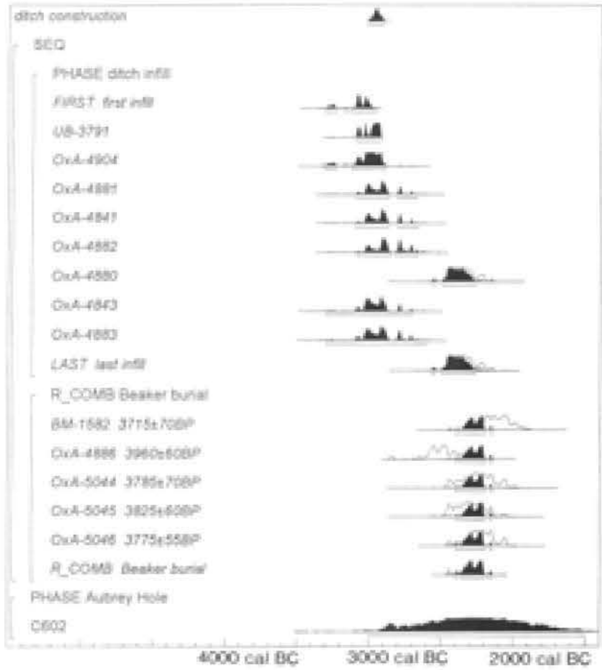



*Fig 270 Radiocarbon distributions of phase 2 dates from Stonehenge*

## The chronology of phase 2

### The Ditch

A series of eight new radiocarbon determinations (Table 64) was obtained from the secondary fills of the Ditch in order to attempt to date its accumulation. The samples, from animal bone and antler, were largely material excavated by Atkinson *et al* (*Chapter 5*) and were distributed from the base (OxA–4904; 4365±55 BP) to the upper portion (OxA–4881, 4300±60 BP) of the secondary fills (Fig 266).

Some of the dated material is probably residual from phase 1 (*see above*), and one antler from the earthy fill at the base of the secondary fill (OxA–4904, 4365±55 BP) gave a determination which equates well with those for the construction of the Ditch. This may be a fragment of antler tine broken from one of those at the bottom of the Ditch. Because some of the dated material is probably residual the best estimate of the accumulation of the ditchfills is provided by the difference between the construction date of the Ditch and the last dated event in the infill, which is constrained by the date of the Beaker-age burial. This approach cannot take into account events after the digging of the Ditch, but before the accumulation of the secondary fill (ie the accumulation of the primary fill itself) because there is no dated material from this deposit. No attempt has been made to model the rate of ditch infill because it has been recorded that the rates of sedimentation are not uniform (Crabtree 1980; Bell et al forthcoming; Evans 1990) and in analysis it cannot be treated as a uniform mathematical 'phase'.

The infilling of the secondary deposits before the Beaker-age burial (phase 2) took *400 to 730* years (ie the difference between digging the Ditch and the last dated event in the infill; Fig 270). However, many of the samples dated from this phase are likely to have been deposited well within the first century after construction. The fill accumulated between the digging of the Ditch (*3020–2910 cal BC*) and *2570–2260* cal BC* (or as a segmented range; *2570–2540 cal BC* (3%) or *2500–2260 cal BC* (92%)) ie the last dated event in phase 2.

### Aubrey Holes

Unfortunately it has not been possible to date more precisely either the excavation of the Aubrey Holes or the insertion of the human cremation burials into them as there was insufficient collagen in the only available artefacts (skewer pins). The single determination (C-602; 3798±275 BP) from charcoal associated with a cremation is too imprecise to be very informative, giving a calibrated date range of 3020–1520 cal BC (Fig 270).

## The chronology of phase 3

It was hoped that a series of radiocarbon dates would improve upon and potentially revise the published sequence of events (Atkinson 1979) within this phase. In reality, however, very little suitable material was available (as discussed above) and thus only a limited series of samples was submitted for dating. This resulted in 16 new determinations for the monument and 2 for the Avenue.

The span of phase 3 is between *850 and 1090* years, with the first dated event (Sarsen Circle) dating to *2850–2480* cal BC* and the last dated event (the Y Holes) at *1640–1520 cal BC* (Figs 268 and 271). It is very clear that phases 2 and 3 overlap, with a probability of 98%. The estimated dates for the individual events within phase 3 are given below. Shorter ranges, which include a very high percentage of the probability can be cited if we use segmented ranges (Table 65) based on the probability distributions. Where these segmented ranges are considered to make an appreciable difference this is noted below.

**Table 65 Details of segmented date ranges as appropriate for events in phase 3**

| *Event* | *Segmented ranges (cal BC)* | | |
|---|---|---|---|
| Sarsen Circle | 2620–2480 (92%) | 2660–2640 (2%) | 2850–2830 (1%) |
| Stonehole E | 2480–2270 (92%) | 2240–2200 (3%) | |
| Beaker-age burial | 2360–2190 (90%) | 2170–2140 (3%) | 2400–2380 (2%) |
| Sarsen Trilithons | 2440–2100 (95%) | | |
| Bluestone Circle | 2280–2030 (95%) | | |
| Z Hole | 2030–1750 (95%) | | |
| Y Hole | 1640–1520 (95%) | | |

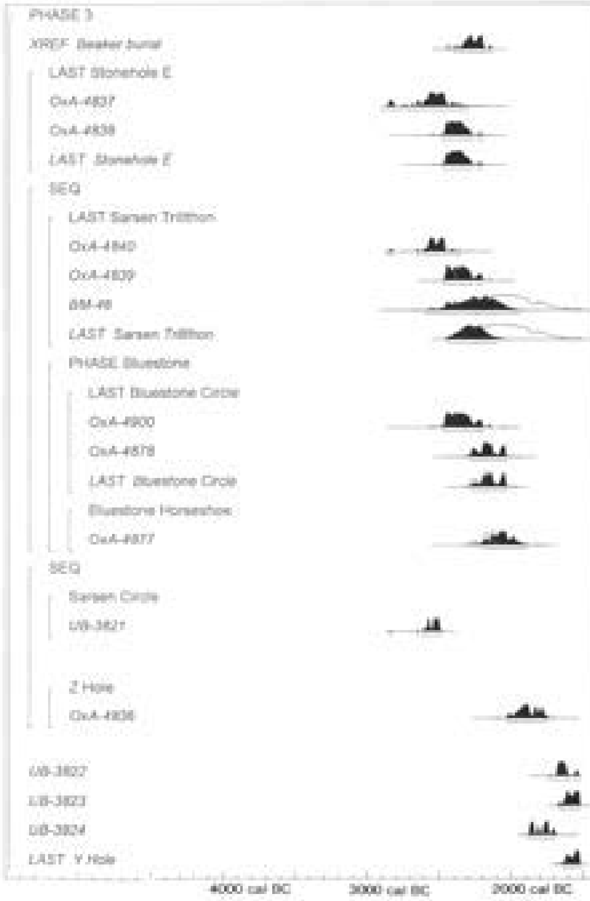



*Fig 271 Radiocarbon distributions of phase 3 dates from Stonehenge*

### Sarsen Circle

The date for the Sarsen Circle is based on a single determination (Stonehole 1) of 4023±21 BP (UB-3821), giving an calculated range of *2850–2480 cal BC*. However, there is also a 92% probability that the calendar date lies in the shorter range of 2620–2480 cal BC (92%) (Table 65).

### Stonehole E

On the basis of the position of Stonehole E in the entrance to the enclosure it was initially considered that it might have been a part of the phase 1 monument (Atkinson 1979), but the radiocarbon determinations (OxA-4837; 3995±60 BP and OxA-4838; 3885±40 BP) place it firmly within phase 3. The analysis provides an estimated date for the construction (the last dated event) of *2480–2200 cal BC*.

### Beaker-age burial

The five determinations from the Beaker-age burial are not significantly different at 95% confidence (Ward and Wilson 1978) and so a weighted mean may be taken of the results (3817±27 BP; BM-1582, OxA-4886, OxA-

5044 to OxA–5046). The best estimate for the date of this burial is *2400–2140 cal BC*, slightly earlier than the previously estimate of 2340–1930 cal BC (3715±70 BP, BM–1582). This date demonstrates that the burial is another event within phase 3 and also provides an earlier constraining date for the end of phase 2.

**Sarsen Trilithons**

The Sarsen Trilithons are dated by three determinations; one from Trilithon stonehole 53/54 (OxA–4840, 3985±45 BP) and two from Trilithon Stonehole 56 (OxA–4839, 3860±40 BP and BM–46, 3670±150 BP). Analysis of these determinations provides a best estimate of the date of construction of *2440–2100 cal BC*, which is broadly contemporary with the Beaker-age burial.

**Bluestone Circle**

Two new determinations provide the only results for the Bluestone Circle (OxA–4900, 3865±50 BP and OxA–4878, 3740±40 BP). Analysis provides a best estimate of construction of *2280–2030 cal BC*.

**Bluestone Horseshoe**

The dating of the Bluestone Horseshoe is based upon a single determination (OxA–4877; 3695±55 BP) providing an estimated date of the construction of this setting of *2270–1930 cal BC*.

**Z Holes**

The Z Holes are dated by a single determination from Z Hole 29 (OxA–4836; 3540±45 BP) which provides a calculated range of *2030–1750 cal BC*.

**Y Holes**

Three determinations from antlers, all stacked on the bottom of Y Hole 30 (UB±3822; 3341±22 BP, UB–3823; 3300±19 BP, and UB–3824; 3449±24 BP) enabled analysis which provides an estimate of *1640–1520 cal BC* for the last constructional event at Stonehenge.

**Order of construction**

The stratigraphic information combined with the radiocarbon evidence provides a most likely order for all the dated constructional events of:

Q and R Holes
Sarsen Circle
Stonehole E
Beaker-age burial
Sarsen Trilithons
Bluestone Circle
Bluestone Horseshoe
Y Holes and Z Holes

although this has a probability of only 26%. The probabilities of the relative order of groups of events are more informative however, since they indicate the strengths and weaknesses of this order.

The constructional sequence is based on only 18 determinations (5 of which are from the Beaker-age burial) spread over 8 events. The probabilities for these orders are the best estimates given the data presented here, but some constructional events are dated entirely by a single determination. The Sarsen Circle, for instance, seems very likely to be the first dated event (over 95% confidence) but as this relies on only one sample which could be residual our confidence may be misplaced. With this in mind the relative order of some of the events appears well known, while others are rather uncertain. For instance it is very likely that the Y Holes are the last dated event (over 95% confidence). The main areas of uncertainly are the relative order of the Beaker-age burial and the Sarsen Trilithons, and the relative order of the two main Bluestone settings.

If the sequence is analysed using groups of constructional elements that are believed archaeologically to belong together, rather than by the individual structural elements (three of which rely on single determinations), then an order which has a higher level of confidence and which is more reliable can be given. The constructional groups are considered to be Q and R Holes, Sarsen settings (Sarsen Circle and Trilithons), Bluestone settings (Bluestone Circle and Horseshoe), and the Y and Z Holes (*Chapter 7*). The analysis of these groups gives an order with a confidence level better than 95%.

| | Sub-phase |
|---|---|
| Q and R Holes | 3i |
| Sarsen settings | 3ii |
| Bluestone settings | 3iv–3v |
| Y and Z Holes | 3vi |

The relationship between the Q and R Holes and Sarsen settings is demonstrated by stratigraphy. The order of the Sarsen settings to the Bluestone settings is based on stratigraphic evidence and seven determinations and is known with more than 95% confidence. Finally, the relationship between the Bluestone settings and the Y and Z Holes is based on seven determinations (independent of any archaeological information) and is known with more than 95% confidence. There are no stratigraphic relationships for this pair.

**Avenue**

The Avenue extends over a distance of nearly 2.8km but has only produced four radiocarbon results that are considered reliable (Table 64). There is no stratigraphic information which can be used to relate any of these dated items. It would, however, be useful if the dating evidence could determine whether the two main sections of the Avenue (that near the monument and that beyond the elbow at Stonehenge Bottom (Plan 4, Zone C) were contemporaneous, or if not, whether it could determine the order of construction of the two lengths.

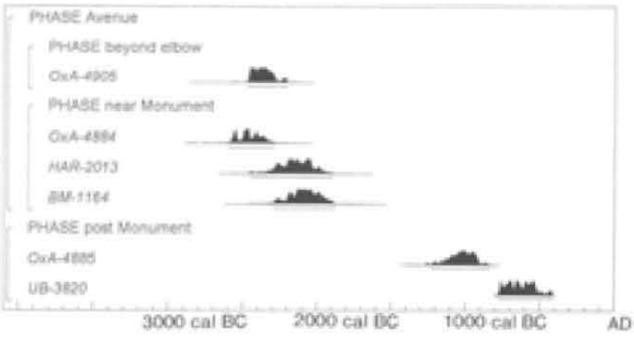



*Fig 272 Radiocarbon distributions of the Avenue and post-monument dates*

The results of the dating analysis are inconclusive. The dated objects cover a period of *190 to 640* years indicating that the construction may have extended over several centuries. It is most likely (*c* 80%) that the first dated event (*2590–2330 cal BC*) comes from the section nearest the monument (Zone G) but it is almost certain (98%) that the last dated event (*2240–1880 cal BC*) also comes from this zone. Given the span of the dates, and the fact that there is only one from the length between the elbow and the river Avon, it is very difficult to make any deductions about the order of construction (Fig 272). The radiocarbon evidence confirms, however, that the Avenue was constructed during phase 3, which accords well with the results of Montague's re-examination of the the archaeological excavations along its length (*Chapter 7*).

## Post-phase 3

### Artefacts

Only one cultural artefact was submitted on the basis of intrinsic significance, a bone point (WA obj no 24). This provided a date of 1260–840 cal BC (OxA-4885; 2840±60 BP), placing it in the Middle Bronze Age. The closest comparison which has been found for this item comes from an unstratified assemblage at Hockwold, Norfolk, associated with Middle Bronze Age pottery (J Davies and S Margeson pers comm, *see Chapter 9*).

### Iron Age burial

The human skeleton (cat no PUP69, context 9470) was dated in an attempt to provide a *terminus ante quem* for the Palisade Ditch (C8; *Chapter 6*). This feature produced little diagnostic artefactual material but on the basis of the few objects recovered and in comparison with other sites it was expected to be of later Neolithic date. The burial was expected to be of Beaker or Early Bronze Age date and to be broadly contemporary with the earlier part of phase 3. A femur was submitted for radiometric dating at Belfast, but the determination (UB-3820, 2468±27 BP) gave an Iron Age date of 780–410 cal BC, from which it can only be deduced that the Palisade Ditch was prehistoric. Perhaps the most useful aspect of this date is that it demonstrates that this area was used for burial almost 1000 years after the use of the monument itself. This provides evidence for another discrete episode of activity not previously recognised.

## Conclusions

The following date ranges can be applied to the major phases and events at Stonehenge:

| | Span of event(s) (years) | Calculated date range (cal BC) |
|---|---|---|
| Mesolithic postpits | *300–1600* | *8500–7650 to 7500–6700* |
| **Phase 1** | | |
| Curated material | *50–850* | *3900–3050 to 3020–2910* |
| Ditch construction | | *3020–2910* |
| **Phase 2** | | |
| Secondary fills | *400–730* | *3020–2910 to 2570–2260* |
| **Phase 3** | | |
| Sarsen Circle | | *2850–2480* |
| Stonehole E | | *2480–2200* |
| Beaker-age burial | | *2400–2140* |
| Sarsen Trilithons | | *2440–2100* |
| Bluestone Circle | | *2280–2030* |
| Bluestone Horseshoe | | *2270–1930* |
| Z Holes | | *2030–1750* |
| Y Holes | | *1640–1520* |
| Phase 3 | *850–1090* | *2850–2480* to 1640–1520* |

In addition the radiocarbon programme has:

1. confirmed the presence, and indicated the longevity, of previous Mesolithic activity in the area,
2. identified activity in the earlier Neolithic, not previously recognised, and
3. identified an inhumation of the Iron Age.

## Global estimated dates

These dates provide a detailed analytical tool for the analysis and understanding of the chronology and order of construction for Stonehenge. For specific events, such as the construction of the Ditch or the Beaker-age burial, the dates above provide the most accurate way of describing the chronology of these events. However, for some of the archaeological phases we have not been able to date all the events (eg the primary fill and organic horizons in the Ditch, phase 1) and elsewhere we have not been able to determine the start of the phase by

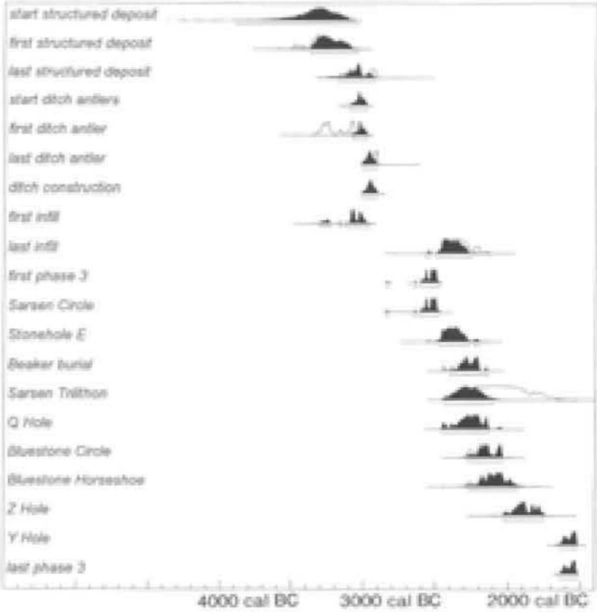



*Fig 273 Summary of radiocarbon distributions of the main dated events*

radiocarbon determinations (eg secondary infill of the Ditch because of residual material; *see above*), but know that is must occur immediately after the estimated end of phase 1. Because the radiocarbon results do not date all of the activities in each phase the duration of the phases has been estimated on the basis of a combination of those radiocarbon dates that have been obtained (*see above*) and our archaeological knowledge of both the undated activities (*Chapters 5–7*) and the processes of ditch silting which are applicable here (*Chapter 1*). For phase 3 it is possible to give an overall estimate for the phase based on the radiocarbon probability distributions of chronological model (Fig 268) presented above which already takes into account both the radiocarbon results and the archaeological information. These estimates provide an easy global reference to all the phases, but are no substitute for the detailed analytical results presented above.

These estimated dates are as follows and these are used as the global summary references throughout the volume:

| | |
|---|---|
| Mesolithic activity | 8100–7100 BC |
| Phase 1<br>Construction of the Ditch | 2950 BC |
| Ditch construction and<br>formation of primary silt | 2950–2900 BC |
| Phase 2 | 2900–2400 BC |
| Phase 3 | 2550–1600 BC |

# Appendix 3 Concordance of twentieth-century interventions by year, cutting, and intervention number

| Year | Cutting no | Intervention | Excavator | Description | Exc trench no/site code |
|---|---|---|---|---|---|
| 1901 | 64 | 5001 | Gowland | Stone 56 | I |
| 1901 | 64 | 5002 | Gowland | Stone 56 | 11 |
| 1901 | 64 | 5003 | Gowland | Stone 56 | 111 |
| 1901 | 64 | 5004 | Gowland | Stone 56 | 1V |
| 1901 | 64 | 5005 | Gowland | Stone 56 | V |
| 1901 | 64 | 5006 | Gowland | Stone 56 | VI |
| 1901 | 64 | 5007 | Gowland | Stone 56 | VII |
| 1901 | 64 | 5008 | Gowland | Stone 56 | VIII |
| 1901 | 64 | 5009 | Gowland | Stone 56 | Q |
| 1901 | 65 | 5010 | Gowland | East of Stone 56 | A |
| 1901 | 66 | 5011 | Gowland | Near Z Hole 16 | B |
| 1901 | 67 | 5012 | Gowland | East of Stone 120 | C |
| 1901 | 68 | 5013 | Gowland | NNW of Stone 156 | D |
| 1901 | 69 | 5014 | Gowland | East of north end of Stone 156 | E |
| 1901 | 70 | 5015 | Gowland | North of Stone 36 | F |
| 1919 | 103 | 5031 | Newall/ MOW | Water pipe parallel to A344, section recorded | |
| 1919 20 | 1 | 5051 | Hawley | Stones 6 & 7 | |
| 1920 | 2.1 | 5052 | Hawley | Stones 1 & 30 | |
| 1920 | 2.2 | 5053 | Hawley | Stone 2 | |
| 1920 | 2.3 | 5054 | Hawley | Stone 29 | |
| 1920 | 2.4 | 5055 | Hawley | Stone 31 | |
| 1920 | 2.5 | 5056 | Hawley | Stone 49 | |
| 1920 | 3.1 | 5057 | Hawley | Stone 95 (Slaughter Stone) | |
| 1920 | 3.2 | 5058 | Hawley | Stone 95 trial trench | |
| 1920 | 18.1 | 5059 | Hawley | Bank, section through | |
| 1920 | 18.2 | 5060 | Hawley | Ditch section, continuation of 5059 | I |
| 1920 | 18.3 | 5061 | Hawley | Ditch section SW of 5060 | I |
| 1920 | 18.4 | 5062 | Hawley | Extension of 5059 towards stones to investigate bush hole | |
| 1920 | 4.1 | 5063 | Hawley | South Barrow trench | |
| 1920 | 32.1 | 5064 | Hawley | Aubrey Hole 1 | |
| 1920 | 32.2 | 5065 | Hawley | Aubrey Hole 2 | |
| 1920 | 32.3 | 5066 | Hawley | Aubrey Hole 3 | |
| 1920 | 32.4 | 5067 | Hawley | Aubrey Hole 4 | |
| 1920 | 32.5 | 5068 | Hawley | Aubrey Hole 5 | |
| 1920 | 32.6 | 5069 | Hawley | Aubrey Hole 6 | |
| 1920 | 32.7 | 5070 | Hawley | Aubrey Hole 7 | |
| 1920 | 32.8 | 5071 | Hawley | Aubrey Hole 8 | |
| 1920 | 32.9 | 5072 | Hawley | Aubrey Hole 9 | |
| 1920 | 32.10 | 5073 | Hawley | Aubrey Hole 10 | |
| 1920 | 32.11 | 5074 | Hawley | Aubrey Hole 11 | |
| 1920 | 32.12 | 5075 | Hawley | Aubrey Hole 12 | |
| 1920 | 32.13 | 5076 | Hawley | Aubrey Hole 13 | |
| 1920 | 32.14 | 5077 | Hawley | Aubrey Hole 14 | |
| 1920 | 32.15 | 5078 | Hawley | Aubrey Hole 15 | |
| 1920 | 32.16 | 5079 | Hawley | Aubrey Hole 16 | |
| 1920 | 32.17 | 5080 | Hawley | Aubrey Hole 17 | |
| 1920 | 32.19 | 5081 | Hawley | Aubrey Hole 19 | |
| 1920 | 32.20 | 5082 | Hawley | Aubrey Hole 20 | |
| 1920 | 32.21 | 5083 | Hawley | Aubrey Hole 21 | |
| 1920 | 32.22 | 5084 | Hawley | Aubrey Hole 22 | |
| 1920 | 32.23 | 5085 | Hawley | Aubrey Hole 23 | |
| 1920 | 32.24 | 5086 | Hawley | Aubrey Hole 24 | |
| 1920 | 32.25 | 5087 | Hawley | Aubrey Hole 25 | |
| 1920 | 32.26 | 5088 | Hawley | Aubrey Hoe 26 | |
| 1920 | 32.56 | 5089 | Hawley | Aubrey Hole 56 | |
| 1920 | 19 | 5091 | Hawley | Ditch (SW of 5061) 12ft x 12ft (3.66 x 3.66 m) | II |
| 1920–21 | 20 | 5090 | Hawley | Ditch (SW of 5091) 26ft (7.9m) long | III |
| 1920 | 31.3 | 5092 | Hawley | Fence posthole (contained human bone) | |
| 1920 | 31.8 | 5093 | Hawley | Hole, possibly near Aubrey Hole 14 | |
| 1920 | 31.9 | 5094 | Hawley | Crane foundation opposite Stones 29-2 | |
| 1920 | 31.10 | 5095 | Hawley | Crane foundation | |
| 1921 | 4.2 | 5101 | Hawley | South Barrow (includes bank sections, excludes Aubrey Hole & 5063) | |
| 1921 | 21 | 5102 | Hawley | Ditch (SW of 5090) 26ft (7.92m) long | IV |
| 1921 | 32.27 | 5103 | Hawley | Aubrey Hole 27 | |
| 1921 | 32.28 | 5104 | Hawley | Aubrey Hole 28 | |
| 1921 | 32.29 | 5105 | Hawley | Aubrey Hole 29 | |
| 1922 | 22 | 5151 | Hawley | Ditch (opposite AH 2–4) 26ft (7.9m) long | V |
| 1922 | 23 | 5152 | Hawley | Ditch (NW of 5151) 26ft (7.9m) long | VI |
| 1922 | 24 | 5153 | Hawley | Ditch and Terminal (SE end) 20ft (6.1m) long | VII |
| 1922 | 5 | 5154 | Hawley | Entrance causeway (excludes Aubrey Hole 55) | |
| 1922 | 32.55 | 5155 | Hawley | Aubrey Hole 55 | |
| 1922 | 25 | 5156 | Hawley | Ditch terminal (NW end) | |
| 1922 | 32.18 | 5157 | Hawley | Aubrey Hole 18 | |
| 1922 | 31.11 | 5158 | Hawley | Investigation of 'natural' chalk hole | |
| 1923 | 33.1 | 5201 | Hawley | Z Hole 1 | |
| 1923 | 33.2 | 5202 | Hawley | Z Hole 2 | |
| 1923 | 33.3 | 5203 | Hawley | Z Hole 3 | |
| 1923 | 33.4 | 5204 | Hawley | Z Hole 4 | |
| 1923 | 33.5 | 5205 | Hawley | Z Hole 5 | |
| 1923 | 33.6 | 5206 | Hawley | Z Hole 6 | |
| 1923 | 33.7 | 5207 | Hawley | Z Hole 7 | |
| | | 5208 | | NOT USED | |
| 1923 | 33.9 | 5209 | Hawley | Z Hole 9 | |
| 1923 | 33.10 | 5210 | Hawley | Z Hole 10 | |
| 1923 | 33.11 | 5211 | Hawley | Z Hole 11 | |
| 1923 | 33.29 | 5212 | Hawley | Z Hole 29 | |
| 1923 | 33.30 | 5213 | Hawley | Z Hole 30 | |
| 1923 | 34.1 | 5214 | Hawley | Y Hole 1 | |
| 1923 | 34.2 | 5215 | Hawley | Y Hole 2 | |
| 1923 | 34.3 | 5216 | Hawley | Y Hole 3 | |
| 1923 | 34.4 | 5217 | Hawley | Y Hole 4 | |
| 1923 | 34.5 | 5218 | Hawley | Y Hole 5 | |
| 1923 | 34.6 | 5219 | Hawley | Y Hole 6 | |
| 1923 | 34.7 | 5220 | Hawley | Y Hole 7 | |
| 1923 | 34.8 | 5221 | Hawley | Y Hole 8 | |
| 1923 | 34.9 | 5222 | Hawley | Y Hole 9 | |
| 1923 | 34.10 | 5223 | Hawley | Y Hole 10 | |
| 1923 | 34.11 | 5224 | Hawley | Y Hole 11 | |
| 1923 | 34.29 | 5225 | Hawley | Y Hole 29 | |
| 1923 | 34.30 | 5226 | Hawley | Y Hole 30 | |
| 1923 | 9 | 5227 | Hawley | Irregular strip between Y Holes 9 & 10 | |
| 1923 | 30 | 5228 | Hawley | Station Stone 91 | |
| 1923 | 31.1 | 5229 | Hawley | 5ft (1.5m) cut on slope of bank, SE of Slaughter Stone | |
| 1923 | 31.2 | 5230 | Hawley | Cut 13ft (4m) SE of Slaughter Stone (includes area of Aubrey Hole 3) | |
| 1923 | 31.4 | 5231 | Hawley | Hole outside ditch (natural) | |
| 1923 | 31.5 | 5232 | Hawley | Small rectangular cut NE of Aubrey Hole 2 | |
| 1923 | 31.6 | 5233 | Hawley | Probable bush hole, outside ditch, S side | |
| 1923 | 31.7 | 5234 | Hawley | Probable bush hole, outside ditch NE side | |
| 1923 | 7.1–7.107 | 5235–5342 | Hawley | Trial trenches 1 to 107, general trenching to chalk natural on NE side of monument | |

| *Year* | *Cutting no* | *Inter-vention* | *Excavator* | *Description* | *Exc trench no/site code* |
|---|---|---|---|---|---|
| 1923 | 8 | 5343 | Hawley | Area around Stones 8 & 9b extending back towards the Z Holes (includes an exploration to try to find ZH 8) | |
| 1923 | 6 | 5344 | Hawley | Narrow trench, full section across the Avenue | 'First' |
| 1923 | 6 | 5345 | Hawley | Narrow trench, full cross section across the Avenue | 'Second' |
| 1923 | 6 | 5346 | Hawley | N ditch of the Avenue from junction with henge, extending east | |
| 1923 | 6 | 5347 | Hawley | S ditch of the Avenue from the henge east (not a full section) | |
| 1923 | 6 | 5348–5355 | Hawley | Trial trenches 1–8 on Avenue | |
| 1923 | 6 | 5357 | Hawley | Heelstone Ditch | |
| 1923 | 88 | 6001 | Crawford and Passmore | Trench across Avenue on King Barrow Ridge | |
| 1923 | 104 | 6002 | Crawford and Passmore | Trench across Avenue South near present day A303 | |
| 1923 | 105 | 6003 | Crawford and Passmore | Trench across Avenue near Stonehenge–Amesbury Road | |
| 1924 | 34.12 | 5401 | Hawley | Y Hole 12 | |
| 1924 | 34.13 | 5402 | Hawley | Y Hole 13 | |
| 1924 | 34.14 | 5403 | Hawley | Y Hole 14 | |
| 1924 | 34.15 | 5404 | Hawley | Y Hole 15 | |
| 1924 | 33.12 | 5405 | Hawley | Z Hole 12 | |
| 1924 | 33.13 | 5406 | Hawley | Z Hole 13 | |
| 1924 | 33.14 | 5407 | Hawley | Z Hole 14 | |
| 1924 | 33.15 | 5408 | Hawley | Z Hole 15 | |
| 1924 | - | 5409 | Hawley | Between Stones 150 and 32 (included within C12) | |
| 1924 | 13 | 5410 | Hawley | Inside Stones 8 and 9, Stones 34 and 33 | |
| 1924 | 16.1 | 5411 | Hawley | Stone 12 | |
| 1924 | 16.2 | 5412 | Hawley | Stone 13 | |
| 1924 | 16.3 | 5413 | Hawley | Around Z Hole 13 | |
| 1924 | 17 | 5414 | Hawley | Stones 15 to 57 | |
| 1924 | 26 | 5415 | Hawley | Ditch (SW of 5102) nearly 80' long | |
| 1924 | 32.30 | 5416 | Hawley | Aubrey Hole 30 | |
| 1924 | 54 | 5417 | Hawley | Near Stone 72 | |
| 1924 | – | 5418 | Hawley | Irregular area noted on MoW plan (part of general trenching C10) | |
| 1924 | 10.1–10.109 | 5419–5529 | Hawley | Trial trenches 1 to 107, general trenching to chalk natural adjacent to C7 | |
| 1925 | 11.1–11. 15 | 5551–5565 | Hawley | Trial trenches 1 to 15, general trenching to chalk natural adjacent to C10 | |
| 1925 | 28.1–28.20 | 5566–5585 | Hawley | Ditch section (between 5061 & 5151) 190ft (58m) long | |
| 1926 | 29.1–29.12 | 5601–5612 | Hawley | Ditch section (SW of 5415) 120ft (41m) long | |
| 1926 | 12.1 | 5613 | Hawley | 4ft (1.2m) from Stone 31 | |
| 1926 | 12.2 | 5614 | Hawley | Opposite Stone 49 | |
| 1926 | 12.3 | 5615 | Hawley | Opposite Stone 48 | |
| 1926 | 12.4 | 5616 | Hawley | Lintel fragments 160 A–C | |
| 1926 | 12.5 | 5617 | Hawley | Opposite Stones 46 and 47 | |
| 1926 | 12.6 | 5618 | Hawley | South of 5613 | |
| 1926 | 12.7 | 5619 | Hawley | Near Stones 60 and 46 to 49 | |
| 1926 | 12.8 | 5620 | Hawley | Peripheral areas later encompassed in 1956 exc | |
| 1926 | 12.9 | 5621 | Hawley | Small cut near Stonehole J | |
| 1926 | 12.10 | 5622 | Hawley | Near Stone 150 | |
| 1927 | 89 | 6051 | RCC Clay | 'probably immediately north of Stonehenge–Amesbury Road' | |
| 1929 | 111 | 5623 | Newall and Engle-heart | Removed soil from around Stone 36 to allow mortises to be felt, but not photographed (Ref: Atkinson 1965, 52) | |
| 1935 | 94 | 610–6129 | WEV Young | Excavations in advance of car park | I to XXVII plus Annex I and II |
| 1950 | 32.31 | 5651 | Atkinson *et al* | Aubrey Hole 31 | |
| 1950 | 32.32 | 5652 | Atkinson *et al* | Aubrey Hole 32 | |
| 1950 | 112 | 5653 | RS Newall | Small shallow excavation for examination of Stone 66 (did not go to base of stone) | |
| 1952 | 113 | 5654 | RS Newall | Small excavation for examination of Stones 71&72 | |
| 1953 | 33.16 | 5701 | Atkinson *et al* | Z Hole 16 | |
| 1953 | 34.16 | 5702 | Atkinson *et al* | Y Hole 16 | |
| 1953 | 36 | 5703 | Atkinson *et al* | From Heelstone to Avenue Ditch | |
| 1953 | 38 | 5704 | Atkinson *et al* | 'Oblique Ditch' section (Avenue elbow) | |
| 1953 | 95 | 5705 | Atkinson *et al* | Section through N Ditch of Avenue (also section through the 'Oblique Ditch') | |
| 1953 | 39 | 5706 | Atkinson *et al* | 'Butterfly' Ditch section of N ditch of Avenue, just E of elbow and also through 'Oblique Ditch' | |
| 1953 | 40 | 5707 | Atkinson *et al* | Section through S ditch of Avenue and 'Newall's Mound' | |
| 1953 | 37 | 5708 | Atkinson *et al* | Gate Ditch section | |
| 1954 | 41 | 5751 | Atkinson *et al* | Ditch section W of entrance | AE |
| 1954 | 42 | 5752 | Atkinson *et al* | Ditch Section W of 5751 | LQ |
| 1954 | 43.1 | 5753 | Atkinson *et al* | Section through Bank | RV |
| 1954 | 43.2 | 5754 | Atkinson *et al* | Section through Counterscarp Bank | |
| 1954 | 44 | 5755 | Atkinson *et al* | Section through Bank opposite Aubrey Hole 14 | |
| 1954 | 45 | 5756 | Atkinson *et al* | Stones 32–33 | |
| 1954 | 14/46 | 5757 | Atkinson *et al* | Stonehole 33a, Q/R Holes 8. Reopened 1964 with C13 | J |
| 1954 | 47 | 5758 | Atkinson *et al* | Stone 36 | |
| 1956 | 12 | 5801 | Atkinson *et al* | Re-excavation of Hawley trench — Stones 46 to 49, 31–32, 150 and 160 | I |
| 1956 | 48 | 5802 | Atkinson *et al* | Avenue cutting NE of the A344 | |
| 1956 | 49 | 5803 | Atkinson *et al* | Ditch section, opposite (unexcavated) Aubrey Hole 40 | IV |
| 1956 | 50 | 5804 | Atkinson *et al* | Ditch section at Station Stone 94 | V |
| 1956 | 51 | 5805 | Atkinson *et al* | Heelstone Ditch, Section | VI |
| 1956 | 35 | 5806 | Atkinson *et al* | Trench between Stones 59A, 58, 70 | III |
| 1956 | 90 | 5807 | Atkinson *et al* | Trial trench looking for Avenue (not found) | |
| 1956 | 106 | 5808 | Atkinson *et al* | Trial trench looking for Avenue (not found) | |
| 1956 | 17 | 5851 | Atkinson *et al* | Re-excavation of Hawley trench between Sarsen Circle and Horseshoe | II |
| 1958 | 52 | 5852 | Atkinson *et al* | Stones 22, 58,69 and 70 | |
| 1958 | 53 | 5853 | Atkinson *et al* | Stones 55A and Altar Stone | |

| *Year* | *Cutting no* | *Inter-vention* | *Excavator* | *Description* | *Exc trench no/site code* |
| --- | --- | --- | --- | --- | --- |
| 1959 | 54 | 5901 | Atkinson *et al* | Stones 60, 72 and 59A (incorporating Hawley 1924 trench) | |
| 1959 | 55 | 5902 | Atkinson *et al* | Stones 4 and 5 | |
| 1964 | 13 | 5951 | Atkinson *et al* | Re-excavation of Hawley 1924 trench, Stones 8 and 9 | |
| 1964 | 56 | 5952 | Atkinson *et al* | Stones 53 and 54 | |
| 1964 | 57 | 5953 | Atkinson *et al* | Stone 23 | |
| 1964 | 114 | 6608 | Atkinson *et al* | Stone 25 | |
| 1964 | 58 | 5954 | Atkinson *et al* | Stones 27 and 127 | |
| 1964 | 71 | 5955 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 1 |
| 1964 | 72 | 5956 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 2 |
| 1964 | 73 | 5957 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 3 |
| 1964 | 74 | 5958 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 4 |
| 1964 | 75 | 5959 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 5 |
| 1964 | 76 | 5960 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 6 |
| 1964 | 77 | 5961 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 7 |
| 1964 | 78 | 5962 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 8 |
| 1964 | 79 | 5963 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 9 |
| 1964 | 80 | 5964 | Atkinson *et al* | 2ft (0.6m) square cut around Stones 53 and 54 | 10 |
| 1966 | 82 | 6151 | F & L Vatcher | Car park | |
| 1967 | 81 | 6201 | F & L Vatcher | Underpass | |
| 1967 | 86 | 6253 | F & L Vatcher | A303 Amesbury By-pass | |
| 1967 | 108 | 6254 | F and Vatcher | Unlocated evaluation trenches (probably at Vespasian's Ridge) | |
| 1968 | 83 | 6251 | F & L Vatcher | N side of A344 (SEB electricity cable trench) | |
| 1968 | 107 | 6255 | F & L Vatcher | A303 widening/improvement | |
| 1968 | 84 | 6252 | F & L Vatcher | Floodlight cable trench | |
| 1968? | 85 | 6256 | F & L Vatcher | Geophone cable trench | |
| 1973 | 87 | 6301 | Smith (CEU) | Section through E ditch of Avenue (Amesbury end) | |
| 1973 | 109 | 6302 | Smith (CEU) | Unsuccessful attempt to locate W Avenue ditch | |
| 1978 | 61 | 6351 | JG Evans | Re-excavation of 1954 trench (5752) | |
| 1978 | 62 | 6352 | JG Evans | Re-excavation & extension of 1953 trench (5707) Avenue S ditch | |
| 1978 | 96 | 6353 | JG Evans | Avenue N ditch | |
| 1978 | 97 | 6354 | JG Evans | Gate ditch | |
| 1978 | 63 | 6401 | A Thom & Atkinson | NE side of Stone 94 | |
| 1979 | 93 | 6451 | Smith (CEU) | Car park | Site 30 |
| 1979–80 | 91 | 6501 | MW Pitts | Rescue excavation cable trench through Heelstone ditch and Avenue | |
| 1981 | 92 | 6551 | Bond (CEU) | Evaluation/Watching brief on footpath through monument (three trenches) | Site 38 |
| 1984 | 98 | 6601 | WA | Sewage pipe watching brief | |
| 1988 | 99 | 6602 | WA | Visitor facility improvements phase 1 | W243 |
| 1989 | 100 | 6603 | | Visitor facility improvements phase 2 | |
| 1990–1991 | 110 | 6606 | WA | Grass repair watching brief No archaeological features or finds recorded | W406 |
| 1993 | 102 | 6605 | WA | Watching brief (electricity cable) No archaeological features recorded | W614 |
| 1993 | 101 | 6604 | WA | Evaluation/Watching brief (temporary toilets) | W614 |
| 1994 | 115 | 6607 | WA | Limited Test Auger Survey 13/8/94 | 30506 |

*CEU = Central Excavation Unit; WA = Wessex Archaeology*

# Appendix 4: Summary of Hawley's Ditch excavations

This summary is presented in chronological order of excavation. For the relative positions of all the cuttings see Figure 36; for details see Chapters 5 and 6, Figs 38–47 and 60–64.

## C18. Hawley's Ist Ditch excavation

Part of Segment 13 (Figs 42 and 62)

This first Ditch excavation began on 25 February 1920 with a narrow trench, 3ft (0.91m) wide extended from a small cutting around Hole H, across the Bank (C18.1). This was then extended by 12ft (3.66m) south-west along the Ditch (C18.2). On 7 April 1920 Newall extended the cutting along the Ditch (C18.3), in an area 12ft by 9ft (3.66 x 2.74m).

## C19 Hawley's IInd Ditch excavation

Part of Segment 13 (Figs 42 and 62)

Excavated 6–20 September 1920. Measurements given as 12ft by 12ft (3.66 x 3.66m) and forming a western extension of the previous cutting (C18). A grid was used, but extended only to K because of the length of the cutting (this point almost certainly being that shown in the photograph in Fig 42).

## C20. Hawley's IIIrd Ditch excavation

Segment 14 and part of Segment 15 (Figs 43, 63, 64)

Excavation began on 8 November 1920, but was worked on only intermittently and finally suspended for the winter on 13 December 1920, when part of it was backfilled because of hard frosts. Work restarted on 22 March 1921 and finished on 5 May 1921.

Measurements given as 26ft by 9ft (7.92 x 2.74m). The grid system was used to record finds and features of the Ditch, and extended from A to Z, but in this case Hawley worked anti-clockwise, although the slices were lettered in the usual way, that is, alphabetically from A clockwise. He explains on 25/11/1920 that he was 'sinking down to get the bottom of ditch as I am uncertain about the position of the sides. I shall then take the digging back to section A'.

## C21 Hawley's IVth Ditch excavation

Part of Segment 15 (Figs 43 and 64)

Excavation began on 25 June 1921 and finished on 27 September 1921, at which point a trench was cut from the Ditch into the interior, where the South Barrow is situated. This trench was 4ft (1.22m) wide.

The Diary entries are missing (or were not written) for the period 5 August to 26 September (inclusive), which covers section G to W of the Ditch in this cutting, but it is clear that the cutting was excavated using the grid system. Unlike the neighbouring cutting to the east (C20) it was excavated in a clockwise direction around the Ditch, that is, towards the west.

## C22. Hawley's Vth Ditch excavation

Parts of Segments 2 and 3 (Figs 39, 40, 61)

Excavation of this section of the Ditch began on 23 March 1922 and finished on 24 May 1922. It was begun in a fresh length of Ditch (ie it did not continue from a previous excavation), and was intended to investigate the length of Ditch nearest the Avenue and the relationship between the two. It was excavated using the grid system, from A to Z working anti-clockwise (ie in this area south to north).

## C23. Hawley's VIth Ditch excavation

Part of Segment 2 (Figs 39 and 61)

Begun on 14 June 1922, as a continuation north of C22 (with a wedge between the two to take in the curvature of the Ditch), it was finished on 1 September 1922. It was excavated using the grid system, with A to Z running south to north.

## C24. Hawley's VIIth Ditch excavation

Segment 1 and part of Segment 2 (Figs 39 and 61)

Excavated 7 September to 2 October 1922, this trench examined the southern terminal of the main north-eastern entrance. It was excavated anti-clockwise using the grid system with a baulk left after excavating strips A to E, which was subsequently removed.

## C25. Hawley's VIIth Ditch excavation

Segments 99 and 100 (Figs 38 and 60)

Excavated 4 October intermittently to 9 November, continuing on from work in C24, whilst also exploring the north-eastern causeway and terminals of the Avenue ditches. Termed by Hawley the 'new cut', the Ditch was here dug anti-clockwise but the use of the grid system was abandoned and it was dug in two parts, though the dividing line between the two sections is not clear. The first part extended right across the Ditch but was only 5ft (1.5m) wide, and the second 15ft (4.6m) wide. Hawley records removing the baulk between them.

## C26. Hawley's 'South' Ditch excavation

Part of Segment 16, Segments 17 and 18, part of Segment 19 (Figs 44 and 45)

Excavation began on 14 July 1924 and continued until 12 August 1924. The cutting included the southern entrance terminals and causeway. It was dug in a series of 5ft (1.5m) wide slices clockwise from the end of C21. Having reached the causeway, Hawley began ' opening the Ditch on the opposite side of the presumed causeway [ie Segment 18]. This is a small dig to find out the confines of the pit it is hoped to find there' (24/7/1924). This trench was then extended through the next 'crater' to the west (Segment 19).

## C28. Hawley's 'East' Ditch excavation

Part of Segment 3, Segments 4–12, part of Segment 13 (Figs 40–2, 61, 62)

The Diary entry dated 27 April to 1 May 1925 states 'The sections will be made in lengths of 10 feet [3m]. Width will be 12 feet [3.67m] unless otherwise mentioned' although the length of the sections seems to have varied and they are generally labelled on the MoW plans in *c* 5ft (1.5m) lengths. Excavation bagan on 27 April and the Ditch was dug clockwise. The Diaries are incomplete for much of the period covering the excavation of C28 and some lengths are not described in much detail. The excavation finished on 24 August 1925, and Hawley commented in the Diary 'And so ends a long laborious and disappointing dig' (24/7/1925).

## C29

Part of Segment 19, Segments 20–28 (Figs 45–7)

Begun on 1 July 1926 and completed on 19 August 1926, a length of some 75ft (22.86m) was excavated in the last of Hawley's Ditch cuttings. Though dated 1 July 1926 the Diary record as it survives is is a continuous narrative and was clearly written after the event. The descriptions are quite detailed but also somewhat confusing and difficult to interpret in places. Excavation seems to have progressed clockwise and by 'bays' which correspond reasonably well with the short, somewhat rounded segments in this area.

# Appendix 5: Dimensions of postholes and stones

## Dimensions of Postholes

Depths, unless specified otherwise, are taken from the chalk surface; 'nd' indicates that no details are available.

### The interior

*Cutting 1*: excavated by Hawley in 1919–20

| *WA context* | *Excavator* | *Cut-ting* | *Max diam* | *Depth* | *Fill* | *Comments* |
|---|---|---|---|---|---|---|
| 1056 | Hawley | C1 | | | 1057; nd | 'a bowl shaped hole' between Stones 6 & 7 |

*Cutting 8*: excavated by Hawley, 1923, MoW sketch survey only (diameters only occasionally noted).

| *WA context* | *Excavator* | *Cut-ting* | *Max diam* | *Depth* | *Fill* | *Comments* |
|---|---|---|---|---|---|---|
| 1876 | Hawley | C8 | | 0.85m 33½in | 1877 | Hawley no 1, earthy chalk towards base |
| 1878 | Hawley | C8 | | | 1879; nd | Hawley no 2 Cut by 1880 |
| 1880 | Hawley | C8 | | 0.46m 18in | 1881; nd | Hawley no 3 'a rough stakehole' |
| 1882 | Hawley | C8 | 0.20m 8in | 0.38m 15in | 1883; nd | Hawley no 4 |
| 1884 | Hawley | C8 | 0.41m 16in | 0.58m 23in | 1885 | Hawley no 9, between Stones 8 & 9, loose chalk rubble dirty & rather fine |
| 1886 | Hawley | C8 | 0.23m 9in | 0.25m 10in | 1887; nd | Hawley no 10, in front of Stone 9 |
| 1888 | Hawley | C8 | | 0.48m 19in | 1889; nd | Hawley no 7 Cut by ZH9 |
| 1890 | Hawley | C8 | 0.23m 9in | 0.34m 13in | 1891; nd | Hawley no 5 |
| 1892 | Hawley | C8 | 0.23m 9in | 0.25m 10in | 1893; nd | Hawley no 6 |
| 1894 | Hawley | C8 | 0.25m 10in | 0.38m 15in | 1895; nd | Hawley no 8 |

*Cutting 12*: excavated by Hawley in 1924 and 1926; reopened by Atkinson *et al* in 1956. No datum is given on the 1956 plan (Archive drwgs no 251, 252, and 814) but comparison of the spot heights with features on the section drawings, which do have datums, indicates that the same datum was used for both plans and sections. The datum was just at the chalk surface so that spot heights within features on the plan give their depths below the chalk surface. These measurements have been used for all features excavated by both Hawley and Atkinson *et al*.

| *WA context* | *Excavator* | *Cut-ting* | *Max diam* | *Depth* | *Fill* | *Comments* |
|---|---|---|---|---|---|---|
| 2697 | Hawley; Atkinson *et al* | C12.5 | 0.30m 12in | 0.46m 18in | 2696; nd | |
| 2699 | Hawley; Atkinson *et al* | C12.7 | 0.35m 14in | 0.28m 11in | 2698; nd | |
| 2701 | Hawley; Atkinson *et al* | C12.5/ 12.7 | 0.30m 12in | 0.51m 20in | 2700; nd | |
| 2703 | ?Hawley; Atkinson *et al* | C12.2 | 0.38 15in | 0.43m 17in | 2702; nd | |
| 2705 | Hawley; Atkinson *et al* | C12.2 | 0.28m 11in | 0.35m 14in | 2704; nd | |
| 2707 | Hawley; Atkinson *et al* | C12.7 | 0.23m 9in | 0.18m 7in | 2706; nd | |
| 2709 | Hawley; Atkinson *et al* | C12.7 | 0.28m 11in | 0.35m 14in | 2708; nd | |
| 2711 | Hawley; Atkinson *et al* | C12.7 | 0.38m 15in | 0.18m 7in | 2710; nd | |
| 2713 | Hawley; Atkinson *et al* | C12.7 | 0.51m 20in | 0.15m 6in | 2712; nd | |
| 2715 | Hawley; Atkinson *et al* | C12.9 | 0.25 10in | 0.43 17in | 2714; | Cut by feature J, Hawley 1928 (WA 2717) |
| 2719 | Hawley; Atkinson *et al* | C12.7 | 0.28m 11in | 0.28m 11in | 2718; nd | |
| 2721 | Hawley; Atkinson *et al* | C12.7 | 0.35m 14in | 0.28m 11in | 2720; nd | |
| 2728 | Atkinson *et al* | C12.2 | 0.3m 12in | 0.25m 10in | 2727; nd | Not found by Hawley |
| 2732 | Atkinson *et al* | C12.1 | 0.28m 11in | 0.56m 20in | 2731; nd | 'A well-defined posthole ... well-cut ... and resembling those met with on the outside on previous occasions'. Posthole E in Hawley 1928, 169, and fig 4 |
| 2734 | Hawley; Atkinson *et al* | C12.1 | 0.35m 14in | 0.20m 8in | 2750 nd | The depth is queried on the 1956 plan Archive Drwg No 251; probably Hawley's posthole 'C' Hawley 1928, 169, fig 4 |

| *WA context* | *Excavator* | *Cutting* | *Max diam* | *Depth* | *Fill* | *Comments* |
|---|---|---|---|---|---|---|
| 2736 | Hawley; Atkinson *et al* | C12.1 | 0.35m 14in | 0.38m 15in | 2735 nd | |
| 2744 | Hawley; Atkinson *et al* | C12.6 | 0.30m 12in | 0.28m 11in | 2743 nd | |
| 2754 | Hawley | C12.1/6 | 0.15m 6in | 0.18m 7in | 2753; nd | Not on 1956 plan, measurements taken from Hawley |
| 2746 | Hawley; Atkinson *et al* | C12.8 | 0.35 14in | 0.41m 16in | 2745; nd | |
| 2756 | Hawley; Atkinson *et al* | C12.1 | 0.33m 13in | 0.37m 14½ in | 2755; nd | Depth not given on 1956 plan; Hawley depths are approximately the same for this cutting, suggesting that they were measured in a similar way |
| 2758 | Hawley; Atkinson *et al* | C12.1 | 0.25m 10in | 0.30m 12in | 2757; nd | Not on 1956 plan; measurements taken from Hawley |
| 2762 | Hawley; Atkinson *et al* | C12.4 | 0.30 12in | 0.20m 8in | 2761; nd | |
| 2764 | Hawley; Atkinson *et al* | C12.4 | 0.35m 14in | 0.35m 14in | 2763; nd | |
| 2766 | Hawley; Atkinson *et al* | C12.6 | 0.48m 19in | 0.35m 14in | 2765; nd | |
| 2768 | Hawley; Atkinson *et al* | C12.4/8 | 0.28m 11in | 0.30m 12in | 2767; nd | |
| 2770 | Hawley; Atkinson *et al* | C12.4/8? | 0.30m 12in | 0.33m 13in | 2769 nd | |
| 2772 | Hawley; Atkinson *et al* | C12.4/8 | 0.30m c12in | nd | 2771 nd | The 1956 plan is damaged in the area of this feature, and it was not recorded in 1926. |
| *1 | Hawley | C12 | 0.28 x 0.35m 11 x 14in | 0.23m 9in | nd | |
| *2 | Hawley | C12 | 0.30m 12in* | 0.24m 91/2in | nd | |
| *3 | Hawley | C12 | 0.18m 7in | 0.14m 51/2in | nd | |
| *4 | Hawley | C12 | 0.25m 10in | 0.15m 6in | nd | |
| *5 | Hawley | C12 | 0.30m 12in* | nd | nd | |
| *6 | Hawley | C12 | 0.46m 18in* | 0.28m 11in | nd | |
| *7 | Hawley | C12 | 0.61m 24in* | 0.25m 10in | nd | |
| *8 | Hawley | C12 | 0.46m 18in | 0.18m 7in | nd | |
| *9 | Hawley | C12 | 0.30m 12in* | 0.28m 11in | nd | |

* = from Archive drwg 75, MOW plan 123/75, measurements annotated unless stated 'measured from plan'

*Cutting 13:* depths are mainly taken from the spot heights given on the 1964 plan (Archive drwg 409), compared with the spot heights for the chalk surface, also on that plan. Depths are therefore below chalk surface.

| *WA context* | *Excavator* | *Cutting* | *Max diam* | *Depth* | *Fill* | *Comment* |
|---|---|---|---|---|---|---|
| 2323 | Hawley; Atkinson *et al* | C13 | 0.30m 12in | 0.48m 19in | 2324; nd | Cut by large feature WA 2321, which in turn is cut by Stonehole 8 of the Sarsen Circle |
| 2325 | Hawley; Atkinson *et al* | C13 | 0.33m 13in | 0.08m 3in | 2326; nd | |
| 2328 | Hawley; Atkinson *et al* | C13 | 0.56m 22in | 0.15m 6in | 2368; nd | |
| 2330 | Hawley; Atkinson *et al* | C13 | 0.23m 9in | 0.25m 10in | 2331; nd | |
| 2332 | Hawley; Atkinson *et al* | C13 | 0.61m 24in | 0.48m 19in | 2333; nd | |
| 2340 | Hawley; Atkinson *et al* | C13 | 0.30 12in | 0.56m 22in | 2341; nd | Earlier than Bluestones. Hawley 1926 |
| 2343 | Hawley; Atkinson *et al* | C13 | 0.74 29in | 1.04m 41in | 2344; nd | Earlier than Bluestones. Hawley 1926 |
| 2345 | Hawley; Atkinson *et al* | C13 | 0.36m 14in | 0.58m 23in | 2346; nd | Probably cut by Bluestone hole 33f 'the half of a well-defined post-hole occurs in the hole of this stone at the end near stone 34 (26/8/1924) |
| 2351 | Hawley; Atkinson *et al* | C13 | 0.69 27in | 1.02m 40in | 2352; nd | On section in Hawley 1926, fig 2 |
| 2355 | Hawley; Atkinson *et al* | C13 | 0.61m 24in | 0.76m 30in | 2356; nd | |
| 2358 | Hawley; Atkinson *et al* | C13 | 0.30 12in | 0.21m 8½in | 2359; nd | |
| 2360 | Atkinson *et al* | C13 | 0.46m 18in | 0.14m 5½in | 2361; nd | |

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comments |
|---|---|---|---|---|---|---|
| 2365 | Atkinson *et al* | C13 | 0.33m 13in | 0.28m 11in | 2366; nd | |
| 2367 | Atkinson *et al* | C13 | 0.41 16in | 0.25m 10in | 2368; nd | approx measured from plan |
| 2369 | Hawley; Atkinson *et al* | C13 | 0.33m 13in | 0.37m 14½in | 2370; nd | |
| 2371 | Hawley; Atkinson *et al* | C13 | 0.30m 12in | 0.51m 20in | 2372; nd | |
| 2375 | Atkinson *et al* | C13 | 0.41m 16in | 0.10m 4in | 2376; nd | |
| 2377 | Atkinson *et al* | C13/14 | 0.38m 15in | 0.38m 15in | 2338; nd | |
| 2380 | Atkinson *et al* | C13 | 0.76m 30in | 1.09m 43in | 2381; nd | 'Post core' present |
| 2382 | Atkinson *et al* | C13 | | | 3677; nd | Possible ramp |
| 3211 | Atkinson *et al* | C13/14 | 0.25m 10in | 0.30m 12in | 3210; nd | Measurements are minimum as the feature lies under the concrete 'raft' around Stones 6 & 7 and was not recorded in full; fill not recorded |
| 3680 | Hawley | C13 | | | 3681; nd | On Hawley plan only; not recorded separately from Q11 by Atkinson and no spot height in that part of the feature |

*Cutting 14/46*: Excavated in 1954 and reopened in 1964 along with C13. No spot heights are given for C14 on the 1954 plan (Archive drwg 211). Archive drwg 410 (1964) incorporates C14.

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comments |
|---|---|---|---|---|---|---|
| 2377 | Atkinson *et al* | C14 | 0.46m 18in | 0.35m 14in | 2378; nd | Not on Archive drwg 211 |
| 3211 | Atkinson *et al* | C14 | 0.30m 12in | 0.30m 12in | 3210 nd | On Archive drwg 211, Apparently cut by Q8 (WA 294) |

*Cutting 16*: excavated by Hawley in 1924 information taken from annotated MoW sketch survey plan

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comments |
|---|---|---|---|---|---|---|
| 2396 | Hawley | C16.1 | | | 2397; nd | 'A large post hole cut by digging the hole for stone 12 (WA 2394)' |

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comment |
|---|---|---|---|---|---|---|
| 2419 | Hawley | C16.3 | 0.61m 24in | 1.22m 48in | 2420; nd | 'A large post hole', cut by ZH13 |
| 2421 | Hawley | C16.3 | 0.81m 32in | 1.22m 48in | 2422; hard compressed earthy chalk over 2423, soft chalk rubble | A large, deep hole 'evidently an early hole' |

*Cutting 17*: Only one spot height for chalk surface given on archive plan (Archive drwg no 301, so heights for chalk surface calculated from the sections (Achive drwg no 304). The OD datums are different, noted as 342.3 OD for the plan, and 341.8 for the sections, so 0.5ft (0.15m) has been added to the spot heights calculated from the sections.

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comment |
|---|---|---|---|---|---|---|
| 2442 | Atkinson *et al* | C17/52 | 24in | 0.55m | 2443; nd | approx measured from plan |
| 3298 | Hawley ? Atkinson *et al* | C17 | 0.23m 9in | 0.43m 17in | 3297; nd | |
| 3300 | Hawley ? Atkinson *et al* | C17 | 0.30m 12in | 0.33m 13in | 3299; nd | |
| 3302 | Atkinson *et al* | | 0.30m 12in | 0.48m 19in | 3301; nd | |
| 3304 | Hawley ? Atkinson *et al* | C17 | 0.38m 15in | 0.48m 19in | 3303; nd | |
| 3313 | Hawley ? Atkinson *et al* | C17 | 0.30m 12in | 0.48m 19in | 3312; nd, but 1 frag sarsen noted as from 'W post-hole floor' | |
| 3317 | Hawley? Atkinson *et al* | C17 | 0.30m 12in | 0.39m 15½in | 3316; nd | There seems to be a linking feature with WA 3319, but the relationship between these features is not clear |
| 3319 | Hawley? Atkinson *et al* | C17 | 0.46m 18in | 0.39m 15½in | 3318; nd | |
| 3323 | Hawley? Atkinson *et al* | C17 | 0.20m 8in | 0.10m 4in | 3322; nd | |

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comments |
|---|---|---|---|---|---|---|
| 3325 | Hawley? Atkinson *et al* | C17 | | | 3324; nd | No spot height on plan, and relationship with WA 3327 not known |
| 3327 | Atkinson *et al* | C17 | 0.33m 13in | 0.19m 7½in | 3326; nd | relationship with WA 3325 unknown |
| 3337 | Atkinson *et al* | C17 | | 0.37m 14½in | 3336; nd but contained 18 frags of sarsen and 1 of bluestone probably volcanic ash | |
| 3339 | Atkinson *et al* | C17 | 0.30m 12in | 0.27m 10½in | 3338; nd | |
| 3341 | Hawley | C17 | | | 3340; nd | Excavated by Hawley, but plan very rough; no details of size, fill etc |
| 3343 | Atkinson *et al* | C17 | 0.30m 12in | 0.27m 10½in | 3342; nd | May be the posthole in SE corner of sub-division 'c' of this cutting |
| 3345 | Hawley? Atkinson *et al* | C17 | 0.18m 7in | | 3344; nd | No spot height given on plan; relationship with WA 3347 unknown |
| 3356 | Hawley? Atkinson *et al* | C17 | 0.20m 8in | 0.36m 14in | 3355; nd | |

*Cutting 33.16:* excavated in 1953 (*c* 1ft [0.3m] north-west of ZH16)

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comments |
|---|---|---|---|---|---|---|
| 3022 | Atkinson *et al* | 33.16 | 0.30m (12in) | | 3023; nd | Measured from plan |

*Cutting 45:* excavated in 1954

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comments |
|---|---|---|---|---|---|---|
| 3180 | Atkinson *et al* | C45 | 0.46m 18in | 0.18m 7in | 3181; nd | |
| 3176 | Atkinson *et al* | C45 | 0.30m 12in | 0.15 6in | 3177; nd | ?Double post hole' with WA 3176 |
| 3144 | Atkinson *et al* | C45 | 0.30m 12in | 0.15 6in | 3142; mouldy above 3143, chalky | '?Double post hole' with WA 3144 postpipe visible |

*Cutting 52:* excavated in 1958

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comments |
|---|---|---|---|---|---|---|
| 2442 | Atkinson *et al* | C52/17 | 0.61m 24in | 0.55m 22in | 2443; nd | Approx measured from plan |
| 3367 | Atkinson *et al* | C52 | 0.46m 18in | 0.61m 24in | 3368; 3369; | Approx measured from plan, packed rubble round sides, soil & rubble main fill |
| 3377 | Atkinson *et al* | C52 | 0.76m 30in | 0.94m 37in | 3378; rubble | Approx measured from plan |
| 3650 | Atkinson *et al* | C52 | 0.41 16in | 0.70m 28in | 3651; greyish chalk rubble | Approx measured from plan |
| 3652 | Atkinson *et al* | C52 | 0.46m 18in | 0.61m 24in | 3653' 'earthy rubble & blues' | Approx measured from plan |
| 3656 | Atkinson *et al* | C52 | 0.61m 24in | 0.45m 18in | 3657; nd | Approx measured from plan |
| 3692 | Atkinson *et al* | C52 | 0.76m 30in | 0.99m 39in | 3693; nd | Approx measured from plan |
| 3694 | Atkinson *et al* | C52 | 0.61m 24in | 1.22m 48in | 3695; nd | Approx measured from plan |
| 3737 | Atkinson *et al* | C52 | 0.46m 18in | | 3738; nd | Approx measured from plan |

*Cutting 53:* excavated in 1958

| WA context | Excavator | Cutting | Max diam | Depth | Fill | Comments |
|---|---|---|---|---|---|---|
| 3362 | Atkinson *et al* | C53 | 18in | | 3363; nd | Approx measured from plan |
| 3364 | Atkinson *et al* | C53 | 18in | | 3365; nd | Approx measured from plan |

*Cutting 55:* excavated in 1959, shown on Archive drwg no 354. No spot heights are given for the chalk surface. It is assumed that the figures annotated in the base of features are the depths below the chalk level.

| *WA context* | *Excavator* | *Cut-ting* | *Max diam* | *Depth* | *Fill* | *Comments* |
|---|---|---|---|---|---|---|
| 3477 | Atkinson *et al* | C55 | 0.20m 8in | 0.28m 11in | 3476; nd | Cut into ZH5 |
| 3497 | Atkinson *et al* | C55 | 0.35m 14in | 0.25m 10in | 3496; nd | Annotated -10" |
| 3501 | Atkinson *et al* | C55 | 0.61m 24in | 0.63m 25in | 3500 | |
| 3507 | Atkinson *et al* | C55 | 0.25m 10in | 0.23m 9in | 3506; nd | Near ZH4 |

*Cutting 56:* Only one posthole; it is shown in profile in Archive drawing 404, which also seems to show the top of undisturbed chalk.

| *WA context* | *Excavator* | *Cut-ting* | *Max diam* | *Depth* | *Fill* | *Comments* |
|---|---|---|---|---|---|---|
| 3522 | Atkinson *et al* | C56 | 0.28m 11in | 0.15m 6in | 3521; nd | |

*Cutting 57:* excavated in 1964, shown on Archive drwg no 403.

| *WA context* | *Excavator* | *Cut-ting* | *Max diam* | *Depth* | *Fill* | *Comments* |
|---|---|---|---|---|---|---|
| 3541 | Atkinson *et al* | C57 | - | - | 3542; nd | Not fully excavated as under baulk |
| 3646 | Atkinson *et al* | C57 | - | - | 3645 ; nd | Not fully excavated? as under concrete |

## Postholes around the north-eastern entrance

*C5, C24, C25:* all excavated by Hawley in 1922 (Fig 67). Shown on Archive drwg no 63, annotated with diameters and depths.

| *Hawley number* | *Cutting* | *Max diam* | *Min diam* | *Depth* |
|---|---|---|---|---|
| 1 | C25 | 0.36m 14in | | 0.20m 8in |
| 2 | C25 | 0.20m 8in | | 0.08m 3in |
| 3 | C5 | 0.18m 7in | | 0.05m 2in |
| 4 | C5 | 0.28m 11in | | 0.04m 1½in |
| 5 | C5 | 0.30m 12in | 0.15m 6in | 0.10m 4in |
| 6 | C5 | 0.25m 10in | | 0.09m 3½in |
| 7 | C5 | 0.28m 11in | | 0.20m 8in |
| 8 | C5 | 0.20m 8in | | 0.18m 7in |
| 9 | C5 | 0.28m 11in | | 0.14m 5½ |
| 10 | C5 | 0.33m 13in | | 0.32m 12½in |
| 11 | C5 | 0.36m 14in | | 0.25m 10in |
| 12 | C5 | 0.43m 17in | | 0.37m 14½in |
| 13 | C5 | 0.28m 11in | | 0.34m 13½in |
| 14 | C5 | 0.36m 14in | | 0.37m 14½in |
| 15 | C5 | 0.28m 11in | | 0.08m 3in |
| 16 | C5 | 0.30m 12in | | 0.23m 9in |
| 17 | C5 | 0.25m 10in | | 0.19m 7½in |
| 18 | C5 | 0.33m 13in | | 0.29m 11½in |
| 19 | C5 | 0.28m 11in | | 0.25m 10in |
| 20 | C5 | 0.25m 10in | | 0.18m 7in |
| 21 | C5 | 0.36m 14in | | 0.25m 10in |
| 22 | C5 | 0.25m 10in | | 0.27m 10½in |
| 23 | C5 | 0.46m 18in | | 0.61m 24in |
| 24 | C5 | 0.30m 12in | | 0.06m 2½in |
| 25 | C5 | 0.30m 12in | | 0.29m 11½in |
| 26 | C5 | 0.33m 13in | | 0.30m 12in |
| 27 | C5 | 0.28m 11in | | 0.30m 12in |
| 28 | C5 | 0.33m 13in | | 0.18m 7in |
| 29 | C5 | 0.23m 9in | 0.13m 5in | 0.14m 5½in |
| 30 | C5 | 0.20m 8in | | 0.10m 4in |
| 31 | C5 | 0.38m 15in | | 0.27m 10½in |
| 32 | C5 | 0.35m 14in | 0.30m 12in | 0.20m 8in |
| 33 | C5 | 0.58m 23in | | 0.58m 23in |
| 34 | C5 | 0.28m 11in | | 0.14m 5½in |
| 35 | C5 | 0.41m 16in | 0.30m 12in | 0.36m 14in |
| 36 | C24 | 0.38m 15in | | 0.57m 22½in |
| 37 | C5 | 0.63m 25in | | 0.66m 26in |
| 38 | C5 | 0.28m 11in | | 0.41m 16in |
| 39 | C5 | 0.25m 10in | | 0.28m 11in |
| 40 | C24 | 0.36m 14in | | 0.27m 10½in |
| 41 | C24 | 0.33m 13in | | 0.37m 14½in |
| 42 | C25 | 0.56m 22in | | 0.65m 25½in |
| 43 | C24 | 0.38m 15in | | 0.36m 14in |
| 44 | C24 | 0.51m 20in | | 0.51m 20in |
| 45 | C24 | 0.23m 9in | | 0.15m 6in |
| 46 | C24 | 0.33m 13in | | 0.36m 14in |

*C6*: these are part of the same setting as those listed above but were dug in 1923 and also numbered 1–7 (labelled 6.1–6.7 on Fig 67). Shown on Archive drwg no 63.

| *WA context* | *No on Fig 67* | *Cutting* | *Max diam* | *Min diam* | *Depth* |
|---|---|---|---|---|---|
| 1896 | 6.1 | C6 | 0.30m 12in | | |
| 1898 | 6.2 | C6 | 0.41m 16in | | |
| 1900 | 6.3 | C6 | 0.30m 12in | | |
| 1902 | 6.4 | C6 | 0.38m 15in | | |
| 1904 | 6.5 | C6 | 0.30m 12in | | |
| 1906 | 6.6 | C6 | 0.38m 15in | | |
| 1908 | 6.7 | C6 | 0.48m 18in | | |

*Postholes at 'A' (C6)*: excavated by Hawley in 1923.

| *WA context* | *Cutting* | *Max diam* | *Min diam* | *Depth* |
|---|---|---|---|---|
| 3599 | C6 | 0.71m 28in | 0.51m 20in | 0.83m 43in |
| 3600 | C6 | 0.61m 24in | | 0.60m 35in |
| 3601 | C6 | 0.58m 23in | | 0.48m 32in |
| 3602 | C6 | Disturbed | | 0.46m 18in |

## Postholes at the Southern Entrance

Excavated by Hawley, information from annotated MoW sketch survey plans, C9 and C10, and Archive drwg no 59, unless otherwise indicated by a published reference.

| *Hawley number* | *Cutting* | *Diam* | *Depth* | *Comment* |
|---|---|---|---|---|
| 1 | C9 | | 0.66m 26in | Joined with no 2 'grave' WA 1676 Hawley 1925, 31, *see Chapter 7* |
| 2 | C9 | | 0.66m 26in | Joined with no 1 'grave' WA 676 Hawley 1925, 31, *see Chapter 7* |
| 3 | C9 | | 0.28m 11in | |
| 4 | C9 | 0.46m 18in | 0.43m 17in | |
| 5 | C9 | | 0.30m* 1ft ?in | |
| 6 | C9 | 0.38m 15in | 0.33m 13in | |
| 7 | C9 | 0.41m 16in | 0.38m 15in | |
| 8 | C9 | | 0.38m 15in | |
| 9 | C9 | | 0.46m 18in | |
| 10 | C9 | 0.23m 9in | 0.41m 16in | |
| 11 | C9 | | ?0.28m ?11in | |
| 12 | C9 | | | Large & irregular |
| 13 | C9 | | 0.23m 9in | |
| 14 | C10 | 0.43m 17in | 0.23m 9in | |
| 15 | C10 | | 0.20m 8in | |
| 16 | C10 | | 0.23m 9in | |
| 17 | C10 | | 0.25m 10in | |
| 18 | C10 | 0.35m 14in | 0.13m 5in | |
| 19 | C10 | 0.18m 7in | 0.23m 9in | |
| 20 | C10 | 0.41m 16in | 0.18m 7in | |
| 21 | C10 | | 0.23m 9in | |
| 22 | C10 | 0.38m 15in | 0.46 18in | |
| 23 | C10 | 0.23m 9in | 0.13m 5in | |
| 24 | C10 | 0.35m 14in | 0.23 9in | |
| 24a | C10 | | 0.13m 5in | |
| 25 | C10 | 0.30m 12in | 0.25m 10in | |
| 26 | C10 | 0.25m 10in | 0.18m 7in | |
| 27 | C10 | 0.23m 9in | 0.08m 3in | |
| 28 | C10 | | 0.23m 9in | |
| 29 | C10 | 0.28m 11in | 0.15m 6in | |
| 30 | C10 | 0.20m 8in | 0.13m 5in | |
| 31 | C10 | | 0.08m 3in | |
| 32 | C10 | | 0.15m 6in | |
| 33 | C10 | 0.23m 9in | 0.10m 4in | |
| 34 | C10 | 0.41m 16in | 0.15m 6in | |
| 35 | C10 | 0.38m 15in | 0.38m 15in | |
| 36 | C10 | 0.33m 13in | 0.10m 4in | |
| 37 | C10 | 0.18m 7in | 0.10m 4in | |
| 38 | C10 | | 0.13m 5in | |
| 39 | C10 | | 0.15m 6in | |
| 40 | C10 | 0.28m 11in | 0.15m 6in | |
| 41 | C10 | 0.20m 8in | 0.15m 6in | |
| 42 | C10 | 0.18m 7in | 0.10m 4in | |
| 43 | C10 | 0.20m 8in | 0.23m 9in | |
| 44 | C10 | 0.23m 9in | 0.20m 8in | |
| 45 | C10 | 0.28m 11in | 0.15m 6in | |
| 46 | C10 | 0.23m 9in | 0.10m 4in | |
| 47 | C10 | 0.28m 11in | 0.13m 5in | |
| 48 | C10 | 0.25m 10in | 0.25m 10in | |
| 49 | C10 | 0.41m 16in | 0.41m 16in | |

| *Hawley number* | *Cutting* | *Diam* | *Depth* | *Comment* |
|---|---|---|---|---|
| 50 | C10 | 0.18m 7in | 0.08m 3in | |
| 51 | C10 | 0.18m 7in | 0.13m 5in | |
| 52 | C10 | 0.28m 11in | 0.33m 13in | |
| 53 | C10 | 0.18m 7in | 0.10m 4in | |
| 54 | C10 | | 0.15m 6in | |
| 55 | C10 | 0.28m 11in | 0.15m 6in | |
| 56 | C10 | 0.18m 7in | 0.13m 5in | |
| 57 | C10 | 0.20m 8in | 0.13m 5in | |
| 58 | C10 | 0.25m 10in | 0.15m 6in | |
| 59 | C10 | 0.30m 12in | 0.10m 4in | |
| 60 | C10 | | 0.20m 8in | |
| 61 | C10 | | 0.15m 6in | |
| 62 | C10 | 0.38m 15in | 0.18m 7in | |
| 63 | C10 | ? 0.63m ?25in | 0.20m 8in | |
| 64 | C10 | | 0.13m 5in | |
| 65 | C10 | 0.20m 8in | 0.08m 3in | |
| 66 | C10 | | 0.18m 7in | |
| 67 | C10 | 0.25m 10in | 0.08m 3in | |
| 68 | C10 | 0.28m 11in | 0.15m 6in | |
| 69 | C10 | | 0.10m 4in | |
| 70 | C10 | | 0.13m 5in | |
| 71 | C10 | 0.23m 9in | 0.13m 5in | |
| 1a | C10a | 0.40m 16in | 0.25m 10in | |
| 1b | C10 | 0.38m 15in | 0.10m 4in | |
| 1c | C10 | 0.66m 26in | 0.50m 0.13in | |
| 1 | C10 | 0.23m 9in | 0.13m 5in | 1-7 Dug Oct 1924 |
| 2 | C10 | 0.23m 9in | 0.10m 4in | |
| 3 | C10 | 0.20m 8in | 0.10m 4in | |
| 4 | C10 | 0.28m 11in | 0.35m 14in | |
| 5 | C10 | | 0.23m 9in | |
| 6 | C10 | | 0.18m 7in | |
| 7 | C10 | 0.25m 10in | 0.15m 6in | |

## Heights of Stones

Information from the records of Professor Atkinson unless otherwise stated. Chief Architects Report of 1919 gives the height of the Stone 'above ground level'.

| *Stone no* | *Feet* | *Metres* | *Source* |
|---|---|---|---|
| 1 | 13ft 0in | 3.96 | Direct from the Chief Architects Report of 1919 |
| 2 | 14ft 0in | 4.27 | as above |
| 3 | 13ft 8in | 4.16 | as above |
| 4 | 14ft 0in | 4.27 | as above |
| 5 | 14ft 0in | 4.27 | as above |
| 6 | 13ft 9in | 4.19 | as above |
| 7 | 13ft | 3.96 | as above |
| 8 | A 2ft 2in; B 1ft 10in | A 0.66; B 0.56 | |
| 9A | A 2ft 0in; B 1ft 6in | A 0.76; B 0.46 | |
| 9B | A 2ft 6in; B 1ft 5in; C 1ft 9in | A 0.76; B 0.43; C 0.53 | |
| 10 | 13ft 0in | 3.96 | Chief Architects Report, 1919 |
| 11 | 9ft | 2.74 | as above |
| 12 | A 1ft 9in; B 1ft 7in | A 0.53; B 0.48 | |
| 14 | A 0ft 6in; B 1ft 4in; C 3ft 6in | A 0.15; B 0.41; C 1.06 | |
| 15 | A 2ft 10in; B 2ft 2in | A 0.86; B 0.66 | |
| 16 | 14ft 0in | 4.27 | Chief Architects Report |
| 19 | A 1ft 4in; B 1ft 0in | A 0.41; B 0.30 | |
| 21 | 13ft 0in | 3.96 | Chief Architects Report, 1919 |
| 22 | A 4ft 6in; B 5ft 0in | A 1.37; B 1.52 | |
| 23 | 12ft 6in | 3.81 | Chief Architects Report, 1919 |
| 25 | A 1ft 9in; B 2ft 3in; C 2ft 8in; D 2ft 0in | A 0.53; B 0.69; C 0.81; D 0.61 | |
| 26 | A 1ft 3in; B 1ft 4in | A 0.38; B 0.41 | |
| 27 | 13ft 0in | 3.96 | Chief Architects Report |
| 28 | 13ft 0in | 3.96 | as above |
| 29 | 13ft 0in | 3.96 | as above |
| 30 | 13ft 0in | 3.96 | as above |
| 31 | A 6ft 2in | A 1.88 | |
| 32 | A 2ft 1in | A 0.63 | |
| 33 | A 5ft 6in | A 1.68 | |
| 34 | A3ft 2in; B 2ft 10in | A 0.97; B 0.86 | |
| 35A | 0ft 5in | 0.13 | |
| 35B | A 0ft 4in; B 0ft 7in | A 0.10; B 0.18 | |
| 36 | A 1ft 2in | A 0.36 | |
| 37 | A 4ft 2in | A 1.27 | |
| 38 | A 1ft 8in | A 0.51 | |
| 39 | A 2ft 0in | A 0.61 | |
| 40 | A 0ft 7in | A 0.18 | |
| 41 | A 1ft 8in; B 0ft 10in | A 0.51; B 0.25 | |
| 42 | A 0ft 9in; B 1ft 7in | A 0.23; B 0.48 | |
| 43 | A 0ft 7in | A 0.18 | |
| 44 | A 0ft 6in | A 0.15 | |
| 45 | A 0ft 10in; B 0ft 9in | A 0.25; B 0.23 | |
| 46 | A 3ft 2in | A 0.96 | |
| 47 | A 4ft 9in | A 1.45 | |

| *Stone no* | *Feet* | *Metres* | *Source* |
|---|---|---|---|
| 48 | A 1ft 2in | A 0.36 | |
| 49 | A 6ft 3in; B 5ft 3in; C 5ft 11in; D 5ft 4in | A 1.90; B 1.60; C 1.80; D1.63 | |
| 51 | 16ft 4in | 4.98 | Chief Architects Report, 1919 |
| 52 | 16ft 8in | 5.08 | as above |
| 53 | 17ft 0in | 5.18 | as above |
| 54 | 17ft 0in | 5.18 | |
| 55A | A 3ft 0in; B 1ft 7in; C 1ft 3in | A 0.91; B 0.48; C 0.38 | |
| 55B | A 3ft 6in; B 3ft 0in; C 3ft 9in | A 1.07; B 0.91; C 1.14 | |
| 56 | 21ft 6in (dowel an extra 1ft 1in) | 6.55 (plus 0.33 ) | |
| 57 | A 2ft 1in; B 0ft 7in | A 0.63; B 0.18 | |
| 58 | A 3ft 0in; B 1ft 9in; C 1ft 1in; D 2ft 7in | A 0.91; B 0.53; C 0.63; D 0.79 | |
| 59A | A 4ft 0in; B 2ft 0in | A 1.22; B 0.61 | |
| 59B | A 2ft 9in; B 1ft 8in; C 1ft 2in; D 2ft 5in | A 0.84; B 0.51; C 0.36; D 0.74 | |
| 59C | A 2ft 9in; B 1ft 0in; C 2ft 7in; D 2ft 6in | A 0.84; B 0.30; C 0.79 : D 0.76 | |
| 60 | 16ft 6in | 5.03 | Chief Architects Report, 1919 |
| 61 | A 5ft 9in | A 1.75 | |
| 62 | A 6ft 8in | A 2.03 | |
| 63 | A 6ft 11in | A 2.11 | |
| 64 | A 0ft 3in | A 0.76 | |
| 65 | A 0ft 11in; B 0ft 6in | A 0.28; B 0.15 | |
| 67 | A 1ft 4in | A 0.41 | |
| 68 | A 8ft 2in | A 2.49 | |
| 69 | A 8ft 6in | A 2.59 | |
| 70 | A 7ft 8in | A 2.34 | |

| *Stone no* | *Feet* | *Metres* | *Source* |
|---|---|---|---|
| 71 | | | |
| 72 | A 0ft 6in | A 0.15 | |
| 80 | A 0ft 4in | A 0.10 | |
| 91 | A 3ft 2in; B 2ft 7in; C 1ft 10in | A 0.97; B 0.79; C 0.56 | |
| 93 | A 4ft 0in | A 1.22 | |
| 95 | A 0ft 7in; B 1ft 2in; C 1ft 2in; D 0ft 8in; E 1ft 1in | A 0.18; B 0.36; C 0.36; D 0.20; E 0.33 | |
| 96 | 15ft 0in | 4.57 | Chief Architects Report, 1919 |
| 120 | A 1ft 3in; B 1ft 6in | A 0.38; B 0.46 | |
| 122 | A 2ft 10in; B 2ft 2in above the upper face of Stone 58 | A 0.86; B 0.66 above the upper face of Stone 58 | |
| 127 | A 0ft 9in; B 0ft 9in; C 0ft 10in | A 0.23; B 0.23 : C 0.25 | |
| 150 | A 0ft 4in | A 0.10 | |
| 156 | A 4ft 4in; B 3ft 11in | A 1.32; B 1.19 | |
| 158 | A 3ft 7in; B 2ft 6in | A 1.09; B 0.76 | |
| 160A | A 1ft 7in | A 0.48 | |
| 160B | A 1ft 10in | A 0.56 | |
| 160C | A 1ft 7in; B 0ft 6in | A 0.48; B 0.15 | |
| Lintel 102 | 2ft 3in high | 0.69 | Chief Architects Report |
| Lintel 105 | 2ft 3in high | 0.69 | as above |
| Lintel 107 | 2ft 2in high | 0.66 | as above |
| Lintel 130 | 2ft 5in high | 0.74 | as above |
| Lintel 100 | 2ft 6in high | 0.76 | as above |
| Lintel 152 | 3ft 6in high | 1.07 | as above |
| Lintel 154 | 3ft 8in high | 1.12 | as above |

# Appendix 6 Original cuttings and miscellaneous plans

Plans of some of Hawley's cuttings are only approximately to scale as the original triangulation points are unknown. All plans are presented at a common scale of 1:30, unless stated otherwise

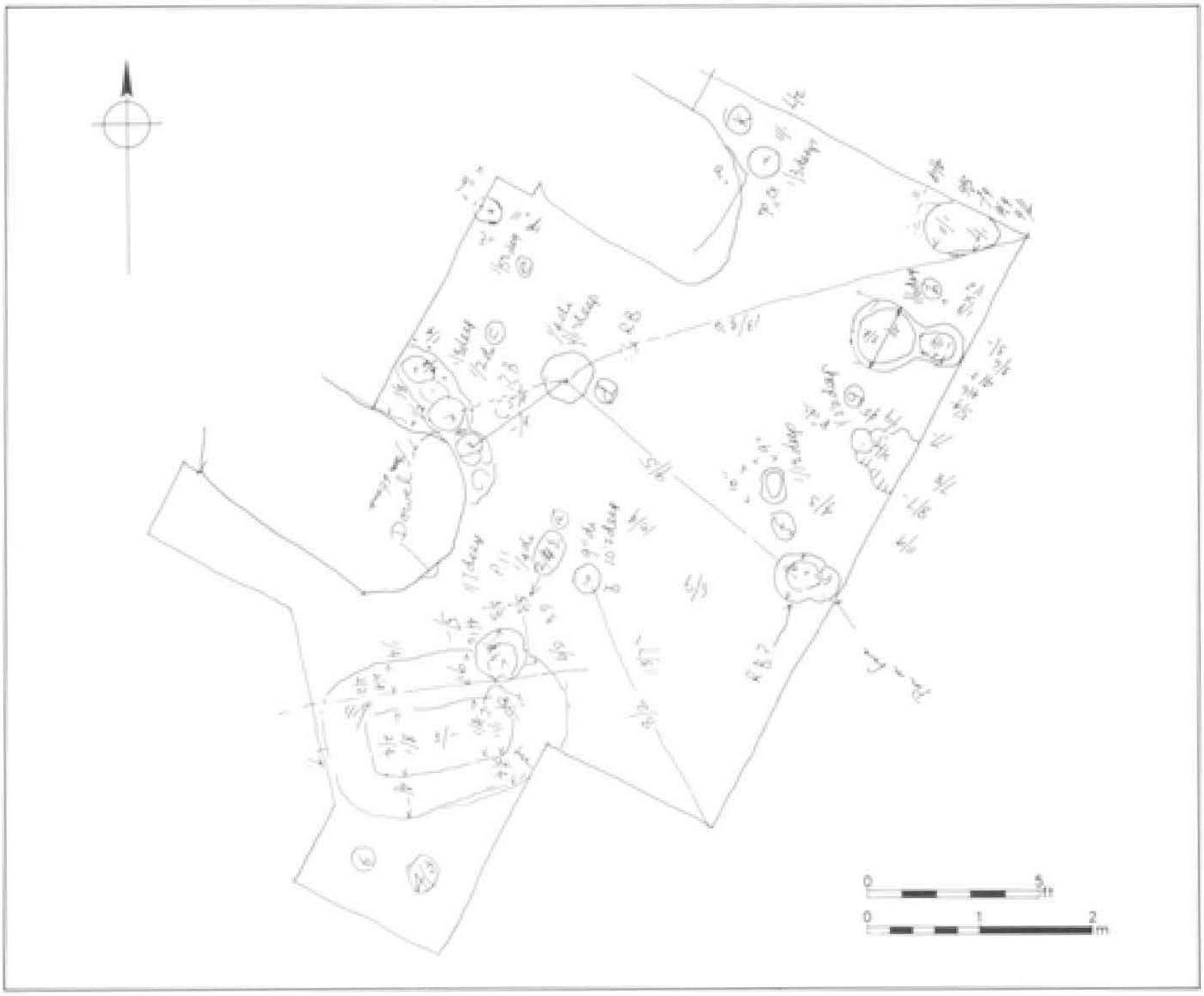



*Fig 274 Cutting 8: Hawley, all features plan. Traced from original site plan*

*Fig 275 Cutting 12: Hawley, all features plan. Traced from original site plan*

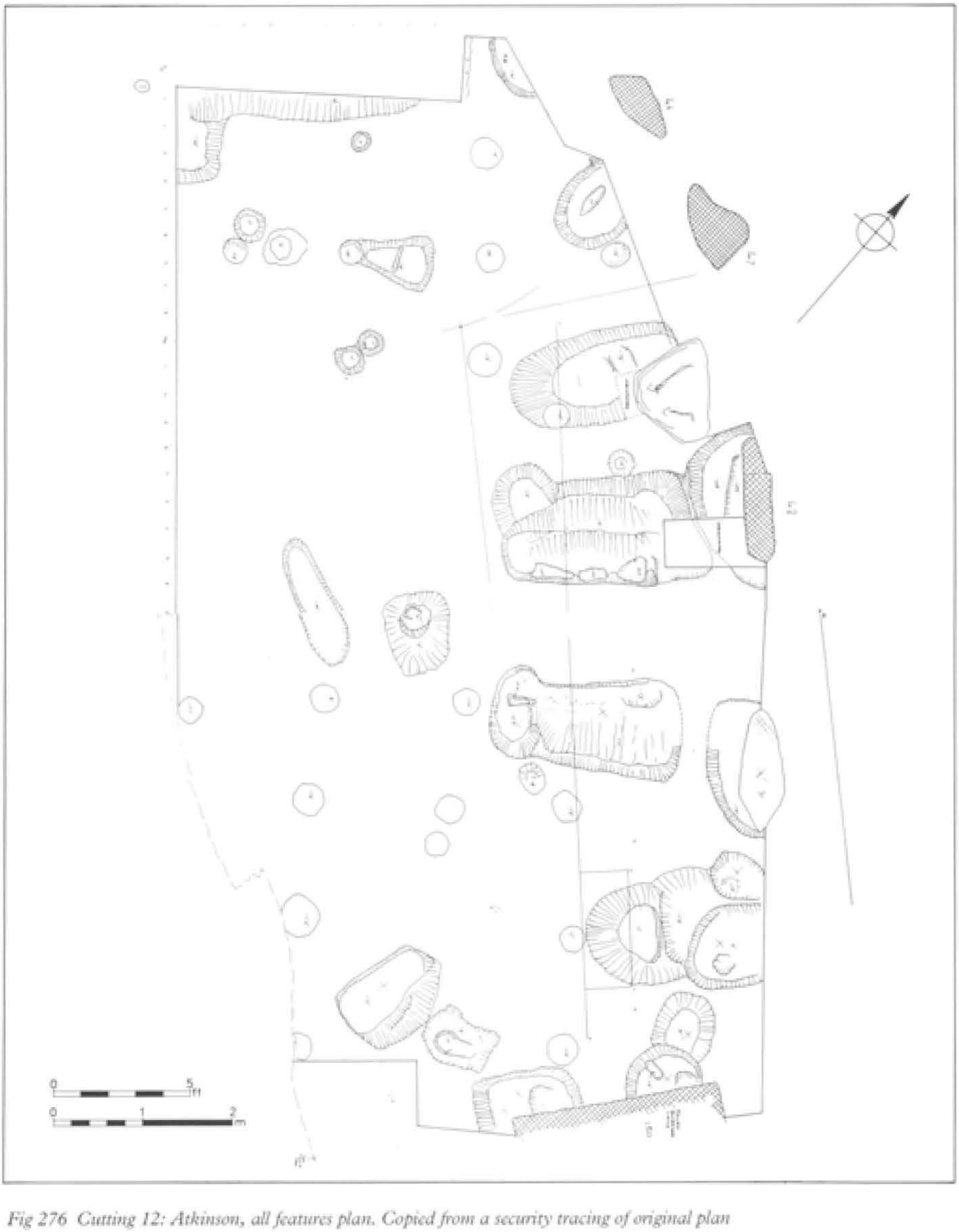


*Fig 276 Cutting 12: Atkinson, all features plan. Copied from a security tracing of original plan*


*Fig 277 Cutting 13: Atkinson, all features plan. Copy of security tracing of original site plan*

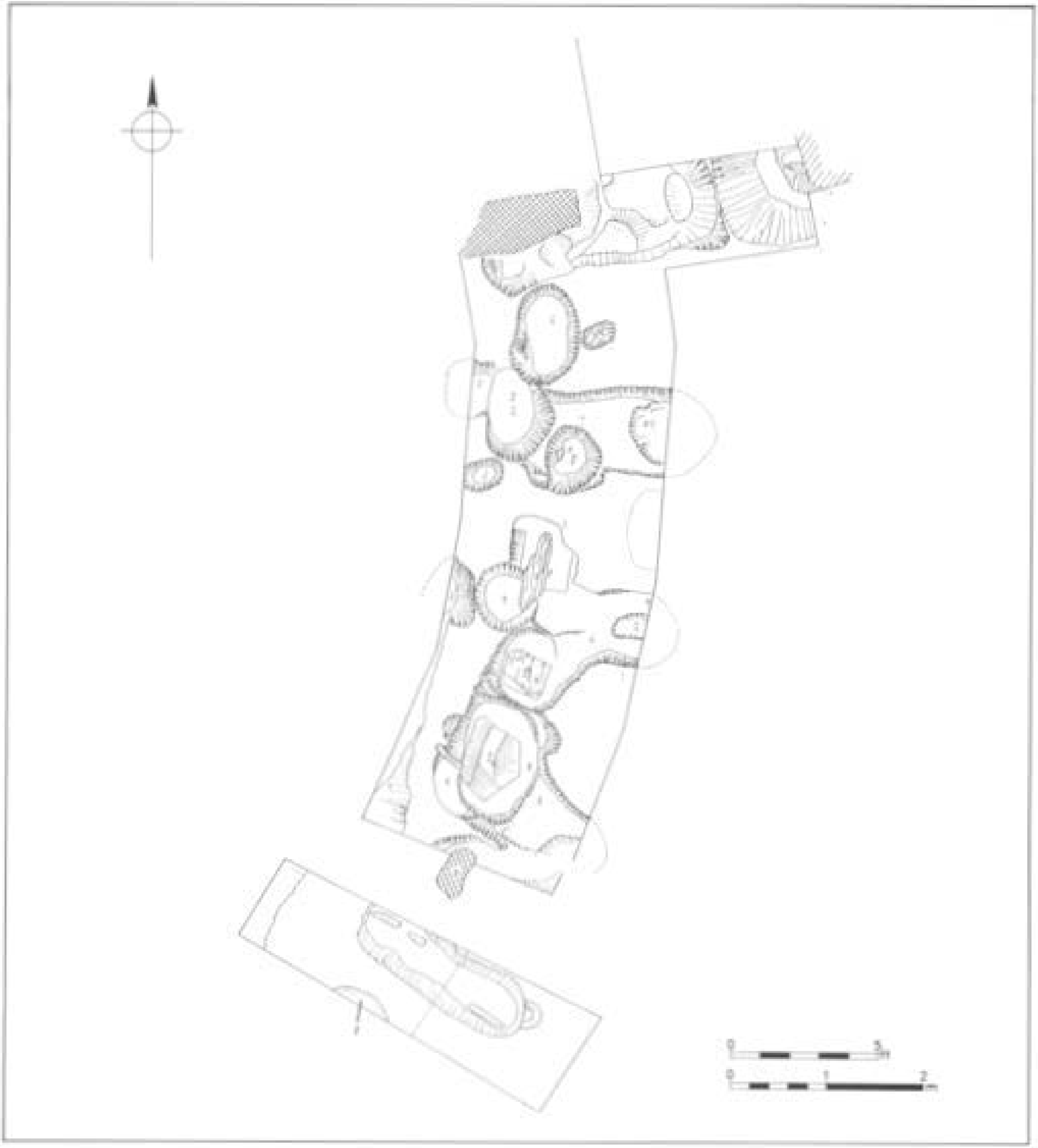


*Fig 278 Cuttings 45/14: Atkinson, all features plan. Copy of security tracing of original site plan*

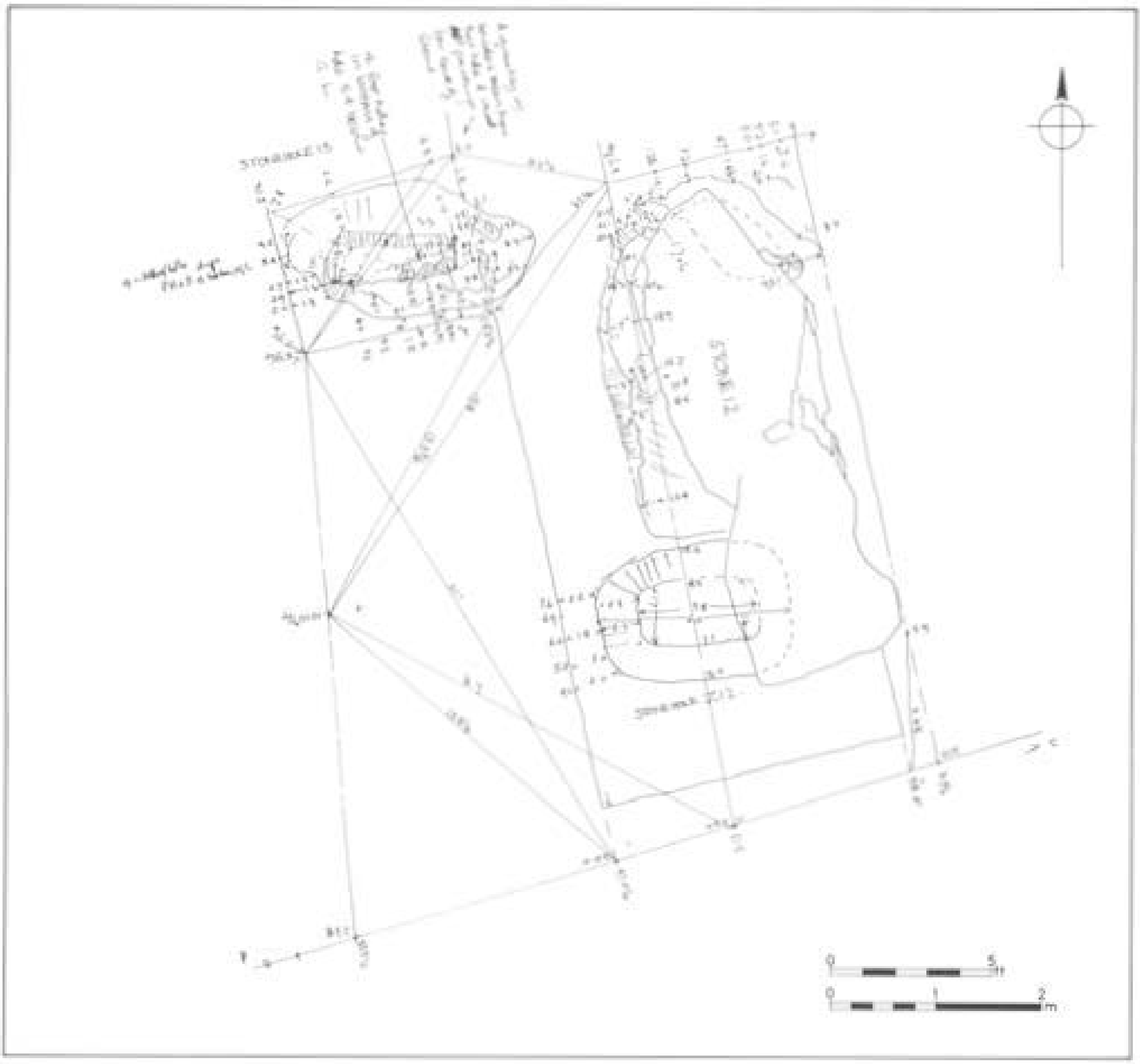



*Fig 279 Cutting 16: Hawley, all features plan. Traced from original site plan. Scale approx 1:30*

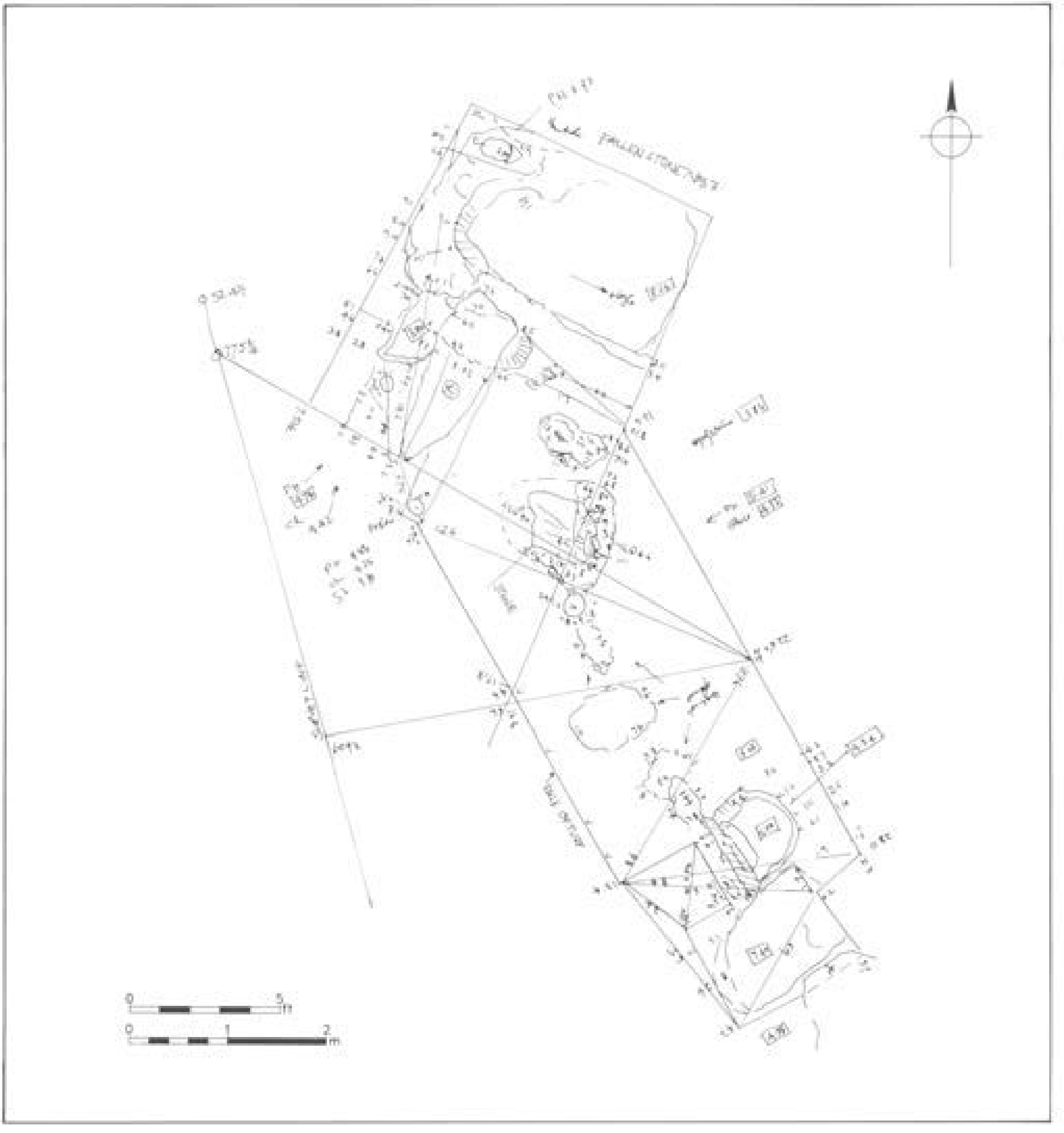


*Fig 280 Cutting 17: Hawley, all features plan. Traced from original site plan. Scale approx 1:30*

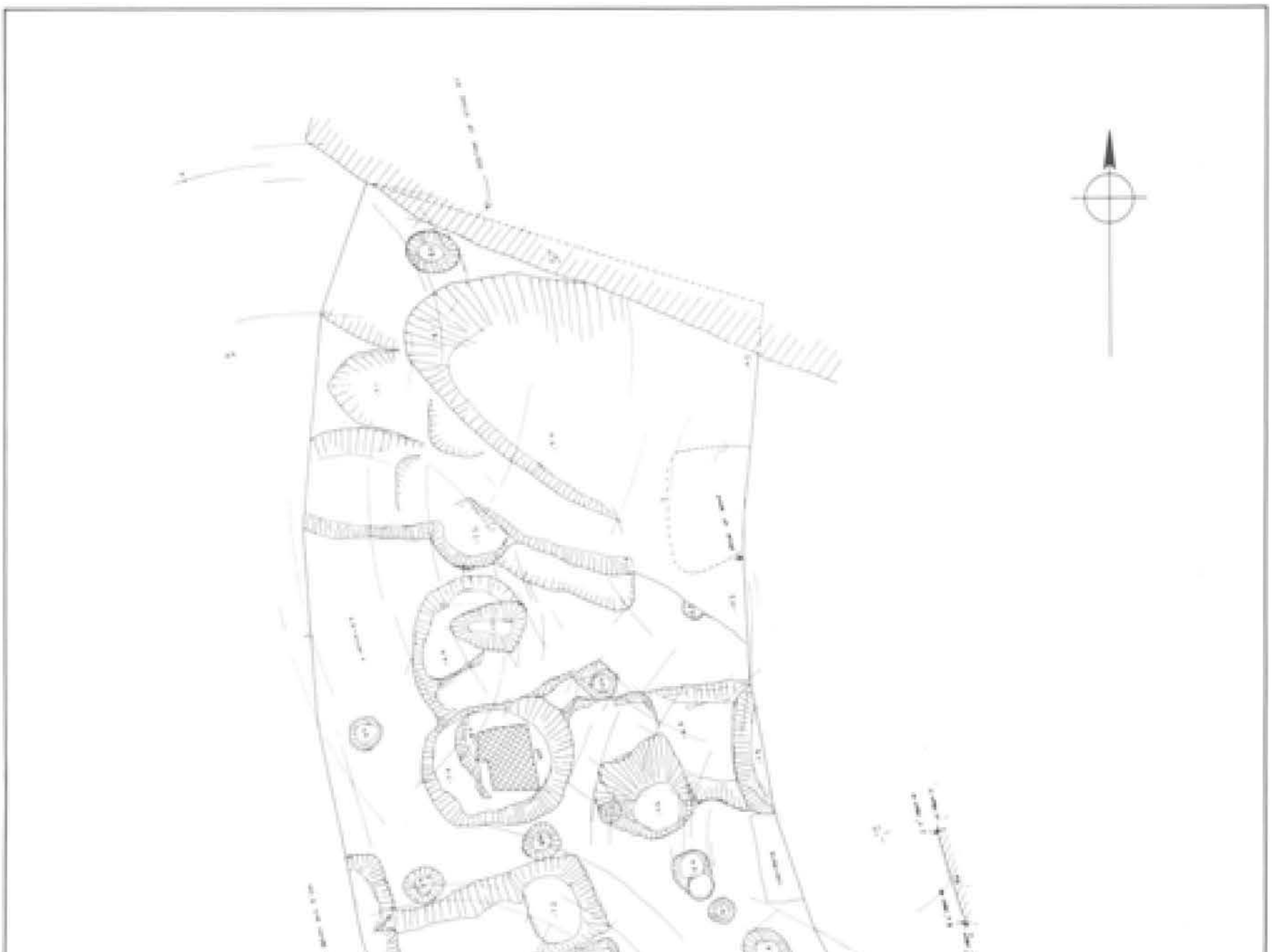


*Fig 281 Cutting 17: Atkinson, all features plan. Copy of tracing of original site plan*

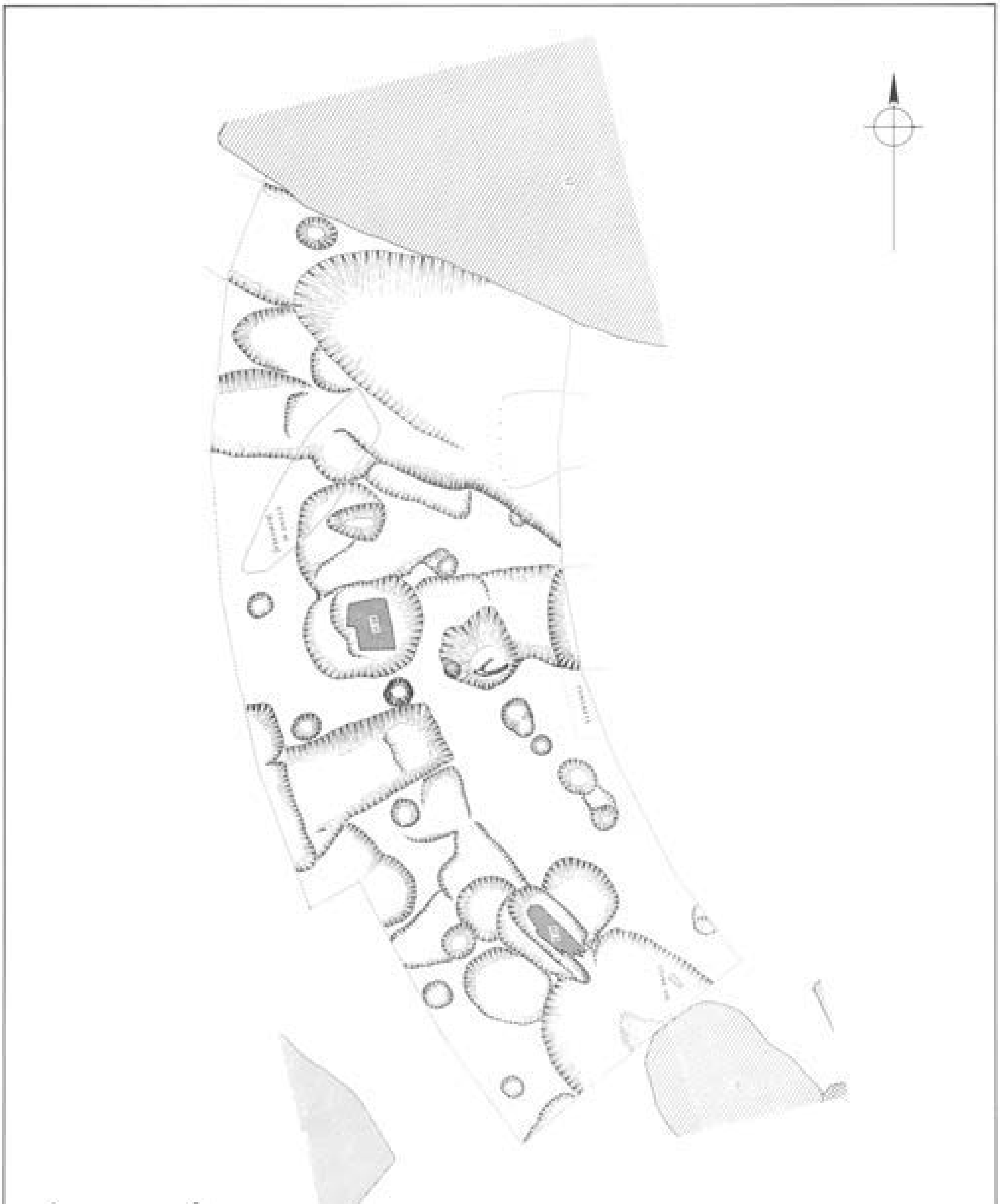


*Fig 282 Cutting 17: Piggott, all features plan. Copy of original post-excavation drawing*

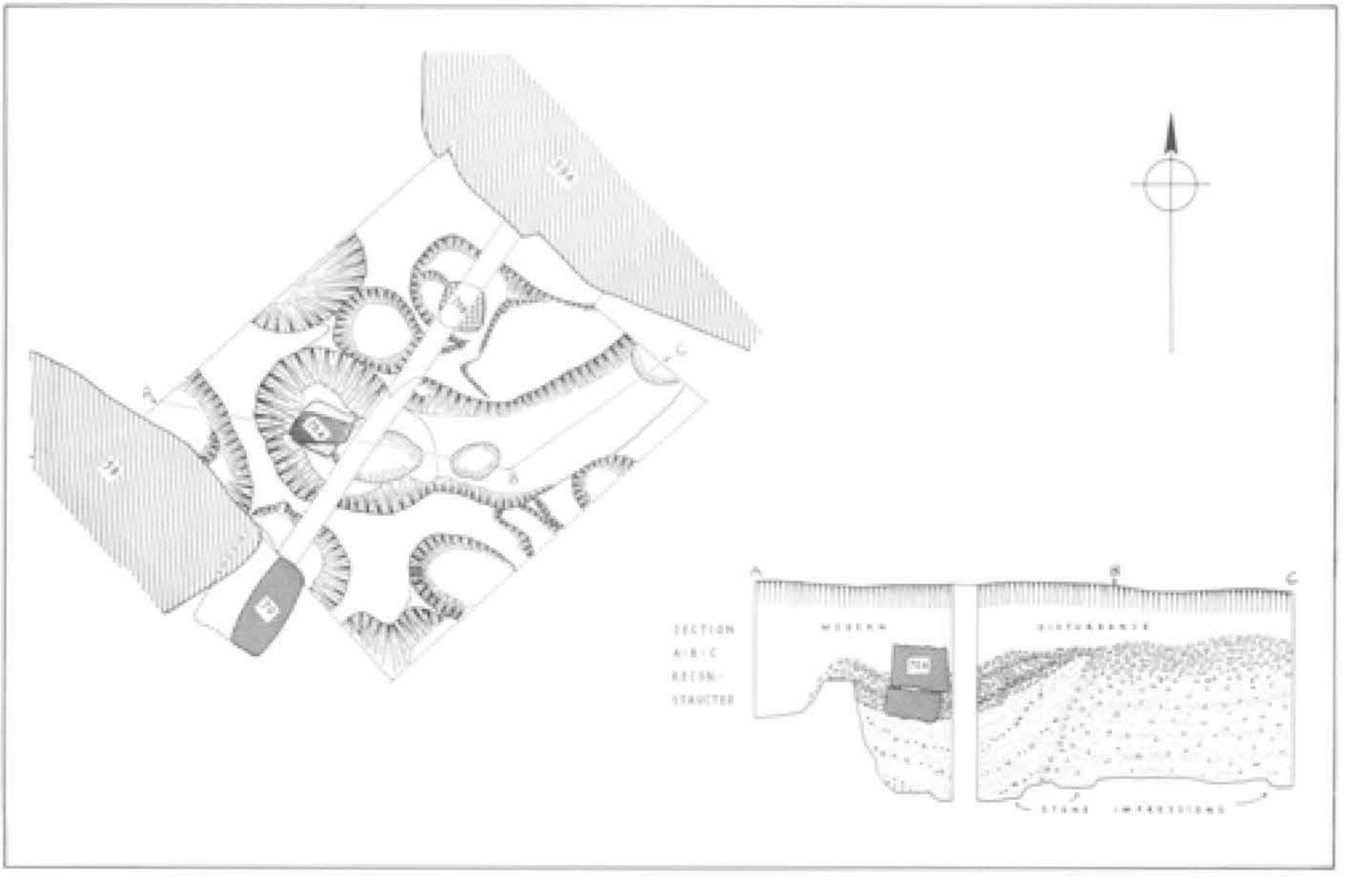


*Fig 283 (above) Cutting 35: Piggott, all features plan and reconstructed section. Copy of original post-excavation plan*

*Fig 284 (left) Cutting 35: Atkinson, all features plan. Copy of security tracing of original site plan*

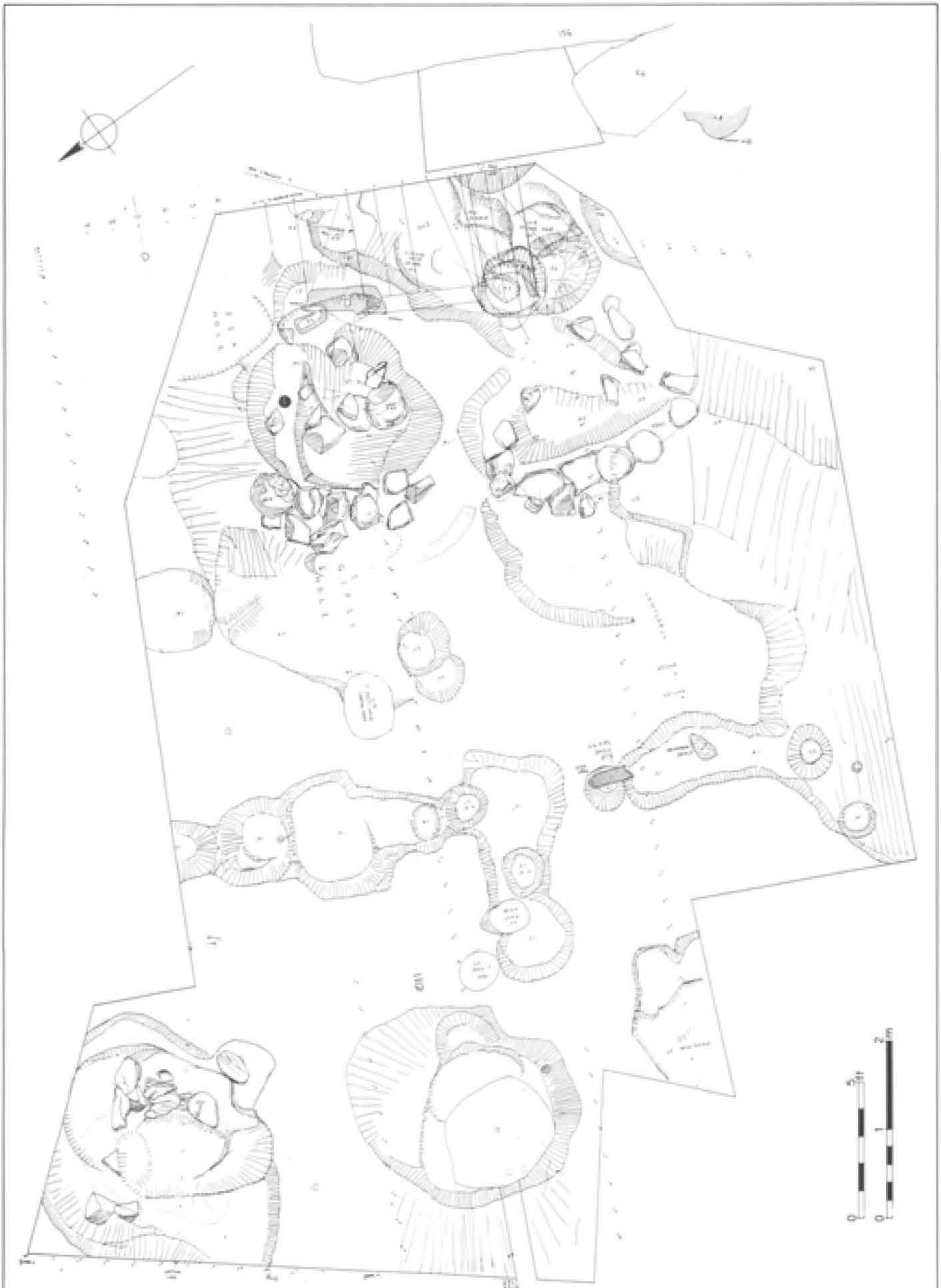


*Fig 285 Cutting 52: Atkinson, all features plan. Copy of tracing from original site plan*

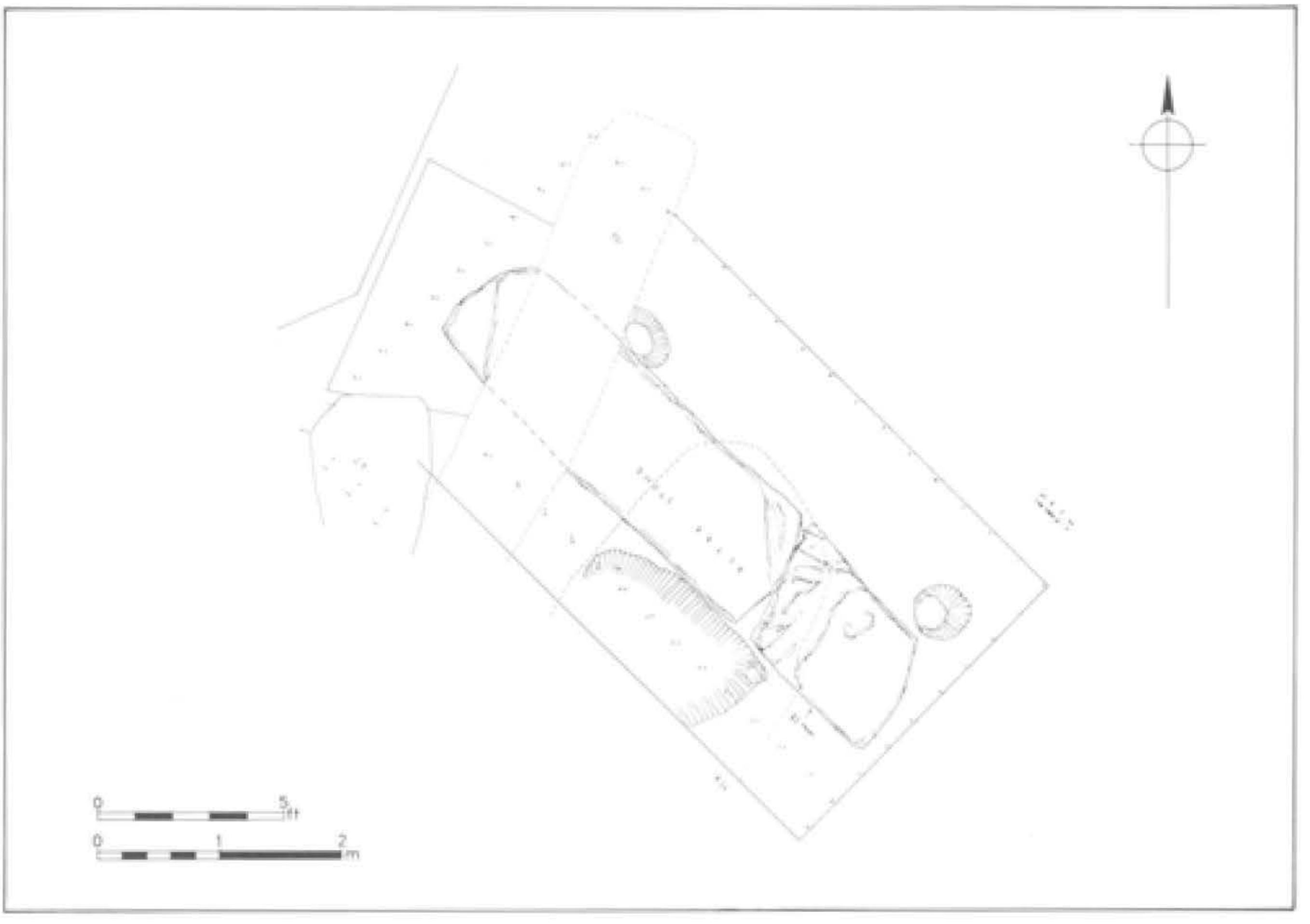



*Fig 286 Cutting 53: Atkinson, all features plan. Copy of tracing from original site plan*

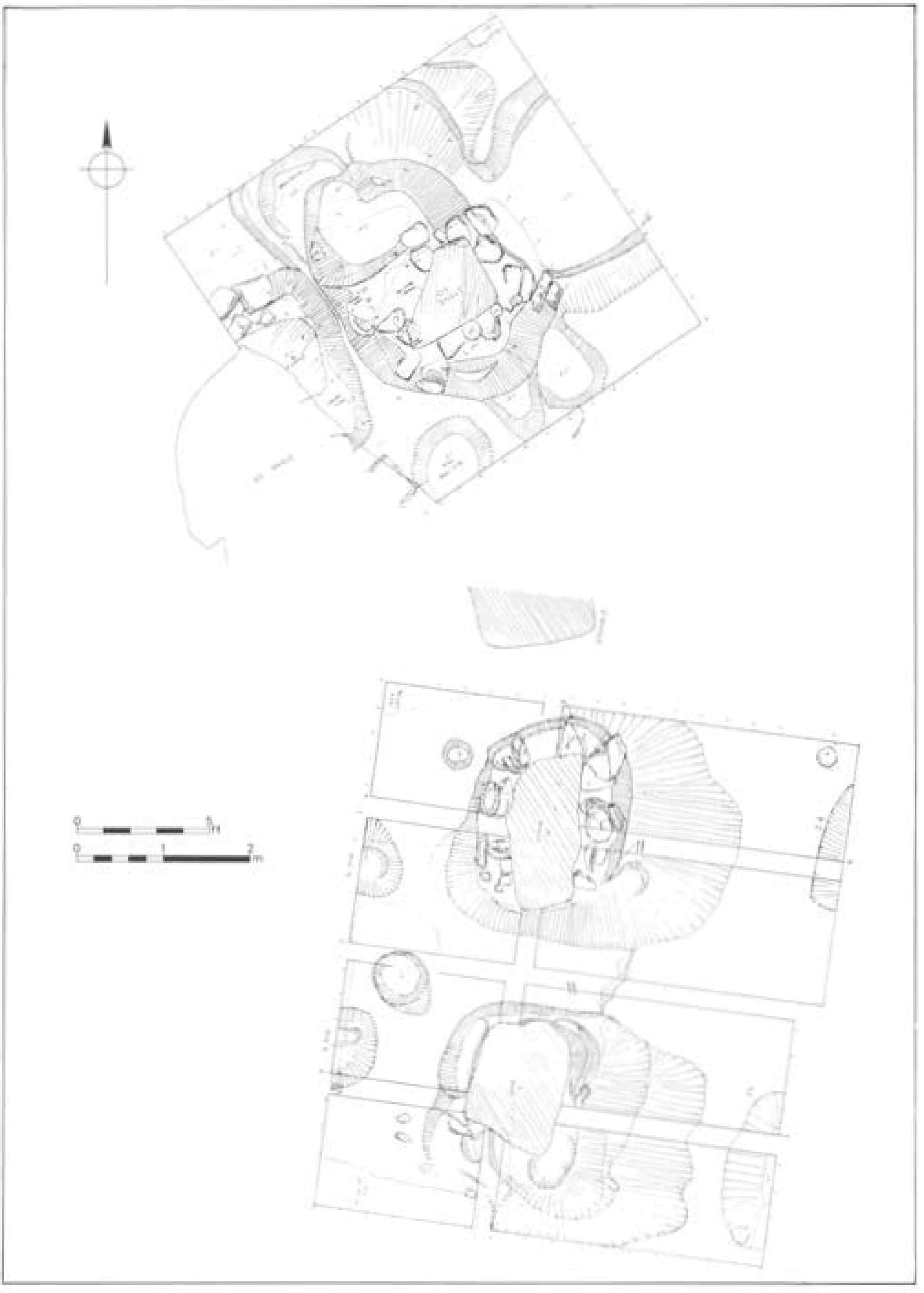


*Fig 287 Cuttings 54 & 55: Atkinson, all features plans. Copies of tracings of original site plans*

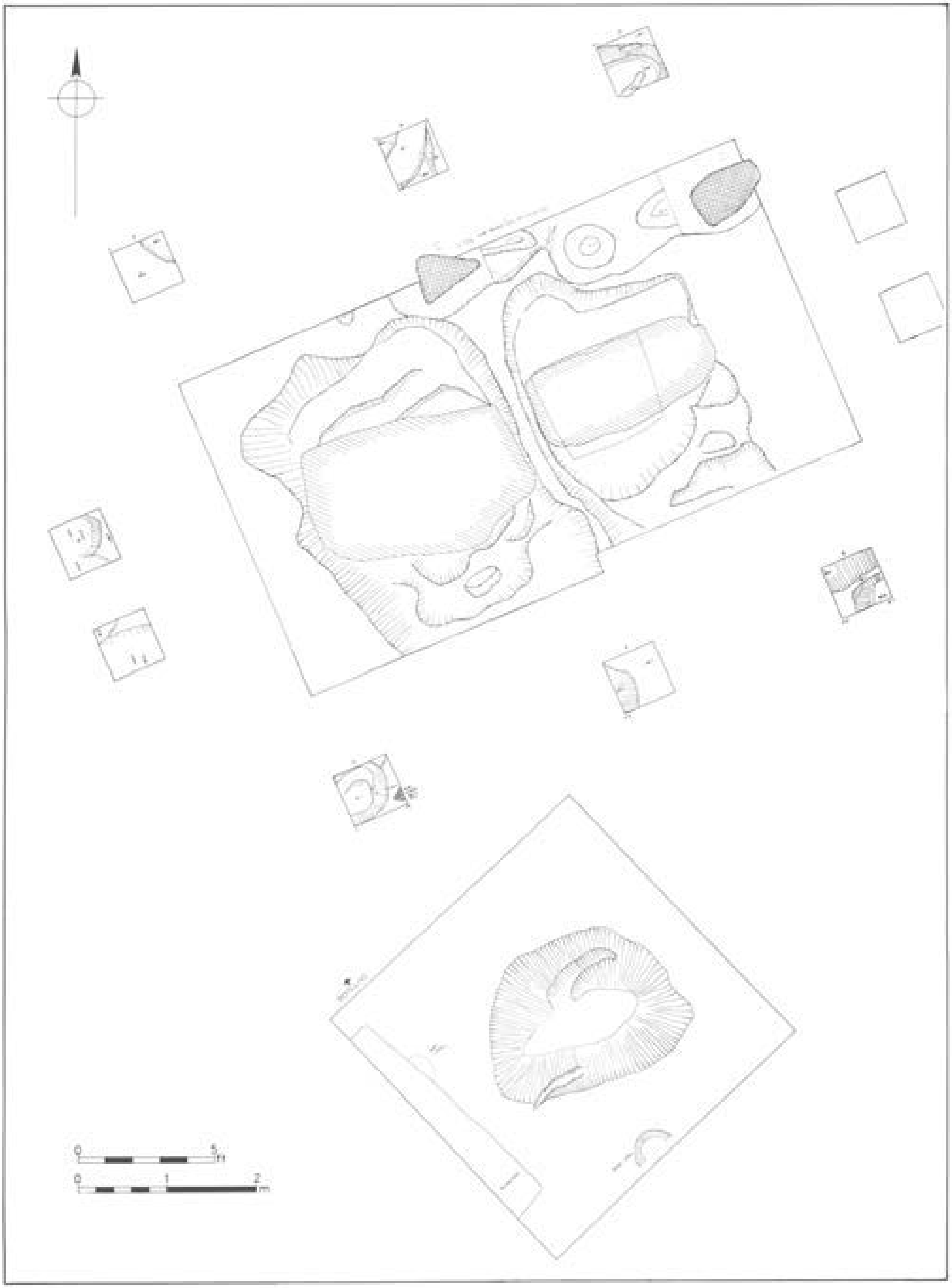


*Fig 288 Cutting 56, with C71–80 around it, & C57: Atkinson, all features plans. Copies of tracings from original site plans*

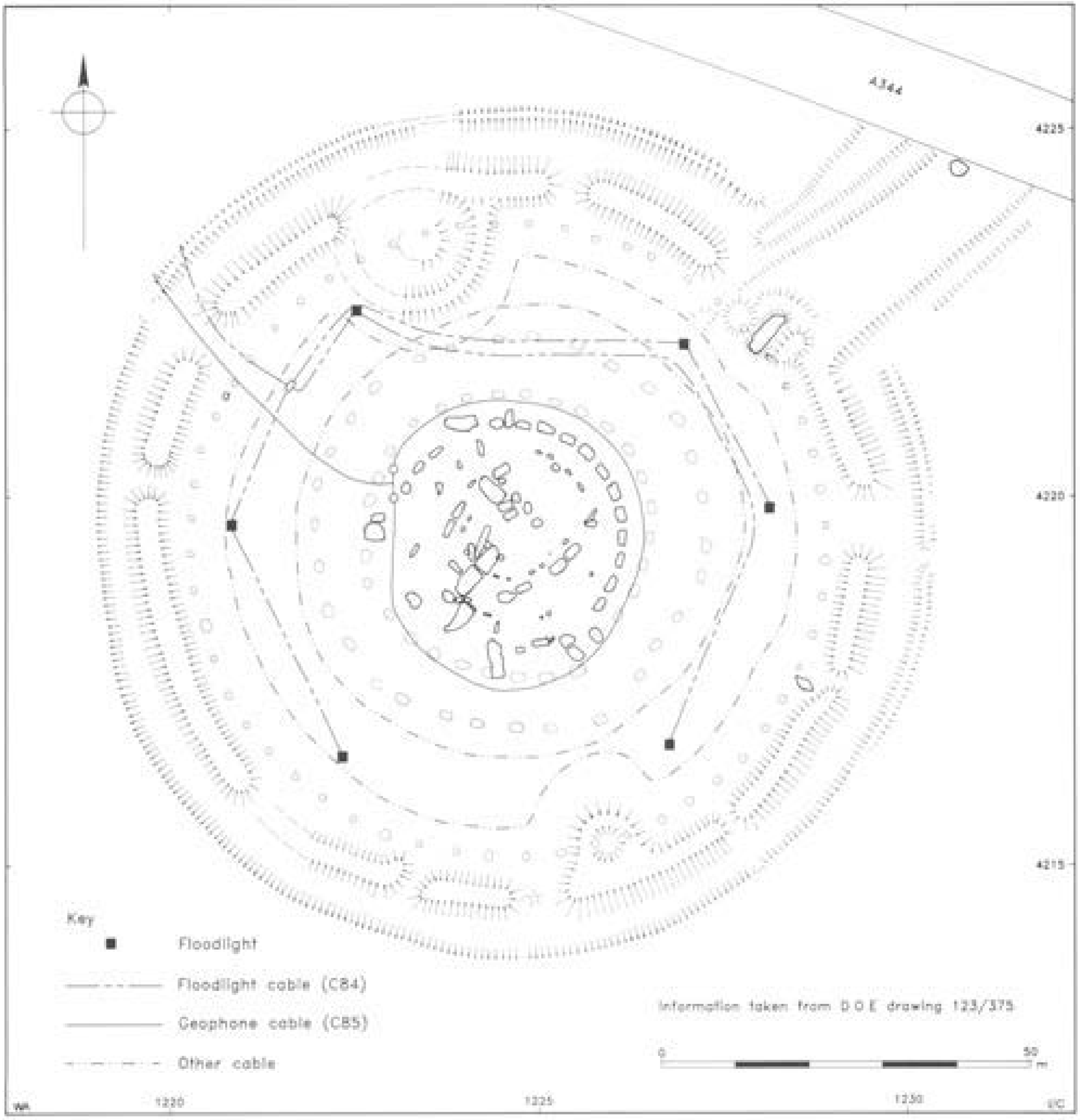



*Fig 289 Cuttings 84 & 85: Floodlight and geophone cables, plus other cables (no cuttings numbers)*

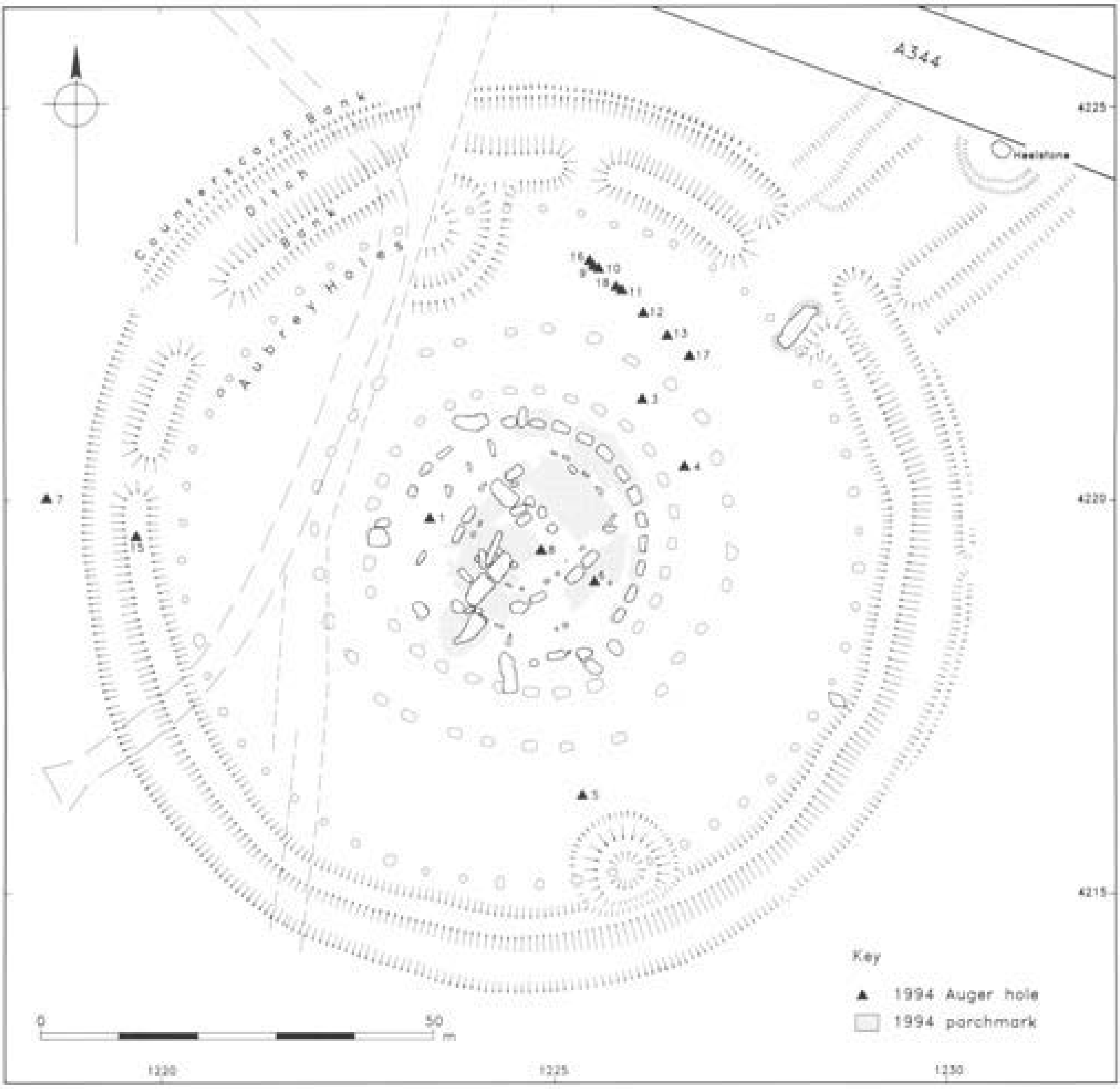



*Fig 290 Plan of parchmarks and auger holes recorded in 1994*

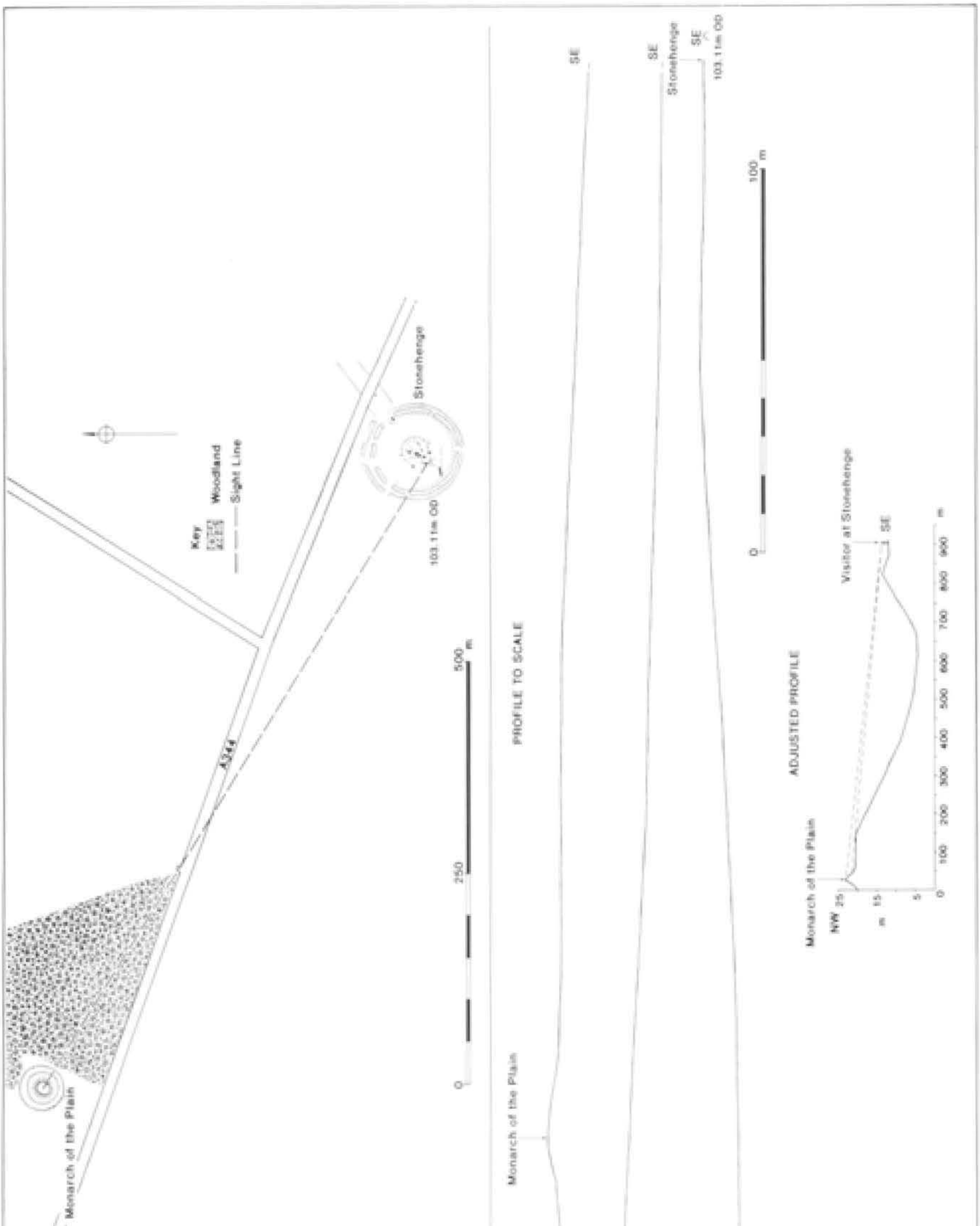



*Fig 291 Intervisibility between Stonehenge and the Monarch of the Plain (© the National Trust)*

# Appendix 7 Ministry of Works elevation drawings of standing stones and plans of fallen stones

The illustrations reproduced here (supplied by English Heritage) were prepared as part of a survey conducted in 1919 to assess the condition of the stones and recommend remedial action. Elevations are presented by major element of the stone monument, proceeding clockwise for each setting. The inner face of each stone is illustrated, except in a few cases where only the outer face was drawn. Not all the stones were illustrated and in some cases where stones have fallen there is only a plan of the upper surface. A selection of ground and 'top' plans, and side elevations of Sarsen stones is included. Scales are approximate as it is not always clear what was being measured: recorded heights are listed in Appendix 5. Copies of all the MoW survey drawings and of the Chief Architect's Report for which they were prepared are included in the archive.

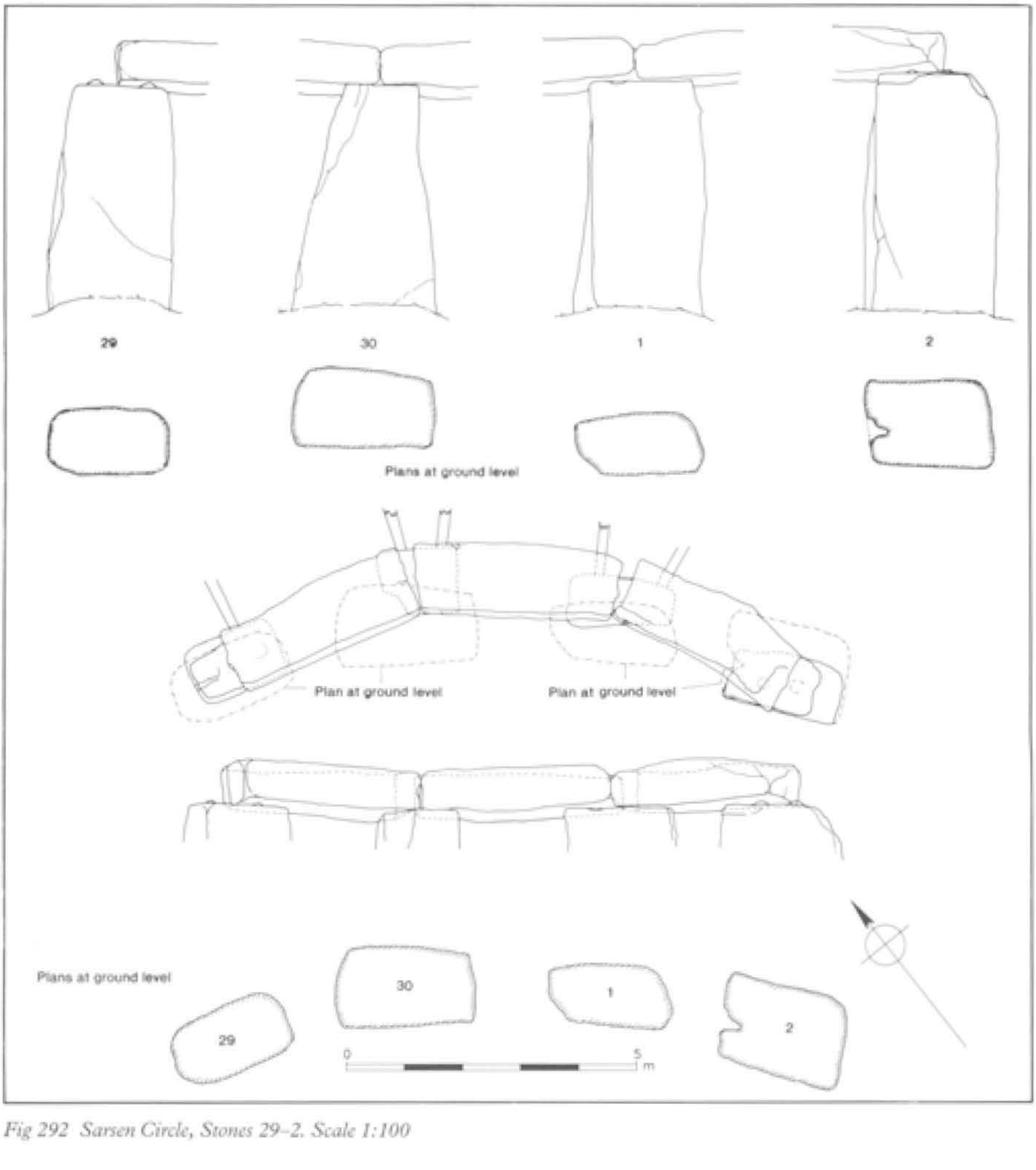



*Fig 292 Sarsen Circle, Stones 29–2. Scale 1:100*

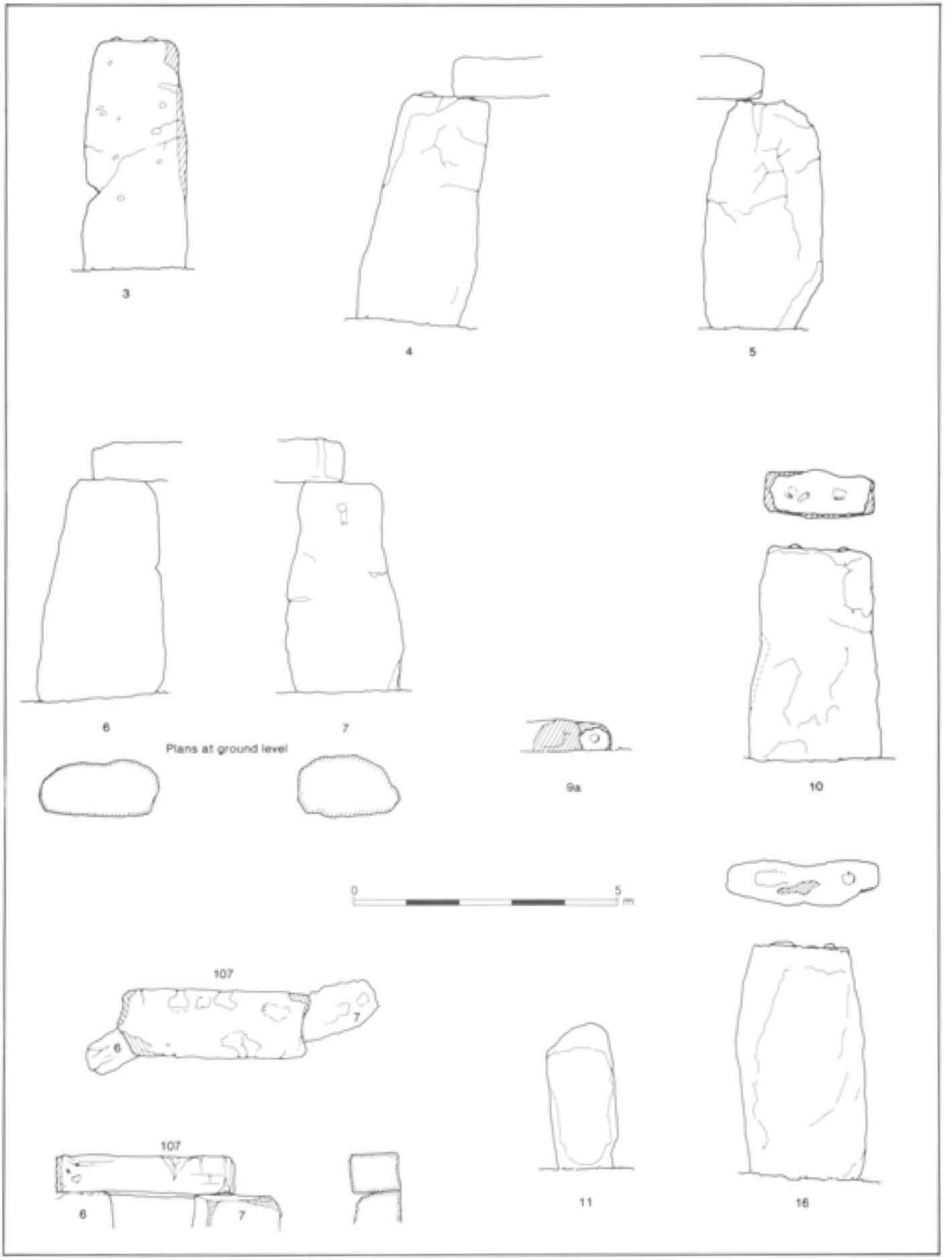



*Fig 293 Sarsen Circle, Stones 3–7, 9a, 10 (exterior face), 11, and 16, and lintel 107. Scale 1:100*

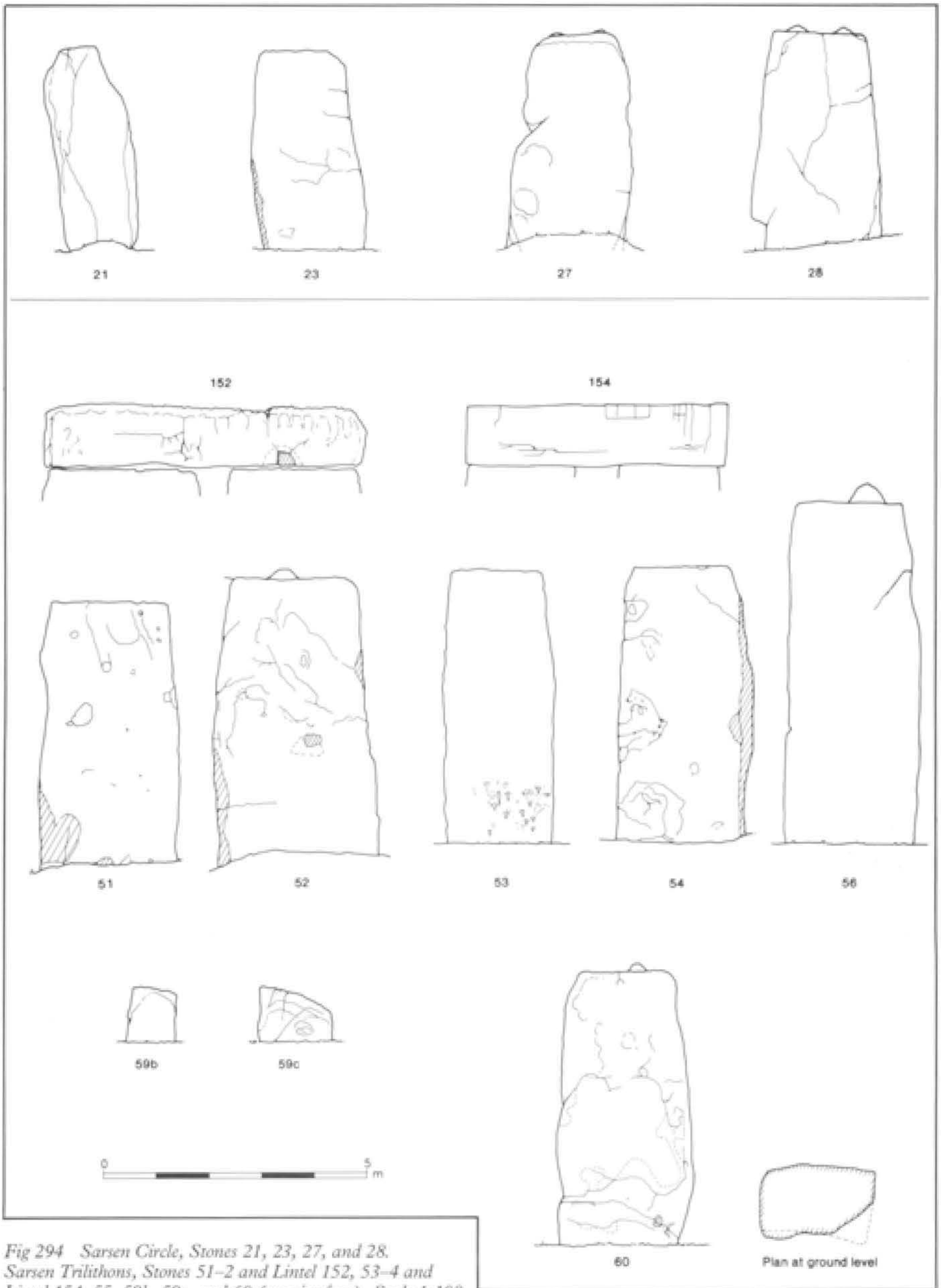



*Fig 294 Sarsen Circle, Stones 21, 23, 27, and 28. Sarsen Trilithons, Stones 51–2 and Lintel 152, 53–4 and Lintel 154, 55, 59b, 59c, and 60 (exterior face). Scale 1:100*

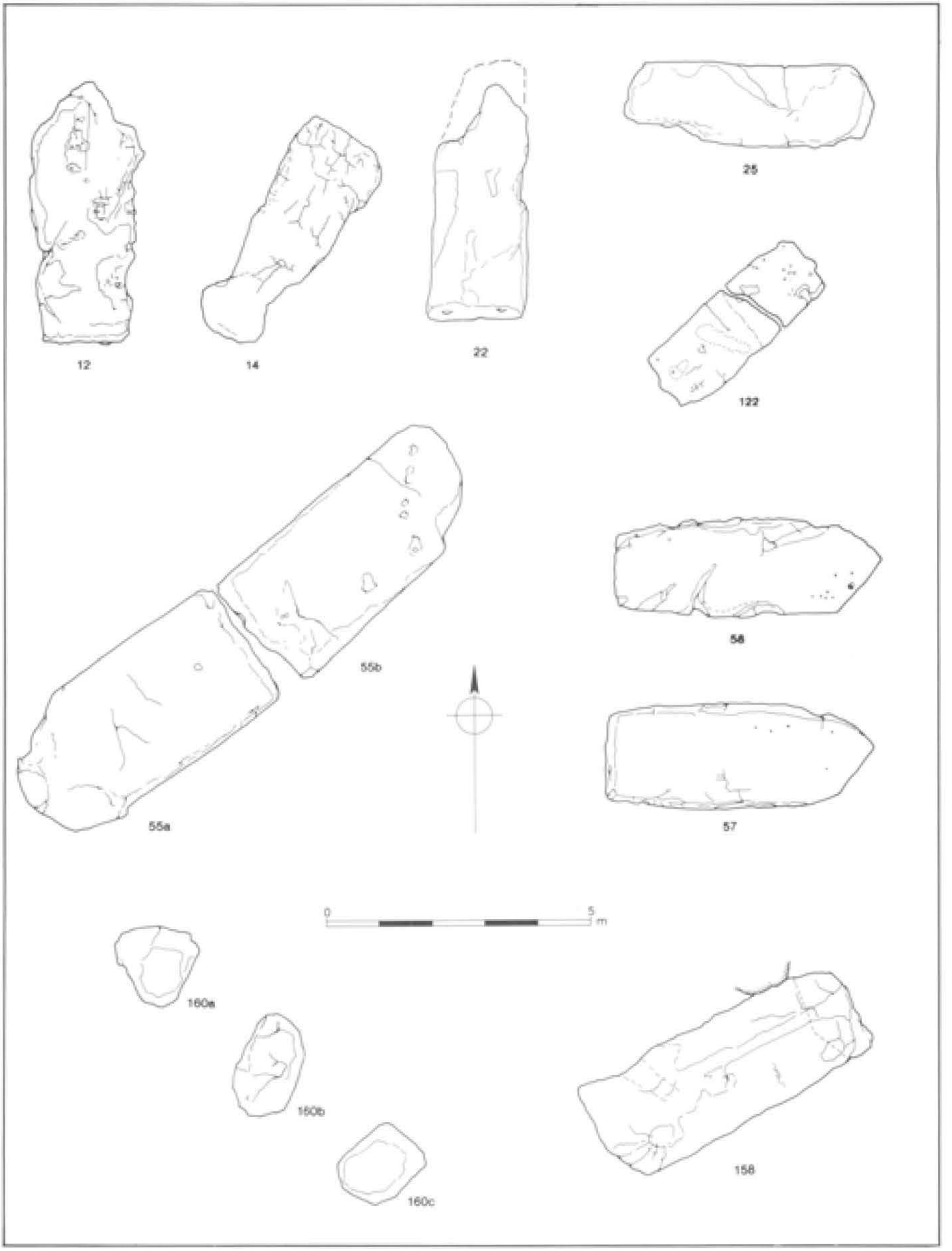



*Fig 295 Surface plans of fallen Sarsens. Note that Stones 22, 23 and lintel 122, and the Trilithon comprising Stones 57–8 and 158 have been re-erected (see Fig 188)*

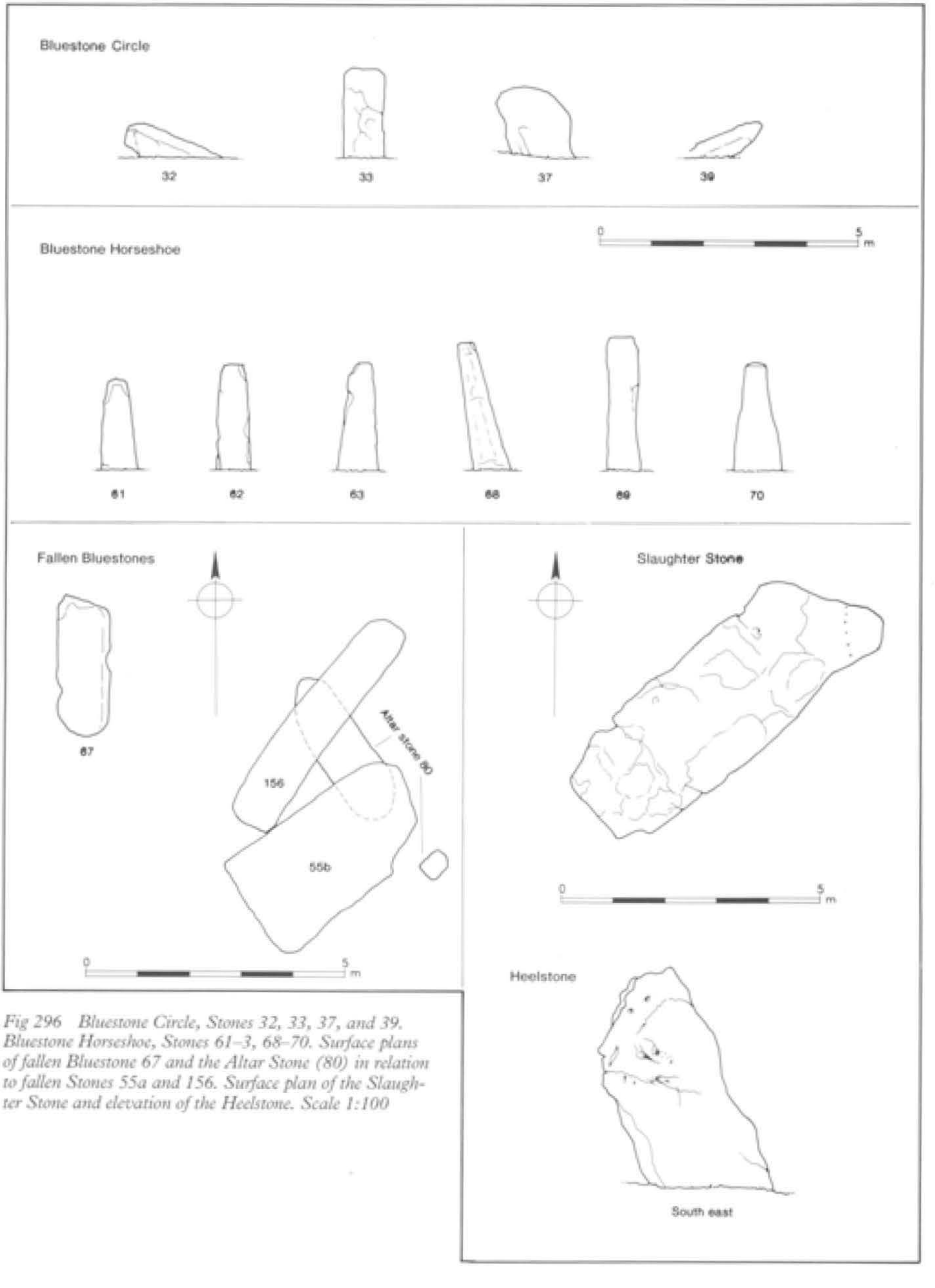



*Fig 296 Bluestone Circle, Stones 32, 33, 37, and 39. Bluestone Horseshoe, Stones 61–3, 68–70. Surface plans of fallen Bluestone 67 and the Altar Stone (80) in relation to fallen Stones 55a and 156. Surface plan of the Slaughter Stone and elevation of the Heelstone. Scale 1:100*

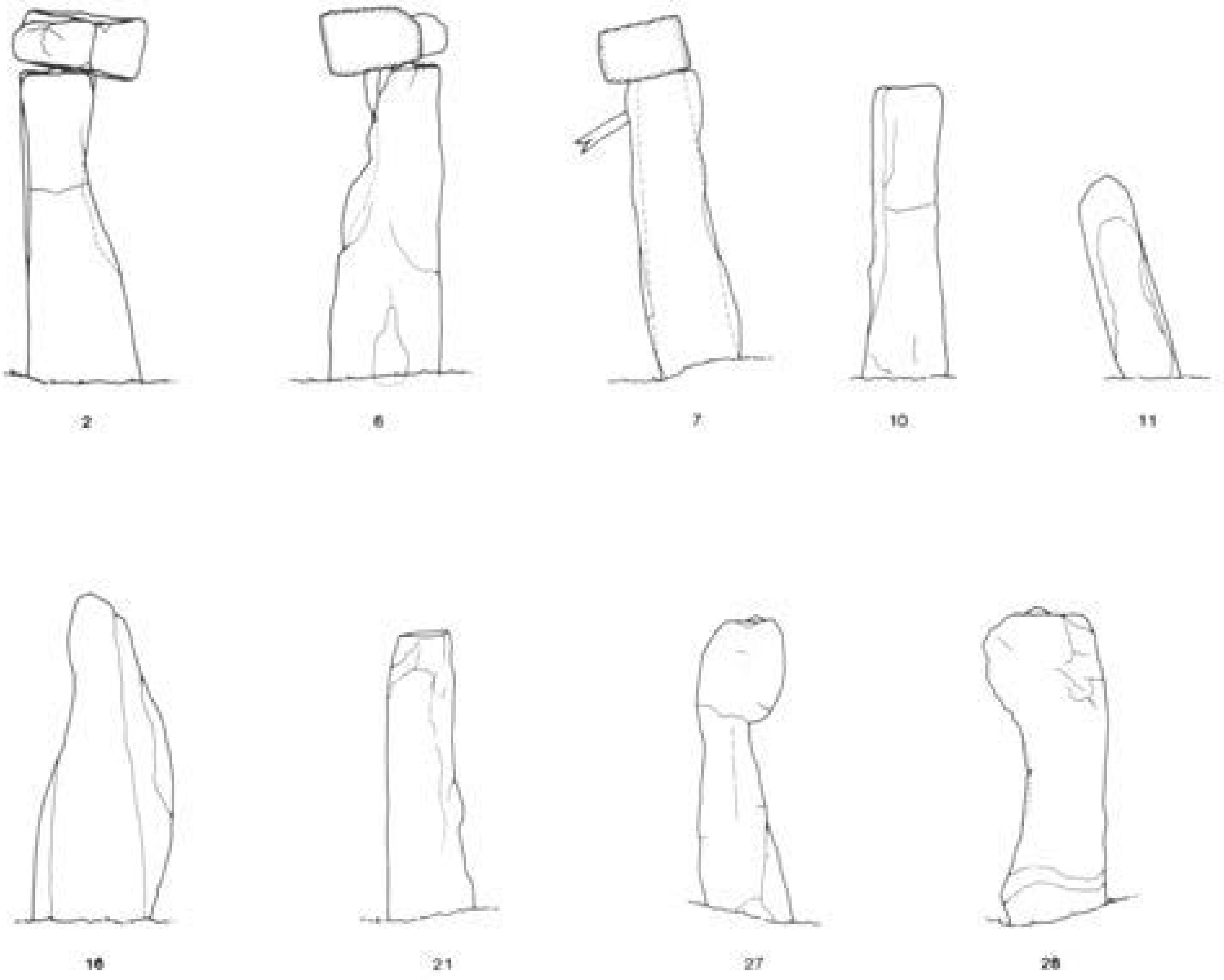
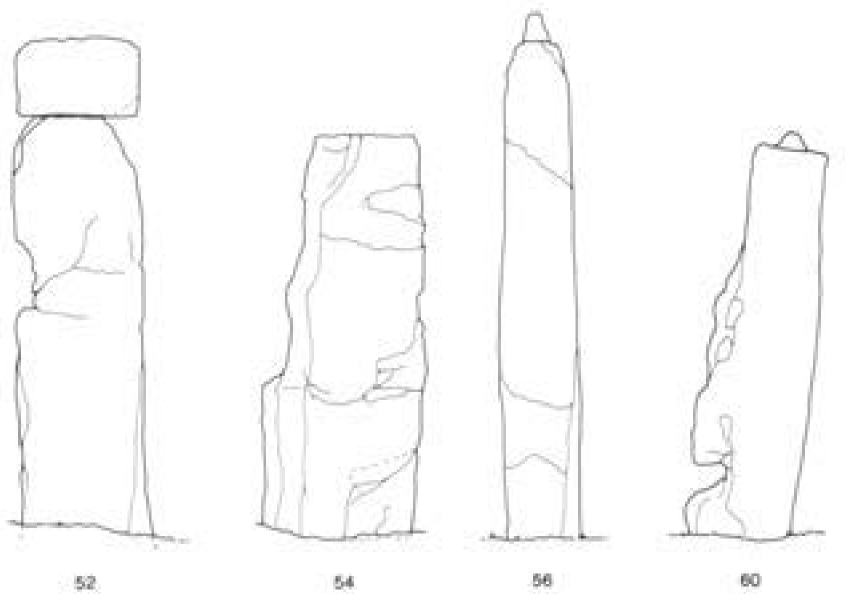



*Fig 297 Selection of side elevations of the Sarsen Stones illustrating the variety of shapes represented and the angle of lean of some stones in 1919. Scale 1:100*



# Appendix 8 Phasing and site database

The phasing used in the database for the present study is distinguished by arabic numerals, sub-divided alphabetically. The details of all contexts are held in the file CORREL in the site database, held with the archive.

The phasing for each context comprises four elements, in the following order, and with the field names given in brackets:

PERIOD [FPI]
PHASE [FPII]
GROUP [FPIII]
UNIT [FPIV]

**PERIOD** : this was not used.

**PHASE**: for the main phases of the monument the alpha-numeric phase codes used in the text are the same as those in the database field FPII, ie 1, 2, 3 with sub-divisions. Plus and minus signs are used in the database to indicate 'or later' and 'or earlier' respectively.

For the post-monument activity, which it did not prove possible to divide into meaningful phases, and for un-phasable activity, codes have been assigned to non-phased categories of related Groups, and are numbered in the Phase field (FPII). These codes are also used for very general categories of contexts which are not assigned to group (eg turf and topsoil, excavation backfill).

These codes are distinguished by the first digit of the 2-digit number, as follows:

6 post-monument destruction of monument
(7 not used)
8 Recent disturbance, not obviously connected with destruction of the monument (but does include excavation backfills)
9 Unphasable features

These codes are given below in Table 66 against Group number, where applicable, and descriptions are given for those codes which have no Groups within them in Table Appx 67.

**GROUPS**: these comprise related groups of contexts, one or more of which may constitute a phase. Group numbers are unique, and therefore form the easiest access to different types of context, eg. all the original fills of Bluestone Circle stoneholes have the group number 5. FPIII is a field for 3 digits.

The Groups are described and phased as in Table 66

**UNITS**: these are more or less equivalent to fields asking for 'component of' and the Unit is normally the cut number for a feature or for a section of the ditch.

**Table 66: Groups**

| *Group* | *Description* | *Revised phase (form on database)* | *Non-phased grouping (form on database)* |
|---|---|---|---|
| 01 | Ditch cut & primary fill; mainly chalk rubble, but may also include trampled clay etc on bottom (as included in classic descriptions of ditch profiles in chalk) | 1 | |
| 02 | Bank | 1 | |
| 03 | Aubrey Holes; cut & primary fill | 1 | |
| 04 | Post-holes on causeway | 2 | |
| 05 | Sarsen Circle | 3ii | |
| 06 | Sarsen Trilithons | 3ii | |
| 07 | Bluestone Circle | 3iv | |
| 08 | Bluestone Horseshoe | 3iv | |
| 09 | Q & R Holes | 3i | |
| 10 | Stoneholes earlier than final Bluestone Horseshoe | 3iii | |
| 11 | Stoneholes earlier than final Bluestone Circle | 3iii | |
| 12 | Other non-posthole features earlier than Bluestone Horseshoe | 3- | |
| 13 | Postholes (noted by excavator) not definitely later than | 2- | |
| 14 | Postholes (assumed) not definitely later than | 2- | |
| 15 | Y Holes; cut & primary | 3vi | |
| 16 | Z Holes; cut & primary | 3vi | |
| 17 | Natural secondary fill of Ditch | 2a | |
| 18 | Aubrey Holes; secondary fill | 2- | |
| 19 | Fills of empty Bluestone Circle holes (exc any remaining original fill) | | 60 |
| 20 | Fills of empty Bluestone Horseshoe holes (exc any original fill) | | 60 |
| 21 | Unphasable, not stonehole or posthole & with no known relationships, ie there obviously were relationships but they have been destroyed unrecorded | | 91 or phased individually |
| 22 | Features noted as IIIc stoneholes by Atkinson | 3- | |
| 23 | Counterscarp Bank | 1 | |
| 24 | Features cutting secondary fill of Ditch | 2b | |
| 25 | As 21, but interpreted as natural by excavator, ie bushholes | | 91 |
| 26 | Features cutting edge of Ditch/Bank | 2 | |
| 27 | Non-posthole, non-stonehole features | 3- | |
| 28 | Probable robber trenches | | 60 |
| 29 | Cremations with no known relationships | | 91 |
| 30 | Non-posthole features earlier than Q&R Holes with no bluestone | 2- | |
| 31 | Post-Bluestone Circle features, not postholes or stoneholes | | 91 |
| 32 | Fills of empty Sarsen Circle holes | | 60 |
| 33 | Unphasable, postholes not or unlikely to be early | | 91 |
| 34 | Aubrey Hole; cut through secondary fill no ash/cremations/bluestone | 2- | |
| 35 | Aubrey Hole; secondary fill ashy layer with/without cremations | 2- | |
| 36 | Aubrey Hole; secondary fill post-ashy layer, no bluestone | 2- | |

**Table 66 (cont)**

| *Group* | *Description* | *Revised phase (form on database)* | *Non-phased grouping (form on database)* |
|---|---|---|---|
| 37 | Aubrey Holes; secondary fills, bluestone layer | 3* | |
| 38 | Stoneholes earlier than 39/10 or 39/11 | 3iii | |
| 39 | Stoneholes not assignable to phase | 3- | |
| 40 | Y Holes; fill, no RB material present | 3vi+ | |
| 41 | Z Holes; fill, no RB material present | 3vi+ | |
| 42 | Y Holes; fill, RB present | | 60 |
| 43 | Z holes fill - RB material present | | 60 |
| 44 | South Barrow; ditch & fills | 3b | |
| 45 | Station Stones; holes & ?fills | 3b | |
| 46 | North Barrow; ditch & fills | 3b | |
| 47 | Avenue ditch; cut & fills where not differentiated | 3c | |
| 48 | Avenue ditch; secondary fills where differentiated | 3c | |
| 49 | Avenue ditch; cut & primary fill & bank | 3c | |
| 50 | Heelstone Ditch; cut & fill | 3b | |
| 51 | Heelstone & hole | 3a | |
| 52 | North Barrow bank | 3b | |
| 53 | Stone 97 hole | 3a | |
| 54 | Post-sarsen but not certainly modern | 91 | |
| 55 | As 29/ but layers | (3-) | |
| 56 | Layers earlier than Q/R Holes without bluestone | (2-) | |
| | **Non-monument north of A344** | | |
| 57 | Avenue ditch; cut and all fills where not differentiated outside the monument | | |
| 58 | Avenue ditch; cut, bank, and primary fill outside the monument | | |
| 59 | Avenue ditch; secondary fill outside the monument | | |
| 60 | Avenue ditch; tertiary fill outside the monument | | |
| 61 | 'Oblique' ditch; cut and fills where not differentiated. Post-dates the Avenue according to Atkinson | | |
| 62 | 'Gate' ditch; cut and fills where not differentiated | | |
| 63 | 'Oblique' ditch; cut, primary fill, and bank | | |
| 64 | Postholes post-dating Avenue ditch and fills outside the monument | | |
| 65 | Postholes and/or pits and fills where not differentiated outside the monument, unphaseable | | |
| 66 | Layers cut by or pre-dating the Avenue ditch, fills, and bank outside the monument | | |
| 67 | Layers post-dating the Avenue ditch, fills, and bank outside the monument | | |
| 68 | Layers outside the monument, unphaseable | | |
| 69 | Linear features and fills where not differentiated outside the monument, unphaseable | | |
| 70 | Curvilinear feature on Vepasians Camp Ridge and fills where not differentiated | | |
| 71 | Features post-dating or probably post-dating curvilinear feature 70 | | |
| 72 | Postholes, primary fills, and packing material outside the monument | | |
| 73 | Postpipe material within postholes 72 | | |
| 74 | Upper posthole fills within postholes 72 | | |
| 75 | Palisade Ditch; cut, primary fills, and packing materials | | |
| 76 | Postpipe material; deliberate backfilling, silting, etc within Palisade Ditch 75 | | |
| 77 | Disturbance after filling of postpipes and before turf formation within Palisade Ditch 75; ie grave, recuts etc | | |
| 78 | Upper ditch fills and turflines within Palisade Ditch 75 | | |
| 79 | Palisade Ditch cut and fills where not differentiated | | |
| 80 | Features and their fills outside the monument interpreted as natural | | |
| 81 | Avenue ditch; recut and fills outside the monument | | |
| 82 | Stakeholes and very small features and their fills identified from section drawings, pre-dating the Avenue ditches outside the monument | | |
| 83 | Stakeholes and small features and their fills identified from section drawings, relationship with Avenue ditch unknown, outside monument | | |
| 84 | Stakeholes and fills outside the monument, unphaseable | | |
| 85 | Linear feature cuts and primary fills outside the monument, not the Avenue or Palisade Ditch | | |
| 86 | Secondary fills within linear features 85 | | |
| 87 | Tertiary fills within linear features 85 | | |
| 88 | Layers cut by linear features 85 | | |
| 89 | Layers cut by postholes 72 outside the monument | | |
| 90 | Features (ambiguity over id) and primary fill outside the monument | | |
| 91 | Secondary fills within features 90 | | |
| 92 | Features (ambiguity over id) predating the Avenue bank outside the monument | | |
| | **monument, south of A344** | | |
| 93 | Backfill of Stonehole 97 | 3b | |
| 94 | Secondary fill of Heelstone Ditch | 3a+ | |
| 95 | Features sealed by Avenue bank | 3- | |
| 96 | Layers in Ditch interpreted as deliberate backfill of chalk following primary fill | 2 | |
| 97 | Minor runs of chalk within normal secondary fill which seem too limited to be part of a deliberate backfilling episode and are not considered as such by Hawley; could therefore be due to eg animal burrowing at side of ditch, or minor disturbance to chalk of Bank etc | 2a | |
| 98 | Humic layer lying directly above primary chalk rubble fill in Ditch. Precedes the deliberate backfill, where that occurs, and in some places is present below the natural secondary fill. It appears to be a stabilisation horizon. It has been | 1 | |

**Table 66 (cont)**

| *Group* | *Description* | *Revised phase (form on database)* | *Non-phased grouping (form on database)* |
|---|---|---|---|
| | counted as phase 1 on the grounds that where there is backfill it appears to immediately precede it, and the primary filling is likely to have formed and begun to stabilise in a very few seasons | | |
| 99 | Natural (usually chalk) | | 9.9 (99) |
| 100 | Subsoil | | 9.8 (98) |
| 101 | Non- posthole features earlier than 102 | 3iii | |
| 102 | Stoneholes earlier than those of Group 10 or 11 | 3iii | |
| 103 | Unphasable features; neither stoneholes nor postholes, but prehistoric; ie as for group 21, but in this case there were no relationships originally, except with recent layers or features. | | 9.1 (91) |
| 104 | Features definable as neither stone-holes nor postholes, and which are later than Q or R Holes | 3+ | |
| 105 | Non-posthole features which are earlier than the Sarsen Circle/ Trilithons but with no other relationships | 3- | |
| 106 | Stoneholes D & E | 3 | |
| 107 | Stonehole in side of Ditch near NE causeway | 2+ | |
| 108 | Arc of stoneholes closing Bluestone Horseshoe | 3iv | |
| 109 | Fills of stoneholes of group 108 | 3iv+ | |
| 110 | Stonehole F | 2+ | |
| 111 | Beaker-period grave (Evans & Atkinson) in Ditch | 3* | |

**Table 67: Non-phased categories**

| *Non-phased categories (as on database in field FPII)* | *Description* |
|---|---|
| 60 | Post-monument destruction of the monument |
| 80 | Probably recent use of the monument |
| 81 | Certainly modern disturbance; human |
| 82 | Rabbit and other animal disturbance |
| 83 | Disturbance of unknown date |
| 86 | Probably modern disturbance; but there is an element of doubt as to its date |
| 87 | Layers of unknown date, overlain only by possibly non-prehistoric features, Stonehenge layer, or turf and topsoil |
| 88 | 'Stonehenge layer' |
| 89 | Turf and topsoil |
| 90 | Used for features which cannot be located and about which no other details as to date, relationships etc known |
| 91 | Unphasable features which are neither stoneholes nor post-holes, or uncertain features, with no relationships other than with modern layers or features, but which are probably prehistoric themselves. |
| 94 | Cremations or other disturbances in Aubrey Holes, subsequent to the appearance of bluestone |
| 98 | Subsoil |
| 99 | Natural (almost always chalk) |

## Hierarchy of phasing criteria

A Assigned to phase on the basis of stratigraphical relationships

B Assigned to the phase on the basis of radiocarbon dates

C Assigned to phase on the basis of presence or absence of specific artefact types

D Assigned to phase on the basis of symmetry of plan

E Assigned on the basis of supposition (basically guesses which may or may not be testable)

More than one reason for phasing may be given, in which case the reasons may be placed in a hierarchical order of 1, 2, 3, with 1 the most influential; or criteria may be given equal weight.

**Table 68 Phasing according to phasing criteria**

| *Phase* | *Archaeological feature* | *A* | *B* | *C* | *D* | *E* | *Comments* |
|---|---|---|---|---|---|---|---|
| 1 | Ditch, cut & primary fill, & main bank | | √ | √ | √ | √ | • No bluestone frags in primary fill (RJCA)<br>• Ditch layout very regular; presumably as a result of being laid out from centre without any obstruction. (RJCA also argues that the centre differs from that of the sarsen setting and the two are therefore not part of the same plan)<br>• Common-sense supposition that the bank is the result of the excavation of the ditch |
| 1 | Cut and primary use of Aubrey Holes | | | √ | √ | | • no bluestone in primary fill<br>• circle on which Aubrey Holes lies is similar to that of bank and ditch (RJCA argues that AH circle was laid out before any obstruction in middle, but this seems dubious)<br>• Aubrey holes must predate the S `Barrow' at least, as ditch cuts AH 19, but S `Barrow ' ditch not firmly phased itself |
| 1 or 2 | Counterscarp Bank | | | | | √ | • Supposition that the material of the bank is derived from the ditch. The period at which it was derived is not determinable: it could have been formed at the same time as the main bank, or subsequently during cleaning out of the ditch<br>• Where excavated by RJCA it contained chalk lumps, and where exc. by Hawley it was largely made up of large flints, which Hawley had not noted so frequently in the main bank. Both these observations suggest that it was made up from primary material, ie derived from the digging of the ditch, or from early cleaning out, when only the primary fill had formed |

**Table 68 (cont)**

| *Phase* | *Archaeological feature* | *A* | *B* | *C* | *D* | *E* | *Comments* |
|---|---|---|---|---|---|---|---|
| 2 | Postholes and passage leading in from southern entrance | | | √ | | √ | The arguments for this being early are:<br>• that there are almost no finds from the area of the 'passageway', either from the 'furrows', the postholes, or the area in between (although it is not possible to separate out these separate features). Hawley notes that nothing of the 'Stonehenge period' had 'penetrated to the lower levels'. As finds he notes that there was nothing 'animal bones, two worn-out picks, and pieces of antler'<br>• that there's no indication that the southern causeway was used in Phase 3, therefore, as it must be a primary feature of the monument, features connected with its use are likely to be early<br>• one 'furrow' of the passageway was cut by a Y Hole. |
| 2 | Postholes in the interior of the monument | √ | | √ | √ | | • there are very few finds from the postholes, and none certainly in primary positions (ie certainly in the deliberate infill, as very few seem to have postpipes; where Hawley describes fill it is usually earthy chalk rubble or dirty chalk rubble. One contained a bluestone fragment, but it was not clear where in the fill it occurred<br>• There are few stratigraphic relationships, but where they do occur the postholes are almost invariably the earliest features<br>• Both the postholes in the interior and the 'passage' could pre-date the Ditch, but a standing setting would have made the laying-out of the Ditch difficult, so that the symmetry of the Ditch is also an argument for no pre-existing monument |
| 2 | Secondary use of Aubrey Holes | √ | | √ | | √ | • There seems to be a phase of use of the Aubrey Holes which pre-dates the appearance of bluestone (although the upper fills are complex and seem to have been disturbed more than once in some cases). This certainly includes the deposition of some of the cremations. As such, it is tempting to equate it with the upper fill of the Ditch and some of the disturbances there. This pre-Bluestone phase must, on stratigraphic grounds, post-date the primary use of the holes |

**Table 68 (cont)**

| *Phase* | *Archaeological feature* | *A* | *B* | *C* | *D* | *E* | *Comments* |
|---|---|---|---|---|---|---|---|
| 2 | Backfilling in Ditch | 1 | | √ | | | • At least in the terminals of the NE entrance this chalky backfilling takes place soon after formation of the primary fill. It is described as typically two layers of chalk, the upper being 'cast in' and the lower the normal lower [primary] filling, separated by a dark layer; this is clearly similar to at least one of the sections drawn in 1954 (C41 and C42). The implication is that if the backfilling is early in the Ditch filling sequence, then it took place before the slower, natural secondary filling, which pre-dates the appearance of Bluestone. However, there are also occurrences of chalk rubble in the upper fill elsewhere around the circuit, which are less well described (Chapter 6) |
| 2 | Postholes on the NE causeway | | | √ | √ | | • The postholes are likely to be early on the grounds of lack of finds. Hawley also noted the similarity in appearance between these postholes, those around the southern 'passageway' and those in the interior<br>• They do not appear to be symmetrical in their placing within the original entrance. In particular, those on the east appear to run in a line that would overlap the end of the eastern terminal, and two seem to have had a relationship with the Ditch, now destroyed (they were not noticed by Hawley until they weathered out). Possibilities are: that they were cut through the chalky upper fill, but the cuts not noticed by Hawley; or that they pre-date the Ditch, which would explain why Hawley saw them only in the side of the Ditch; or that the relationship was created by the weathering back of the upper Ditch, in which case the asymmetry argument still applies, as even with both Ditch terminals smaller than they now are the easterly bias of the plan would still remain |
| 2a | Secondary filling of the Ditch | √ | | √ | | | • Post-dates the primary fill, and at least some of the chalky backfilling<br>• Bluestone fragments only occur in the topmost levels, and then not in certainly undisturbed contexts. The fragment in the middle silts found in 1954 was proved in 1978 to have lain within the Beaker-period grave |

**Table 68 (cont)**

| *Phase* | *Archaeological feature* | *A* | *B* | *C* | *D* | *E* | *Comments* |
|---|---|---|---|---|---|---|---|
| 2b | Features cut into the secondary filling and probably of Neolithic date (ie not demonstrably phase 3 or post-monument disturbance) | √ | | √ | | | • Some associated with Grooved Ware; also some of the cremations belong to this phase. |
| 3 | Stoneholes D & E | | √ | | | | |
| 3 or earlier | Depression under Avenue bank | | | | | | |
| 3a | Stone 97 & Heelstone | | | | √ | | • Both could be earlier, but together they bracket the axis of the stone monument (though this sub-phase can't be equated exactly with a particular stone setting in the interior) |
| 3b | Heelstone ditch dug; Heelstone remains standing , but Stone 97 removed. | √ | | √ | | √ | • The digging of the Heelstone ditch is stratigraphically later than the erection of Stone 97, but it is supposition that Stone 97 was removed at this stage. Pitts considered that it could have remained standing, although it is unlikely.<br>• There is a bluestone fragment in the Heelstone ditch, fairly close to the bottom, indicating that it must be phase 3 or later |
| 3b | Station Stones & N and S Barrows | √ | | √ | | √ | • Placed here on grounds of similarity to Heelstone & ditch.<br>• Barrow ditch at least later than Aubrey Hole 19<br>• Bluestone in N Barrow bank and S Barrow ditch |
| 3c | Avenue bank and ditch | √ | | | | | • Eastern avenue bank overlies fill of Heelstone ditch<br>• Heelstone ditch contains bluestone frag at low level. This does not equate with the deliberate backfill in the main Ditch |
| 3i | Q & R Holes | √ | | √ | | | • Stratigraphically earlier than Sarsen Circle, and not certainly later than anything other than postholes (ie phase 1 or 2) |
| 3i | Crescentic feature | √ | | | | √ | • The feature is earlier stratigraphically than the Bluestone Horseshoe, but its not clear where in the sequence it lies.<br>• It could be as early as phase 1, but is placed here on the basis that it is a stone setting<br>• There are no finds recorded, but as it is a single feature, and finds are few from all the stone settings, this cannot be regarded as diagnostic |
| 3ii | Sarsen Circle | √ | | | | | • Stonehole for Sarsen Circle Stone 3 cuts Q Hole 4 |
| 3ii | Sarsen Trilithons | | | | | √ | • assumption that they are part of the same plan (RJCA) |

**Table 68 (cont)**

| *Phase* | *Archaeological feature* | *A* | *B* | *C* | *D* | *E* | *Comments* |
|---|---|---|---|---|---|---|---|
| 3iii | Pre-Bluestone Horseshoe features | √ | | | | | • There are certainly features which are stratigraphically earlier than the Bluestone Horseshoe, but there is probably more than one sub-phase represented, and they could be contemporary with the Sarsen Horseshoe and Circle, as there are no relationships with them |
| 3iv | Bluestone Oval and Circle | √ | | | √ | √ | • Symmetry of the empty stoneholes and the Horseshoe, both belonging to a single oval<br>• Bluestone Horseshoe must be contemporary or later than the Sarsen Trilithons, on the basis of the Gowland section |
| 3iv | Bluestone Circle | √ | | | | √ | • Supposition that they form part of the same plan as the Oval/Horseshoe<br>• Is stratigraphically later than the Q/R Holes |
| 3v | Bluestone Horseshoe formed by removal of the arc of stones at the NE, ie the Horseshoe is the same as part of 3iv | | | | | √ | • Must be contemporary with or later than the Sarsen Trilithons |
| 3vi | Y & Z Holes | √ | √ | √ | | | • Appear to be late on the basis of the basis of the radiocarbon dates<br>• Are stratigraphically later than the Sarsen Circle<br>• Have later pottery low in their fills, and seem to have been left open and empty, suggesting that they may have been the last monument-associated act |

# Appendix 9 The archive: an introduction and user's guide

Wessex Archaeology was commissioned by English Heritage to produce a comprehensive report on the twentieth-century excavations at Stonehenge. As a result of this work, the Wessex Archaeology Stonehenge Archive was compiled between *c* 1989 and 1994. It contains written material (primary, secondary, original, and copied), graphic, and photographic records, and some finds. These relate to, or are the result of, a large number of excavations and non-archaeological interventions undertaken in and around the Stonehenge Triangle between 1901 and 1994. In particular, the extant primary records from the excavations by Professors Piggott and Atkinson and Dr Stone, together with copies of material on earlier excavations, many gathered by Professor Atkinson, form the core of the archive. Material relating to Stonehenge in Professor Atkinson's personal archive was made available to the project following his death in October 1994, and has been incorporated into the archive.

The Archive is complex, as it necessarily refers to widely disparate material, much of which is stored in different locations and which has been produced under varying conditions. Given the subject of the archive, there is likely to be a continuing desire on the part of scholars to study the records. Whereas it was not possible to obtain a copy of every document relating to excavations at the monument, every effort has been made to copy all `essential' information and to signal the whereabouts of other material, so as to facilitate further study/interpretation of the wider Stonehenge Archive. Every attempt has also been made to cross-reference information. The Wessex Archaeology Stonehenge Archive will be deposited at Salisbury Museum which already holds the majority of the finds and some original archive material.

## Paper archive: summary

| *Type* | *Details* | *No of file* | *Original/ duplicate* | *Location of extra or original material* |
|---|---|---|---|---|
| GENERAL | | | | |
| Index and Guide | | 1 | original | |
| Institutions contacted by Wessex Archaeology & results | Known depositories of Stonehenge material | 1 | original | |
| Correspondence | Pre-Wessex Archaeology; Atkinson | 20 | both | |
| Correspondence | Wessex Archaeology | NYD (2+) | original | |
| PROJECT ADMINISTRATION | | | | |
| | Development of project design progress reports, etc | 2 | | |
| SITE MANAGEMENT | | | | |
| | Management intervention survey (Non archaeo-logical interventions) | 1+ overlay plans | original | compiled from original material at English Heritage, Historic Plans Room |
| | Management intervention survey (Archaeological interventions) | 2 + print-out | original | |
| SITE NOTEBOOKS AND DIARIES FIELD RECORDS | | | | |
| Hawley & Atkinson | Hawley Diaries | 2 | duplicate | Originals with Hawley family |
| | Hawley Diaries; transcript | 2 | duplicate | |
| | Atkinson field survey notebooks | 7 | original | |
| POST-EXCAVATION CONTEXT/STRATIGRAPHIC/ ANALYSIS | | | | |
| Pre-Wessex Archaeology | Atkinson notes & calculations | 9 | | |
| | Annotated Diary copies | | | |
| | Berridge's cuttings files | *c* 50 folders | original | |
| | Ehrenburg's report | | | |
| | Cross-referenced cuttings/Hawley published references | 1 card index | original | |
| Wessex Archaeology | Wessex cuttings files | 9 files | original | |
| | Summary context listing including phasing details ) WA no-F no and F no-WA no | 2 print-outs | | |
| | Context records | 10+ print-out | | |
| | Site phasing notes, matrices etc | 4+ | | |
| GRAPHICS REGISTER | | | | |
| Graphics register | | 1+ print-out | original | |
| FINDS REGISTERS | | | | |
| Pre-Wessex Archaeology | Hawley finds catalogue (prepared by R S Newall ) | 1 | duplicate | original in Salisbury Museum |
| | Atkinson 1954 register | 2 | original | |
| | Card index of finds from 1953-64 | 1 | original | duplicate in Salisbury Museum |
| | Finds lists by category (Hawley & Atkinson excs prepared by Berridge) | 1 | original | |
| | Location of Hawley finds | 1 | original | |
| FINDS ANALYSIS | | | | |
| Pre-Wessex Archaeology | Pre-Wessex Archaeology finds reports and notes | 1 | | |
| Wessex Archaeology | 1991 Salisbury Finds location annotated with priorities | print-out | duplicate | |
| | 1991 pottery scanning sheets | 1 | original | |
| | 1994 detailed pottery analysis | 3 | original | |
| | other finds types; analysis | 1 | 1 | |
| | Specialists' reports | 1 | | |
| FIELD SURVEY REPORTS | | | | |
| Pre-Wessex Archaeology | 1919 stone survey | 1 | duplicate | Original in Public Record Office |
| | Atkinson survey notebooks | | originals | |

| *Type* | *Details* | *No of file* | *Original/ duplicate* | *Location of extra or original material* |
|---|---|---|---|---|
| Wessex Archaeology | 1993–4 Ancient Monuments Lab Surveys | 1+ report | duplicate | |
| PHOTOGRAPHIC REGISTER | | | | |
| Wessex Archaeology | 1950s-64 site photographs indexed as part of the project | 4 | | |
| OTHER EXCAVATION CAMPAIGNS | | | | |
| Newall | | 1 | duplicate | original in Avebury Museum? |
| Vatcher (various sites) | | 1 | both | |
| TWA Site W243 (C104-5) | Complete archive | 2+ | original | |
| TWA W406 (C110) | Report & complete archive | 1+ | original | |
| WA W614 (C101-2) | Report | 1 | copy | |
| WA 600 | Stones survey; proposals only | 1 | copy | |
| WA 30506 (C115) | Limited test augering, report & archive | 1 | original | |

## Further Details (Presented in the same order as the summary list above)

### Correspondence

Non-Wessex Archaeology Stonehenge correspondence consists mainly of Professor Atkinson's correspondence made available in late 1994. This is mainly with other excavators of the monument and interested parties, together with corrrespondence concerning the astronomy of the site, Ministry of Works/Dept of Environment restoration work, and matters concerning publication. A detailed index for each file can be found at the front of the correspondence section in the archive.

Wessex Archaeology correspondence files include correspondence relating to various aspects of the monument not directly relevant to the project, and letters with the excavators and other sources of information obtained early in the history of the project.

### Project administration

The *twentieth-century excavations at Stonehenge project* was set up, run, and administered under Wessex Archaeology's standard management procedures. Administration files include copies of the Project Designs produced by Wessex Archaeology for English Heritage at the beginning of each stage of the project; copies of regular progress reports; of work schedules and report briefs prepared for WA staff and specialist contributors; and correspondence relating to the progress of the project.

### Site management

#### Main points

**Non-archaeological Interventions** (ie below ground disturbances resulting from development or monument management) within the Stonehenge management area, have been allocated a number. They have been plotted (by type) on a series of overlay plans (Scale 1:200). This information has been compiled largely from official graphic records held by English Heritage. Note that in some cases the plans show proposed interventions for which there is no information as to whether the work was actually carried out. Further, the usual caution should be applied before assuming that the line of an underground service pipe follows its plan exactly.

**Example**: Intervention-8428, pre-1952, 3¼" water pipe running round SE/ESE of monument, Plan 51416 67008 3.P

**Excavated areas** (trenches) have had numbers allocated. A system of 'Cuttings' ('C' numbers) was established by Peter Berridge. These are not unique numbers, however, for example all Aubrey Holes form Cutting 32, ie Aubrey Hole 1 is C32.1. A Wessex Archaeology Intervention Number has therefore been allocated to each individual cutting or investigation. As much of the archive was created with regard to these cuttings, most of the information is organised in this way and then cross-referenced. Where the excavator is known to have used a particular trench identification name or number this is also cross-referenced. Cutting numbers range from 1 to 115 and Archaeological Inter- vention numbers from 5001–6607. The concordance of intervention and cutting numbers is provided in Appendix 3 of this volume.

**Example**: Cutting C19 = Intervention 5091 = Hawley Ditch II, excavated 1920

The major elements of the monument are well known, with an established terminology. For the purposes of the analysis each has been assigned a context number (according to standard Wessex Archaeology practice), between 1 and 1000, in a unique number context sequence. It has been decided, however, to use the 'established' nomenclature where appropriate (for example, stone numbers based on Ministry of Works and the major published sources) in discussion and on figures to avoid confusion. This is despite the fact that the commonly accepted names may be misleading or inaccurate, for exmple, the 'North Barrow' is not a burial mound.

**Example**: Context 43 = Stone 16, standing Sarsen

Peter Berridge also established a type of context record, ('F numbers') which are annotated on many of the 'working copies' of graphics, and throughout the Berridge 'Cuttings Files'. Again, the 'F numbers' were not used in a unique sequence, so a unique number context series has been established.

**Example**: F149E = WA 3004, component of WA 200 = compact chalk at base of Aubrey Hole 31

### Hawley and Atkinson site notebooks, Diaries, field records

The Hawley material is largely duplicated from elsewhere. The Atkinson material includes a lot of new primary material made available in late 1994, following the Professor's death. This material is still undergoing asesment but will be incorporated into the archive in due course. It includes the following:

File notes to students on recording and survey proceedures to be followed (1 file)

Survey notebooks and files including primary data (7 files)

## Post-excavation analysis

### Pre-Wessex Archaeology

Atkinson Notebooks: calculations of various types, as yet unknown (8 files)
Summary reports of 1956, 1958 and 1964 excavations apparently for DOE/press releases
Berridge Original Cutting Files (exactly as left with Professor Atkinson, *c* 1984.)

### Wessex Archaeology

**Number Allocation**

| *Number* | *Allocation* |
|---|---|
| 1-1000 | major components of the monument |
| 1001-3927<br>4000-4142 | other contexts – monument excavations |
| 5001-6608 | archaeological interventions |
| 8000-9000 | non-archaeological interventions |
| 9001--9834 | Archaeological contexts – non- monument (ie Avenue, car park, etc |
| 50001-52000 | Atkinson photographic record |
| 52301-52396 | Numbers Issued by National Archaeological Record (part of national seqence) |

**Cuttings files**
The Wessex Archaeology Cutting Files consist of photocopies of the originals amended, updated, and added too during the progress of the project.

**Context records**
A full set of context records sheets, using the allocated Wessex Archaeology context numbers has been produced.

**Finds analysis**
Complete finds records, including metrical data and full catalogues, for all artefacts examined during the project are included with the archive

## Graphics

All available site graphics have been allocated group numbers, which relate to the individual campaigns of work, and individual numbers within that group.

| *Number Group* | *Numbers used* | *Numbers not used* | *Campaign* | *Number allocated to a drawing known to have existed, but not yet located* | *WA security copies* |
|---|---|---|---|---|---|
| 1-50 | 1-2 | 3-50 | Petrie, (Survey) | | |
| 51-140 | 51-135 | 136-140 | Hawley, 1919-26 including Min of Works Survey material and copies of excavation drawings | | |
| 141-150 | 141 | 142-150 | Newall, 1929 | | |
| 151-200 | 151-168 | 169-200 | Atkinson *et al*, 1953 | | 164-166 |
| 201-250 | 201-222 | 223-250 | Atkinson *et al*, 1954 | | 217-222 |
| 251-300 | 251-263 | 264-300 | Atkinson *et al*, 1956 | | 258-262 |
| 301-350 | 301-331 | 332-350 | Atkinson *et al*, 1958 | 302 (S.58.2) | 316-327 |
| 351-400 | 351-362 | 363-400 | Atkinson *et al*, 1959 | | 357-362 |
| 401-450 | 401-426 | 427-450 | Atkinson *et al*, 1964 | | 415-418 |
| 451-500 | 451-474 | | Vatcher, car park 1966 | | |
| | 475-478 | 479-500 | Young, car park 1935 | | |
| 501-550 | 501-515 | 516-550 | Vatcher, underpass 1967 | | |
| 551-600 | 551-3, 557 | 563*-600 | Vatcher, Avenue 1967 | 554, 555 not used | |
| 601-629 | 556,558 601-612 | 613-629 | Vatcher, SEB/A303 1968 | | |
| 630-640 | 559-562 630-634 | 635-640 | Vatcher, A303 Road widening | | |
| 641-650 | 641-642 | 643-650 | Vatcher, Geophone/ floodlight cable 1968 | | |
| 651-700 | 651-654 | 655-700 | Thom, survey 1973 | | |
| 701-750 | 701-718 | 719-750 | Evans and Atkinson, 1978 | | |
| 751-800 | 751-757 | 758-800 | DOE/CEU 1979, 1981 | | |
| 801-850 | 801-830 | 831-850 | Misc post-exc/ publication figures | 828 not used | |
| 851-869 | 851-858 | 859-869 | HBMC/AMLab/ RCHM(E), surveys | | |
| 870-889 | 870-871 | 872-889 | Smith, Avenue 1973 (published only) | | |
| 890-900 | 890-900 | | Trust for Wessex Archaeology, 1989 | | |
| 901-950 | 901-903 | 904-950 | Wessex Archaeology, 1993 | | |

## Photographic

The photographic archive for the excavations of Atkinson *et al* consists of some 1500 black and white negatives. Two prints (full size) have been made of each negative. One copy has been lodged with the RCHM(E) (Swindon) and the other with the archive. Various copies of contact sheets have since been located, and are included in the archive. No evidence has been recovered for contemporary recording of the photographs. Where possible the prints have been separated by Cutting (three files), otherwise they are left within their original order. The original film and shot number has been recorded, with an archive number, and an NAR number assigned by RCHM (E).

Among the files recovered after Atkinson's death was a photographic record but this seems to be a list of shots to be taken and cannot be correlated with the existing archive.

A small photographic archive exists for the various excavations undertaken by the Vatchers during the 1960s. This includes some negatives and some prints but not necessarily both for each excavation.

A small number of second generation photographic prints from Hawley's excavations, provided by Dr S Briggs, have also been incorporated into the archive.

### The databases

Paper and disk copies of the databases, written in dBase 4, are housed with the main archive. These comprise the following:

| *Name* | *Subject* |
|---|---|
| ARCHIVE | Location of wider Stonehenge Archive materials |
| ATPHOTO | Index and catalogue of Atkinson *et al* site photographc archive |
| CORREL | Summary context record, correlaton with Berridge numbers and phasing information |
| DIARY | Total finds from Hawley Diaries (ie includes those not kept) |
| SHENPOT | Earlier prehistoric pottery |
| ELMPOT | later prerhistoric pottery |
| LATE_POT | Late Iron Age/Romano-British and later pottery |
| FINDS | `Other finds' (Non-ceramic/flint/faunal) in Salisbury Museum examined during the project |
| FLINT | Flint |
| GRAPHICS | Graphics register |
| HAWLEY | Hawley finds (Newall Catalogue) with Berridge Nos and location within Salisbury Museum (*c* 1989) |
| SHENGE | Card catalogue of Atkinson *et al* finds index |
| STONANT | Antler (Southampton FRU) |
| STONBONE | Animal bone (Southampton FRU |

## Finds

Finds studied in detail for this project are mainly held by Salisbury and South Wiltshire Museum. The packaging for the finds varies as does the labeling, which may reflect not only the original excavator's numbering, but also later study episodes. Finds have been allocated to Wessex Archaeology context and this number has been written onto the packaging. No original labeling has been removed from finds, although it was necessary to rebox or rebag some items whose previous containers were non-conservation standard, or to store individually some objects previously bagged together, on conservation grounds.

**Table 69 Summary of the principal archives at the commencement of the project**

| *Excavator* | *Year / project* | *Location of archive* | *Records* | *Graphic* | *Photo* | *Corres-pondence* | *Finds* | *Accession no(s)* | *Comment* |
|---|---|---|---|---|---|---|---|---|---|
| Gowland | 1901 | Salisbury, Salisbury & South Wiltshire Museum | | | Y | | Finds transferred from Devizes Museum | 19/1983 | Print copies of slides |
| Gowland | 1901 | London, Society of Antiquaries | Y | Y | Y | Y | | Gowland Collection MS 894 | *Primary*: Site plan, original archive, photographs, corresponedence, accounts etc<br>*Secondary*: press cuttings |
| Gowland | 1901 | Devizes, Devizes Museum | | | | | Finds transferred to Salisbury | | |
| Hawley | 1919-1926 | Salisbury & South Wilts Museum | Y | Y | Y | Y | Y | None | *Primary*: The bulk of retained finds from Hawley excavations<br>Transcript of excavation Diary plus various site notes/rough work<br>Original and copied site graphics (various formats)<br>Copies of site photographs<br>*Secondary*: some related material |
| Hawley | 1919-1926 | Cardiff, National Museum of Wales | | | | | Misc finds (pottery, flint, antler, stone, chalk) | 34.222<br>33.561 | |
| Hawley | 1919-1926 | Cambridge, University Museum of Archaeology & Anthropology | | | | | Misc finds (pottery, flint, antler, stone, chalk) | Z32717,<br>Z32718<br>Z24686,<br>Z24694 | |
| Hawley | 1919-1926 | Oxford, Ashmolean Museum | | | Y | | Misc finds (pottery, flint, antler, stone, chalk) | 1932.3-<br>1932.27 | Small number of slides and negatives |
| Hawley | 1919-1926 | London, British Musueum | | | | | Misc finds (pottery, flint, antler, stone chalk, bronze) | See boxes<br>5c 22<br>5c 23<br>5c 33 | Some material in Blythe Road Store |
| Hawley | 1919-1926 | Edinburgh University Dept of Archaeology | | | | | Misc finds | | Teaching collection, mainly small frags from Stonehenge Layer, plus stone samples |

**Table 69 (cont)**

| *Excavator* | *Year / project* | *Location of archive* | *Records* | *Graphic* | *Photo* | *Corres-pondence* | *Finds* | *Accession no(s)* | *Comment* |
|---|---|---|---|---|---|---|---|---|---|
| Hawley | 1919-1926 | Kew, Public Record Office | | Y | | Y | | Documents WORK 14 Maps/plans WORK 31 | |
| Hawley | 1919-1926 | London, English Heritage Historic Plans Room | | Y | Y | | | | |
| Hawley | 1919-1926 | London, Society of Antiquaries | | Y | Y | Y | | | Prints from slides (Ditch) MOW plans (copies) |
| Hawley | 1919-20 | Aberystwyth, Royal Commission on Historic Monuments (Wales) | | | Y | | | | Prints, mainly of the lifting of stones |
| Newall /MOW | 1919 | Salisbury, Salisbury & South Wiltshire Museum | | Y | | | | | |
| Newall | 1925 | Salisbury & South Wilts. Museum | | | | | | 100/1988/1 | |
| Newall | various | Avebury | Y | Y | Y | Y | | | Includes rubbings of carvings |
| Young | 1935 car park | Salisbury, Wessex Archaeology | Y | | | | | ?100/1988/5 | Extract from unpublished diary of WEV Young Trench and finds report, Source: JFS Stone |
| Atkinson *et al* | 1950-1964 | Salisbury, Salisbury & South Wiltshire Museum | | Y | | | Y | 29/1983 | Bulk of finds (some believed to be missing ) |
| Atkinson *et al* | 1950-1964 | Salisbury, Wessex Archaeology | 2ndry | Y | Y | Y | | | |
| Atkinson *et al* | 1950-1964 | Devizes | 2ndry | | | | | | Transcript of lecture |
| Atkinson *et al* | 1950-1964 | Kew, Public Record Office | | Y | | Y | | Documents WORK 14 Maps/plans WORK 31 | Correspondence closed until 2003 |
| Vatcher | 1967 car park | Salisbury, Wessex Archaeology | Y | Y | | | | | |

**Table 69 (cont)**

| *Excavator* | *Year / project* | *Location of archive* | *Records* | *Graphic* | *Photo* | *Corres-pondence* | *Finds* | *Accession no(s)* | *Comment* |
|---|---|---|---|---|---|---|---|---|---|
| Vatcher | 1967 under pass | Salisbury, Wessex Archaeology | | Y (micro-fiche) | | Y | | | |
| Vatcher | 1967 underpass | Salisbury, Salisbury & South Wiltshire Museum | | | | | Pottery, human bone, stone | | |
| Vatcher | 1967 Amesbury Bypass | Salisbury, Wessex Archaeology | | Y | Y | | | | |
| Vatcher | 1968 A303 widening | Salisbury, Wessex Archaeology | | Y (2ndry only?) | | | | | |
| Vatcher | 1968 SEB & Floodlights | Salisbury, Salisbury & South Wiltshire Museum | | | | | Y | 39/1983 | |
| Vatcher | 1967-1968 | Salisbury, Wessex Archaeology | | Y | Y | Y | Y | | |
| Smith (CEU) | 1973 Avenue | ?Salisbury, Salisbury & South Wiltshire Museum | | | | | | | Could not be found |
| Evans | 1978 | Salisbury, Salisbury & South Wiltshire Museum | | | Y | | Y | 7/1983 | |
| Pitts | 1979-1980 | Salisbury, Salisbury & South Wiltshire Museum | Y | Y | Y | Y? | Y | 10/1983 | |
| Central Excavation Unit | 1979 car park | Salisbury, Salisbury & South Wiltshire Museum | | | | | Y | 8/1983 | |
| Central Excavation Unit (Bond) | 1981, Path watching brief | Salsbury, Salisbury & South Wiltshire Museum | | | | | Y | 9/1983 | |

**Table 69 (cont)**

| *Excavator* | *Year / project* | *Location of archive* | *Records* | *Graphic* | *Photo* | *Corres-pondence* | *Finds* | *Accession no(s)* | *Comment* |
|---|---|---|---|---|---|---|---|---|---|
| Vatcher | 1967 under pass | Salisbury, Wessex Archaeology | | Y (micro-fiche) | | Y | | | |
| Vatcher | 1967 underpass | Salisbury, Salisbury & South Wiltshire Museum | | | | | Pottery, human bone, stone | | |
| Vatcher | 1967 Amesbury Bypass | Salisbury, Wessex Archaeology | | Y | Y | | | | |
| Vatcher | 1968 A303 widening | Salisbury, Wessex Archaeology | | Y (2ndry only?) | | | | | |
| Vatcher | 1968 SEB & Floodlights | Salisbury, Salisbury & South Wiltshire Museum | | | | | Y | 39/1983 | |
| Vatcher | 1967-1968 | Salisbury, Wessex Archaeology | | Y | Y | Y | Y | | |
| Smith (CEU) | 1973 Avenue | ?Salisbury, Salisbury & South Wiltshire Museum | | | | | | | Could not be found |
| Evans | 1978 | Salisbury, Salisbury & South Wiltshire Museum | | | Y | | Y | 7/1983 | |
| Pitts | 1979-1980 | Salisbury, Salisbury & South Wiltshire Museum | Y | Y | Y | Y? | Y | 10/1983 | |
| Central Excavation Unit | 1979 car park | Salisbury, Salisbury & South Wiltshire Museum | | | | | Y | 8/1983 | |
| Central Excavation Unit (Bond) | 1981, Path watching brief | Salsbury, Salisbury & South Wiltshire Museum | | | | | Y | 9/1983 | |

**Table 69 (cont)**

| *Excavator* | *Year / project* | *Location of archive* | *Records* | *Graphic* | *Photo* | *Corres-pondence* | *Finds* | *Accession no(s)* | *Comment* |
|---|---|---|---|---|---|---|---|---|---|
| Trust for Wessex Archaeology | 1984, pipe watching brief | Salisbury, Wessex Archaeology | | | | | | | No finds or separate archive. Note in with report on project W243 |
| Trust for Wessex Archaeology | 1988-1989 Visitor centre | Salisbury, Wessex Archaeology | Y | Y | Y | Y | Y | | Project code W243 |
| Trust for Wessex Archaeology | 1990-1991 grass repair | Salisbury, Salisbury & South Wiltshire Museum | Y | Y | Y | | | | Project code W406, no finds |
| Trust for Wessex Archaeology | 1993, toilets watching brief | Salisbury, Wessex Archaeology | Y | Y | Y | | | | Project code W614 |
| Hawley Atkinson & Misc | 1919-964 | Swindon, Royal Commission on Historic Monuments, England/National Archaeological Record | Y 2ndry only | Y 2ndry only | Y | | | | Material ex Southampton, London, Air Photo Library, & NMR, now held at the National Monuments Record Centre, Swindon. Includes MF of Hawley Diaries & Atkinson photographic archive (duplicate copy) |

*All material held by Wessex Archaeology has now been, or will be, deposited with the Salisbury & South Wiltshire Museum*

# Bibliography


Adams, J C, 1986 *Outline of orthopaedics*, London

——, 1987 *Outline of fractures*, London

Algar, D, Light, A, and Trehane, P, 1979 *The Verwood and district potteries: a Dorset industry*, Ringwood

Allen, M J, 1988 Archaeological and environmental aspects of colluviation in south-east England, in *Man-made Soils* (eds W Groenman-van Waateringe and M Robinson), BAR, **S410**, 67–92, Oxford

——, 1989 Land Snails, in Fasham, P J, Farwell, D E, and Whinney, R J B, *The archaeological site at Easton Lane, Winchester*, Hampshire Fld Club Archaeol Soc Monog, **6**, 134–40

——, 1990 The molluscan evidence, in Howard, S, A double ring ditched, Bronze Age barrow at Burford Farm, Pamphill, *Proc Dorset Natur Hist Archaeol Soc*, **111**, 49–52

——, 1991 Analysing the landscape: a geographical approach to archaeological problems, in *Interpreting artefact scatters: contributions to ploughzone archaeology* (ed A J Schofield), Oxbow Monog **4**, 39–57, Oxford

——, 1992 Products of erosion and the prehistoric land-use of the Wessex chalk, in *Past and present soil erosion: archaeological and geographical perspectives* (eds M G Bell and J Boardman), 37–52, Oxford

——, 1994 *The land-use history of the southern English chalklands with an evaluation of the Beaker period using environmental data: colluvial deposits as environmental and cultural indicators*, unpubl PhD thesis, Univ Southampton

——, forthcoming a Environment and economy, in Cleal, Allen, and Newman forthcoming

——, forthcoming b The prehistoric land-use and human ecology of the Malling-Caburn Downs; two Late Neolithic/Early Bronze Age sites beneath colluvial sequences, *Sussex Archaeol Collect*, **133**

——, forthcoming c Land-use history; the land mollusc evidence, in Smith, Healy, Allen, Morris, and Barnes forthcoming

——, forthcoming d Landscape, land-use and farming, in Smith, Healy, Allen, Morris, and Barnes forthcoming

——, unpubl The history of land-use on the hilltop within Vespasian's camp: the molluscan evidence, unpubl manuscript

——, Entwistle, R, and Richards, J, 1990 Molluscan studies, in Richards 1990, 253–8

——, and Wyles, S F, 1993 The land-use history: the molluscan evidence, in Graham, A H and Newman, C, Recent excavations of Iron Age and Romano-British enclosures in the Avon Valley, *Wiltshire*, *Wiltshire Archaeol Natur Hist Mag*, **86**, 45–50

——, and ——, 1994 The contemporary land-use and landscape of the King Barrows as evidenced by the buried soils, pollen and molluscs, in Cleal and Allen 1994, 76–81

——, and ——, forthcoming, Land Mollusca, in Cleal, Allen, and Newman forthcoming

——, Heaton, M, and Richards, J, nd The salvage excavation of round barrow, Durrington G3. Wessex Archaeology, unpubl report

Anderson, A C, 1978 Wiltshire fine wares, in *Early fine wares in Roman Britain*, (eds P Arthur and G Marsh), BAR, **57**, 373–92, Oxford

Annable, F K, and Simpson, D D A, 1964 *Guide catalogue of the Neolithic and Bronze Age collection in Devizes Museum*, Devizes

Antrobus, F C M, nd *A sentimental and practical guide to Amesbury and Stonehenge*, compiled by Lady Antrobus, Amesbury

Armour-Chelu, M, forthcoming The animal bones, in F Pryor (ed), *Etton*, London, English Heritage Archaeol Rep

Ashbee, P, 1966 The Fussell's Lodge long barrow excavations 1957, *Archaeologia*, **100**, 1–80

——, 1975/6 Amesbury Barrow 51: excavation 1960, *Wiltshire Archaeol Natur Hist Soc Mag*, **70/71**, 1–60

——, 1981 Amesbury Barrow 39: excavations 1960, *Wiltshire Archaeol Natur Hist Soc Mag*, **74/5**, 3–34

——, Bell, M, and Proudfoot, E, 1989 *Wilsford Shaft, excavations 1960–62*, London, English Heritage Archaeol Rep, **11**

——, and Cornwall, I W, 1961 An experiment in field archaeology, *Antiquity*, **35**, 129–34

Atkinson, K B, 1968 The recording of some prehistoric carvings at Stonehenge, *Photogrammetric Record*, **6** (31), 24–31

Atkinson, R J C, 1946 *Field Archaeology*, London

——, 1952 The Date of Stonehenge, *Proc Prehist Soc*, **18**, 236–7

——, 1956 *Stonehenge*, London

——, 1957 Worms and weathering, *Antiquity*, **31**, 219–33

——, 1961 Neolithic engineering, *Antiquity*, **35**, 292–9

——, 1967 Further radiocarbon dates for Stonehenge, *Antiquity*, **61**, 63–4

——, 1978 *Stonehenge and neighbouring monuments*, London

——, 1979 *Stonehenge*, (3rd edn), London

——, Piggott, C M, and Sandars, N K, 1951 *Excavations at Dorchester-on-Thames, Oxon*, Oxford

——, Piggott, S, and Stone, J F S, 1952 The excavation of two additional holes at Stonehenge, and new evidence for the date of the monument, *Antiq J*, **32**, 14–20

——, Vatcher, F, and Vatcher, L 1976 Radiocarbon dates for the Stonehenge Avenue, *Antiquity*, **50**, 239–40

Baker, A, nd *History beneath our feet: a guide to the Devizes Road and London Road cemeteries*, Salisbury

Bamford, H, 1985 Briar Hill excavations 1974–78, Northampton: *Northampton Development Corporation Archaeol Monog*, **3**

Barclay, G J, and Russell-White, C J, (eds), 1993 Excavations in the ceremonial complex of the fourth to second millennium BC at Balfarg/Balbirnie, Glenrothes, Fife, *Proc Antiq Scotl*, **123**, 43–210

Barfield, L H, 1991 Wessex with and without Mycenae: new evidence from Switzerland, *Antiquity* **65** (246), 102–7

Bard, E, Arnold, M, Fairbanks, R G, and Hamelin, B, 1993 $^{230}$Th-$^{234}$U and $^{14}$C ages obtained by mass spectrometry on corals, *Radiocarbon*, **35**, 191–200

Barker, H, and Mackey, C J, 1960 British Museum natural radiocarbon measurements II, *Radiocarbon*, **2**, 26–30

Barrett, J C, 1980 The pottery of the Later Bronze Age in Lowland England, *Proc Prehist Soc*, **46**, 297–319

——, 1994 *Fragments from antiquity*, Oxford

——, Bradley, R, and Green, M, 1990 *Landscape, monuments and society: the prehistory of Cranborne Chase*, Cambridge

Barron, R S, 1976 *The geology of Wiltshire*, London

Bartlett, A D H, and David, A E U, 1982 Geophysical survey of the Stonehenge Avenue, in Pitts 1982, 90–3

Bass, W M, 1987 *Human osteology*, Missouri

Bayliss, A, and Orton, C, 1994 Strategic considerations in dating, or 'How many dates do I need?', *Inst Archaeol Bull*, **31**, 151–65

Becker, B, 1993, An 11,000-year German oak and pine dendrochronology for radiocarbon calibration, *Radiocarbon*, **35**, 201–14

Beek, G C van, 1983 *Dental morphology: an illustrated guide*, London

Bell, M G 1983 Valley sediments as evidenec of prehistoric land-use on the South Downs, *Proc Prehist Soc*, **49**, 119–50

——, 1986 Archaeological evidence for the date, cause and extent of soil erosion on the chalk, *J South East Soils Discussion Group (SEESOIL)*, **3**, 72–83

——, 1990 Sedimentation rates in the primary fills of chalk-cut features, in *Experimentation and reconstruction in environmental archaeology* (ed D E Robinson), 237–48, Oxford

——, and Jones, J, 1990 Land mollusca [Coneybury], in Richards 1990, 154–8

——, Fowler, P J, and Hillson, S, forthcoming *The experimental earthwork project 1960–1992*, Counc Brit Archaeol Res Rep, York

Berger, R, Horney, A G, and Libby, W F, 1964 Radiocarbon dating of bone and shell from their organic components, *Science*, **144**, 999–1001

Berry, A C, and Berry, R J, 1967 Epigenetic variation in the human cranium, *J Anatomy*, **4**, 361–79

Binford, L R, 1981 *Bones: ancient men and modern myths*, New York

BMC, *Catalogue of coins in the British Museum*, London

Bokonyi, S, 1972 Aurochs (*Bos primigenius Boj*) remains from the Orjeg peat-bogs between the Danube and the Tisza rivers, *Cumania*, **1**, 17–56

Bond, D, 1983 An excavation at Stonehenge, 1981, *Wiltshire Archaeol Natur Hist Mag*, **77**, 39–43

Bond, J, 1991 Landscape regression analysis (appendix H), in Darvill (ed), 1991, 383–444

Bowen, H C, 1978 'Celtic' fields and 'ranch' boundaries in Wessex, in *The effect of man on the landscape: the lowland zone*, (eds S Limbrey and J G Evans), CBA Res Rep, **21**, 115–23, London

——, and Fowler, P J, 1978 *Early land allotment*, BAR, **48**, Oxford

——, and Smith, I F, 1977 Sarsen stones in Wessex: the Society's first investigations in the Evolution of the Landscape Project, *Antiq J*, **57**, 185–96

Bowman, S G E, 1990 *Radiocarbon dating*, London

——, 1994 Using radiocarbon: an update, *Antiquity*, **68**, 838–43

——, Ambers, J C, and Leese, M N, 1990 Re-evaluation of British Museum radiocarbon dates issued between 1980 and 1984, *Radiocarbon*, **32**, 59–79

Bradley, R J, 1970 The excavation of a Beaker settlement at Belle Tout, East Sussex, England, *Proc Prehist Soc*, **36**, 312–79

——, 1976 Maumbury Rings, Dorchester: the excavations of 1908–1913, *Archaeologia*, **105**, 1–97

——, 1978 *The prehistoric settlement of Britain*, London

——, 1991 Ritual, time and history, *World Archaeology* **23** (2), 209–19

——, 1993 *Altering the earth*, Soc Antiq Scotl Monog, **8**

——, and Chambers, R, 1988 A new study of the cursus complex at Dorchester on Thames, *Oxford J Archaeol*, **7**, 271–89

——, Lobb, S, Richards, J, and Robinson, M, 1980—Two Late Bronze Age settlements on the Kennet gravels: excavations at Aldermaston Wharf and Knight's Farm, Burghfield, Berkshire, *Proc Prehist Soc*, **46**, 217–95

——, and Thomas, J, 1984 Some new information on the henge monument at Maumbury Rings, Dorchester, *Proc Dorset Natur Hist Archaeol Soc*, **106**, 132–4

——, Entwistle, R, and Raymond, F, 1994 *Prehistoric land divisions on Salisbury Plain*, English Heritage, Archaeol Rep, **2**

——, Cleal, R, Legge, A J, Green, M, and Brown, A, 1990 The excavated material and its distribution, in Barrett, Bradley, and Green 1990, 96–101

Brazier, D, unpublished, Report to the Faunal Remains Unit, Southampton. An investigation into the angles between the tine and main shaft of the red deer antlers, 25 March 1994

Brinch Peterson, E, 1989 Vøget Nord: excavation, documentation and interpretation of a Mesolithic site at Vedbæk, Denmark, in *The Mesolithic of Europe; papers presented at the third international symposium, Edinburgh 1985* (ed C Bonsall), 325–30, Edinburgh

Britton D, 1963 Traditions of metal-working in the later Neolithic and Early Bronze Age of Britain: Part 1, *Proc Prehist Soc*, **29**, 258–325

Bronk, C R, and Hedges, R E M, 1987 A gas ion source for radiocarbon dating, in *Proceedings of the 4th international symposium on accelerator mass spectrometry: nuclear instruments and methods B29* (eds H E Gove, A E Litherland, and D Elmore), 45–9

——, and ——, 1989 Use of the $CO_2$ source in radiocarbon dating by AMS, *Radiocarbon*, **31**, 298–304

——, and ——, 1990 A gaseous ion source for routine AMS radiocarbon dating, *Nuclear instruments and methods*, **B52**, 322–6

Bronk Ramsey, C, forthcoming Radiocarbon calibration and analysis of stratigraphy, *Radiocarbon proceedings of the 14th international $^{14}C$ conference*

Brooks, S T, 1955 Skeletal age at death: the reliability of cranial and pubic age indicators, *Amer J Physical Anthrop*, **13**, 567–97

Brothwell, D R, 1972 *Digging up bones*, London

Buck, C E, Kenworthy, J B, Litton, C D, and Smith, A F M, 1991 Combining archaeological and radiocarbon information: a Bayesian approach to calibrations, *Antiquity*, **65**, 808–21

——, Litton, C D, and Smith A F M, 1992 Calibration of radiocarbon results pertaining to related archaeological events, *J Archaeol Sci*, **19**, 497–512

——, ——, and Scott, E M, 1994 Making the most of radiocarbon dating: some statistical considerations, *Antiquity*, **68**, 252–63

Buckley, J D, Trautman, M A, and Willis, E H, 1968 Isotopes' radiocarbon measurements VI, *Radiocarbon*, **10**, 246–94

Bull, G, and Payne, S, 1982 Tooth eruption and epiphyseal fusion in pigs and wild boar, in *Ageing and sexing animal bones from archaeological sites* (ed B Wilson, C Grigson, and S Payne), BAR, **109**, 55–71, Oxford

Burgess, C, 1979 The background to early metalworking in Ireland and Britain, in *The origins of metallurgy in Atlantic Europe*, (ed M Ryan), Proc Fifth Atlantic Colloq, Dublin, 207–14

——, 1990 The chronology of cup-and-ring marks in Britain and Ireland, *Northern Archaeol*, **10**, 21–6

Burl, A, 1987 *The Stonehenge people*, London

——, 1993 *From Carnac to Callanish: the prehistoric stone rows and avenues of Britain, Ireland, and Brittany*, Yale

——, 1994 Stonehenge: slaughter, sacrifice and sunshine, *Wiltshire Archaeol Natur Hist Soc Mag*, **87**, 85–95

Burleigh, R, 1979 Radiocarbon dates for Mount Pleasant, in Atkinson 1979, 184–9

—— and Hewson, A, 1979 British Museum natural radiocarbon measurements VI, *Radiocarbon*, **21**, 339–52

Bushe-Fox, J P, 1928 *Richborough* vol 2, Rep Res Soc Antiq London, 7, Oxford

Carruthers, W, 1990 Carbonised plant remains, in Richards 1990, 250–2

Catt, J A, 1978 The contribution of loess to soils in lowland Britain, in *The effect of man on the landscape: the lowland zone*, (eds S Limbrey and J G Evans), CBA Res Rep, **21**, 12–20, London

——, 1979 Distribution of loess in Britain, *Proc Geol Assoc*, **90**, 93–5

Chandler J, and Goodhugh P, 1989 *Amesbury: history and description of a south Wiltshire town*, (2 edn), Amesbury

Chippindale, C, 1975–6 The enclosure of Stonehenge, *Wiltshire Archaeol Natur Hist Soc Mag*, **70/71**, 109–23

——, 1983 *Stonehenge Complete*, London

——, 1990 The Stonehenge phenomonon, in Chippindale, C, Devereux, P, Fowler, P, Jones, R, and Sebastian, T, *Who owns Stonehenge?*, 9–34, Cambridge

Christie, P M, 1963 The Stonehenge Cursus, *Wiltshire Archaeol Natur Hist Soc Mag*, **58**, 370–82

——, 1964 A Bronze Age round barrow on Earl's Farm Down, Amesbury, *Wiltshire Archaeol Natur Hist Soc Mag*, **59**, 30–45

——, 1967 A barrow-cemetery of the second millenium BC in Wiltshire, England, *Proc Prehist Soc*, **33**, 336–66

——, 1970 A round barrow on Greenland Farm, Winterbourne Stoke, *Wiltshire Archaeol Natur Hist Soc Mag*, **65**, 64–73

Clark, J G D, 1934 Derivative forms of the petit tranchet in Britain, *Archaeol J*, **91**, 32–58

——, 1952 *Prehistoric Europe — the economic basis*, Cambridge

Clark, K M, 1994 *Palaeopathology in archaeological faunal remains: a new approach*, unpubl PhD thesis, Univ Southampton

Clarke, D L, 1970 *Beaker pottery in Britain and Ireland*, London

Clarke, D V, Cowie T G, and Foxon, A, 1985 *Symbols of power at the time of Stonehenge*, Edinburgh

Clay, R C C, 1927 Stonehenge Avenue, *Antiquity*, **1**, 342–4

Cleal, R M J, 1990 The ceramic sequence: summary and discussion, in Richards 1990, 242–6

——, 1991 Cranborne Chase — the earlier prehistoric pottery, in *Papers on the prehistoric archaeology of Cranborne Chase*, (eds J Barrett, R Bradley and M Green), 134–200, Oxford

——, forthcoming a Earlier prehistoric pottery, in Smith, Healy, Allen, Morris, and Barnes forthcoming

——, forthcoming b The earlier prehistoric pottery, in *Excavations at Barrow Hills, Radley, Volume 1, the prehistoric monument complex*, (eds A Barclay and C Halpin), Oxford

——, and Allen, M J, 1994 Investigation of tree-damaged barrows on King Barrow Ridge and Luxenborough Plantation, Amesbury, *Wiltshire Archaeol Natur Hist Soc Mag*, **87**, 54–84

——, and Gingell, C J, 1992 Discussion [pottery], in Gingell 1992, 99–103

——, Cooper, J, and Williams, D, 1994 Shells and sherds: identification of inclusions in Grooved ware, with associated radiocarbon dates, from Amesbury, Wiltshire, *Proc Prehist Soc*, **60**, 445–8

——, with Raymond, F, 1990a The prehistoric pottery, in Richards 1990, 233–46

——, with ——, 1990b Prehistoric ceramics from surface collection, in Richards 1990, 30–9

——, Allen M J, and Newman, C, forthcoming An archaeological and environmental study of the Neolithic and later prehistoric landscape of the Avon Valley and Durrington Walls environs, *Wiltshire Archaeol Natur Hist Soc Mag*

Clifford, E M, 1938 Excavations at Nympsfield Long Barrow, Gloucestershire, *Proc Prehist Soc*, **4**, 188–213

Clough T H McK, and Cummins, W A (eds), 1979 *Stone Axe Studies*, CBA Res Rep, **23**, London

——, and —— (eds), 1988 *Stone Axe Studies 2*, CBA Res Rep, **67**, London

Clutton-Brock, J, 1984 Neolithic antler picks from Grimes Graves, Norfolk and Durrington Walls, Wiltshire: a biometrical analysis, in Longworth, I, *Excavations at Grimes Graves, Norfolk 1972–1976*, Fasc **6**, London

Colt Hoare, R, 1812 *The ancient history of Wiltshire*, London

Cornwall, I W, 1953 Soil Science and archaeology with illustrations from some British Bronze Age monuments, *Proc Prehist Soc*, **19**, 129–47

Crabtree, K, 1971 Overton Down experimental earthwork, Wiltshire 1968, *Proc Univ Bristol Spelaeol Soc*, **12**, 237–44

——, 1990 Experimental earthworks in the United Kingdom, in *Experimentation and reconstruction in environmental archaeology*, (ed D E Robinson), 225–35, Oxford

Craw J Hewat, 1930 Excavations at Dunadd and at other sties on the Pottalloch Estates, Argyll, *Proc Soc Antiq Scotl*, **64**, 111–46

——, 1931 Further excavations of cairns at Pottalloch, Argyll, *Proc Soc Antiq Scotl*, **65**, 269–80

Crawford, O G S, 1923a Stonehenge from the air, *The Observer*, 22nd July 1923, 11–12

——, 1923b The Stonehenge Avenue, *The Observer*, 23rd October 1923

——, 1924 The Stonehenge Avenue, *Antiq J*, **4**, 57–8

——, 1954 The symbols carved on Stonehenge, *Antiquity*, **28**, 25–31

Crummy, N, 1983 *The Roman small finds from excavations in Colchester 1971–9*, Colchester Archaeol Rep, **2**, Colchester

Cummins, W A, 1979 Neolithic stone axes: distribution and trade in England and Wales, in Clough and Cummins 1979, 5–12

Cunnington, M E, 1929 *Woodhenge*, Devizes

——, 1933 Evidence of climate derived from snail shells and its bearing on the date of Stonehenge. *Wiltshire Archaeol Natur Hist Soc Mag*, **46**, 350–5

Cunnington, R H, 1935 *Stonehenge and its date*, London

Curwen, E, 1936 Excavations in Whitehawk Camp, Brighton, third season, 1935, *Sussex Archaeol Collect*, **77**, 66–92

——, and Curwen, E C, 1926 Harrow Hill flint-mine excavation, 1924–5, *Sussex Archaeol Collect*, **67**, 137–70

Curwen, E C, 1924 Blackpatch flintmine excavation, *Sussex Archaeol Collect*, **65**, 69–111

——, 1930 *The archaeology of Sussex*, London

Cushing, E J, 1967 Evidence for differential pollen preservation in Late Quaternary sediments in Minnesota, *Rev Palaeobot Palynol*, **4**, 87–101

Darvill, T C (ed), 1991 *Stonehenge conservation and management project: environmental statement*, London

Davis, R V, Howard, H, and Smith, I F, 1988 The petrological identification of stone implements from south-west England: sixth report of the Sub-Committee of the South-West Federation of Museums and Art Galleries, in Clough and Cummins 1988, 14–20

Davis, S, and Payne, S, 1993 A barrow full of cattle skulls, *Antiquity*, **67**, 12–22

Dekling, H and Plicht, J, van der, 1993 Statistical problems in calibrating radiocarbon dates, *Radiocarbon*, **35**, 239–44

Degerbol, M, and Fredskild, B, (eds), 1970 *The Urus* (Bos primigenius *Bojanus) and neolithic domesticated cattle* (Bos taurus domesticus *Linne) in Denmark*, Kobenhavn

Dimbleby, G W, 1984 Anthropogenic changes from Neolithic through medieval times, *New Phytol*, **98**, 57–72

——, 1985 *The palynology of archaeological sites*, London

——, and Evans, J G, 1974 Pollen analysis and land snail analysis of calcareous soils, *J Archaeol Sci*, **1**, 117–33

Driesch, A von den, 1976 *A guide to the measurement of animal bones from archaeological sites*, New York

Egan, G, and Pritchard, F, 1991 *Dress accessories c 1150–c 1450, Museum of London medieval finds from excavations in London*, **3**, London (MLDA)

Ellison, A B, 1990 The prehistoric pottery [Coneybury henge], in Richards, J, 1990, 144

Entwistle, R, 1990 Land mollusca, in Richards 1990, 88–93, 105–9

Evans, J G, 1971 The pre-henge environment, in Wainwright and Longworth 1971, 329–37

——, 1972 *Land snails and archaeology*, London

——, 1975 *The environment of early man in the British Isles*, London

——, 1983 Molluscan analysis in Evans, J G and Smith, I F 1983, 101–9

——, 1984 Stonehenge — the environment in the Late Neolithic and Early Bronze Age and a Beaker-age burial, *Wiltshire Archaeol Natur Hist Soc Mag*, **78**, 7–30

——, 1990 Notes on some Late Neolithic and Bronze Age events in long barrow ditches in southern and eastern England, *Proc Prehist Soc*, **56**, 111–6

——, and Wainwright, G J, 1979 The Woodhenge excavations, in Wainwright 1979, 71–4

——, and Jones, H, 1979 The land Mollusca, in Wainwright 1979, 190–213

——, and Smith, I F, 1983 Excavations at Cherhill, North Wiltshire 1967, *Proc Prehist Soc*, **49**, 43–118

——, French, C, and Leighton, D, 1978 Habitat change in two Late-glacial and Post-glacial sites in southern Brtian: the molluscan evidence, in *The effect of man on the landscape: the lowland zone*, (eds S Limbrey and J G Evans), CBA Res Rep, **21**, 63–75, London

——, and Williams, D, 1991 Land Molluscs from the M3 archaeological sites — a review, in Fasham, P J and Whinney, R J B, *Archaeology and the M3; the watching brief, the Anglo-Saxon settlement at Abbots Worthy and restrospective sections*, Hampshire Fld Club Archaeol Soc Monog, **7**, 113–42

Evens, E D, Grinsell, L V, Piggott, S, and Wallis, F S, 1962 Fourth report of the Sub-Committee of the South-Western Group of Museums and Art Galleries on the petrological identification of stone axes, *Proc Prehist Soc*, **28**, 209–66

Findlay, D C, Colbourne, G J N, Cope, D W, Harrod, T R, Hogan, D V, and Staines, S J, 1984 *Soils and their use in south west England*, Soil Survey of England and Wales Bulletin, **14**, Rothhamstead

Finnegan, M, 1978 Non-metric variation of the infracranial skeleton, *J Anatomy*, **125**, 23–37

Finch, L A, 1971 Report on the petrological examination of sherds from Durrington Walls, in Wainwright and Longworth 1971, 409–10

Fox, A H L, 1976 Excavations at Cissbury Camp, Sussex, *J Anthrop Inst*, **5**, 357–90

Fulford, M G, 1975 *New Forest pottery*, BAR **17**, Oxford

Gale, R, 1990 Charcoals, in Richards 1990, 252–3

Gardiner, J, 1988 *The composition and distribution of Neolithic surface flint assemblages in central-southern England*, unpubl PhD thesis, Univ Reading

——, 1991 Spatial analysis: the lithic scatter and the Cursus, in Bradley, Barrett, and Green 1991, 73–5

Garwood, P, forthcoming Grooved Ware chronology, in *Grooved Ware in context* (eds A.MacSween and R M J Cleal)

Gejvall, N G, 1981 Determination of burnt bones from prehistoric graves, *OSSA letters*, **2**, 1–13

Gelfand, A E, and Smith, A F M, 1990 Sampling based approaches to calculating marginal densities, *J Amer Stat Assoc*, **85**, 398–409

Gerloff S, 1975 *The Early Bronze Age daggers in Great Britain and a reconsideration of the Wessex Culture*, Prähistorische Bronzefund, **VI**, Munich

——, 1993 Zu Fragen mittelmeerländischer Kontackte und absoluter Chronologie der Fr hbronzezeit in Mittel- und Westeuropa, *Praehistorische Zeitschrift*, **68**, 58–102

Gibson, A, 1982 *Beaker Domestic Sites*, BAR, **107**, Oxford

——, 1994 Excavations at the Sarn-y-bryn-caled cursus complex, Welshpool, Powys, and the timber circles of Great Britain and Ireland, *Proc Prehist Soc*, **60**, 143–223

Gingell, C, 1988 Twelve Wiltshire round barrows. Excavations in 1959 and 1961 by F de M and H L Vatcher, *Wiltshire Archaeol Natur Hist Mag*, **82**, 19–76

——1992 *The Marlborough Downs: a later Bronze Age landscape and its origins*, Wiltshire Archaeol Natural Hist Soc Monog **1**, Devizes

Godwin, H, 1975 *History of the British Flora*, 2 edn, Cambridge

Goodall, I, 1980 The iron objects, in Wade-Martins 1980, 509–16.

Gowland,W, 1902 Recent excavations at Stonehenge, *Archaeologia*, **58**, 37–105

Grant, A, 1975 Appendix B: the use of tooth wear as a guide to the age of domestic animals. A brief explanation, in Cunliffe, B, *Excavations at Portchester Castle*, Rep Res Comm Soc Antiq London, **32**, London

Gray, H, 1977 *Anatomy*, New York

Gray, H St George, 1935 The Avebury excavations 1908–1922, *Archaeologia*, **84**, 99–162

Green, H S, 1980 *Flint arrowheads of the British Isles*, BAR, **75**, Oxford

Greenfield, H J, 1986 *The palaeoeconomy of the central Balkans (Serbia)*, BAR, **S304**, Oxford

Grigson, C, 1965 Faunal remains: measurements of bones, horncores, antlers and teeth, in Smith 1965, 145–67

——, 1969 The uses and limitations of differences in absolute size in the distinction between the bones of aurochs (*Bos primigenius*) and domestic cattle (*Bos taurus*), in *The domestication and exploitation of plants and animals* (eds P J Ucko and G W Dimbleby), 277–94, London

Grinsell, L, 1957 Archaeological gazetteer, in *Victoria County History of Wiltshire vol 1 pt 1* (eds R B Pugh and E Crittall), 21–279

Gurfinkel, D M, 1987 Comparative study of the radiocarbon dating of different bone collagen preparations, *Radiocarbon*, **29**, 45–52

Harcourt, R A, 1971 Animal bones from Durrington Walls, in Wainwright and Longworth 1971, 338–50
——, 1974 The dog in prehistoric and early historic Britain, *J Archaeol Sci*, **1**, 151–75
Harding, A F, 1981 Excavations near Milfield, Northumberland, *Proc Prehist Soc*, **47**, 87–136
Harding, P, 1988 The Chalk Plaque Pit, Amesbury, *Proc Prehist Soc*, **54**, 320–7
——, 1990a The comparative analysis of four stratified flint assemblages and a knapping cluster, in Richards 1990, 213–25
——, 1990b Lithics [Wilsford Down W31], in Richards 1990, 164–9
——, 1990c Lithics [King Barrow Ridge], in Richards 1990, 116–9
Harding A F, with Lee, G E, 1987 *Henge monuments and related sites of Great Britain: air photographic evidence and catalogue*, BAR, **175**, Oxford
Harman, M, 1993 Appendix 1: animal remains from Ardnave, Islay, in Ritchie, G, and Welfare, H, Excavations at Ardnave, Islay, *Proc Soc Antiq Scotland*, **113**, 302–66
Hattatt, R, 1982 *Ancient and Romano-British Brooches*, Sherborne
Hawley, W, 1921 The excavations at Stonehenge, *Antiq J*, **1**, 19–39
——, 1922 Second report on the excavations at Stonehenge, *Antiq J*, **2**, 36–51
——, 1923 Third report on the excavations at Stonehenge, *Antiq J*, **3**, 13–20
——, 1924 Fourth report on the excavations at Stonehenge, *Antiq J*, **4**, 30–9
——, 1925 Report on the excavations at Stonehenge during the season of 1923, *Antiq J*, **5**, 21–50
——, 1926 Report on the excavations at Stonehenge during the season of 1924, *Antiq J*, **6**, 1–25
——, 1928 Report on the excavations at Stonehenge during 1925 and 1926, *Antiq J*, **8**, 149–76
Haynes, C V, 1967 Bone organic matter and radiocarbon dating, in *Radiocarbon dating and methods of low-level counting*, Vienna, International Atomic Energy Agency, 163–8
Healy, F forthcoming Site 3. Flagstones, in Smith, Healy, Allen, Morris, and Barnes forthcoming
Hedges, J, and Buckley, D, 1978 Excavations at a Neolithic causewayed enclosure, Orsett, Essex, *Proc Prehist Soc*, **44**, 219–308
Hedges, R E M, and Law, I A, 1989 The radiocarbon dating of bone, *Applied Geochemistry*, **4**, 249–54
——, ——, Bronk, C R, and Housley, R A, 1989 The Oxford Accelerator Mass Spectrometry facility: technical developments in routine dating, *Archaeometry*, **31**, 99–113
——, Humm, M J, Foremen, J, Klinken, G J van, and Bronk, C R, 1992 Developments in sample combustion to carbon dioxide, and the Oxford AMS carbon dioxide ion source system, *Radiocarbon*, **34**, 306–11
Hillson, S, 1986 *Teeth*, Cambridge
Howard, H, 1982 A petrological study of the rock specimens from excavations at Stonehenge, 1979–1980, in Pitts 1982, 104–24
Ingold, T, 1980 *The appropriation of nature: essays in human ecology and social relations*, Manchester
International Study Group, 1982 An inter-laboratory comparison of radiocarbon measurements in tree rings, *Nature*, **298**, 619–23
Jewell, P, 1963 *The experimental earthwork on Overton Down, Wiltshire 1960*, London
——, and Dimbleby, G W, 1966 The experimental earthwork on Overton Down, Wiltshire, England: the first four years, *Proc Prehist Soc*, **32**, 313–42
Jope, M, 1965 Faunal remains: 2. Frequencies of ages and species, in Smith 1965, 142–5
Keepax, C, 1980 *Charcoal from Stonehenge*, Wiltshire, Ancient Monuments Lab Rep, **3210**
Kennard, A S, 1935 Report on the non-marine Mollusc from the Stonehenge excavations 1920–6, in Kennard and Jackson 1935, 432–4
——, and Jackson, J W, 1935 Reports on 1. The non-marine Mollusca, and 2. The animal remains from the Stonehenge excavations of 1920–6, *Antiq J*, **15**, 432–40
Kilvert, F, 1992 *Kilvert's Diary 1870–1879*, (ed W Plomer), London
Kinnes, I A, and Longworth, I H, 1985 *Catalogue of the excavated prehistoric and Romano-British material in the Greenwell Collection*, London
——, Gibson, A M, Ambers, J, Bowman, S, Leese, M, and Boast, R, 1991 Radiocarbon dating and British beakers: the British Museum programme, *Scott Archaeol Rev*, **8**, 35–68
Kromer, B, and Becker, B, 1993 German oak and pine $^{14}C$ calibration, 7200–9400 BC, *Radiocarbon*, **35**, 125–36
La Farge, O, 1962 *A pictorial history of the American Indian*, London
Laidler, B, and Young, W E V, 1938 A surface flint industry from a site near Stonehenge, *Wiltshire Archaeol Natur Hist Soc Mag*, **48**, 151
Larsson, L, 1989 Late Mesolithic settlement and cemeteries at Skateholm, southern Sweden, in *The Mesolithic of Europe; papers presented at the third international symposium, Edinburgh 1985*, (ed C Bonsall), 367–78, Edinburgh
Law, I A, and Hedges, R E M, 1989 A semiautomated bone pretreatment system and the pretreatment of older and contaminated samples, *Radiocarbon*, **31**, 247–53
Lawson, A J, 1992 Stonehenge: creating a definitive account, *Antiquity*, **66**, 934–41
Legg, R, 1986 *Stonehenge antiquaries*, Dorchester
Legge, A J, 1981 The agricultural economy, in Mercer 1981, 169–81
——, 1986 Review of J Clutton-Brock, Neolithic antler picks from Grimes Graves, Norfolk and Durrington Walls, Wiltshire: a biometrical analysis, *J Archaeol Sci*, **13**, 99–100
——, 1992 *Excavations at Grimes Graves, Norfolk 1972–1976. Fascicule 4: animals, environment and the Bronze Age economy*, London
Levitan, B, 1990 The nonhuman vertebrate remains, in Saville 1990, 199–214
Levitan, B and Serjeantson, D, forthcoming The animal bones and antler, in *Excavations at Barrow Hills, Radley, volume 1, the prehistoric monument complex*, (eds A Barclay and C Halpin), Oxford
Libby, W F, 1955 *Radiocarbon dating*, 2nd edn, Chicago
L'Helgouac'h J 1979 Les groupes humains du V^e^ au III^e^ milléniase, in P R Giot, J L'Helgouac'h, and J L Monmier, *Prehistoire de la Bretagne*, 155–320, Rennes
Limbrey, S, 1973a in Vatcher and Vatcher 1973, 62–3
——, 1973b Report on the soils, in Smith 1973, 55
——, 1975 *Soil science and archaeology*, London
——, 1978 Changes in the quality and distribution of soils of lowland Britain, in *The effect of man on the landscape: the lowland zone*, (eds J G Evans and S Limbrey), CBA Res Rep, **21**, 21–7, London
Lockyer, N, 1909 *Stonehenge and other British stone monuments*, Oxford

Long, A, and Kalin, R M, 1990 A suggested quality assurance protocol for radiocarbon dating laboratories, in Proceedings of the International Workshop on intercomparison of radiocarbon laboratories (eds E M Scott, A Long, and R S Kra), *Radiocarbon*, **32**, 329–35

Longin, R, 1970 *Extraction du collagene des os fossiles pour leur datation par la methode du carbone 14*, unpubl PhD thesis, Univ Lyon

——, 1971 New method of collagen extraction for radiocarbon dating, *Nature*, **230**, 241–2

Longworth I H, 1981 Neolithic and Bronze Age pottery, in R Mercer 1981, 39–59

——, and Haith, C, 1992 Henry Durden and his collection, *Proc Dorset Natur Hist Archaeol Soc*, **114**, 151–60

Lupo, K D, and Schmitt, D N, unpublished, *Meat and bone preparation techniques: nutritional returns and archaeological reflections*, lecture to the seventh International Congress of the International Council for Archaeozoology, Konstanz, 27 September 1994

MacGregor, A, 1985 *Bone, antler, ivory and horn*, Beckenham

McCormac, F G, 1992 Liquid scintillation counter characterisation, optimisation, and benzene purity correction, *Radiocarbon*, **34**, 37–45

——, Kalin, R M, and Long, A, 1993 Radiocarbon dating beyond 50,000 years by liquid scintillation counting, in *Liquid scintillation spectrometry* (eds J E Noakes, F Shonhofer, and H A Polach), 125–33

——, Baillie, M G L, Pilcher, J R, Brown, D M, and Hoper, S T, 1994 $\delta^{13}C$ measurements from the Irish oak chronology, *Radiocarbon*, **36**, 27–35

——, ——, ——, Jirikovic, J, and Kalin, R M, forthcoming Indication of location dependent differences in the $^{14}C$ content of wood, *Radiocarbon*, **37**

McKerrell H, 1972 On the origins of British faience beads and some aspects of the Wessex–Mycenae relationship, *Proc Prehist Soc*, **38**, 286–301

McKinley, J I, 1988 Human remains, the 1988 excavation (W267), in Butterworth, C, and Lobb, S, J, Excavations at Field Farm, Burghfield, Berkshire, in Butterworth C A and Lobb, S J, *Excavations in the Burghfield area*, Berkshire, Wessex Archaeol Rep, **1**, 62, Salisbury

——, 1989 Cremations: expectations, methodologies and realities, in *Burial Archaeology: current research, methods and developments* (eds C A Roberts, F Lee, and J Bintliff), BAR, **211**, 65–76, Oxford

——, in press a, Bone fragment size and weights of bone from modern British cremations and its implications for the interpretation of archaeological cremations, *Int J Osteoarchaeol*, **3**, 283–7

——, in press b Bone fragment size in British cremation burials and its implications for pyre technology and ritual, *J Archaeol Sci*, **21**, 339–42

——, forthcoming a The cremation burial, in Wymer, J, A bronze age cremation burial from Alpington, Norfolk, *Norfolk Archaeol*, **41**, 71–3

——, forthcoming b A bronze age cremation burial from Guiting Power, Gloucestershire

——, and Heaton, M J, forthcoming A Romano-British farmstead and associated burials at Maddington Farm, Shrewton, *Wiltshire Archaeol Natur Hist Soc Mag*

McMinn, R M H, and Hutchings, R T, 1985 A colour atlas of human anatomy, London

Maltby, M, 1990 The exploitation of animals in the Stonehenge environs in the Neolithic and Bronze Age, in Richards 1990, 250–8

Mapleton, Rev R J, 1871 Notice of remarkable cists in a gravel bank near Kilmartin, and of incised sculpturings of axe heads and other markings on the stones of the cists, *Proc Soc Antiq Scotl*, **8**, 378–81

Margeson, S, 1993 *Norwich households: medieval and post-medieval finds from Norwich Survey excavations 1971–78*, E Anglian Archaeol, **58**, Norwich

Mayton, W G, 1800 Account of the fall of some of the stones of Stonehenge, *Archaeologia*, **13**, 103–6

Mercer, R, 1981 *Grimes Graves, Norfolk: excavations 1971-72*, London

Mitchell, A 1974 *Field guide to the trees of Britain and Northern Europe*, London

Moffett, L, Robinson, M A, and Straker V, 1989 Cereals, fruits and nuts: charred plant remains from Neolithic sites in England and Wales and the Neolithic economy, in *The beginnings of agriculture* (eds A Milles, D Williams, and N Gardner), BAR, **S496**, 243-61, Oxford

Mook, W G, 1986 Business meeting: recommendations/resolutions adopted by the twelfth international radiocarbon conference, *Radiocarbon*, **28**, 799

——, and Waterbolk, H T, 1985 *Radiocarbon dating*, European Science Foundation handbook for archaeologists, **3**, Strasbourg

Moore, C N, and Rowlands, M, 1972 *Bronze Age metalwork in Salisbury Museum*, Salisbury

Moore, P D, Webb, J A, and Collinson, M E, 1991 *Pollen analysis*, 2nd edn, Oxford

Musty, J, Algar, D J, and Ewence, P F, 1969 The medieval pottery kilns at Laverstock, near Salisbury, Wiltshire, *Archaeologia*, **102**, 83–150

Needham S P, 1986 Towards a reconstruction of the Arreton hoard, *Antiq J*, **66**, 9–28

——, 1990 Middle Bronze Age ceremonial weapons: new finds from Oxborough, Norfolk and Essex/Kent, *Antiq J*, **70**, 239-52

——, 1991 *Excavation and salvage at Runnymede Bridge 1978: the Late Bronze Age Waterfront Site*, London

——, Lawson A J, and Green H S, 1985 *British Bronze Age metalwork: Early Bronze Age Hoards, A1–6*, London

Newall, R S, 1929 Stonehenge, *Antiquity*, **3**, 75–88

——, 1929a Stonehenge, the recent excavations, *Wiltshire Archaeol Natur Hist Soc Mag*, **44**, 150

——, 1952 Stonehenge stone no. 66, *Antiq J*, **32**, 65–7

Noakes, J E, Kim, S M, and Stipp, J J, 1965 Chemical and counting advances in liquid scintillation age dating, in Proceedings of the 6th International Conference on radiocarbon and tritium dating (eds E A Olsson and R M Chatters), 68–92

North, J J, 1963 *English Hammered Coinage*, London

O'Kelly M, 1982 *Newgrange: archaeology, art and legend*, London

Otlet, R L, Walker, A J, Hewson, A D, and Burleigh, R, 1980 $^{14}C$ interlaboratory comparison in the UK: experiment design, preparation, and preliminary results, *Radiocarbon*, **22**, 936–46

——, Huxtable, G, Evans, G V, Humphreys, D C, Short, T D, and Cochie, S J, 1983 Development and operation of the Harwell small counter facility for the measurement of $^{14}C$ in very small samples, *Radiocarbon*, **25**, 565–76

Payne, S, and Bull, G, 1988 Components of variation in measurements of pig bones and teeth, and the use of measurements to distinguish wild from domestic pig remains, *ArchaeoZoologia*, **2**, 27–65

Pearson, G W, and Qua, F, 1993 High-precision $^{14}C$ measurement of German and Irish Oaks to show the natural

$^{14}$C variations from 7890 to 5000 BC, *Radiocarbon*, **33**, 105–24
——, and Stuiver, M, 1986 High-precision calibration of the radiocarbon time scale, 500–2500 BC, *Radiocarbon*, **28**, 839–62
——, and ——, 1993 High-precision bi-decadal calibration of the radiocarbon time scale, 500–2500 BC, *Radiocarbon*, **33**, 25–34
——, Pilcher, J R, Baillie, M G L, Corbett, D M, and Qua, F, 1986 Highprecision $^{14}$C measurement of Irish oaks to show the natural $^{14}$C variations from AD 1840–5210 BC, *Radiocarbon*, **28**, 911–34
——, Becker, B, and Qua, F, 1993 High-precision $^{14}$C measurement of German and Irish oaks to show the natural $^{14}$C variations from 7890 to 5000 BC, *Radiocarbon*, **35**, 93–104
Petrie, W M Flinders, 1880 *Stonehenge: plans, descriptions and theories*, London
Pfitzenmeyer, C D C, 1962 *Arrenatherum elatius* (L.) J and C Presl, *J Ecol*, **50**, 235–45
Piggott S, 1938 The Early Bronze Age in Wessex, *Proc Prehist Soc*, **4**, 52–106
——, 1939 The Badbury Barrow, Dorset, and its carved stone, *Antiq J*, **19**, 291–99
——, 1954 *Neolithic cultures of the British Isles*, Cambridge
——, 1959 Stonehenge restored, *Antiquity*, **33**, 50–1
——, 1962 *The West Kennet Long Barrow: excavations 1955–56*, London
Pitts, M W, 1981 Stones, pits and Stonehenge, *Nature*, **290**, 46–7
——, 1981a The discovery of a new stone at Stonehenge, *Archaeoastronomy*, **4**, 17–21
——, 1982 On the road to Stonehenge: report on investigations beside the A344 in 1968, 1979, and 1980, *Proc Prehist Soc*, **48**, 75–132
——, 1983 Procurement and use of flint and chert, in Evans and Smith 1983, 72–84
Plicht, J, van der, 1993 The Gröningen radiocarbon calibration program, *Radiocarbon*, **35**, 231–7
Pollard, J, 1993 *Traditions of deposition in the Neolithic of Wessex*, Unpubl PhD thesis, Univ Wales Cardiff
——, forthcoming Inscribing space: formal deposition at the later Neolithic monument of Woodhenge, Wiltshire, *Proc Prehist Soc*, **61**
Pryor, F M, 1985 *The Fenland Project number 1. Archaeology and environment in the lower Welland valley*, E Anglian Archaeol, **27**, Cambridge
Pull, J H, 1932 *The flint miners of Blackpatch*, London
Quarrie, B, 1987 Stonehenge, Wiltshire, *Action stations, 10. supplement and index*, 102–5, Wellingborough
RCHM(E), 1979 *Stonehenge and its environs*, Edinburgh
Rahtz, P, 1979 *The Saxon and medieval palaces at Cheddar, excavations 1960–1962*, BAR, **65**, Oxford
Rawlings, M N, and Fitzpatrick, A P, forthcoming A ring-ditch and related features, and a Romano-British settlement at Butterfield Down, Amesbury, Wiltshire, *Wiltshire Archaeol Natur Hist Soc Mag*
Raymond, F, 1990 The prehistoric pottery (W31), in Richards 1990, 169–171
——, 1994 The pottery, in Bradley, Entwistle, and Raymond 1994, 69–90
Reece, R, 1994 Are Bayesian statistics useful to archaeological reasoning?, *Antiquity*, **68**, 848–50
Renfrew C, 1968 Wessex without Mycenae, *Annu Brit School Athens*, **63**, 277–85
Richards, C, 1994 Monumental choreography: architecture and spatial representation in Late Neolithic Orkney, in *Interpretative archaeology* (ed C Tilley), 143–78, Oxford
Richards, J C, 1984 The development of the Neolithic landscape in the environs of Stonehenge, in *Neolithic studies* (ed R Bradley and J Gardiner), BAR, **133**, 177–87, Oxford
——, 1986 Sites and monuments around Stonehenge, in *The management and presentation of field monuments* (eds M Hughes and L Rowley), 103–8, Oxford
——, 1990 *The Stonehenge environs project*, HBMCE Archaeol Rep, **16**, London
——, 1991 *Beyond Stonehenge*, Salisbury
Robinson, M, 1988 The significance of the tubers of *Arrhenatherum elatius* (L.) Beauv from site 4, cremation 15/11, in *The Rollright Stones: megaliths, monuments, and settlements in the prehistoric landscape* (ed G Lambrick), HBMCE Archaeol Rep, **6**, London, 102
Roe, F E S, 1968 Stone mace-heads and the latest Neolithic cultures of the British Isles, in *Studies in ancient Europe* (eds J M Coles and D D A Simpson), 145–72, Leicester
——, 1979 Typology of stone implements with shaftholes, in Clough and Cummins (eds) 1979, 23–8
Rogers, N, 1991 Earlier evidence for Stonehenge Carvings?, *Wiltshire Archaeol Natur Hist Soc Mag*, **84**, 116
Rowley-Conwy, P, 1984 Mellemneolitisk okonomi i Danmark og Sydengland: knoglefunde fra Fannerup, *Kuml*, 77–111
——, 1985 The origins of agriculture in Denmark: a review of some theories, *J Danish Archaeol*, **4**, 188–95
Rozanski, K, Stichler, W, Gonfiantini, R, Scott, E M, Beukens, R P, Kromer, B, and Plicht, J, van der, 1992 The IAEA $^{14}$C intercomparison exercise 1990, *Radiocarbon*, **34**, 506–19
Rymer, L, 1976 The history and ethnobotany of bracken, *Botan J Linnean Soc*, **73**, 151–76
Saville, A, 1990 *Hazleton North, Gloucestershire, 1979–82: the excavation of a Neolithic long cairn of the Cotswold-Severn group*, HBMCE Archaeol Rep, **13**, London
Sandars, H W, 1910 On the use of the deer-horn pick in the mining operations of the ancients, *Archaeologia*, **62**, 101–24
Saunders, P, and Saunders, E, (eds), 1991 *Salisbury and South Wiltshire Museum medieval catalogue*, part 1, Salisbury (SSWM)
Scaife, R G, 1980 *Late Devensian and Flandrian palaeoecological studies in the Isle of Wight*, unpubl PhD thesis, Univ London
——, 1982 Late-Devensian and early Flandrian vegetation changes in southern England, in *Archaeological aspects of woodland ecology* (eds M Bell and S Limbrey), BAR, **S146**, 57–74, Oxford
——, 1984 *Gallibury Down, Isle of Wight — pollen analysis of a Bronze Age downland palaeosol*, unpubl Ancient Monuments Lab Rep, **4240**
——, 1990 Pollen analysis, in Saville 1990, 218–9
——, forthcoming Avon valley floodplain sediments: the pre-Roman vegetation history, in Cleal, Allen, and Newman forthcoming
Schmid, E, 1972 *Atlas of animal bones*, Amsterdam
Scott, E M, forthcoming Business meeting, *Radiocarbon*, **37**
——, Harkness, D D, Cook, G T, Miller, B F, Begg, F H, and Holton, L, forthcoming The TIRI project: a status report, *Radiocarbon*
——, Long, A, and Kra, R S (eds), 1990 Proceedings of the international workshop on intercomparison of radiocarbon laboratories, *Radiocarbon*, **32**, 253–397

Seagrief, S C, 1959 Pollen diagrams from southern England: Wareham, Dorset and Nursling, Hampshire, *New Phytol*, **58**, 316–25

Serjeantson, D, 1991a 'Rid Grasse of Bones': a taphonomic study of the bones from midden deposits at the Neolithic and Bronze Age site of Runnymede, Surrey, England, *Int J Osteoarchaeol*, **1**, 73–89

——, 1991b The bird bones, in Cunliffe, B W, 1991 *Danebury: an Iron Age Hillfort in Hampshire, volume 5: the excavations 1979–1988: the finds*, 479–81, Counc Brit Archaeol Res Rep, **73**, London

——, forthcoming Animal bones: methods, taphonomy and preliminary analysis, in *Runnymede excavations: Area 16*, (ed S P Needham), London

Shackley, M L, 1976 The Danebury Project: an experiment in site sediment recording, in *Geoarchaeology* (eds D A Davidson and M L Shackley), 9–21, London

Sharples, N, 1991 *Maiden Castle. Excavations and field survey 1985–6*, HBMCE Archaeol Rep, **19**, London

Simmons, I G, Dimbleby, G W, and Grigson, C, 1981 The Mesolithic, in Simmons, I and Tooley, M, *The environment in British prehistory*, 82–124, London

Simpson, D A, and Thawley J E, 1973 Single grave art in Britain, *Scott Archaeol Forum*, **4**, 81–104

Smith, G, 1973 Excavation of the Stonehenge Avenue at West Amesbury, Wiltshire, *Wiltshire Archaeol Natur Hist Soc Mag*, **68**, 42–56

——, 1979–80 Excavations in the Stonehenge carpark, *Wiltshire Archaeol Natur Hist Soc Mag*, **74/5**, 181

Smith, I F, 1965 *Windmill Hill and Avebury: excavations by Alexander Keiller, 1925–1939*, Oxford

——, 1966 Description and catalogue of the Neolithic and Bronze Age pottery, in Ashbee 1966, 18–23

——, 1979 The chronology of British stone implements, in Clough and Cummins (eds) 1979, 13–22

——, 1991 Round barrows Wilsford cum Lake G51–G54: excavations by Ernest Greenfield in 1958, *Wiltshire Archaeol Natur Hist Soc Mag*, **84**, 11–39

Smith, R C, Healy, F, Allen, M J, Morris, E L, and Barnes, I, forthcoming, *Excavations along the route of the Dorchester by-pass 1986–8*, Wessex Archaeol Rep

Stead, I, M, and Rigby, V, 1986 *Baldock, the excavation of a Roman and pre-Roman settlement 1968–72*, Britannia Monog, **7**, London

Stace, C, 1991 *New flora of the British Isles*, Cambridge

Stockmarr, J, 1971 Tablets with spores used in absolute pollen analysis, *Pollen et spores*, **13**, 614–21

Stokes, P, unpublished *The butcher, the cook and the archaeologist*. Lecture to the Association for Environmental Archaeology Annual Conference, Durham, September 1993

Stone, J F S, 1947 The Stonehenge Cursus and its affinities, *Archaeol J*, **104**, 7–19

——, 1949 Some Grooved Ware pottery from the Woodhenge area, *Proc Prehist Soc*, **15**, 122–7

Stone, J F S, Piggott, S, and Booth, A St J, 1954, Durrington Walls, Wiltshire: recent excavations at a ceremonial site of the early second millennium BC, *Antiq J*, **34**, 155–77

Straker, V, 1990 Carbonised plant macrofossils, in Saville 1990, 215–9

Stuiver, M, 1983 International agreements and the use of the new oxalic standard, *Radiocarbon*, **25**, 793–5

——, 1993 A note on single-year calibration of the radiocarbon time scale, AD 1510–1954, *Radiocarbon*, **33**, 67–72

——, and Becker, B, 1993 High-precision decadal calibration of the radiocarbon time scale, AD 1950–6000 BC, *Radiocarbon*, **33**, 35–66

——, and Pearson, G W, 1986 High-precision calibration of the radiocarbon time scale, AD 1950–500 BC, *Radiocarbon*, **28**, 805–38

——, and ——, 1993 High-precision bi-decadal calibration of the radiocarbon time scale, AD 1950–500 BC and 2500–6000 BC, *Radiocarbon*, **33**, 1–24

——, and Reimer, P J, 1993 Extended $^{14}C$ data base and revised CALIB 3.0 $^{14}C$ Age calibration program, *Radiocarbon*, **35**, 215–30

——, Braziunas, T F, Becker, B, and Kromer, B, 1991 Climatic, solar, oceanic, and geomagnetic influences on late glacial and holocene atomospheric $^{14}C/^{12}C$ change, *Quat Res*, **35**, 1–24

Stukeley, W, 1740 *Stonehenge: A temple restor'd to the British Druids*, London

Tansley, A G, 1939 *The British Islands and their vegetation*, Cambridge

Thorley, A, 1971 Vegetational history in the Vale of the Brooks, in *A guide to Sussex excursions* (ed R B G Williams), Inst Brit Geog Conf (Jan 1971), 47–50

——, 1981 Pollen analytical evidence relating to the vegetation history of the chalk, *J Biogeog*, **8**, 93–106

Thomas, J 1991 *Rethinking the Neolithic*, Cambridge

Thomas, K D, 1985 Land snail analysis in archaeology: theory and practice, in Palaeobiological investigations: research design, methods and data analysis (eds F R J Fieller, D D Gilbertson, and M G A Ralph), 131–56, Oxford

——, 1977 The Mollusca from an Iron Age pit at Winklebury, in Smith K, The excavation of Winklebury Camp, Basingstoke, Hampshire, *Proc Prehist Soc*, **43**, 70–4

Thomas, N, 1952 A Neolithic chalk cup from Wilsford in the Devizes Museum: and notes on others, *Wiltshire Archaeol Natur Hist Mag*, **54**, 452–63

——, 1964 The Neolithic causewayed camp at Robin Hood's Ball, Shrewton, *Wiltshire Archaeol Natur Hist Soc Mag*, **59**, 1–27

Thorpe, R S, and Williams-Thorpe, O, 1991 The myth of long-distance megalith transport, *Antiquity*, **65**, 64–73

——, ——, Jenkins, D G, and Watson, J S, 1991 The geological sources and transport of the bluestones of Stonehenge, Wiltshire, UK, *Proc Prehist Soc*, **57**, 103–57

Trotter, M and Gleser, G C, 1952 Estimation of stature from long bones of American whites and Negroes, *Amer J Phys Anthrop*, **10**, 463–514

——, 1957 A re-evaluation of estimation of stature based on measurements of stature taken during life and of long bones after death, *Amer J Phys Anthrop*, **16**, 79–123

Tylecote R F, 1986 *The prehistory of metallurgy in the British Isles*, London

Vatcher, F de M, 1961 The excavation of the long mortuary enclosure on Normanton Down, Wilts, *Proc Prehist Soc*, **27**, 160–73

——, and Vatcher, H L, 1968 Excavation and fieldwork in Wiltshire, 1967, Winterbourne Stoke/Wilsford, *Wiltshire Archaeol Natur Hist Mag*, **63**, 108–9

——, and ——, 1973 Excavation of three post-holes in Stonehenge Carpark, *Wiltshire Archaeol Natur Hist Mag*, **68**, 57–63

Vince, A G, forthcoming Excavations at Bartholomew Street, 1979, in Vince, A G, Lobb, S J, Richards, J C, and Mepham, L N, *Excavations in Newbury 1979–1990*

Wade-Martins, P, 1980 *Excavations at North Elmham Park, Norfolk*, E Anglian Archaeol, **9**, Dereham

Wainwright, G J, 1979 *Mount Pleasant, Dorset, excavations 1970–1971*, Rep Res Comm Soc Antiq London, **37**, London

——, 1989 *The henge monuments*, London

——, Donaldson, P, Longworth, I, and Swan, V, 1971 The excavation of prehistoric and Romano-British settlements near Durrington Walls, Wiltshire, 1970, *Wiltshire Archaeol Natur Hist Soc Mag*, **66**, 78–128

——, and Longworth, I H, 1971 *Durrington Walls: excavations 1966–1968*, Rep Res Comm Soc Antiq London, **29**, London

Waldèn, H W, 1976 A nomenclatural list of the land Mollusca of the British Isles, *J Conch*, **29**, 21–5

Waton, P V, 1982 Man's impact on the chalklands: some new pollen evidence, in *Archaeological aspects of woodland ecology* (eds M Bell and S Limbrey), BAR, **S146**, 75–91, Oxford

——, 1986 Palynological evidence for early permanent woodland on the chalk of central Hampshire, in *The scientific study of flint and chert*, (eds G de G Sieveking and M B Hart), 169–74, Cambridge

Ward, G K, and Wilson, S R, 1978 Procedures for comparing and combining radiocarbon age determinations: a critique, *Archaeometry*, **20**, 19–31

Webb, P A O, and Suchey, J M, 1985 Epiphyseal union of the anterior iliac crest and medial clavicle in a modern multiracial sample of American males and females, *Amer J Phys Anthrop*, **68**, 457–66

Wessex Archaeology, 1991 Archaeological evaluation (appendix K), in Darvill 1991, 457–546

——, 1993a *The twentieth century excavations at Stonehenge: proposals for the completion of an accessible research archive and the reporting of the previously unpublished results*, unpubl research design, **T1406b**

——, 1993b *Stonehenge Visitor Centre, Wiltshire, Site 12: A303 footbed; archaeological evaluation*, unpubl client rep, **W639a**

——, 1993c *Stonehenge car park compound: archaeological monitoring and excavation*, unpubl client rep, **W614**

——, 1994a *Stonehenge: limited test augering*, unpubl client rep, **30506**

——, 1994b *A354–A353 Dorchester to Weymouth road improvements: archaeological field evaluation — trial trenching*, unpubl archive report, **W565c**

——, *Land at Stonehenge, Amesbury, Wiltshire: archaeological investigation and recording during water supply works*, unpubl client rep, **W7611**

West, S E, 1990 *West Stow: the prehistoric and Romano-British occupations*, E Anglian Archaeol, **48**, Bury St Edmunds

Wheeler, R E M, 1943 *Maiden Castle, Dorset*, Rep Res Comm Soc Antiq London, **12**, London

Whittle A, 1991 A late Neolithic complex at West Kennet, Wiltshire, England, *Antiquity*, **65**, 256–62

——, 1993 The Neolithic of the Avebury area: sequence, environment, settlement and monuments, *Oxford J Archaeol*, **12**, 29–53

——, Rouse, A J, and Evans, J G, 1993 A Neolithic downland monument in its environment: excavations at the Easton Down Long Barrow, Bishops Cannings, north Wiltshire, *Proc Prehist Soc*, **59**, 197–239

——, Atkinson, R J C, Chambers, R, and Thomas, N, 1992 Excavations in the Neolithic and Bronze Age complex at Dorchester-on-Thames, Oxfordshire, 1947–1952 and 1981, *Proc Prehist Soc*, **58**, 143–201

——, Davies, S M, and Graham, A H, 1993 *Excavations at the Old Methodist Chapel and Greyhound Yard, Dorchester, 1981–84*, Dorset Natur Hist Archaeol Soc Monog, **12**, Dorchester

Wymer J J, 1977 *Catalogue of Mesolithic sites in England and Wales*, CBA Res Rep, **21**, London

Zvelebil M, 1994 Plant use in the Mesolithic and its role in the transition to farming, *Proc Prehist Soc*, **60**, 95–134

# Index

*by Barbara Hird*

NOTE: References in italics denote Figures

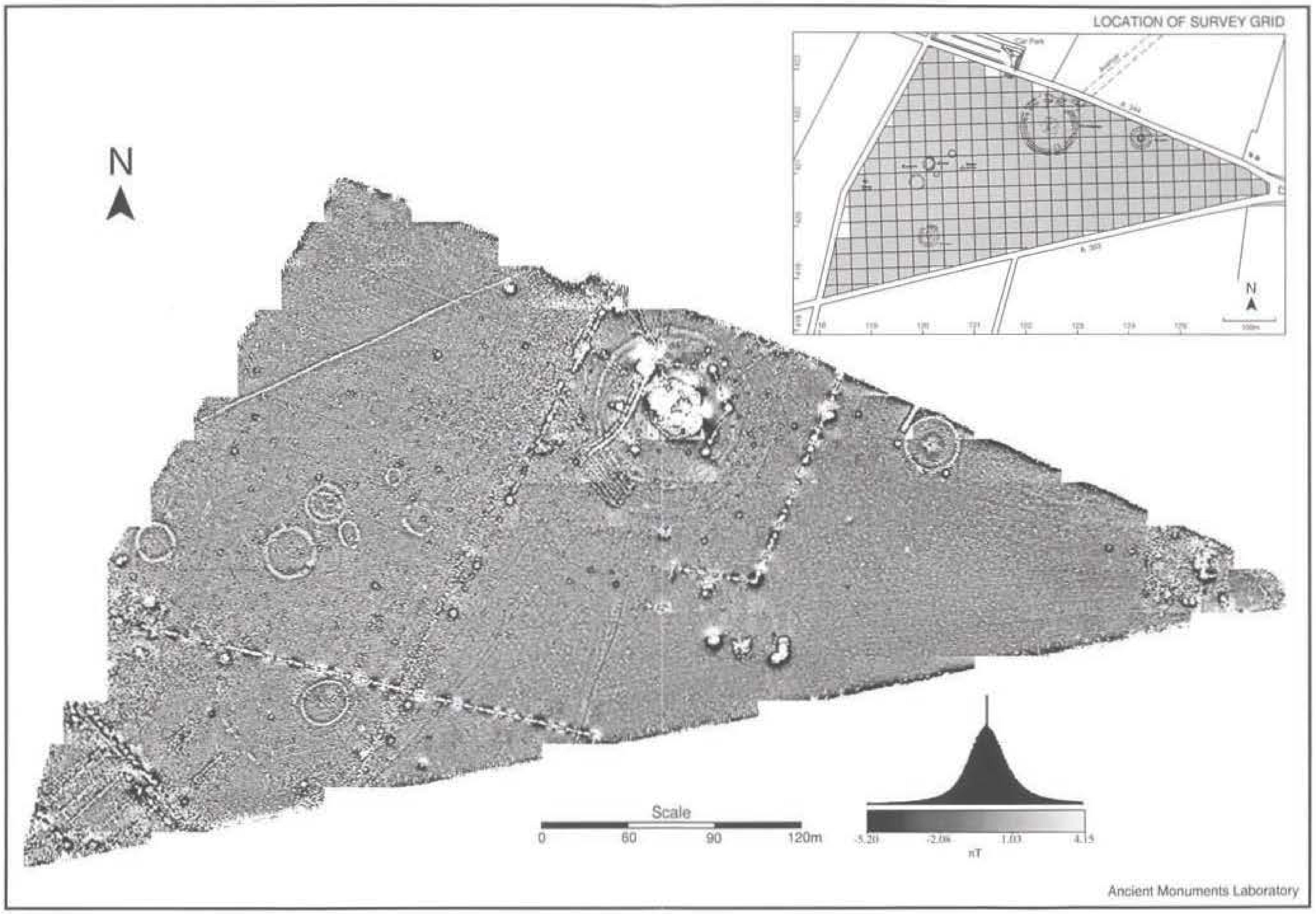



*Fig 258 Greyscale plot of total magnatometer survey coverage of the Stonehenge Triangle. Scale 1:2050*

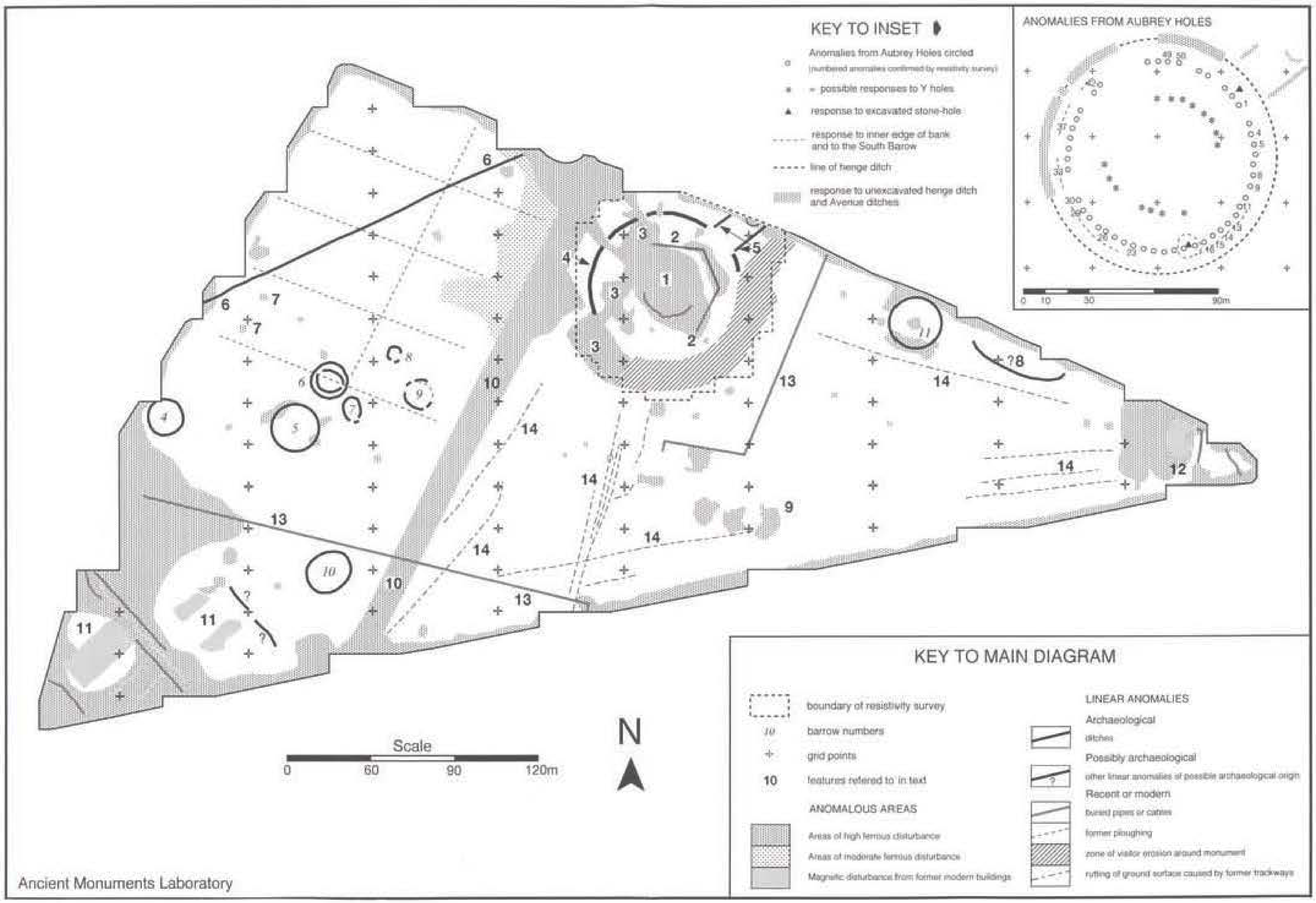
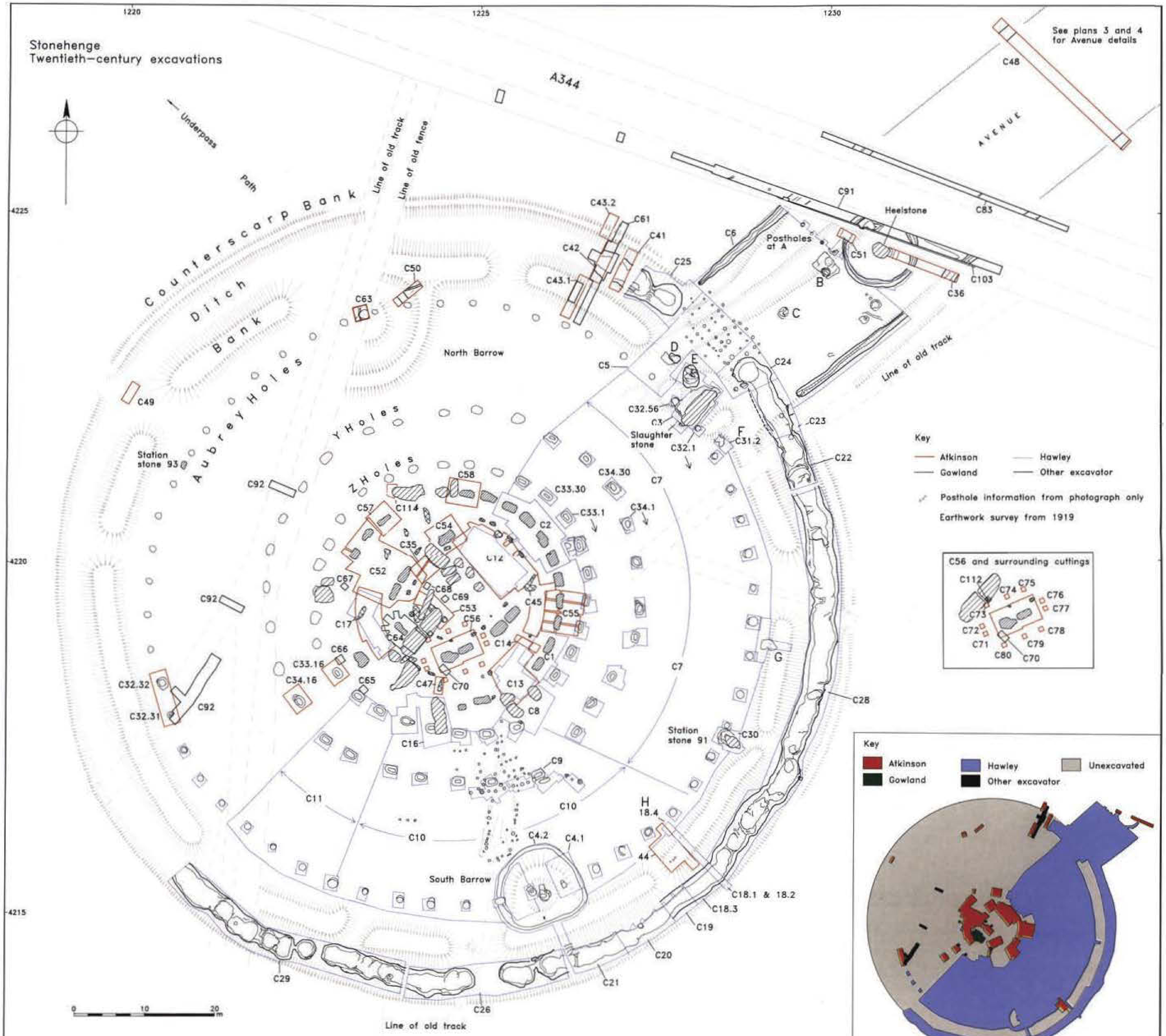
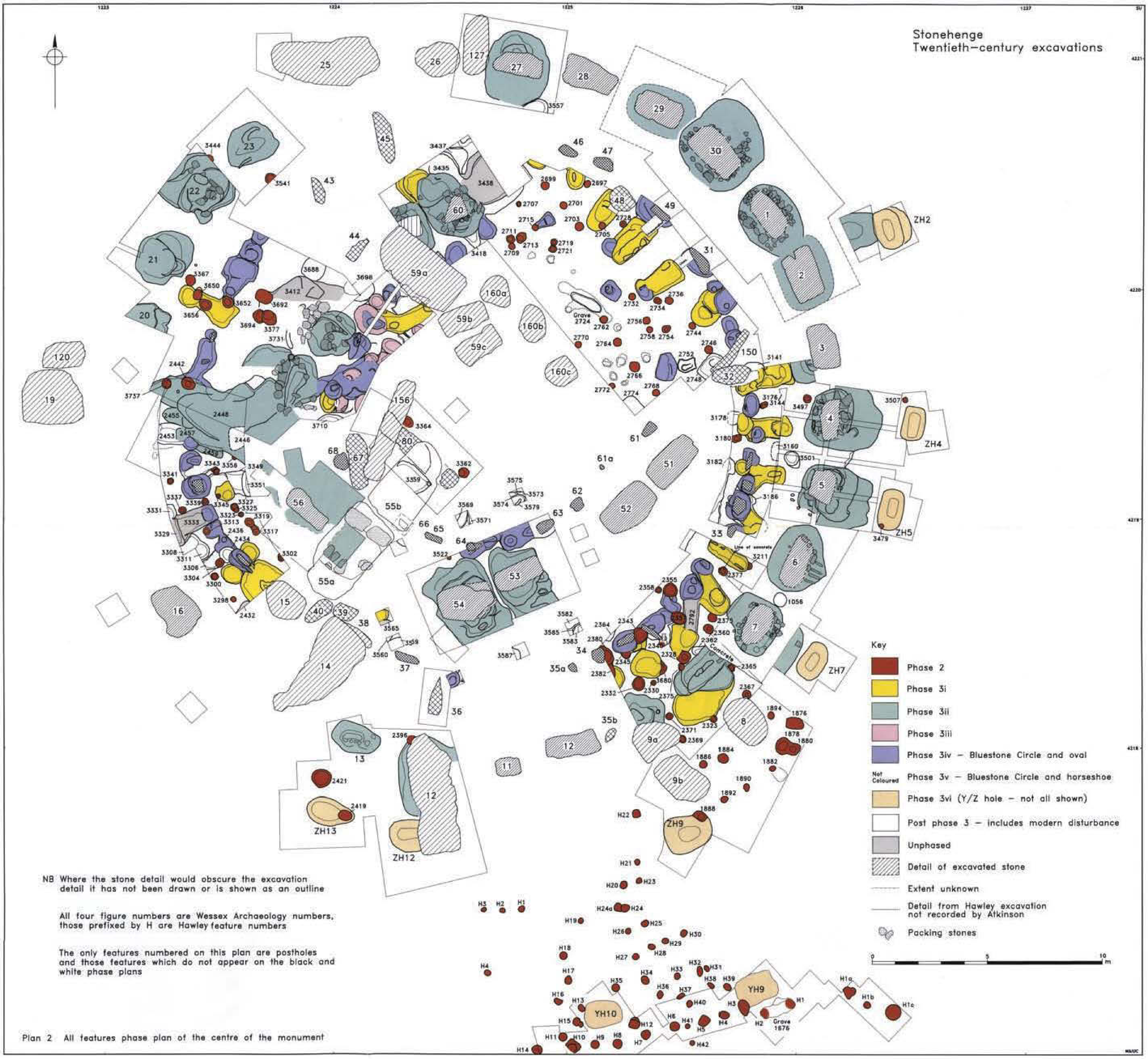


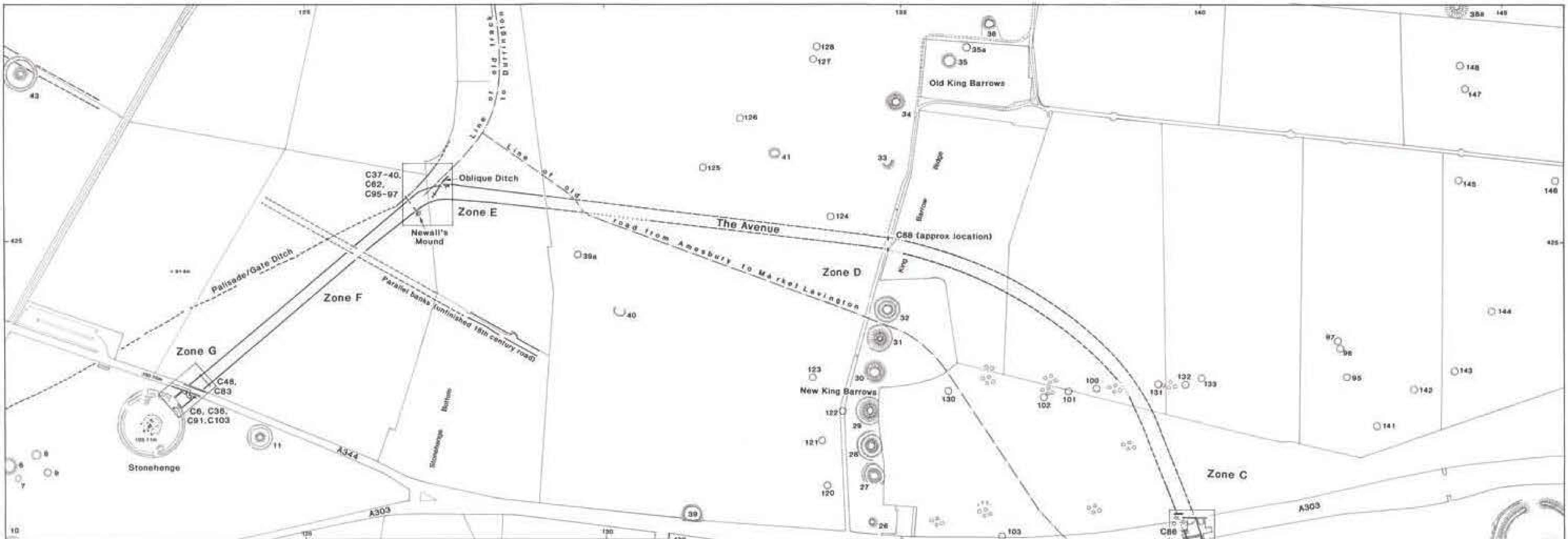

*Fig 259 Interpretation of the magnetometer survey. Scale 1:2050*

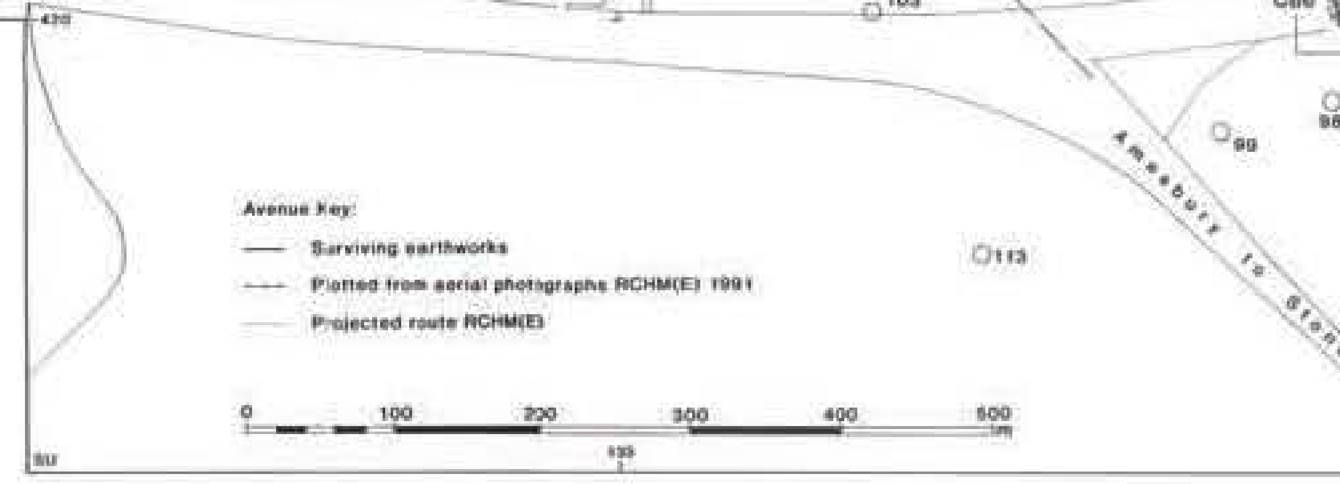


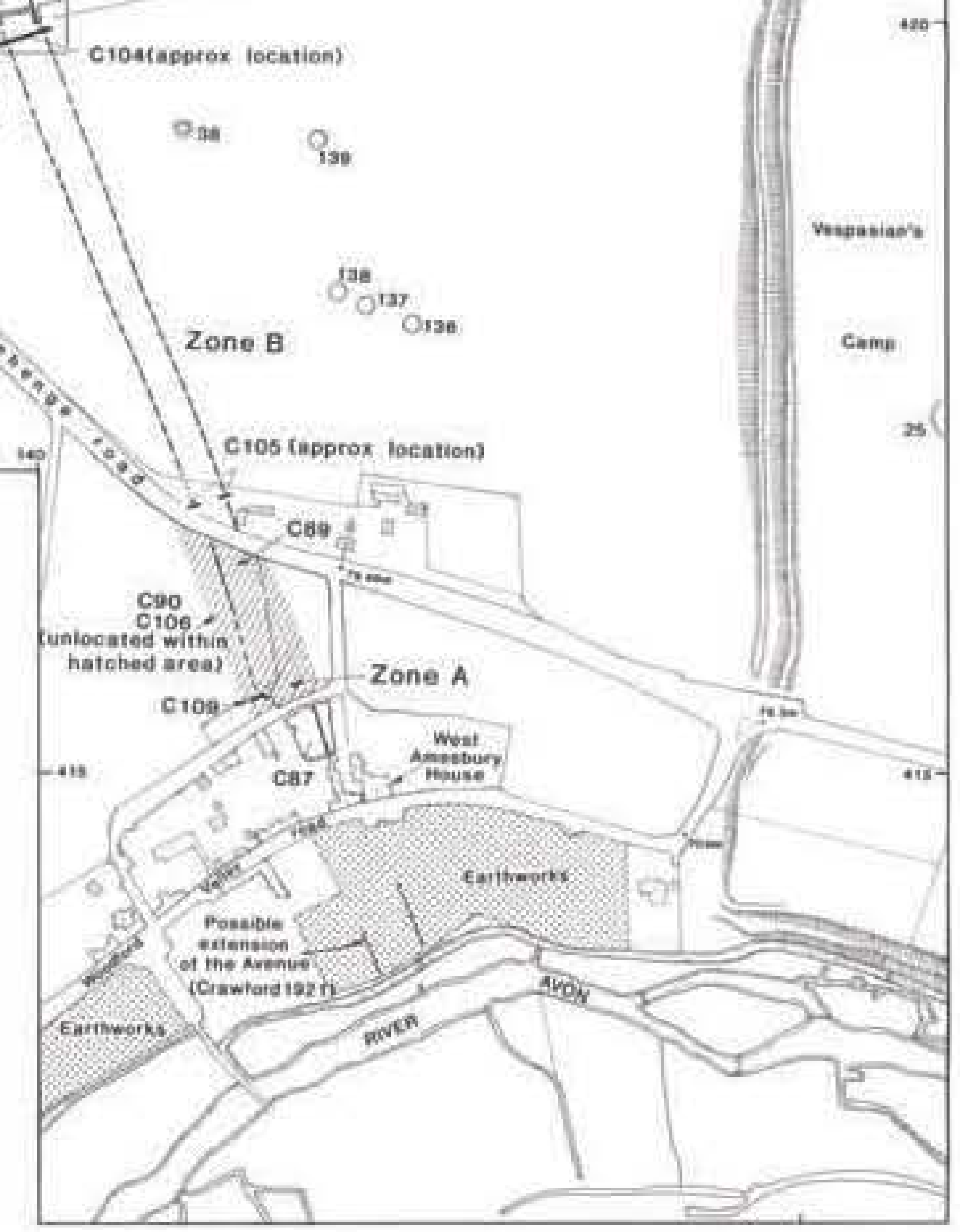

PLAN 1 All twentieth-century excavations at Stonehenge by excavator




Plan 2 All features phase plan of the centre of the monument



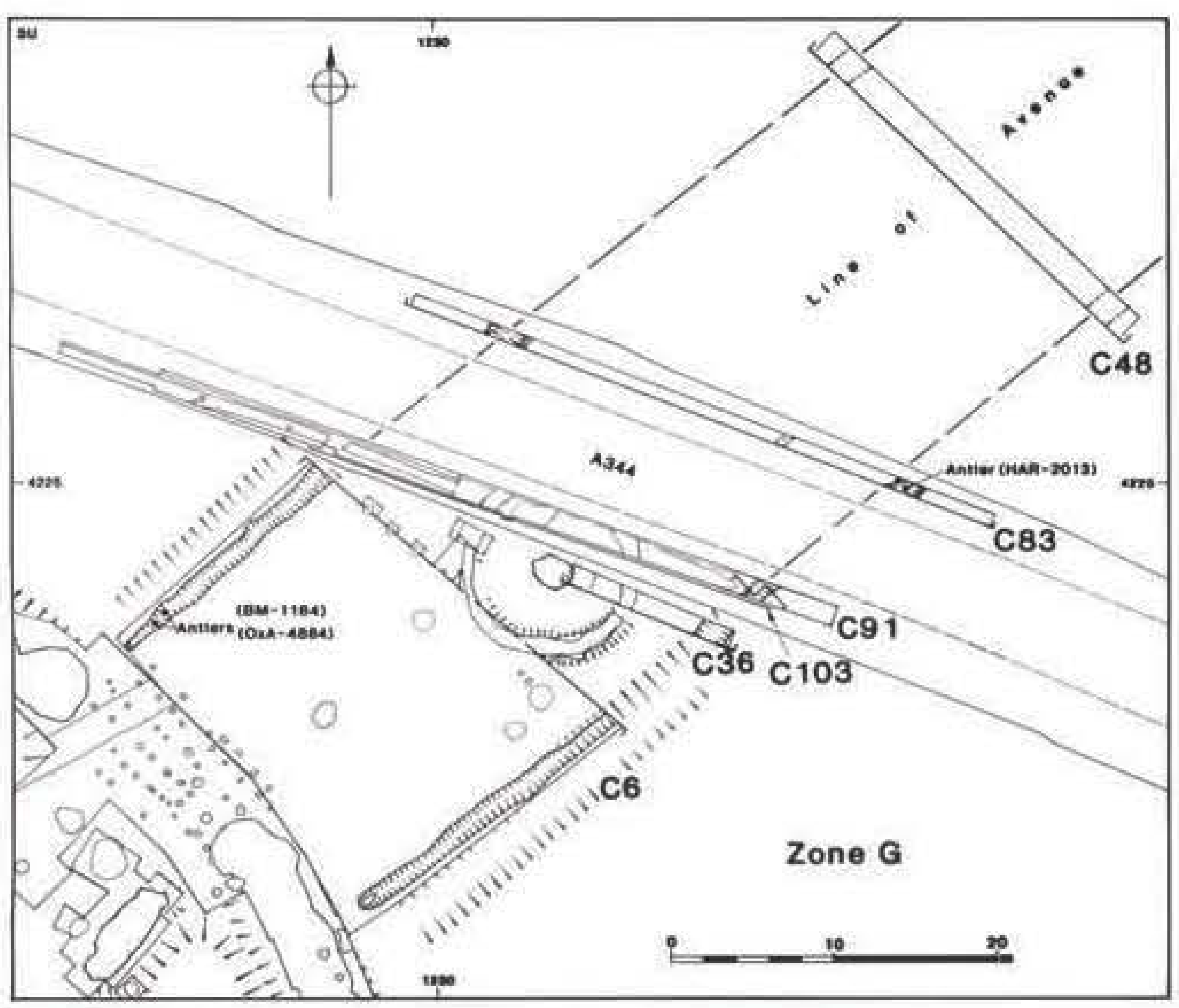



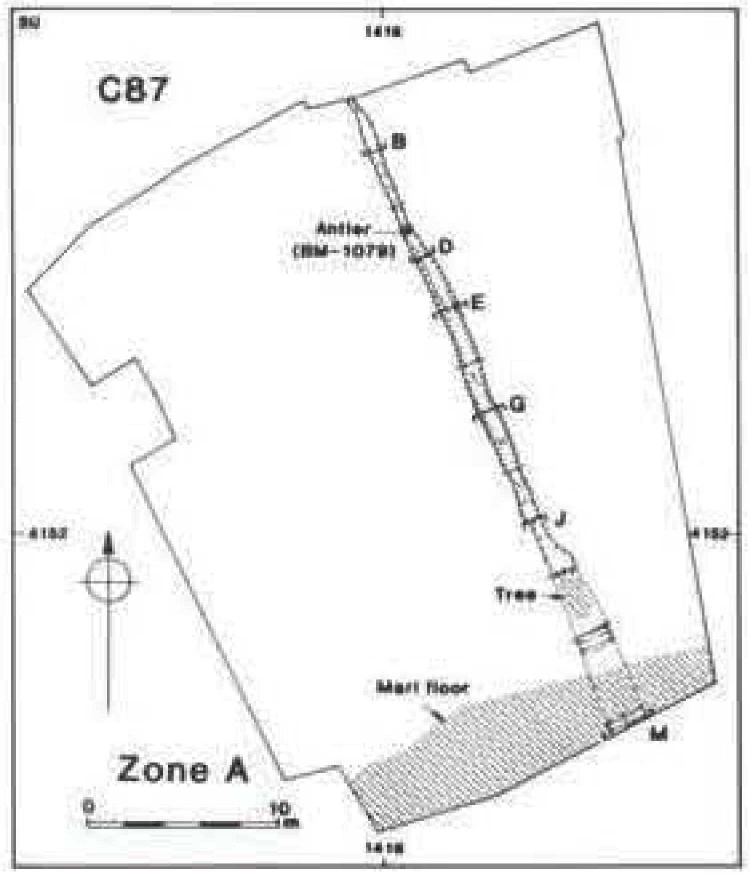

This figure is based on the relevant 1:2500 1972 editions of the Ordnance Survey maps, with the position of the Avenue transcribed from the RCHM(E) 1991 transcription of earthworks and plough-levelled archaeology of Stonehenge and Environs, and from information from recent excavations. It appears that a detailed survey of the full length of the Avenue earthworks has never been conducted. Detailed surveys which have been conducted are: the earthworks at the Stonehenge terminal (HM Office of Works, May 1919); at the western bend (RCHM(E) 1979, fig 5 (Zone E)); and of earthworks which may represent the Avenue close to the river Avon (RCHM(E), in prep). Otherwise the most detailed available representation of the earthworks is the schematic hachuring on the 1:2500 OS map.

The excavation areas have generally been concentrated in four of the Zones: A, C, E, and G, and these are shown in the insets here and overleaf at scale 1:400. In a number of cases the exact position or extent of excavation trenches cannot be re-established and only a general location for these has been indicated. A single excavation was carried out in Zone B, and one in Zone D. These are only marked on the main plan. In addition, the positions of three additional excavations, one across the 'Oblique' Ditch and two across the 'Palisade' or 'Gate' Ditch are shown.

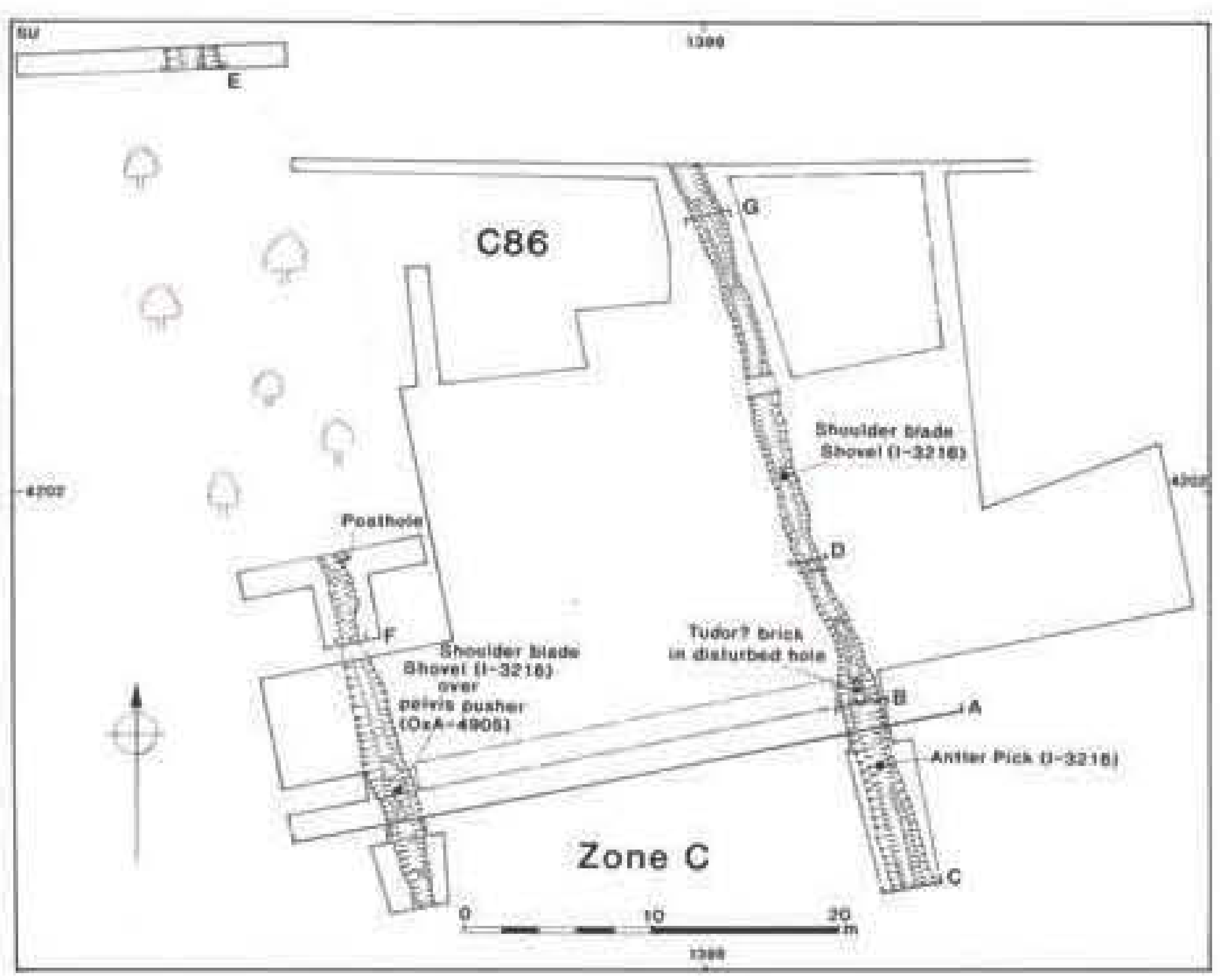
Plan 3 The Avenue, showing positions of all known excavations and details of the Zones used in the text. Archaeological and modern features discussed in text are also shown. Scale 1:100,000. Details of Zone G. Scale 1:400



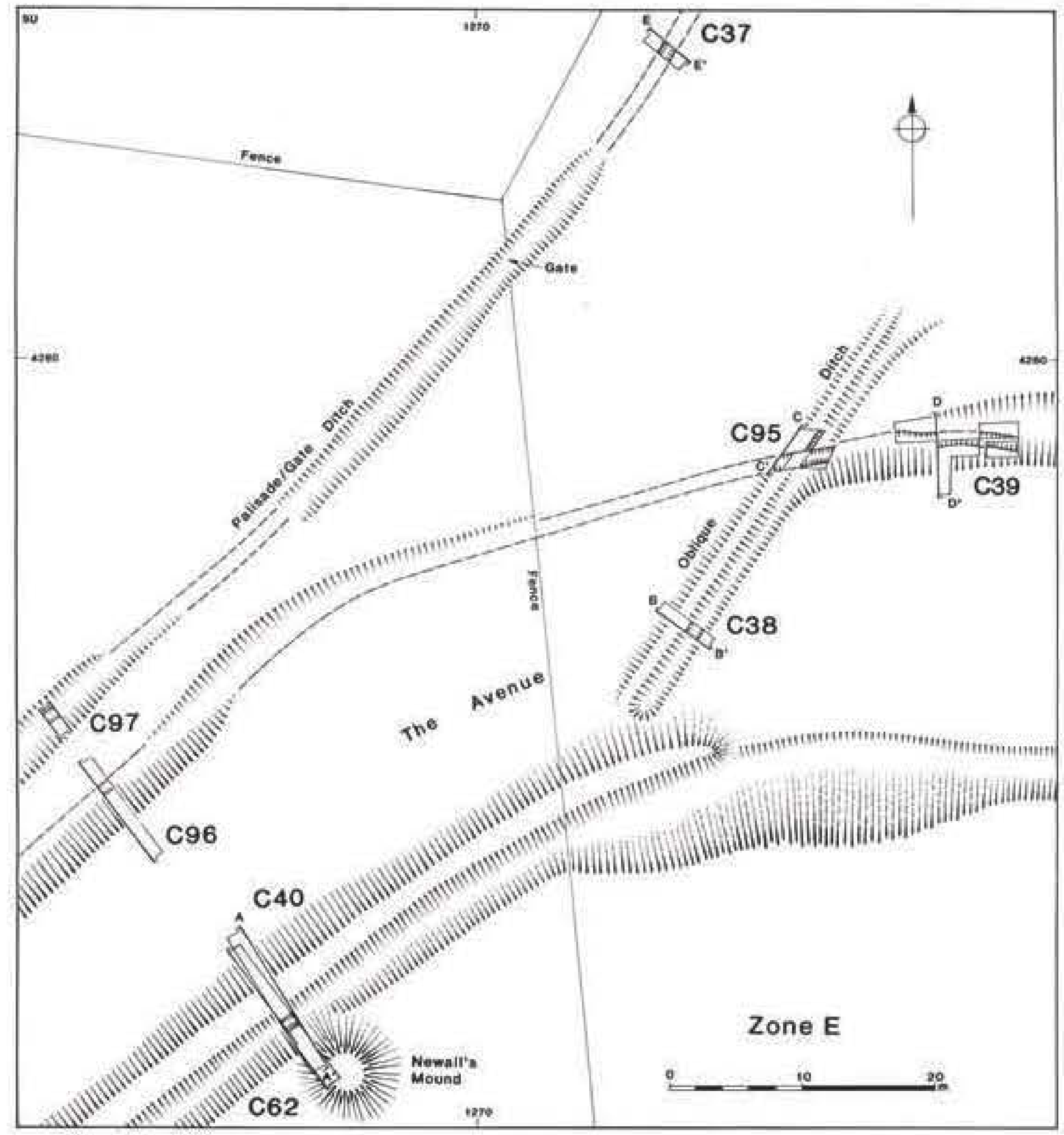

Zone G: Details of excavations at the Stonehenge terminal. The position and orientation of C48 is approximate; Atkinson located the trench: '372 NE of centre of Stonehenge' on an annotated section drawing but no plan has been found. See also Fig 156 for features in this area




Zone A: Details of the Avenue in C87 (after Smith 1973, fig 3). Later features have been omitted, apart from those overlying or cutting the Ditch




Zone C: Details of the Vatchers' excavation close to the A303 (C86). The outline of the area planned is shown though photographic evidence (Fig 170) shows that a larger area of the road easement was stripped. The anotations are from the original site plan. The positions of the samples submitted for radiocarbon dating (I-3216 and OxA-4905) are indicated




Zone E: Details of the Avenue excavations at the 'elbow'

Plan 4 Details of Avenue Zones A, C, and E. Scale 1:400

Published by English Heritage, The Engine House, Fire Fly Avenue, Swindon SN2 2EH
www.english-heritage.org.uk
English Heritage is the Government's lead body for the historic environment.

© English Heritage 1995

Images (except as otherwise shown) © English Heritage or © Crown copyright. NMR

Ebook (PDF) published 2014

Ebook (PDF) ISBN 978 1 84802 210 2
Version 1.0
Figs 3, 4 and 76 ©Wiltshire Archaeological and Natural History Society
www.wiltshiremuseum.org.uk
Fig 15 ©Antiquity www.antiquity.ac.uk
Fig 230 © The Trustees of the British Museum. All rights reserved.

First published 1995 in paperback ISBN 1 85074 605 2

*British Library Cataloguing in Publication data*
A CIP catalogue record for this book is available from the British Library.

**All rights reserved**
No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage or retrieval system, without permission in writing from the publisher.

Application for the reproduction of images should be made to English Heritage. Every effort has been made to trace the copyright holders and we apologise in advance for any unintentional omissions, which we would be pleased to correct in any subsequent edition of this book.

For more information about English Heritage images, contact Archives Research Services, The Engine House, Fire Fly Avenue, Swindon SN2 2EH; telephone (01793) 414600.

Edited and brought to publication by Ellen McAdam, Publishing, English Heritage and Julie Gardiner.

Designed by Julie Gardiner, Linda Coleman, and Rosamund M J Cleal

Scanning and production of e-book (PDF) by H L Studios www.hlstudios.eu.com

*Front cover*
*View from the north-west, in the foreground Trilithon 5718, to the right stone 56 of the Great Trilithon.*