

SOUTH-WEST AFRICA

(1884-1914)

ALBERT F. CALVERT

RARE 250



SOUTH-WEST AFRICA



*In Preparation.*

BY ALBERT F. CALVERT.

GERMAN EAST AFRICA.

Over 200 Illustrations and Maps.

THE CAMEROONS.

Over 150 Illustrations and Maps.

TOGOLAND.

Over 150 Illustrations and Maps.

THE GERMAN COLONIES  
IN AFRICA.

With Coloured Plates.









LUDERITZBUCHT, SOUTH WEST AFRICA.

JSL

00020150

175 00

# SOUTH-WEST AFRICA

DURING THE GERMAN OCCUPATION  
1884—1914.

BY

ALBERT F. CALVERT, F.C.S.

*Knight Grand Cross of The Royal Order of Isabel  
the Catholic, Knight Grand Cross of The  
Royal Order of Alfonso XII., etc.*

London:

T. WERNER LAURIE, LTD.,  
8, ESSEX STREET, STRAND.  
1915.

Books & Maps

1915



LUDERITZBUCHT SOUTH WEST AFRICA.

\$175.00

JSL  
00020450

# SOUTH-WEST AFRICA

DURING THE GERMAN OCCUPATION  
1884—1914.

Rocks & Ages

BY

ALBERT F. CALVERT, F.C.S.

*Knight Grand Cross of The Royal Order of Isabel  
the Catholic, Knight Grand Cross of The  
Royal Order of Alfonso XII., etc.*

London:

T. WERNER LAURIE, LTD.,

8, ESSEX STREET, STRAND.

1915.

2/07

*E. Goodman and Son, The Phoenix Press, Taunton.*

TO GENERAL LOUIS BOTHA,  
PRIME MINISTER OF CAPE COLONY AND  
COMMANDER OF THE CAPE UNION FORCES,  
WHO IS NOW REALISING THE IMPERIAL AMBITION  
FOR THE FORMATION OF AN  
ALL BRITISH SOUTH AFRICA,  
AS AN EXPRESSION OF  
PROFOUND ADMIRATION AND ESTEEM,  
THIS BOOK IS DEDICATED.



## PREFACE

THE comic conditions which, according to Herr Dernburg, would "fulfil the peaceful aims Germany has had for the last forty-four years," and permit the Kaiser to give peace to Europe, include the incorporation of Belgium in the German Customs Union, the neutralization of England's south and east coasts, the return of Egypt to Turkey, and the recognition of Germany's sphere of influence from the Persian Gulf to the Dardanelles. The minor items which, with rare if unconscious humour, the Kaiser's ingenuous agent in America incorporates in Germany's peace terms, are the right of the Boers, if they support Germany, to frame their own destinies, and the return of all Germany's colonies to Germany. With a view to stimulating the desire of the Boers to frame their own destinies, Germany intrigued De Wet into an act of criminal lunacy which has ended in his ruin and disgrace. It was designed to make the Cape Union provinces an annexe of German South-West Africa ; it has resulted in consolidating Boers and British in their determination to include Damaraland and Namaqualand in the Union. Herr Dernburg's phraseology does not mean, as upon the face of it would appear, that all Germany's colonies have already been wrested from her, but his words may be regarded as an intelligent anticipation of what will happen to them in the near future. Kiautschou has been surrendered to the Japanese and



British forces, the German South Sea Islands are being acquired by the Australian Navy, Togoland has been occupied by Anglo-French troops, and the allied arms are co-operating in the German Cameroons.

These are among the German colonies for which the Kaiser is in the position to demand if not to enforce the return, but German East and South-West Africa are not yet ours to withhold or to restore. But whatever national destiny is in store for Kiautschou, Togoland and the Cameroons, the German East and South-West African Protectorates will, in future, be British, and while the economic progress of all Germany's disappearing colonial possessions will be watched with general interest, these two colonies in particular are of chiefest concern to England. The inaccuracy of the popular impression of South-West Africa as a desert—"a sandy and most unattractive waste, waterless and barren"—will, I hope, be corrected by the perusal of the following pages. The argument that this German colony, and that of East Africa, are useless, is contradicted by a study of the natural resources of those territories, and their annexation will not only round off British possessions in Africa, but, as Mr. A. Wyatt Tilby shows, will solve two pressing local problems: (1) It will provide the Botha Government, in Namaqualand and Damaraland, with more land for the "bijwohners," or poor white class, and, if an energetic public works policy is introduced, the poor whites and a more substantial class of Boer

farmers should find their homes in the new south-western province of the Union. (2) It will provide in German East Africa a much-needed port for the people of Northern Rhodesia by means of a railway across the new province, and, incidentally, will make feasible the all-British Cape-Cairo line.

The area of British East Africa is to be doubled, and the natural boundaries of the Union of South Africa are to be expanded northwards from the Orange River to Portuguese Angola, and westward from Bechuanaland to the Atlantic Ocean. On the Gulf of Guinea the French claim to that portion of German Cameroon territory, which was recently transferred by her, would appear to be indisputable, and the allocation of Togoland will be a matter of amicable arrangement. Equally indisputable is the right of the British to annex and administer the territories which the German Colonial Office took over from those merchant-adventurers, Carl Peters and Adolf Luderitz, and in writing of these colonies it is not my intention to make a contribution to the literature of German *Welt-politik*, but simply to set forth what I have accumulated in the way of information concerning the natural resources and the industrial and commercial possibilities of the new dependencies which the British Empire will be called upon, in the near future, to develop and direct.

The justice of the action of the Allies in stripping Germany of her colonies will not be challenged by anybody outside Berlin and Vienna. The German

ambition to establish a place in the sun for her teeming millions,—an ambition which took concrete form in the trick by which she acquired a footing in Togoland, in the bolder predatory move by which she filched Damaraland and Namaqualand from under the nose of a lethargic British Liberal administration, and in the mendacious coup of Agadir, which gained for her a tract of French territory in West Africa,—has led her to undertake an immense amount of arduous colonising work, but she has never been blind to the advantage of acquiring colonies ready-made, well-equipped and in working order. Lord Haldane, who deplored Germany's "one particular piece of ill-luck—the misfortune of having been born a hundred years late in the world's history"—and sympathised with her policy of colonial expansion, was flattered by her study and application of English methods of colonial development, and observed "that she was penetrating everywhere to the profit of mankind." Lord Haldane may have known, as Herr Dernburg now frankly explains, that "Germany's view is that her growing population must get extra territory capable of population by whites," and even our ex-Minister for War can no longer deny that in pursuance of his life's purpose, "to make the world better," the Kaiser intended to find that extra territory in the Cape Colony, British East Africa, the Belgian Congo, and Morocco. The colonies of Germany, of England, France, and Belgium (and, subsequently, those of Holland) form part of the stakes for which the

belligerents are now fighting; and in a war of aggression and acquisition, in which Germany designed to work her will upon the Allies, it is not only the right but the duty of France and England to defend their own possessions from seizure and to confiscate those of the common enemy.

"The most common complaint in the German Press against the British," Mr. Tilby shrewdly observes in *The Nineteenth Century* (November, 1914), "apart from the monotonous charge of treachery because we kept our word to Belgium, appears to be that we are 'stealers of colonies.' As the Germans, on their Chancellor's own admission, had an eye to the French colonies, we need not take the charge much to heart; it is our way of making war, and on the whole we prefer it to the German way of destroying cities and cathedrals, and outraging women and children. *De gustibus non est disputandum.*" The Rev. Wm. Greswell on this phase of the subject says: "It may be perfectly true that British colonies have been won by arms from savage possessors, especially in Africa, where Zululand was rescued from the barbarities of Cetewayo, Egypt from the Mahdi, Kaffraria from Kreli and Sandili; but the aftermath of British colonisation is worth recommending to the consideration of our German critics. We replace savagery by civilisation; the mission school is planted in the unholy groves of the heathen; the slave market of Zanzibar is replaced with a Christian Cathedral."

It may, of course, be urged on behalf of the

Germans that they also colonise with pastors and mission-teachers, and that even in South-West Africa they have reared churches in the unholy groves of the heathen, but as Mr. Evans Lewin, the Librarian of the Royal Colonial Institute, points out in an article in *The Nineteenth Century*, their national colonial policy in this region was marked by all the defects of the German temperament. "At the very outset of her enterprises," he writes, "the Colonial Party's official organ in Africa declared that 'Germany had nothing to learn from England or any other colonising nation, having a method of handling social problems peculiar to the German spirit.' So far as South-West Africa is concerned, the arrogance of the 'German spirit' has been specially in evidence. As Professor Bonn, of Munich University, stated in an address before the Royal Colonial Institute (January 13th, 1914), 'We have had native risings and extremely silly European settlement schemes. . . . Apart from South-West Africa, where we solved the native problem by smashing tribal life and by creating a scarcity of labour, we are only just now beginning to understand native administration.' Germany has from the first stood for scientific methods in colonisation, and with true German arrogance she has applied fixed rules to flexible problems. Such success as she has had—and in many directions this success must be freely admitted—has been neutralised by certain things that have tended to throw ridicule upon the efforts of her scientists and social reformers to impose by the aid of the

military caste rigid rules and inflexible regulations upon the natives. The complex military and administrative machinery of the Fatherland has been little suited to the soil of Africa, and the scientific methods of dragooning the natives into a dull comprehension of the meaning of German *kultur* have cast discredit upon the excellent work that German administrators have performed in other directions. Germany had indeed much to learn from England, but she was too proud and too imbued with the consciousness of her own superior merit to stoop to Anglo-Saxon levels."

The fact has, indeed, been revealed in Germany's thirty-year effort in Colonial-empire building that the Germans have no genius for the high task of colonisation. They have experimented with their policy of "pipeclay, red-tape and finance" in South-West Africa, and the native races, the land and the progress of the work of the world have suffered from their intrusion. As the High Commissioner for South Africa has admitted, it would be merely childish to blind our eyes to the fact that Germany has accomplished a great deal in Africa, but at the same time Germany has never really colonised at all, either in Africa or anywhere else. In order to colonise it is necessary to possess some sort of perception of the rights of humanity, and Germany has invariably committed the fatal error of misjudging humanity altogether. The lessons which must be mastered before a nation can control and govern a subject race she has systematically refused to learn, until her violations of treaties and her brutal

treatment of the natives compelled the Hon. W. P. Schreiner to the conclusion that it would never be possible again for Germany and Britain to march side by side in the work of colonisation in Africa.

This misconception, on the part of German administrators, of the first principles of successful colonisation, is as complete as their misunderstanding of the nature of our Colonial Empire—a misunderstanding which is the more surprising, as Sir Francis Piggott explains, “because we have never made any secret of how the links were forged which bind the Empire together and the Empire to the Mother Country. They were at liberty to inquire, they would have had most truthful answers; they were free to examine for themselves; more than that, the House of our Fathers has no door to keep open or shut, and they, as all others, might walk in and, taking up their habitation, test our theories on the spot, observing our methods, and drawing their own conclusions. How freely the Kaiser’s subjects availed themselves of this liberty, how we welcomed them, even though it became sometimes our own hindrance, how we made both hearth-room and heart-room for them, they seem somewhat to have forgotten. Yet in spite of it all they have misunderstood what was so very plain, and the hopelessness of the blunder which has resulted from the misunderstanding has been ruthlessly demonstrated by the hard facts as the world knows them to-day.”

In the matter of annexing the German colonies, Mr. Tilby believes the ordinary Englishman will take

a plain, common-sense view. "He does not believe in dividing the bear's skin before the bear is caught," he says, "but, seeing the bear's tail and the tips of his ears have been secured, there is no valid reason against adding them to that strange but serviceable patchwork which is called the British Empire. If they do not fit, they can easily be made to fit. And I believe our plain man will think that, when peace comes, any indemnity which Germany can be made to pay should go to France and Belgium, the countries which have suffered most by the war; and that our part of the business will have justified its trouble and expense—I say nothing of the obligations of national honour—if it gets rid for our time of the intolerable competition of the German fleet and secures us that form of indemnity which has become traditional after a successful war, the oversea possessions of our opponent."

So far from there existing any doubt upon the subject of our right or intention to deprive Germany of South-West Africa, together with her other colonies, the question of the extent of the spoliation to which the Union will subject the huge concession corporations, the recipients of colossal grants and the mysterious possessors of mammoth rights, is already being discussed. But the consideration of these and mightier matters of policy may be postponed until the fitting hour for such discussion is reached. That the Union will have to recoup herself the cost of conquering South-West Africa will be understood, but whether she will favour any



territorial sub-division of the new colony is a matter for surmise. Sir Harry H. Johnson, in the course of an illuminating address delivered in February last before the Geographical Society, threw out the suggestion that while the southern half of the new possession (including Swakopmund and Walfisch Bay) should pass to the Union of South Africa, the northern half might profitably be governed by the administration of the British South Africa Company on the same lines as Barotseland. He pointed out that Rhodesia at present has no outlet to the sea, and that such an arrangement would, when wealth comes to the region of South Central Africa, give to Rhodesia a port on the Atlantic much nearer to England than Beira or Cape Town. It was a proposition that was evidently as unexpected as it was fascinating, but it inspired the South African High Commissioner to congratulate the lecturer upon the possession of the highest powers of imagination combined with a fine poetic fancy. The exhibition of Sir Harry Johnson's map of South Africa after the War, with the word Rhodesia writ large along the northern part of South-West Africa, suggested to him such questions as, What became of Bechuanaland, of Basutoland and Swaziland, and of the Union which he had the honour to represent? Probably Sir Harry Johnson will have his replies to all these interrogatories, but at the moment it is less instructive to conjecture the future administration of the conquered colony, than to consider what Germany's intentions had been towards the neigh-

bouring Union, and how she had prepared herself to give effect to her designs.

Thirty years ago, in *The Fortnightly Review*, the Rev. William Greswell warned this country that the annexation of South-West Africa by Germany was no sporadic effort, no random impulse, but part of a plan, and while the writer did not attempt to fathom the depth of the intrigue, he was convinced that "German colonisation in South Africa is no myth or dream, but a series of ventures and projects thrust forward by keen business men, backed by official support, and directed by a master hand." Behind the protection of Herr Luderitz he detected other projects. "The face value of Namaqualand and Damaraland was worth little; the country was a sandy and most unattractive waste, waterless and barren; the natives (as the Germans discovered later on) hard to subdue. But the real value lay in the proximity of the region to the Boer States, disaffected to Great Britain. The land was not taken for *bona fide* colonisation, only as a *point d'appui*."

The truth of this prediction has since been clearly seen in the light of recent events, and the difficulty of the task with which England is confronted in Africa has been made greater by the considerable force which the Government of East Africa raised—ostensibly for the maintenance of peace among its native subjects—and by the larger force of well-trained and equipped white soldiers which are under arms in South-West Africa, where

inter-tribal warfare is practically unknown, and the danger of a native uprising is *nil*. Dr. Solf, the German Colonial Secretary, issued on 7th December, 1914, a belated official statement in which, after declaring that the Anglo-German war in no wise affects South Africa, and denying that Germany ever had any intention of occupying, either permanently or temporarily, the territory of the South African Union, he announced that Germany is prepared "to cease hostilities which the South African Government forced on her, provided that the Union Government also refrains from hostile action against German territory, and evacuates regions already occupied by Union forces." The impertinence of this proposal is made more amazing by the existence of abundant evidence which proves that for many years Germany in South-West Africa, as in Europe, has been stealthily, methodically, relentlessly preparing for war. The railways built, and those that were under construction at the outbreak of hostilities, are all strategic railways, made on what is still called the Cape gauge, and leading out to the Union border. Windhoek is the capital of the colony, and is described as its chief military station. But at the artillery depot at Windhoek, is collected only a worthless medley of damaged gun-carriages and iron hoops, and some bales of locally collected hay, while at Keetmanshoop—situated near the British border—is a great arsenal furnished with guns and gun-carriages, ambulances and convoy vehicles, thousands of military rifles, of bandoliers and soldiers' kits, and

huge stores of ammunition and compressed fodder. And Keetmanshoop, the most important town in the country, some 150 miles from the Cape territory, is hundreds of miles further than Windhoek from Amboland, against which the concentration of the German troops was ostensibly directed.

Collateral security against the imaginary evil intentions of the unarmed, unwarlike and unoffending Ovambos has been provided by Germany in the shape of a force of ten thousand trained German soldiers, fully equipped with arms, ammunition stores, and military supplies sufficient to last the army for six years. This army, with its supplies, are distant over 1,000 English miles from Amboland, while five thousand troops and two years' stores are concentrated within 150 miles of the Union border. It will be gathered from these few indisputable figures that Germany has been preparing to make trouble for the British in this part of the world on a thoroughly organized plan, and her only misfortune, so far as German ambitions are concerned, is that the Kaiser embarked upon his scheme of world-conquest a year or two before the authorities at Windhoek had completed their railway system and military preparations. But the only regret of the future administrators of the Protectorate is that, in organizing for their conquest of British South Africa, the German Colonial Government neglected to develop their territory on a more progressive and productive scale. They had a colony, as I have quoted German authorities to show, which is the equal of Australia

or the Argentine as a cattle-breeding country, but they confined themselves to breeding horses for military purposes. They invited German colonists to exploit the agricultural and mineral resources of the Protectorate, and immediately pressed into the military service every colonial subject of the Emperor who was fit to bear arms. They recognized that the territory was capable of supporting as large a mining population as could be enticed into it, and as soon as the diamond fields gave promise of substantial profits, they invented a system of quick returns—for the relief of the Imperial Exchequer and the financing of local military preparations. Dr. Solf, who made a tour of observation through East, South and South-West Africa in 1912, declared that the mineral resources of the latter country were capable of immense development, and that the prospects of its pastoral and agricultural industries were of the brightest. Dr. Solf brought away with him the conviction that the territory "was worth every ounce of German sweat and industry that could be put into it"; but German planters and pastoralists, who judge the colony from a longer and more intimate acquaintance with its resources and requirements, assert, with more reserve, that while "it is not a bad country," it is one "that imposes heavy tasks upon its colonists."

My object in compiling this book—the first published in England dealing with a German colony—and making it the first of a series of similar volumes descriptive of the several possessions composing

Germany's disappearing Colonial Empire, was prompted by a desire to do something in connection with the War. We are not all eligible for military duty at the Front, but each is anxious to render some sort of personal service, and I venture to hope that a useful purpose will be served by providing the British public with reliable information concerning the various German and ex-German dependencies, and indicating the lines along which they may be most profitably developed, after the curse of Teutonic *kultur* and militarism has been swept away.

A. F. CALVERT.

ROYSTON,  
ETON AVENUE,  
N.W.



## COLOURED PLATES

Luderitzbucht . . . . .	<i>Frontispiece</i>
Windhoek . . . . .	<i>Page 1</i>

## LIST OF ILLUSTRATIONS

	PLATE
Luderitzbucht . . . . .	1
Luderitzbucht, 1912 . . . . .	2
Luderitzbucht . . . . .	3
German Bank at Luderitzbucht . . . . .	4
Luderitzbucht Railway Station . . . . .	5
Kapp's Hotel, Luderitzbucht . . . . .	6
Post Office, Luderitzbucht . . . . .	7
Luderitzbucht. View from Shark Island over the Harbour and Town . . . . .	8
Rocky Desert South-east of Luderitzbucht . . . . .	9
Coast Scenery near Luderitzbucht . . . . .	10
Rocks on the Coast near Luderitzbucht . . . . .	11
The Bogen Rock (over 150 feet high) South of Luderitzbucht . . . . .	12
Great shifting Sand Dune at Grasplatz, near Luderitzbucht . . . . .	13
View of Bethanien, in the South . . . . .	14
Gochas Fort, in the South . . . . .	15
View of Auas on the Road to the South . . . . .	16
View of Warmbad, in the South . . . . .	17
Stony Country near Warmbad . . . . .	18
Rocks partly covered by shifting sand at Hottentot Bay . . . . .	19
Sand Dunes in the Namib Desert on the Railway from Luderitzbucht to Keetmanshoop . . . . .	20
View of Keetmanshoop . . . . .	21
The Slangkop, South-west of Keetmanshoop, as seen from the South . . . . .	22
Ox Wagon about to leave Keetmanshoop . . . . .	23



	PLATE
View of the Orange River in South-west Africa . . . . .	24
View of the Orange River from Hohenfels Pobei Station . . . . .	25
The Orange River at Raman's Drift . . . . .	26
Raman's Drift on the Orange River . . . . .	27
Raman's Drift . . . . .	28
Pool in the Little Karas Mountains . . . . .	29
The Orange River . . . . .	30
The Great Fish River . . . . .	31
In the Gibeon District, Great Namaqualand . . . . .	32
Gibeon, with fort on top of the hill . . . . .	33
Scenery near Kuibis, on the Road to the South . . . . .	34
View near Gibeon . . . . .	35
View of the Naukluft Mountains . . . . .	36
Horses on Abbabis Farm in North-west Namaqualand . . . . .	37
Rock Formation in Namaqualand. This gorge is a rushing torrent after a storm . . . . .	38
Nama Cattle . . . . .	39
Scenery in the Great Karas Mountains . . . . .	40
Swakopmund from the West, Namib Desert in the background . . . . .	41
Swakopmund . . . . .	42
A View of Swakopmund . . . . .	43
View of Swakopmund . . . . .	44
View on the Swakop River, near Okahandja, with Giraffe and Hebeclada Acacia on the left . . . . .	45
Gericke Farm at Goanikontes, in the Swakop Valley . . . . .	46
Small Holdings. Brock Farm at Goanikontes, on the Swakop River . . . . .	47
Ruins of a Jam Factory at Sandfischhafen, buried by the shifting sands . . . . .	48
Government Offices and Monument to the Fleet, Swakopmund . . . . .	49
View of Windhoek . . . . .	50
Windhoek . . . . .	51
Windhoek . . . . .	52
Government House, Windhoek . . . . .	53

## ILLUSTRATIONS.

xxvii.

	PLATE
Kaiser-Wilhelm-Strasse, Windhoek . . . . .	54
View in the Public Gardens, Windhoek . . . . .	55
View in the Public Gardens, Windhoek . . . . .	56
The Waterworks, Windhoek . . . . .	57
View on the Swakop River . . . . .	58
Water Dam on the Voigtland Farm, near Windhoek, with Auas Mountains in the distance . . . . .	59
Small Holdings, Little Windhoek . . . . .	60
Ludwig Farm, Little Windhoek . . . . .	61
Han's Farm, near Windhoek . . . . .	62
Vines at Little Windhoek . . . . .	63
A Native Village near Windhoek . . . . .	64
View of Karibib, Damaraland . . . . .	65
School at Mount Damara . . . . .	66
Wedding of Jacob Narib, Mount Damara . . . . .	67
Natives of Mount Damara . . . . .	68
Etiro Farm, near Karibib . . . . .	69
Mount Damara Children, with curios . . . . .	70
Omaruru Kop, which was used as a Signal Station during the native rising . . . . .	71
The Omaruru River bed during the dry season . . . . .	72
Small Cattle watering at water dam at Mercker's Farm . . . . .	73
Ox Wagon, with Herero Driver, at Mercker's Farm . . . . .	74
After Dinner on Neimals Station in Okombahe . . . . .	75
The Sunday Wash on Neimals Station in Okombahe . . . . .	76
The Buren Farm . . . . .	77
Flowering Bramble . . . . .	78
Street in Omaruru, Damaraland . . . . .	79
The Omaruru River in the dry season . . . . .	80
The Omaruru River in the rainy season . . . . .	81
In the Auas Mountains . . . . .	82
Palms in a Small Wood, Okombahe . . . . .	83
Okahandja and Mt. Kaiser Wilhelm, Damaraland . . . . .	84
View of Gobabis . . . . .	85
General View of Otjimbingwe . . . . .	86
The Namib at the 53rd Kilometre of the Otavi Railway . . . . .	87

	PLATE
Scenery in the Namib . . . . .	88
Flowering <i>Welwitschia Mirabilis</i> at Welwitoch, in the Namib . . . . .	89
Camels in the Namib . . . . .	90
Company of German Colonial Force . . . . .	91
Camel Patrol . . . . .	92
"Parole Heimat" . . . . .	93
German Mountain Battery . . . . .	94
One-year German Volunteers . . . . .	95
A Herero Native . . . . .	96
A Native of Bergdamara . . . . .	97
A Bushman . . . . .	98
An Ovambo Native . . . . .	99
A Fifteen-year-old Girl of the Topnaar Hottentots . . . . .	100
A Topnaar Native . . . . .	101
An old Hottentot . . . . .	102
Chief of the Topnaar Hottentots . . . . .	103
A young Herero . . . . .	104
A man from Karibib . . . . .	105
Native of South Kalahari . . . . .	106
Native of South Kalahari . . . . .	107
Nara Bush with Ripe Fruit, in the Kuiseb River . . . . .	108
Alhagi Shrub (the Camel's Thorn). On the Ground are "Tsamas" . . . . .	109
The Namib Desert, near Arandis, with Aloes in fore- ground . . . . .	110
The Gowarib Gorge . . . . .	111
Reservoir at Paviansfontein . . . . .	112
Sekgoma District of the Kalahari . . . . .	113
Dune District, South Kalahari, near Hafür . . . . .	114
Spring Vegetation ( <i>Brunswigia</i> ) in the Bouche Area of the Kalahari . . . . .	115
Otjikoto Lake. Landslip Basin in the Otavi Chalk. This supplies Tsumeb with Water . . . . .	116
Otjikoto Lake, West of Tsumeb . . . . .	117
View of the Tsumeb Mine . . . . .	118
Native Workmen in the Tsumeb Limestone Quarry . . . . .	119

## ILLUSTRATIONS.

XXIX.

	PLATE
Military Station at Zesfontein, in the North . . . . .	120
Military Station at Grootfontein, in the North . . . . .	121
Namutoni Fort, in the North . . . . .	122
View of Outjo, in the North . . . . .	123
Khan Bridge over the Otavi River, near Isakos. The Khan River is dry, but there is water below the surface . . . . .	124
A Sycamore Tree ( <i>Ficus damarcusis</i> ), near Otavi . . . . .	125
Herero Girls Dancing at Otavifontein . . . . .	126
Ovambo Women . . . . .	127
Ovambo Girl, with Ovambo Calabashes and Baskets . . . . .	128
Low Country Wood on the Okavango, near Libebe . . . . .	129
The Mosquito Pool in the Estuary District of the Selinda . . . . .	130
Native Granary in the North of Ovambo . . . . .	131
The Okavango River . . . . .	132
Cultivated Land in the Linyanti Basin, Caprivizipfel District . . . . .	133
Swamp on the Kwando, Caprivizipfel District . . . . .	134
Freight Boats of the Massubians on the Zambesi, near Sescheke . . . . .	135
Vegetation of the Linyanti . . . . .	136
View in the Kaokofeld . . . . .	137
Garden at Rietfontein Farm . . . . .	138
The Bed of the Kaschanga in the Flood Area of the Linyanti . . . . .	139
Scene in Amboland . . . . .	140
On the Upper Zambesi, Caprivizipfel District . . . . .	141
Granaries in Amboland . . . . .	142
Women's Costumes at Olukondo, in Amboland . . . . .	143
Pot Sellers, Amboland . . . . .	144
Vegetation on the River . . . . .	145
The Cunene River . . . . .	146
Young Ambo Native . . . . .	147
Hukwe Women on the Bed of the Gangu . . . . .	148
Mbala, a Summer Village of the Mafi . . . . .	149
Steep Slope down to the River of the Koankip, near Chanis River Bed . . . . .	150

	PLATE
Galiankile, a Summer Village of the Mambalankwe . . . . .	151
Wagons Crossing the South-west African Grazing Steppes . . . . .	152
Mule Carts used for Fast Travelling . . . . .	153
Ox Wagon on the " Pad " . . . . .	154
Herd of Cattle in South-west Africa . . . . .	155
Field Hereros, with their Women, in full Dress . . . . .	156
Herero Woman with her Children . . . . .	157
Half-castes in front of their " Pontoks " . . . . .	158
Herero " Pontoks " on a Clearing. The pointed Leather Caps were formerly the sign of a Married Woman . . . . .	159
Hendrik Witbooi, with his Sons and Headmen . . . . .	160
Open-air Service for Railway Workmen. The Sermon is Preached by a Herero Native Mission Helper . . . . .	161
Herero Woman . . . . .	162
Banjo, the Herero Chief . . . . .	163
Natives Fishing . . . . .	164
Herero Chief, Kambasembi . . . . .	165
A Mambukuschu, Adorned for the Dance . . . . .	166
Native Bushman's Camp . . . . .	167
Herero " Pontok," or Native Dwelling . . . . .	168
Herero Warriors . . . . .	169
Ovambo Corn . . . . .	170
Siedlung, in Hereroland . . . . .	171
Bridge over a River in South Hereroland . . . . .	172
A Laggies' Pump for Artificial Irrigation . . . . .	173
Pomegranate Tree . . . . .	174
Fig Cactus Hedge . . . . .	175
Ostrich Farm . . . . .	176
Ostriches with Young Birds . . . . .	177
Ostrich Farm. A Nest . . . . .	178
Cattle and Ostriches Grazing . . . . .	179
Ostriches on a South-west African Farm . . . . .	180
Imported Thoroughbred Bull, from Simmental, with Half-bred Cows . . . . .	181
Merino Rams on the Ramtsas Station, 1912, Crossed with Electorals from Oschatz . . . . .	182

## ILLUSTRATIONS.

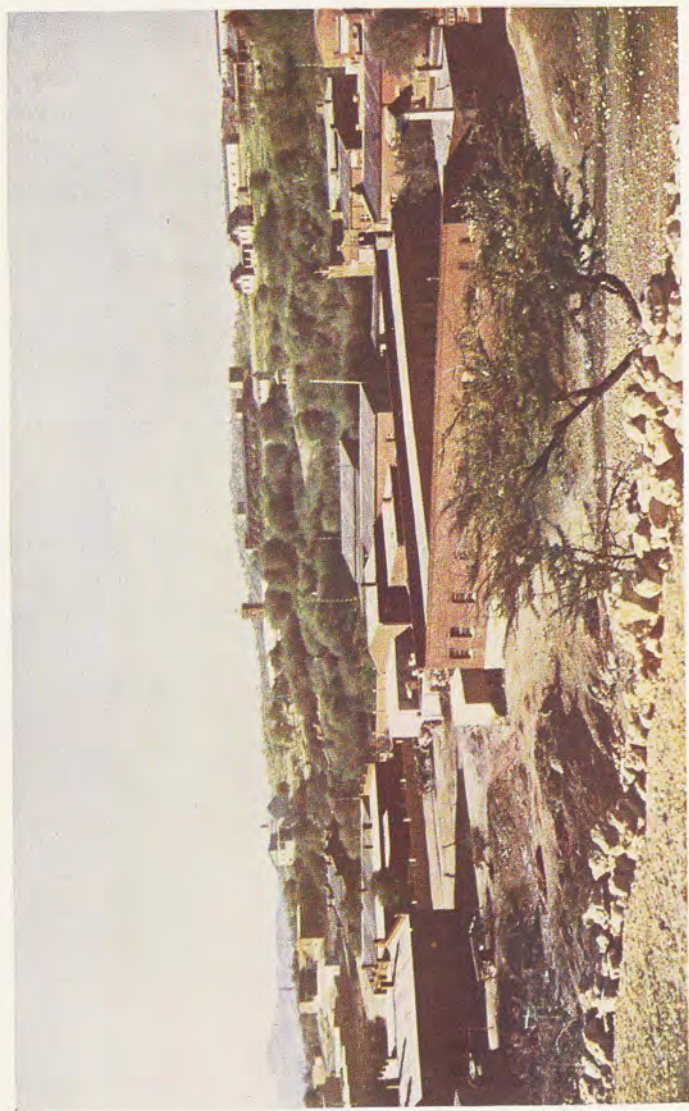
XXXI.

	PLATE
Prize Cross-bred Cows . . . . .	183
Cross between an African and an Angora Goat . . . . .	184
Herero opens and closes the Dams . . . . .	185
Watering Cattle . . . . .	186
Tobacco Growing. The Beds . . . . .	187
Ripe Tobacco Field . . . . .	188
Tobacco Growing. Plaiting the Dry Leaves . . . . .	189
Tobacco Growing. Stringing the Leaves . . . . .	190
Camels in the Desert . . . . .	191
Maize Field . . . . .	192
African Fruits . . . . .	193
African Fruits . . . . .	194
Typical Valley in the Namib, near Luderitzbucht, showing Diamondiferous Gravel . . . . .	195
Searching for Diamonds at Luderitzbucht . . . . .	196
Deutsche Diamanten Gesellschaft. Bogenfels Settle- ment, 1914 . . . . .	197
Deutsche Diamanten Gesellschaft. Schiechel plant and the Granitberg Settlement, 1914 . . . . .	198
Deutsche Diamanten Gesellschaft. Watering Place . . . . .	199
"Hotel" on the Diamond Fields . . . . .	200
Diamond Washing with Hand-sieves . . . . .	201
Working with a Jig on the Diamond Fields . . . . .	202
Kolmanskop Diamond Mines, Ltd. Sifting Gravel . . . . .	203
At the Diamond Washing Machine . . . . .	204
Searching for Diamonds in the Concentrates . . . . .	205
Kolmanskop Diamond Mines, Ltd. Hand-washing and Small Sieve in the Charlotte Valley, 1908 . . . . .	206
Kolmanskop Diamond Mines, Ltd. Hand-washing Machine, 1909 . . . . .	207
Kolmanskop Diamond Fields . . . . .	208
Kolmanskop Diamond Mines, Ltd. A Schiechel Plant, 1910 . . . . .	209
Kolmanskop Diamond Mines, Ltd. A Sifting Gang at work . . . . .	210
Kolmanskop Diamond Mines, Ltd. A Schiechel Plant, 1912 . . . . .	211

	PLATE
Kolmanskop Diamond Mines, Ltd. Dredger with Drum Sieve, worked by Electricity, 1913 . . . . .	212
Vereinigte Diamantminen, Luderitzbucht. Early method of Hand-washing for Diamonds on the Schmidtfeld . . . . .	213
Vereinigte Diamantminen, Luderitzbucht. Bucket Dredger and Wire Rope Railway on the Schmidtfeld . . . . .	214
Vereinigte Diamantminen, Luderitzbucht. Storage of coarse Sand and Gravel, also Heatment Plant at the Schmidtfeld . . . . .	215
Koloniale Bergbau Gesellschaft. Original method of Washing the Diamondiferous Gravel at Luderitzbucht . . . . .	216
Koloniale Bergbau Gesellschaft. Construction of Railway to the Dumps . . . . .	217
Koloniale Bergbau Gesellschaft. Washing House, North Block . . . . .	218
Diamanten-Pacht-Gesellschaft. Concentration Plant	219
Koloniale Bergbau Gesellschaft. Settlement at Kolmanskop . . . . .	220
Diamond Deposit in the Pomona District. Porphyry Rocks partly hidden by shifting sands . . . . .	221
On the way to work at the Diamond Fields . . . . .	222
Ornaments of the Hereros . . . . .	223
Section through Great Namaqualand from West to East	224
Section of German South-west Africa from North to South, showing heights of the three principal countries . . . . .	225
Section of Damaraland from West to East . . . . .	226
Sketch Geological Plan from Luderitzbucht to Keetmanshoop . . . . .	227
Map of German South-west Africa . . . . .	228
Military Map of German South-west Africa . . . . .	229
Map of Africa, showing the German Colonies . . . . .	230







WINDHOEK, SOUTH WEST AFRICA.

# SOUTH-WEST AFRICA

(1884—1914)

## INTRODUCTORY

FROM very early times the German has proved himself to be a good colonist—law-abiding, industrious and thrifty. His success as a settler and trader in the overseas dominions of other nations must have inspired Bismarck and his advisers with the belief that because the German was a good colonist he would also be an ideal coloniser, and in the early 'Eighties he set about acquiring territories in East, West and South-West Africa, and experimenting in the work of colonisation on a large scale. Germany came late into the field of colonial empire: Africa had already been largely appropriated by other nations, and in edging herself in she ran the risk of edging other powers out. By reason of the apathy and short-sightedness of British statesmanship, she planted herself in South-West Africa in 1884, when she sent her warships to patrol the coast-line of Namaqualand and Damaraland, and proclaimed her Protectorate over the 322,450 square



WINDHOEK, SOUTH WEST AFRICA.

# SOUTH-WEST AFRICA

(1884—1914)

## INTRODUCTORY

FROM very early times the German has proved himself to be a good colonist—law-abiding, industrious and thrifty. His success as a settler and trader in the overseas dominions of other nations must have inspired Bismarck and his advisers with the belief that because the German was a good colonist he would also be an ideal coloniser, and in the early 'Eighties he set about acquiring territories in East, West and South-West Africa, and experimenting in the work of colonisation on a large scale. Germany came late into the field of colonial empire: Africa had already been largely appropriated by other nations, and in edging herself in she ran the risk of edging other powers out. By reason of the apathy and short-sightedness of British statesmanship, she planted herself in South-West Africa in 1884, when she sent her warships to patrol the coast-line of Namaqualand and Damaraland, and proclaimed her Protectorate over the 322,450 square

miles of country which is bounded on the north by Portuguese West Africa, on the east by Bechuanaland, and on the south by Cape Colony. This is the territory which for the following thirty years was to be known as German South-West Africa.

This incursion on the part of the German Government was as unexpected as it was undesirable. In 1883 a Bremen merchant, named Franz Adolf E. Luderitz, landed in the bay (Luderitzbucht) which bears his name, and acquired from the native chief an extensive tract of land in exchange for a few old muskets and a cash payment of 2,000 marks. Namaqualand and the neighbouring province of Damaraland were at that time, and had been for generations, under the unofficial protection of the British, and were regarded as the annexe of Cape Colony. Acts of authority had been occasionally exercised in these regions, and in 1874 the Damaras had made representations to the Cape, praying to be formally taken under the Colonial protection. Mr. W. C. Palgrave, the Commissioner appointed to confer with the chiefs, reported favourably upon the project, and Sir Bartle Frere, the prescient Governor of Cape Colony, urged upon the authorities in Downing Street the desirability of extending a British Protectorate from the Orange River northward to the Portuguese territory in Angola. British policy at that period was parochial rather than Imperial, and this scheme of colonial expansion was discouraged by the Colonial Office. Beyond declaring the port at Walfisch Bay British, nothing was

done. Even when the German Chancellor made inquiries as to Great Britain's intentions with regard to these countries, there was so much unfortunate delay in the Colonial Secretary's communications with the Cape Government, that Bismarck decided to adopt bold and immediate measures, and on April 24th, 1884, he despatched to the German Consul at Cape Town the following telegraphic announcement of Germany's entrance into world politics as a Colonial Power :—

“ According to a communication from Herr Luderitz, the British Colonial officials doubt whether his acquisitions north of the Orange River can claim German protection. You will declare officially that he and his settlement are under the protection of the Empire.”

This challenge was immediately followed by the Cape Government's declaration of her eager willingness to annex the debatable territory, but Germany had followed her telegram with battleships and flags, and the colony was ceremoniously enrolled as a German province. “ It was a vexatious incident,” we read in Bryden's *History of South Africa*, “ the more vexatious in that, but for the culpable weakness and *laches* of the Colonial Office, it never ought to have been possible. It destroyed the symmetry of a South Africa which in future years, if not entirely British from the Cape to the Zambesi, at any rate bade fair to become a great confederation of States and Colonies under the protection of the British flag. And it gave to Germany rights in

territory marching with British Colonies, which may in future, when England has her hands full in other parts of the world, lead to unpleasant or unexpected results. The Imperial Government protested against the German annexation, but Prince Bismarck had pretty accurately taken the measure of Mr. Gladstone and his Colonial Secretary, and was not to be moved from one of the first serious attempts at German Colonial expansion. It was an unfriendly act, carried out in an unpleasant manner, and the British Colonists in South Africa are not soon likely to allow it to pass out of remembrance. The boundaries of the German Protectorate in South-West Africa, as agreed upon by the two Governments, are, upon the north and south, the Cunene and the Orange Rivers ; upon the east, the 20th degree of longitude as far as the 22nd parallel of south latitude. North of that latitude, as far as the 18th parallel, the eastern boundary runs with the 21st degree of longitude. In 1890, for some unfortunate reason which can never be satisfactorily explained, access was granted to the Germans to the Zambesi valley, and they now possess in that direction a narrow wedge of country running between British Central and British South African territory."

It is not necessary to further emphasize the fatuousness of acquiring an isolated port when the whole of the territory between the Cunene and Orange Rivers might have been absorbed, but the fact must not be forgotten that the natural harbour of Walfisch Bay possesses a geographical and political

importance which can scarcely be over-rated. In Keane's *History of Africa* we read: "It gives direct access to the two great water-courses, Tsoakhub and Kuiseb, which here converge from the north-east and south-east; it is thus practically the only natural outlet for a region some 400,000 square miles in extent, stretching from the sea-board inland to Zambesia, and from Angola southwards to the Cape. The whole of this region is at the mercy of the political masters of Walfisch Bay, which in the hands of an alien Power might serve as a convenient base of operations directed against the British possessions between the Zambesi and Orange Rivers. At present this vitally important strategical point is an administrative dependency of the Cape, and it is politically held by England in trust for her future South African Empire, the consolidation of which has already begun. Hence it is not surprising that both the Imperial and Colonial Governments are at one as regards the policy of holding this commodious naval station and declining to treat with Germany for its surrender on any terms. If Germany cannot retain profitable possession of her hastily—perhaps rashly—acquired South-West African Protectorate without Walfisch Bay, she must abandon it, for Great Britain cannot certainly afford to abandon Walfisch Bay. The harbour, easily approached by a channel four fathoms deep, affords good anchorage in depths of four to five fathoms, and is completely sheltered from all winds except those blowing from the north-west, which are rare on this sea-board. It takes its name



from the whales which formerly abounded in the neighbouring waters, but which are now rarely seen. The ostrich and elephant, at one time numerous on the surrounding grassy uplands, have also disappeared, so that the ivory and feathers formerly shipped at this port have now given place to hides and cattle exported chiefly to the Cape. Since the German occupation of Damaraland, Walfisch Bay has been declared a free port for all exchanges with Europe and the Colonies. It has thus retained the foreign trade which might else have been diverted to the neighbouring German station of Sandwich Haven. The Walfisch Bay territory is inhabited by the Topnaar tribe, who are a branch of the Nama Hottentots."

In the hope of increasing the considerable trade that formally passed through the port of Walfisch Bay, a substantial pier, 200 yards long, with all necessary appliances was erected, but the occupation of the surrounding territory by Germany cut off the settlement—which had a population of about 150 whites and under a thousand natives—from the interior, and with the exception of men-of-war it is visited by few vessels. But with the occupation of the colony by the English and the hoisting of the English flag at Windhoek, Walfisch Bay would become an important harbour, and the present railway to Swakopmund could be linked up with Walfisch Bay by a new line about twenty-five miles in length.

Having acquired German South-West Africa, if

not by the sword, at least by the boasted rattle of that Imperial emblem, German officials proceeded to colonise it on military lines. There is no British territory in South Africa which is so little developed as this colony, but it is burdened with more official ordinances and regulations than would be required to run an Empire. The railways have been constructed with regard to their strategic importance; the townships have been laid out at points selected by the administration in conformity with their plans for strategic purposes, as opposed to local and economic development. A former British colonist of the South-West, while testifying to the progressive qualities displayed by the German farmers, has described the administration of the colony as mischievously autocratic. In his own words: "There is far too much government. There is one official out of every three in the population, and it is a great burden on the country. Take a place like Keetmanshoop. The town and country around can be compared with Upington and the district, where they probably have a magistrate and one or two clerks. At Keetmanshoop they have a Deputy-Governor with a secretary and about half-a-dozen clerks, in addition to ten or a dozen policemen who are also largely engaged in clerical work. Then there are the law courts, with two judges, a secretary, and another half-dozen clerks. There is, it is true, an awful lot of litigation, chiefly over debts.

"It can hardly be said that the English are looked upon with favour. The Germans don't

approve of them, and the English don't like the Government because there is too much red tape. The Dutch population is not pleased with the Government, which they find very different from what they were accustomed to have. I do not think much of the future of the country—at least under German rule. It is highly mineralised, but it has still to be developed. I have no great opinion of the German as a coloniser, for one thing, because he wishes to do everything on the same lines as he does it in Germany. The system of Government is an elaborate machine not at all suited to a thinly-populated country like German South-West Africa."

On this subject of the difference between British and German ideals of Empire, the *Times* recently pointed to the action of the Dominions and of the native Indian rulers as a triumphant vindication of the British principles of world-power, which von Bernhardt and other German writers have affected to deride. "The lesson is not for Germany alone," the article declares, "but for the world at large and for some of our own politicians at home. The German attempts at Colonial expansion have been a lamentable failure because they violate deep-seated principles, and the German claim of a superior moral right to rule on the ground of superior strength is based on a superficial and fallacious conception of the nature of strength and weakness in world-politics. If, indeed, we had borne ourselves cravenly in this crisis, and had behaved as some of our politicians would have had us behave, the German estimate of

our Imperial weakness might have been justified. The Germans will learn through bitter disillusionment that their teachers are wrong, and that our apparently weak rule conceals a virility equal to their own and more stable because rooted in liberty. South Africa presents this lesson in the most direct and convincing form, because there the Boers, converted by British rule to be its enthusiastic supporters, are defending it against the Germans, to whom they looked as saviours before they knew what British rule was like. Their choice is as deliberate as it is decided, and no German thinker can honestly misread the lesson it contains or ignore the contrast it offers to Alsace-Lorraine under German rule."

In constructing its railways, the German administration has pursued the policy of cutting off the colony from all intercourse with the rest of South Africa, and of forcing communication with the interior through Luderitzbucht and Swakopmund. Thus of the three main lines from the coast into the interior, two have their termini at Swakopmund. The northern service continues through Omaruru to Otavi, whence one branch goes to Grootfontein and the other to the Tsumeb mine. The second continues in a north-east direction to Karibib, and then circles around south through Windhoek, Rehoboth and Gibeon to Keetmanshoop. The extreme southern line starts from Luderitzbucht, and continuing through Seeheim links up with the Windhoek-Keetmanshoop railway. From Seeheim a railway runs due south to Kalkfontein, from which point a line has been

under construction to Warmbad, not far from the Orange River border. A scheme was under consideration some time ago for continuation of the railway from Keetmanshoop to Rietfontein on the border, whence a line might at some time be extended to Kuruman. By the construction of this line German South-West Africa would be brought into direct communication with the Transvaal, and thus enable miners and farmers from the Union to open up the territory. As there is no coal in the colony, it would be a means of importing the coal which is necessary. The principal point of interest in connection with these German South-West African railways, from the point of view of the Union, has always been the possibility of linking up the Union railways with the coast and thereby reducing the ocean distance to Europe.

The latest German scheme of railway extension was designed for the opening up of Amboland. The completion of the Amboland railroad would be followed by a line connecting Gobabis, the centre of the eastern district, with Windhoek. When that connection had been made, it was officially considered that the requirements of the farmers, as regards railway transport, would have been practically fulfilled.

It is highly probable that these suggested and projected extensions of the present railway service of the colony will be duly undertaken, but of more immediate importance would seem to be the completion of the new line from Prieska to Upington,

and the linking up of Upington by a railway connecting with the Luderitzbucht-Kalkfontein line, which is now being pushed forward to Warmbad. The Railway Commissioners, in the course of their exhaustive report upon the Prieska-Upington line, state that they visited Marydale, Upington, Keimoes, Kakamas, and Kenhart, and are satisfied that substantial agricultural development will result from railway communication, especially if irrigation works on the Orange River and its tributaries are extended. In regard to the irrigation possibilities along the river, the Commissioners admit that the Department of Irrigation is not yet in possession of information of a really definite nature, but a detailed survey is now in progress amongst the maze of islands at and down-stream of Upington and on a considerable length of river-frontage up-stream of Upington. The results of the survey are not yet available.

The Commissioners, however, were informed upon what they regarded as reliable authority, that on the up-stream side of Upington there is irrigable land, both river-frontage and on the islands, to the extent of 26,000 acres, and on the down-stream side, for a distance of eighty-five miles west of Upington, some 50,000 acres, well supplied with water and capable of development. Further, it is estimated that there are some 50,000 acres of good land, which, though not irrigable by gravitation, are capable of being put under the furrow by pumping. The soil is very fertile, and the fruit grown, both oranges and grapes, is of excellent quality, and has the advantage that it

can be produced at a time when it could be disposed of in the European markets without much competition from elsewhere. Wheat and other cereals could be grown, but it will probably be found more advantageous to cultivate crops which would yield a higher monetary return per acre.

The Commissioners, while agreeing that the Prieska-Upington Railway was desirable and would promote considerable agricultural development, and while feeling that the energy and enterprise of the inhabitants of the area to be served entitled them to sympathetic consideration, are unable to record that this railway is likely to be remunerative from a financial point of view for many years to come, and they are of opinion that there are other districts in the Cape and elsewhere in the Union without railway communication where the construction of railways would produce better financial results. Circumstances have arisen, however, which make it possible that the railway will become a paying concern sooner than was anticipated, and the Union may congratulate themselves upon the rapidity with which the work was conducted. The despatch of the first train from Prieska to Upington on the 18th of October, 1914, signals the completion of the first section of the line, which will probably be extended into the South-West Colony without delay.

The following are the details of the railway: Approximate length of line, 150 miles; gauge, 3 ft. 6 ins.; estimated cost of construction, £337,500; average cost per mile, £2,250; estimated capital

cost, including £201 per mile for rolling stock, £367,650; ruling grade (compensated for curves), 1 in 66; curves (minimum radius), 660 ft.; weight of rails, 60 lbs. (second-hand).

The Prieska-Upington Railway follows a nearly straight route, except for a sharp bend to the south for a few miles just after leaving Prieska, where the line keeps to the right bank of the Prieska River before crossing the Doornbergen. Over the rest of the route such hills as exist are well avoided, and the railway runs at a fairly equal distance from the Orange River all the way, crossing numerous small watercourses, suggesting good farming possibilities in the neighbourhood.

Upington, in Bechuanaland, the capital of Gordonia—the largest district in the Cape Province—is the southern gateway of the Kalahari Desert. It was an out-of-the-world village, being 120 miles from the nearest railhead at Prieska. Its history is lost in antiquity. The story runs that years ago it was honoured by a visit from the Cape Attorney-General, Sir Thomas Upington, and the Prime Minister, Sir Gordon Sprigg. And these two genial knights left—not their spurs on the table, as in the old Border tale—but their names on the map, to commemorate their visit. And so this immense and desolate region was duly christened, and then forgotten. Since then, these lost tribes will tell you, in slow and solemn tones, no Cabinet Minister has ever deigned to set foot in their “dorp,” or district. Yet the simple facts, as set forth by Dr. William Macdonald



in an article in the *Westminster Gazette*, are these :  
“ Here is a progressive and highly intelligent community, possessing a river frontage fringing the finest orange-lands in the world, backed by a truly magnificent ranching country, stretching northward for four hundred miles—the largest, richest, and grandest district in the Cape Province, paralysed and perishing for lack of a railway. And now, through the fortune of war, it is coming ! ”

The district of Gordonia has an area of 18,499 square miles, more than two-thirds of which is unsurveyed waterless desert—the southern portion of the great Kalahari Desert. This part of the desert is inhabited by roving bands of semi-savage natives, who live on the Tsamma melon, extracting the water from it for drinking purposes, and grinding the pips to make a sort of coffee. The southern boundary of the district is the Orange River, on which there is a frontage, as it may be called, of 200 miles. This frontage is occupied by a series of long, narrow farms, averaging a breadth of three miles on the river, and stretching northwards back from the river for a distance of fifteen to eighteen miles. They were originally laid out on the basis of half-an-hour's ride along the river and two and a half hours' ride away from the river into the “ Back Country.” Between these river farms and the actual desert there is a considerable area surveyed into large farms, varying in size from 10,000 to 100,000 acres.

## PROGRESS, POPULATION, AND THE MILITARY SYSTEM

**D**R. ROHRBACH, the Imperial Emigration Commissioner, declares that German South-West Africa has made greater progress during the last ten years than any other African colony. On the whole, every district is being more or less vigorously developed, and he claims that the Protectorate is at least as profitable as Cape Colony was in the early days. The Cape exports wool, mohair and ostrich feathers to the value of about 100,000,000 marks yearly, and as in South-West Africa there is as great an area available for small stock as in Cape Colony, he argues that there is no reason why its exports should not be equally large.

If the British Consul's Report for the year 1913 does not entirely bear out this glowing retrospect and prediction, the statistics he supplies shows that the colony is in a prosperous and progressive condition. For the six months ended June 30th, 1913, the total trade value was £2,357,100, which compares very favourably with the £3,517,100 which represented the full year's trading in 1912. The Government revenue for the year ended March 31st, 1913, was £1,081,400 as against an estimated revenue of £766,500, while the revenue and expenditure for the year ended March 31st, 1915, have been estimated to balance at £2,081,157.

In 1912 the exports exceeded the imports by £321,375 and by £517,127 in the first six months of 1913. This strange disparity in the case of a young country, badly in need of capital, must be attributed to the sudden forward movement in the development of the diamond fields. The diamond industry is the dominating factor in the colony's trade, but the number of persons employed and the money circulated in the country by the industry, are small when compared with the value of the diamond production. Moreover, as the British Consul explains, "the lion's share of the actual profits goes into Government revenue and pays for the civil administration of the country. In 1911 there was a small deficit, but 1912, which bade fair to be a lean year, necessitating caution, ended with a handsome surplus of actual over estimated revenue, while the surplus for 1913 amounts to something like £800,000. The greater portion of the surpluses of these two years has been devoted to the liquidation of liabilities previously incurred. A new period of construction of public works out of revenue will start in 1914. The bulk of the dividends paid by the diamond companies goes into the pocket of absentee shareholders, who are cautious about making new investments in German South-West African enterprises."

These remarks seem necessary to make it clear, that a sudden increase in the amount of wealth extracted from the diamond fields, does not necessarily imply an immediate corresponding improvement in the general prosperity of the country. The

improvement in the figures for the first half of 1913 is due entirely to the mining industries. The most satisfactory increase is under the head of machinery, which increased from £50,783 to £122,504. As this represents increased equipment for future production, the benefit thereof will be felt in subsequent years.

Of the two German ports, Luderitzbucht is a nice little harbour capable of great improvement, while Swakopmund must be regarded as an expensive and unsuccessful experiment. Swakopmund, as the terminus of the railway, is a place of importance, being a passable town with two-storeyed houses, straight streets, and public offices. But landing in the harbour is very difficult, large vessels having to anchor 1,000 m. from the shore, and goods to be transferred into lighters and landed through the terrible surf and sandbanks. In 1898 the German Government resolved to construct a harbour at Swakopmund, the mouth of the Swakop (Zwachaub) River, twenty-five miles to the north of Walfisch Bay. A wooden landing-pier, built at a cost of £30,000, was replaced by a stone jetty, at the cost of £160,000. This was partly demolished by the sea and has been abandoned, but an iron jetty, 600 yards long, is in course of construction.

Luderitzbucht was originally called Angra Pequena by its original founders, the Portuguese. Their fleet, consisting of two vessels of 50 tons each and a store ship, under the command of Bartholomew Dias, left Portugal in 1486. Sailing southward, and

passing along a barren shore, covered the greater part of the time by a thick haze, Dias came to an inlet or small gulf, with a group of islets at its entrance. There he cast anchor, and for the first time Christian men trod the soil of Africa south of the tropic of Capricorn. To this inlet he gave the name of Angra Pequena, or small bay, and by this name it was known until the German occupation of South-West Africa.

The town of Luderitzbucht has been greatly benefited by the diamond discoveries made in the district, and now contains many well-built, comfortable houses dominated by the large cathedral on a hill. The surrounding country has no vegetation, and little greenery of any kind is to be seen, but the formation of brown-grey rocks is picturesque, and the hills and valleys surrounded by a margin of sea are not at all unsightly. A cool breeze blows from the north, but during December, January and February the heat is trying. Water is almost non-existent. It is brought in tanks from Cape Town or condensed on the spot. No corrugated iron being allowed except as sheds or working premises, the buildings have a ship-shape appearance. There is a great deal of sand in the streets, and such trolleys as there are, are only used for merchandise. The dinner hour (or hours) occurs in the middle of the day, and there is a long siesta afterwards, black girls meanwhile sitting on doorsteps to guard business premises. There is a more pretentious style of architecture than is common in such small places in Africa. The few people who are in the streets are

well dressed and have a prosperous air, children playing in the sand, being red-cheeked and healthy. Luderitzbucht is free from fever, and there is little illness of any kind. The great drawbacks are lack of water and the absence of trees and gardens. The people take infinite pains to produce something green, bringing up soil from Cape Town, but their efforts in this direction are not very successful. Preliminary works in connection with a water supply for the town of Luderitzbucht have been carried out. A plentiful supply of water has been struck by boring in the valley of the Kuichab River near Aus. Financial considerations seem likely to postpone the laying of the pipe line and the construction of the reservoirs. The cathedral has two stained-glass windows given by the German Emperor and Empress. Looking at the sea from a height a blue bay spreads out, surrounded by a wreath of arid grey rocks, and marvellous swirls of sand-dunes created by the wind, which is renowned here. The sand and rock resemble a sea, and geologists think that centuries ago the land must have been the bottom of a great ocean or river bed. At the back of the town are the recreation grounds and the race track of Boerenkamp. Luderitzbucht has its race meetings on holidays, but as yet there is no theatre. From the hill the entire panorama is seen distinctly, including Shark Island, on which is erected a large hospital.

Dr. Schultz holds that Luderitzbucht harbour, the rocks of which rise bare and steep from the sea, was

once a submerged valley. A ridge of rock, 5 kilometres wide, which forms its western wall, terminates at Angra Point. On the east it is landlocked as far as Diamentenberg (Diamond Mountain), while the neighbouring Shark Island on the north is so near the mainland that the intervening strip of water has been bridged over. The English islands—Penguin and Seal Island—which once formed the summits of the eastern wall of this sunken valley, have lost their connection with the mainland. Roberthafen, in the innermost corner of the bay, is described as the safest landing-place for men and goods in the whole Protectorate.

According to Dr. Schultz, the artificial harbour of Swakopmund is silted up by the Bengal current and the surf. The masses of sand which level the coast at some places vary its formation in others. Walfisch Bay, for instance, owes its existence to a tongue-shaped strip of sand, which shuts the bay off from the raging surf. The remarkable transformations that have occurred at Sandfischhafen are proof of the changes which take place along the entire coast of South-West Africa. In 1832 seal-hunters anchored in Sierra Bay, three miles south of Cape Cross. Sixty years later the entrance of the bay was dammed up by a wall of sand, 500 to 600 metres wide. In 1829 Morrell anchored in a beautiful bay, which fifty years later had entirely disappeared.

Windhoek, the capital of the colony, consists of two settlements—Great Windhoek, which is the

garrison and headquarters of the officials, and Little Windhoek, which is inhabited by the civilian settlers. The natives live outside the town at Matten Pontocks. Windhoek is 1,625 m. above sea-level, in the midst of a peak-like district, surrounded by hilly country covered with brushwood. Being until recently the terminus of the Swakopmund Railway, Windhoek was practically the economic centre of the colony. Tsumeb, the terminus of the line in the Outjo district, is a place of importance owing to its vicinity to the Otavi mines. Rehoboth, south of Windhoek, is the centre of a rich and well-watered grazing district, and Mariental, still further south, in the Gibeon district, boasts a remarkably fine flood-dyke with a reservoir 12 metres square, having a capacity of 40,000,000 cubic metres of water. The Keetmanshoop district is only remarkable for a tobacco farm at Seeheim, an unsuccessful diamond mine at Berseba, and a scarcity of rain. Kubub was formerly a flourishing sheep station of the German Kolonial Gesellschaft, and was destroyed by Witbooi in 1903.

The European population of the Protectorate was arrived at by census on January 1st, 1913, when the total number of persons was officially returned at 14,830, including the military. During 1911 the number of British subjects decreased from 204 to 169. With regard to the native population, the figures are partly arrived at by guess-work, and the statistics do not pretend to be accurate. The number of natives actually counted on January 1st, 1913, was 69,003, and the total estimated population



was set down at 78,810. In addition to this total, there were some 2,648 foreign natives resident in the country, of whom 2,089 came from the Cape. The population of Ovamboland, and the Caprivizipfel, together, was roughly estimated to be between 150,000 and 200,000.

The comparatively small population of German South-West Africa proper, explains the scarcity of native labourers from which the country is suffering. The Hereros, Bergdamaras and Hottentots are employed in farm work and as domestic servants, and it was arranged by the mines and railways that the recruits arriving from Ovamboland should be shared between them. Of the 27,543 adults of every race in the country on January 1st, 1913, 5,557 were Ovambos and 2,462 were residents from beyond the borders of the Protectorate. Of the total number, 24,645 were in the employ of Europeans. The number of labourers that came from Ovamboland in search of work in 1911 was 9,295; in 1912, 6,076; and in 1913, as the result of droughts in their own country, no fewer than 12,025 recruits arrived in the Protectorate. These figures, derived from the latest British Consular Report, illustrate the irregularity of the supply of native labour. In the middle of 1913 the various industries had practically all the labourers they required; by the end of the year there was a shortage. From the returns made by the Luderitzbucht Chamber of Mines, it is seen that the number of Ovambos employed on the diamond fields in 1913 rose from 2,007 in January, to 4,724 in

May, and dropped to 2,494 in November. When the supply of Ovamboland natives runs short—the Chamber of Mines estimated the shortage of labourers at 2,650 in November, 1913—the employers fall back upon the Cape boy, of whom an average of rather more than 11,000 were engaged on the diamond fields in 1913.

As the Cape boy is paid £3 per month and his rations, as against £1 5s. plus rations, which is the standard wage of Ovambo labourers, the Government and the large employers of labour are doing their utmost to attract recruits from the Ovambo district. As far as circumstances permit, the housing, clothing, transport, and hospital arrangements have been improved, and the decision to construct a railway line to the Ovambo border arose from the urgent necessity that exists for developing the labour supply.

The farmers and agriculturists complain that they are handicapped not only by the scarcity but also by the unreliability of native labour. The difficulty in the latter respect can be traced to the inability of the German employer to handle the natives. The farmer who learns how to manage his servants, and understands their limitations, has no difficulty in getting his work done; but the native has his preferences, and while on some farms there are sufficient labourers for every emergency, there are other farmers who cannot get their hands to stay. The police have adopted a conscriptive method of rounding up loose natives and apportioning them to masters in need of servants, but the scheme is made

inoperative by the perverseness of the natives, who melt away from unpopular farms and betake themselves to the wilderness.

Before the Herero War opened on January 11th, 1904, the Hereros formed the most important tribe in German South-West Africa. A few thousands of them had been converted to Christianity by the Rhine Mission, which had representatives in Namaqualand and Damaraland long before the Protectorate was proclaimed. The Rhine Mission had, in large measure, cleared the ground for European rule by establishing some sort of relations between the Mission and the natives. They laid the foundations for peaceful occupation, while the German military authorities, who followed them, declared war on the new converts and, in the course of the campaign, annihilated from 15,000 to 20,000 Herero natives—probably half of the entire race. The days of the Herero lordship of large tracts of land and vast herds were terminated, and the tribesmen began to deteriorate. They even abandoned their native dress and adopted European clothing.

In the north of the colony lives another black tribe, the Bergdamaras, who were formerly slaves of the Hereros. They are very uncivilized, but make good workmen, and speak the same language as the Hottentots. The Ovambos, who inhabit Amboland and Portuguese territory, are a powerful race, who do not live by breeding cattle but by agriculture. The Okavangaris, who inhabit the Okavango River, in the extreme north of the colony, dwell in villages

surrounded by pallisades, like the Ovambos, to whom they are nearly allied. The natives of Bustardland, in the south, who occupy the region south of Windhoek, across the Auas Mountains, are a mixed race of Boers and Hottentots, dwelling in extremely primitive imitations of European houses.

Although the friendly tribes rendered the German forces valuable service as scouts during the Herero War, a scheme for training the natives to arms proved futile. The Bustards are fairly reliable for military purposes, but all the other native tribes gave more than sufficient proof that they are unfitted for anything but labour—as regular troops they showed themselves to be impossible.

The colonisation of German South-West Africa was based on the Anglo-French model of granting concessions for private enterprise. The first concession was secured by the Deutsche Kolonial Gesellschaft, which took over the Luderitz settlement, and other commercial adventurers quickly followed their lead. Concession hunting, among the early settlers, seems to have been the principal business, and mineral rights over large areas were sold by the chiefs to various individuals, syndicates and companies. The concessions were in some instances transferred to third parties, and eventually the mining rights of the whole country were held by the following: The Deutsche Kolonial Gesellschaft, the South-West Africa Company, the Kaoko Land und Minen Gesellschaft, the Otavi Minen und Eisenbahn Gesellschaft, the Hanseatische Land und

Minen Gesellschaft, the Gibeon Schuerf und Handels Gesellschaft, the South African Territories Company, and the Government, after the confiscation of the native tribal property. Each of these companies had its own laws, regulating or prohibiting prospecting operations, the relative merits of which need not be discussed. The Government recognised the desirability of obtaining greater uniformity, and entered into negotiations with the object of bringing the whole country under the Government Mining Ordinance of 1905. The Deutsche Kolonial Gesellschaft was the first to come into line. The remaining companies stood out. In order to bring pressure to bear upon them, the Government took powers under an ordinance dated April 10th, 1913, to impose a tax, not exceeding  $\frac{1}{4}$ d. per hectare per annum, upon the concession areas which were not submitted to the Imperial Mining Law. This had the desired effect, and all the companies, with the exception of the South-West Africa Company, entered into agreements with the Government. The Kaoko Land Company and the South African Territories Company reserved certain circumscribed areas in which they had discovered minerals, but as for the rest of the country the Imperial Mining Ordinance of 1905 was in force when war was declared. The royalties payable to the various companies were fixed by the agreements.

The Concessions System has given very little satisfaction—the disappointment being attributed to the half-hearted, dilatory methods adopted by the

companies—and the desirability of introducing a better system was being considered by the administration when war was declared. Eight concession companies had an aggregate original capital of 86 million marks, of which  $34\frac{1}{2}$  millions had been paid up, and of these, six companies had sunk or squandered about 8 million marks without in any way benefiting the Colonial finances. The Government, it appears, were impatiently waiting for them to fail in the fulfilment of their obligations in order to forfeit their concessions.

The practice of granting concessions led, in 1887, to the introduction of the military system, for in that year gold was discovered on the Deutsche Kolonial Gesellschaft's land near Pot and Anawood, and the Imperial Commissioner represented to the Government that a military force was necessary for the protection of the mines. Although the funds of the company were small, they expended 70,000 marks in 1888 on the formation of a body of troops. Dr. Göring engaged a couple of subalterns and several non-commissioned officers, who, in May, 1888, were stationed at Otjimbingwe with twenty Bustards and Hottentots under them. They were put into uniform, and formed the nucleus of a larger unit recruited from the natives.

This force was badly organized, very expensive to maintain, too weak to keep the natives in order, and absolutely undisciplined. It fell to pieces directly the Hereros assumed a threatening attitude and, in 1888, it was disbanded, and replaced by a

body of mercenary troops. Eight men, selected from the "active" army and thirteen reservists, were put into yellow-brown uniforms, and armed with Maüser "carbines" (these arms were found to be unsuitable and were replaced by Maüser's model 71/84 and later, in 1890, by model 88), revolvers, &c. This was the nucleus of the body of troops which was transformed into an Imperial force in 1894. At first it was instructed :—

(1) Not to engage in warlike expeditions, especially against the Hereros. (2) To visit the chiefs and keep peace between them; and (3) To arrest the English agitator, John Lewis, or to make him "unschädlich" (literally harmless). If serious opposition were to arise, Lewis & Co. were to have their communications with Cape Town and Walfisch Bay cut off, and the chiefs were to have their imports of ammunition limited.

In 1897 the strength of the force was 700, divided into four field companies, one field battery and district troops. At the outbreak of the Herero rising their strength was 34 officers, 730 men in the field, 120 trained Bustard scouts, and a police corps. Police and field troops were on an absolutely distinct footing. The police were under the civil administration, and were divided into eight companies. The field corps was divided into four field companies and a battery, with a gun to each separate company. The artillery, of which the natives had a superstitious fear before the war, consisted of five 6 cm. quick-firing mountain guns, five older guns

c/73 for the defence of stations, four 5·7 cm. quick-loading guns, and five machine guns.

The stations were built fortress-fashion of stone buildings, or of walls surrounding courtyards; observation towers were built, and the water supply was assured. These fortified stations enabled small forces to withstand overwhelming numbers. The transport question being a particularly difficult one, the principal stations were made depots for wagons and draft oxen, and natives and 132 native soldiers were pressed into the service as drivers. Stores were brought from the coast by the Swakopmund-Windhoek Railway. The weakness lay in the small number of troops, and the difficulty of mobilization over enormous areas.

According to German authorities on the Herero War, no Britishers rendered the Colonists any aid in the protracted struggle, and we read that "the Boers in Grootfontein had enough to do to defend their own homes," but it is well known that the Colonial troops, at the beginning of the rising, were strengthened by 1,141 whites, including hundreds of British and Dutch irregular troopers. This force was reinforced during the war, but to what extent is unknown. Dr. Kulz says that in March, 1907, it was reduced to about 7,000 men, and divided into a Northern and a Southern Army, and that in 1909 it was further reduced to 2,431 regulars, while a scheme for the formation of a reserve force of white settlers and a volunteer corps was under consideration.

According to the German Year Book (1913) the



white troops in German South-West Africa consisted of a rapidly increasing force of 2,500 men in twelve companies, armed with three detachments of machine guns and three batteries, an equally numerous corps of armed civilians, and an establishment of 700 police, officered by soldiers.

Dr. W. Kulz, in *Deutsch Sud-Afrika in 25 Jahre* (1909), writes: "The greater part of the work done in the first twenty-five years of German rule in South Africa has been accomplished by German troops. The colony in its present form, and in its possible future development as a German country, would be an impossibility without the fights and the successes of the German soldier. In the past as well as in the future, there are other factors in the forefront of German dominion in addition to the soldier; but for the first twenty-five years he holds first place."

The exact strength of the German force in South-West Africa at the outbreak of hostilities is less uncertain than "its possible future development as a German country," but while we have reasons to know that the authorities would have been better prepared for war a couple of years hence, they made strenuous efforts to complete their military organisation in the time that the Kaiser allowed them. They had established large artillery bases, provided themselves with a big stock of guns and ammunition, and stored in huge warehouses provisions for at least six years. The military force is estimated by English authorities at from 3,000 to 10,000 men. "The main force," says the *Gwalo Times* (Aug. 6th,

1914), "which is known as the Protectorate Troop, is composed of Army veterans who have taken up their residence as Colonists in the country. The troop numbers about 2,500 men, and is commanded by officers of the regular army. This force is in garrison. In addition, there is a police force which, it is understood, numbers some 500 men. In the event of a general call to arms, to which all the Colonists must respond, it is estimated that an additional 6,000 men might be available. The aerial contingent consists of a monoplane and two biplanes. With these the scattered settlements and outlying desert are effectively patrolled." Later estimates place the total military forces at 10,000 officers and men.

The loyalty of the Boers of the Union in this struggle against the Germans may have been contributed to in no small measure by the treatment their people received in the South-West African Protectorate. At a time when Lord Selborne was declaring that "every German is an asset to this country," the *Luderitzbuchter Zeitung* asserted that "the only gratifying feature in the census returns is the fact of the large decrease in the number of foreigners in our midst." Theoretically the German is friendly towards the Boer, colonially and commercially he regards him as an intrusive and competitive foreigner, while personally he cannot forgive him for the services he rendered the Fatherland in the subjection of the tribes from 1904 to 1908. "But for the assistance of hundreds of British and Dutch

Afrianders," writes the Special Commissioner of the *Transvaal Chronicle* of some two years ago, "it is doubtful whether the Herero War would have been settled even in the long space of four years. There are Boers in the country to-day who have rendered splendid services to the Germans, but who have been treated shamefully ever since, and are now fast leaving the country. . . . Feeling between German and Boer is very strained. They do not understand each other. The German soldier envies those of another nationality who wear the Kaiser's medals for conspicuous bravery and deeds of valour on the battlefield, and to-day many an Afrikaner wears the black and white ribbon—a coveted order. The shooting of Marengo, on September 20th, 1907, by Major Elliott, of the C.M.R.—a corps, by the way, into which so many Germans would like to get—was another event which fanned the jealousy of the German officials. They had been on the track of Marengo for months. Major Elliott settled the matter in a couple of hours, and the coveted 'Kaiser Medalle' went to him instead."

## THE COUNTRY AND ITS RESOURCES.

**D**R. PAUL ROHRBACH declares that German South-West Africa is, of all the German Colonies, the most difficult upon which to form a correct idea unless one has a previous knowledge of a similar country. "A mental picture may be made of Cameroon or of East Africa"—Rohrbach is still the authority—"by exaggerating European German vegetation, rivers, climate, &c. In place of German woods, imagine a primeval forest with trees 60 m. high; in place of German gardens and orchards, cocoa palms and plantations; in place of meadows, elevated plateaux swept by tornadoes. Men like Wissmann, Schweinfarth, Stanley, and others have familiarised us with the appearance of tropical countries, but the South African landscape is composed of entirely local features, which find no parallel elsewhere."

The inhospitable aspect of the shore regions of the colony are described in *Unser Kolonialwesen*, by Herr Grotefeld, in a set of shorthand phrases: "Coast horribly desolate; reddish grey sand; climate cool, influenced by the very cold Polar Benguella current. Little rain, but very cloudy. Every harbour silted up by the surf. Dunes formed on land by the shifting sands. Coarse grass has to be cultivated along the Luderitz-Kubub Railway to prevent the rails from being buried, and corrugated

iron tunnels made in places. The Dune region extends 15-30 km. inland from the coasts—is succeeded by an equally desolate tract of wilderness—the 'Namib'—50 to 90 km. wide. Enormous masses of sand, due to the sudden and violent changes of temperature acting upon granite, gneiss, and similar primitive rocks. It is said that on a cold night, following a hot day, the splitting of the rocks sounds like the rattle of musketry."

Rather more than a quarter of South Africa, the territory which extends from the Zambesi to the Cape of Good Hope, is comprised in the German South-West African Protectorate. Here the mountains are so deeply buried that only their summits rise above the surface, for the masses of detritus, which in other lands are washed down to the sea by rains, have collected in the desert regions for thousands of years and serve to veil the original formation of the country.

Herr Grotefeld, in the same work, adds the following particulars to our knowledge of the mountainous district of the colony: "In the north the Waterberg Mountains, known on account of the Herero War, the Auas Mountains, near Windhoek (2,200 m.); north of them the Otjihaneero and Onjati Mountains, the Nunibeb, and the Gansberg Mountains (about 2,300 m.), near Nauchas; the Hanami Plateau, west of Gibeon; and, finally, in the south, the Small and Great Karasberge; the mountainous country near Kubub, &c. The highest mountain in the colony is Omatako (2,680 m.)—

about in the centre near Omaruru. These mountains are all bare, wild and desolate; no vegetation grows in their glowing rocks: they are, however, rich mineral treasure-houses."

The northern district of German South-West Africa includes Amboland, and the Cunene River—the frontier river between the Protectorate and Portuguese territory—flows through the region. The rainfall is heavier here than in the fruitful rainy district of Grootfontein, and maize, beans, &c., can be regularly cultivated, but the semi-tropical, unhealthy climate has made it impossible for permanent European settlement. The most beautiful district in North Hereroland lies around the Waterberg. The Waterberg is a bold plateau of red sandstone, the upper edge of which is almost perpendicular. Beyond it begins the Grootfontein, or Northern District. Its physical character is different from that of Hereroland, and it is important on account of the great copper deposits at Tsumeb, which yield 30,000 tons ("Tonnen") of ore annually. In the neighbourhood of Tsumeb and Grootfontein woods and palm trees show that we are gradually approaching tropical Africa. The rainfall in the Grootfontein district is so heavy that, in favourable years, crops, and especially maize, can be grown without artificial irrigation. The drawback here is a certain amount of malaria, but all experts are agreed that this is the best district of the whole country.

The district in the extreme north of South-West

Africa, on the Okavango River, is similar to Ambo-land. The Okavango River flows throughout the year, and runs through a very fertile valley, but the region is so remote that it has not yet been colonised. In the south of the colony are Namaqualand and Bustardland. The east, with Gobabis as an administrative and farming centre, resembles Hereroland in the advantages it offers to farmers. The road leads through Bustardland to the former country of the Hottentots or Namas. The whole region south of Rehoboth, the chief town of the Bustards, is simply known as the "Suden" (the south), and its chief artery is the Fish River. In the central Fish River district lies Gibeon, formerly the chief town of the Witbooi Hottentots. The Gibeon district and the whole of North Namaqualand is important on account of the sheep that are bred there, especially for their wool. In South Namaqualand, the Keetmanshoop district has less water, and is the most desolate part of South-West Africa, except the Namib, but there are many places in it with sufficient grazing-land and water to support cattle. The southern frontier of the colony is formed by the Orange River, but it is not navigable owing to its very rocky bed and the swiftness of its current.

The western coast of South Africa is influenced by the cold ocean current, as the English territory on the east is affected by the high chain of the Drakensberg Mountains. These condense the moisture from the Indian Ocean before it crosses the mountains, causing abundant rains to fall upon the narrow tract

of coast country between the Drakensberg and the ocean, but the regions that lie in the so-called "shadow of the rain"—Cape Colony, the former Orange Free State, part of the Transvaal, the Kalahari steppe and German South-West Africa—are left with little rain, and only a small amount of the moisture brought by the monsoon from the Indian Ocean reaches the Protectorate.

Actual rain only falls in South-West Africa during a few months in the year, from December to March, and never later than some time in April. This rainy period is also the hottest in the year. It must not be supposed that rain falls continuously during the rainy season in South-West Africa, as in the tropics; the individual rainstorms are often separated by rainless intervals that last several weeks. The rainfall is lowest in the south of the colony, where it totals only 50 to 100 millimetres in the year. In the central districts—Windhoek, for instance—it is from 300 to 400 millimetres in the year, not less, therefore, than in some countries in Southern Europe. In the north, in Grootfontein and Amboland, 500 to 700 millimetres fall in the course of the year, or as much as in North Germany; but the rain is all concentrated into one season of the year. The dry climate of South-West Africa determines the economic working of the country. It is impossible to cultivate the soil according to European methods in a land where, as a rule, no rain falls for nine months together. Agriculture in South-West Africa is only "garden" culture confined to small



areas, and assisted by irrigation. Only in the valleys, which are flooded during the rainy season, does a little loose and really fertile soil collect, but the rivers flow only for a few weeks, sometimes only for a few days, above ground. Often a "rivier" is formed (a word from the Boer language, meaning, throughout the whole of South-West Africa a periodical river-course, generally filled with sands that contain water). Streams are very rare in the colony, the farmer having to obtain the water for irrigation from wells or reservoirs.

On the alluvial land of the "riviers" are a number of small holdings on which vegetables, wines, fruit, tobacco, &c., are cultivated. Throughout the whole of South-West Africa part of the rain water sinks through clefts in the ground, part of it quickly evaporates, and part of it collects in countless large and small "dry beds," a great network of which intersects the greater part of the country. Into these, great masses of sand and rubble are brought by the rivers and usually fill up the whole of the beds of the "riviers." In the wider valleys, on each side of the gravel and sand beds, a strip of darker and very fertile alluvium is often deposited, which absorbs water. This is the soil for the small cultivator. When, after heavy rain, the water washes down the "riviers," the sandy bed and the alluvium on both sides suck up the moisture, and only after excessive rain is the "rivier" completely filled up by the rushing water, as the bed of an ordinary river would be. This flowing of the "rivier," as it is called,

sometimes lasts for only a few days, often for only a few hours, or it may occur several times during the rainy weather. There is not a single stream in the whole colony that flows continuously throughout the year, with the exception of the three frontier rivers. Where the layers of sand and alluvium are sufficiently thick, they store up part of the water they have absorbed until the next rainy season. If a well be sunk in the bed, or near it, water may often be found a few feet beneath the surface; but it is usually necessary to bore deeper for it. In places where the bed is confined by rocky banks, or cliffs, the water rises from the depths of the sands and flows on the surface, sometimes only for a distance of a few feet, sometimes for several kilometres, before it again disappears in the sand. In dry years no South-West African "rivier" can be depended upon for a water supply. In consequence of this a very large amount of irrigation is necessary in so dry a climate. The average calculation is from 5 to 10 litres of water to one square metre in every twenty-four hours, according to the nature of the crop. On account of the great initial cost of irrigation, the prices of garden products are very high in the Protectorate: a hundredweight (zentner) of potatoes costs 8 to 15 marks; a pound (pfund) of grapes 50 to 70 pf.

Herr E. Hermann, in *Viehucht und Bodenkultur in Deutsch Sudwest Afrika* (1914), is very pessimistic about the future of the Protectorate as a farming and agricultural colony, but he is an enthusiastic

believer in its prospects for stock-breeding. "The country," he writes, "with the exception of Amboland and a few other districts too remote to be colonised, is essentially a cattle-breeding land like Australia, the Argentine, West Texas, and the remainder of South Africa. The rainfall is seldom sufficient and the soil is rarely suitable for agriculture; labour and markets are scarce; and prices for produce, although high, often do not cover cost of transport, irrigation, &c. In the south and centre of the country, out of an area of many thousands of square miles only a very small proportion is arable land. The few markets there—Windhoek, for instance—do not owe their existence to the produce of the surrounding country, since it is in a mountainous, rocky region, in which the plough can only penetrate the ground in a few isolated spots.

"Some farms, favourably situated near the railway and the larger towns, can often be worked profitably, but if the sale of vegetables, maize and potatoes is the farmer's only resource, he will be ruined in dry years. He should breed cattle chiefly, and besides cattle-breeding, every farmer should cultivate a limited area, and conserve a sufficient supply of water for his cattle and crops. Crop-growing is a secondary consideration, but can be made very profitable in good years."

If "garden culture" *only* be decided upon, the ground must be very carefully chosen. Windhoek, Osana, Okahandja, Omaruru are favourable places, but land is very dear, the price having been fixed by

Government in 1907 at from 75 pfennigs to 1.50 mk. per hectare, and taxes. Herr Hermann also warns new settlers that they must be prepared to compete with people already established. He considers that tobacco growers with experience and capital might do well; fruit growers require to be equipped with great experience, and be prepared to work in the country a long time before they can learn the local conditions. Their ultimate success, he contends, will depend upon the amount of their capital.

But if Herr Hermann sees but a poor and uncertain prospect before the agricultural future of the Protectorate, he can be enthusiastic upon its possibilities in one respect. "The whole country," he writes, "is open to cattle-breeders. Every blade of grass, every leaf, every shoot, possesses unusual nourishing properties. This is proved by the fat, good condition and strength of the cattle, mules, horses, &c., that are fed on this dry but extraordinarily nourishing fodder, even after a ten months' drought. . . . One district is best for cattle-breeding, another for small stock, another for horse-breeding, but cattle can be raised everywhere; even the most desolate districts, which look like veritable deserts to the new-comer, can be turned to account by grazing the cattle over a large area—to make up for the scanty grazing. Sufficient water for cattle can be obtained in almost every district."

This high opinion of the possibilities of the region as a cattle land is corroborated by Dr. Rohrbach, who, as a Commissioner entrusted by the German

Government with the formation of a scheme for the systematic settlement of the country, travelled extensively in the Protectorate and published an extremely careful and valuable report. "In spite of the varied nature of the land," he concludes, "from the Orange River in the south to the Cunene in the north, and from the Namib in the west to the Kalahari in the east, its vegetation and conformation are those of a sub-tropical steppe and grazing country, which is marked out by nature herself for cattle-raising. Although this is evident, South African cattle-breeding cannot be undertaken on an extensive plan, as in Germany, where the cattle are kept under cover during the winter, and roots, hay &c., are grown to feed them with; where high milk and meat-production are assured, and large dairies are supplied. Milk products can only be sold at a profit in South-West Africa in the vicinity of the larger towns, and the cultivation of fodder is limited to a very few places. The grazing veldt in South-West Africa has no resemblance whatever to European fields or mountain pastures. Instead of a green sward, isolated clumps of grass grow here and there with bare ground between them. The grass growing on a certain given area is, therefore, in no way proportionate to its size; nor does the farmer allow the cattle to eat down his whole veldt between one rainy season and the other, as the expected rain of the following year may be insufficient or too long delayed to revive the exhausted grazing lands. Droughts are particularly frequent in the south of

the Protectorate. As the animals of South Africa are always in the open, great tracts of grazing land are necessary for their support. In South-West Africa 10 to 20 hectares of grazing land are reckoned to one ox, &c. ! Hence a farm of 1,000 hectares can only feed a few hundred head of cattle and a few thousands of small stock. The ordinary size of a farm in the colony is, therefore, from 5,000 to 10,000 hectares. Those who look upon the colonies with an unfriendly eye maintain that German South-West Africa is of no value to Germany, as only a few thousands of farmers could find room to settle there with profit. This opinion will not bear close investigation. The total area of the country is 800,000 square kilometres, of which about 500,000 sq. km. can be turned to account as grazing land. This corresponds to a total of 50,000,000 hectares, or 5,000 individual farms. 'So then,' say the opponents of our colonial policy, 'all the enormous efforts of these last years have been made for the sake of 5,000 farmers!' This certainly sounds like a very plausible argument. But it is not the number of South-West African farms, but their material importance as a market for the German home trade which is their chief value. Each farm requires every year several thousands of marks' worth of necessaries from Europe, of which the greater proportion are building materials, which have to be imported. South African trees do not produce good building wood, and beams, windows, doors, as well as galvanized iron for roofing, furniture, dress materials

and tools, all have to be imported. A farm must also be supplied with wind-motors, pumps, drainage pipes, &c.

“As the agricultural development of South-West Africa progresses, the population outside the farming districts will increase with it. Even to-day, when the whole country is far from being completely occupied, the large towns—Windhoek, Swakopmund, Luderitzbucht—have from 1,500 to 2,000 white inhabitants. Large towns, in the European sense, cannot develop in a purely agricultural country, as may be seen in the case of British South Africa. But the great importance of the mineral treasures of the colony must not be overlooked. In South-West Africa at present we only possess the diamond fields of Luderitzbucht, and the copper mines of Otavi and Tsumeb; but if other large deposits of valuable minerals are discovered—which is by no means unlikely—a strong development would set in, such as that of the Transvaal. As soon as large mines exist, the population and the revenue from trade increases, independently of agricultural profits. Even now the total value of the imports into South-West Africa is over 30,000,000 marks, and even supposing that no extraordinary discoveries are made, this sum can easily be doubled in the course of the next decade. The importance that our colonies are beginning to assume as a market for the home industries is therefore evident, and South-West Africa, when fully developed, will be well able to maintain a population of several hundreds of thousands of white men.”

On April 1st, 1913, there were in German South-West Africa 1,255 farms in private hands, with an area of 13,393,606 hectares, and the number of white male adults employed in farming was 1,587. Of these farms, 1,060 were occupied and 195 lay idle. The country had been devastated by the recent drought, and the climatic conditions in that year were most unfavourable to the industry. As a result, the crops, other than those under irrigation, were a total failure. The farmers, and consequently the majority of the merchants, were affected by protracted drought, which would have been felt more seriously had the railway lines not been completed. In spite of the railways it would have been a black year for the whole of the colony if the Land Bank had not been sanctioned. The prospects of relief from the financial strain of the last few years kept hope alive, and enabled the merchants to carry over the trying period, when money was scarce and dear in Germany, and the farmers, instead of reducing their outstandings, were compelled to ask for an extension of credit. It was only the impending introduction of new capital that induced creditor and debtor to carry on until the establishment of a Land Bank with a capital of £500,000 would bring relief.

Although the Land Bank will pass away with the passing of German rule in South-West Africa, it is interesting to review its constitution and ascertain what the Government intended to do on behalf of the farming and agricultural community. The



object of the bank was to supply the farmer with capital at a reasonable rate of interest under a bond that could not be called up as long as the interest and other charges were duly paid, and which provided easy terms for the repayment of the principal. The rate of interest was fixed at 6 per cent., and the repayment of the principal sum was to be made by means of annual instalments amounting to  $1\frac{1}{2}$  per cent. of the total sum advanced. This compared very favourably with the rate of interest then ruling, which was 8 per cent. or more, under a bond which might be called up on short notice.

Under its regulations the bank was only to be permitted to make advances equal to half the estimated value of the property offered by way of security, but some farmers were already indebted for a greater amount than the bank could advance. Unless special provision was made, such persons would not be able to obtain any assistance from the bank. But as it happened they were so numerous that they had to be brought within the sphere of the bank's operations if the country as a whole was to prosper, and it was proposed to overcome the difficulty in the following manner. The holders of existing mortgages were to be invited to confer with the Land Bank and the debtor, and asked to agree that advances made by the bank should rank as a first mortgage.

On the other hand, the bank was to undertake that if a second or later mortgagee should be compelled to buy in the property\* in order to protect his claim, in the event of the bankruptcy of the debtor,

the bank was to allow the purchaser to step into the place of the debtor with regard to the loan made by the bank, and allow him the same conditions as to interest and repayment as were granted to the original debtor. It was anticipated that no practical difficulties would hinder the adoption of this plan, as the position of existing creditors would be bettered rather than damaged if an agreement was arrived at.

If the farmer was enabled to liquidate the whole or part of his indebtedness to the merchant, it would have the effect of reducing the burden which he had to bear and at the same time relax the strain upon the merchant's credit, for which relief both parties would breathe more freely. Business generally would be placed upon a sounder basis by the separation of the functions of merchant and banker.

The bank was also to provide fresh capital for increasing the productivity of the farms. Where money was advanced for the purpose of effecting improvements it was to be paid over to the farmer in instalments, the amount of which would depend upon the actual progress of approved works. The increased value of the farm would be the security for the advances made. The farmer would thus be able to equip his farm so as to yield the best results, and it was hoped that the industry would enter upon a period of rapid and continuous expansion.

When all the money, for which real security was provided, had been borrowed, further sums would have to be provided from time to time, the lack of which might seriously jeopardise the position of the

farmer. Payments might fall due at a time when the farmer was unable to realise his produce to advantage, and a little ready cash might make a considerable difference to him. In order to meet this want the Land Bank decided to foster the establishment of co-operative societies for the sale of produce, the purchase of certain articles in bulk, and the provision of personal credit on the joint security of the members of such societies to the amount of the share capital subscribed by them.

During 1913 the veldt, for the greater part of the year, was in a wretched condition owing to drought, but the stock withstood the effects of a disastrous season in quite a remarkable manner. The number of animals increased at a faster rate than the population, and the prices at the end of the year were somewhat better than at the beginning. The drought had some influence upon the upward trend, while the market was relieved by the supply of meat to the steamers that call at the ports, and to the whaling station in Walfisch Bay. During the first six months of the year the value of the meat thus disposed of amounted to £3,630. Sheep and goats were once more permitted to enter the Union of South Africa, which took close on to 30,000 small stock for slaughter purposes during 1913. This improved the market prospects and put fresh life into the southern districts of the Protectorate.

The number of cattle was 205,643, an increase of 33,859. This must be regarded as a satisfactory increase. There was very little sickness among the

cattle, tuberculosis being conspicuous by its complete absence. *Lammziekte* may have been a trifle worse in the Kalahari owing to the drought. Anthrax and *sponziekte* claimed a certain number of victims, but as farmers gain more experience in connection with these diseases it may be anticipated that they will abate. There was a small outbreak of lung sickness near the Etoscha Pan among cattle that had come down from Ovamboland. The whole herd was immediately slaughtered, and there was no recurrence of the disease.

During the year the Government imported a number of bulls and cows from Germany, both on its own behalf and on account of private persons, with the object of improving the cattle of the country. Breeding cows were in great demand, but as the import of cattle from the Union of South Africa was forbidden, and very few farmers in the German Protectorate had cows to sell, not many changed hands. Newcomers found it difficult to get enough cows together to make a start.

Woolled sheep numbered 53,691, an increase of only 6,790. A combination of drought and scab seems to be the reason for the relatively small increase. One farmer lost 4,000 sheep out of a total of 5,000. It was considered advisable to establish herds of pure-bred wool sheep in preference to crossing Afrikander sheep with pure-bred rams. Towards the end of the year, 1,400 high-class flock sheep arrived from Australia. They were purchased on account of various farmers. The farmers paid the

Australian cost price, which amounted to £2 2s. apiece, while the Government paid the cost of transport, which came to something like £4 10s. per head. The venture was so successful that it was decided to import a fresh lot.

The number of pure-bred Karakul sheep was 776, and the total of half-bred Karakuls increased to 10,418. With the experience that has been gained, it is expected that the increase of Karakul sheep will be more rapid in the future. It is said to be the hardiest sheep in the country, and the sample skins of half-bred animals which have been sent to Europe give promise of the establishment of a lucrative industry. Karakul sheep were first imported into the colony from their native Bokhara in 1907, being regarded as specially suited to the sandy soil. Since 1909 there has been a Government farm for the breeding of these sheep near Windhoek. The Karakul sheep has been crossed with the native African sheep with the most satisfactory results, and it is now understood, according to the information available at the Imperial Institute, that the industry is an established success, the sheep having found on the higher plateaux of German Damaraland and Namaqualand, climatic conditions not far removed from those of their original habitat. Prices as high as £2 or even more are obtained for an exceptionally good lamb skin, but the industry can, it is believed, be carried on at a profit if from 10s. to 15s. are realised per skin. Afrikander sheep in the colony in 1913 numbered 472,585, and Afrikander goats 485,401,

in addition to 13,340 Angora goats and 18,163 half-bred Angoras.

A very satisfactory increase of 2,576 in the number of horses in the colony in 1913 brought up the total to 15,916, while the quality of the animals continued to show an improvement. Mules and donkeys numbered 13,618.

Ostrich breeding promises to be a lucrative industry. Although the total number of birds is only 1,507, a number of first-class breeding chicks have been introduced from the Cape province, and the improved quality more than compensates for the reduced rate of increase in number. Chicks bred in the colony from good birds are beginning to fetch a fair price, but the expenses in connection with successful ostrich farming are so high that it only pays to keep the very best class of bird. The value of the feathers exported in the first six months of 1913 amounted to over £2,000.

## GEOLOGY AND MINERALS

**I**N his remarks on the German geological map of German South-West Africa, Professor Schenk traces the formations which give the country its plateau-like character. These formations are steep and rocky, and overlie the primary mountains in a confused mass of horizontal layers of sandstone, schists and limestone of the Nama and the Karoo formations. In addition to these are recent sedimentary rocks which may have originated in the quartzite period, and which form the covering stratum to the older rocks in many places. The primary mountains of the South-West African table-land consist of gneiss and other crystalline schists, which are known as the South-African primary formation. Their ages in relation to each other and to other formations beyond Africa cannot be estimated, owing to the absence of fossils. It is assumed, however, that they correspond partly with the Carchaic and partly with the Palaeozoic formations of Europe. Four distinct formations are distinguishable—a gneiss formation, a gneiss and schist formation, a schist formation, and a loadstone formation. The gneiss formation is widely extended over South-West Africa. It is composed of coarse-veined gneisses and granite gneiss, some amphibolites and, here and there, crystalline limestone, and is intersected by huge masses of

intrusive granite. In the north this formation extends from Angola across the Cunene to Kaokoland. It gains in breadth further south, and in Damaraland it stretches furthest east to the region of the tributaries of the Ngami basin.

In Great Namaqualand almost the whole of the desert coast country, to a width of from 80 to 150 km., is composed of rocks of this formation. It also appears in the valleys of the Huib Plateau under the Nama strata and, in a few places, outcrops through it. It is also to be seen in the Little and Great Karas Mountains, covered, in the former, by recent strata, and edged by them in the latter. In the Orange district the gneiss formation extends towards the east as far as the frontier of the Protectorate. In the centre of the country, on the boundary between Damaraland and Great Namaqualand, Komasschists, which also belong to the South African primary formation, take the place of the gneiss formation. There are fine-veined gneisses, micaceous and other crystalline schists and enormous masses of quartzite. The Komasschists extend from the central Kuiseb to the east of Windhoek, and form the Komasshighlands, the Auas Mountains and the Onjati Mountains. The rocks which extend in a broad tract, 40 km. wide, towards the coast on both sides of the estuary of the Orange River, and northwards as far as Sinclair Island, are somewhat different from the Komassschists, being grey schists with strata of siliceous schists, quartzites and light-blue crystalline limestone. Passarge found in various places in the



Kalahari, especially in Chansefeld, steep reddish to grey loadstone—chansewacke—which he includes in the primary formation.

Following the line of the railway from Luderitzbucht to Keetmanshoop, one enters the table-mountain region east of Auas. Between Auas and Bethanien the Huib Plateau is deeply intersected by valleys. Here, overlaying gneiss and granite, are flat stratified table-lands of the Nama formation, close to the Huib strata formed by conglomerates and quartzite sandstones covered by blue-black dolomite-limestone—the Otavi limestone.

East of Bethanien rises the Hanami Plateau, formed, in the west, of green schists and bright-coloured sandstones. In the east, towards the Fish River, these are covered by masses of reddish schists and red-coloured quartzites—known as the Fish River schists. These schists—the green schists and sandstones as well as the red schists and quartzite—are classed as Hanami schists, as the limit of the upper and lower division is not yet defined. As the Otavi limestone on the western edge of the Hanami Plateau is also covered with green schists and sandstones, as well as with red-coloured Fish River schists, it is also taken as belonging to the Hanami schists.

Whereas isolated masses of sandstone, west of Rehoboth on the Gansberg and in the Kaokofeld as far as the Cunene, may be included in the Huib sandstones, red sandstone, belonging to the Fish River schists and overlaying the Otavi limestone,

appear in a few places on the Waterberg in North Damaraland. The Otavi limestone is most extended in the neighbourhood of Otavi, whence it stretches westwards, and also occurs in isolated masses in the Kaokofeld and in West Damaraland, where it lies partly directly above the granite and partly upon conglomerates and the quartzites of the Huib schists. In the Kalahari, Passarge's Ngami schists may correspond with the Nama formation.

Dr. Paul Range, in a paper read before the Geological Society of South Africa in 1914, made the following remarks upon the geology of German South-West Africa:—"Studt believes that Passarge's Maseganite formation and Wagner's Inselberg Series represent the Swazi System in Damaraland. I should rather like to correlate them with the Ventersdorp System, while Wagner is of opinion that some of the conglomerates may represent the Banket of the Witwatersrand. From other parts of the country I have never seen conglomerates resembling those of the Witwatersrand, and I believe also that Kuntz would have observed them if they existed in the Kaokofeld, the north-western part of the German Colony, about which he and Krause lately gave valuable geological information. Voit, in 1904, divided the crystalline coastal belt of Damaraland into three horizons, as follows: (1) A granite gneiss zone; (2) a gneiss-schist zone; (3) a schist zone. Corresponding with his observations, I divided the 'Primär' formation of Great Namaqualand also into these three horizons. I may state that they

are only of value till we have more detailed observations and are able to classify that formation better. The upper division of the Transvaal System exists also in German Namaqualand, and is represented by the Schwarzrand series, which consists of conglomerates, grits, gray and green sandstones and black shales; they are well developed in the district of Maltahöhe. Further south in Little Namaqualand—where I stayed in April, 1913, and had a look over the country under the guidance of Dr. Rogers—the Steinkopf beds correspond with the 'Kuibisschists' in Great Namaqualand. Their correlation with the formations farther south is given by Rogers in his paper, 'The Nama System.' To correct my geological map of 1912, I may add that the Karoo formation extends to the Orange River at Velloer Drift and Aussenkehr. As mentioned before, Kuntz investigated the Kaokofeld in 1910 and 1911, and noticed large sheets of amygdaloidal diabase and similar volcanic rocks underlain by soft gray and yellow sandstones; the complex is named Kaoko formation according to Gürich. Although Kuntz did not observe typical Dwyka conglomerate, he believes that the sandstones belong to the Karoo formation, and that seems very probable. So far as I know, the glacial conglomerate thins out near Kubub in Great Namaqualand (Bezirk Gibeon). South of that place I observed it only a few feet thick; there it is overlain by a large sheet of amygdaloidal melaphyre, stretching to the east into the Kalahari. Rimann observed the higher horizons of the Karoo

formation in the Gobabis district on the Nossob and near Aminuis, represented by a sheet of diabase underlain by black shales. According to the observations of recent years, the northern border of the Nama formation is given by the Nawkluft, Tsennis and Okasewa east of Windhoek. I believe that great parts of the 'Sandfeld' north-east of Windhoek are also underlain by Nama formation. In Hereroland only some elevated mountains are capped by this formation. Cloos observed in the Erongo, north of Karibib, quartzites probably corresponding with the Kuibis quartzites, overlain by amygdaloidal melaphyre and said volcanic rocks, such as porphyry, porphyrites and tuffs. That author also observed a younger granite on the southern side of the Erongo, besides the well-developed older granite, the latter with pegmatitic veins containing cassiterite, discovered in 1909, and since worked with more or less success. Farther north the Nama formation covers the Otavi Mountains, the Waterberg Plateau, and a great part of the Kaokofeld, chiefly developed as Otavi-dolomite and Kuibis-quartzite. The fossils of the Otavi-dolomite are pseudo-fossils, as Gürich states, so that we have no palæontological evidence for the age of the Nama formation. I believe that great parts of the Ovamboland and the north-eastern Sandfeld are also underlain by horizons of the Nama formation and perhaps of the Karoo formation, and that the sand of this immense tract of country takes its origin from the sandstone horizons of these formations. Wagner mentions outcrops of Botletle series

on the Okavango. Older rocks exist on the south of the Okavango near Andara, and on the Zambesi at Katima Molilo and Kasungula, but it is not yet quite clear to what formation they belong. The younger formation in the coastal belt of Luderitzland is not of cretaceous age. The determinations of Merensky are not confirmed by newer investigations, which give clear evidence that the sandstones, clays and conglomerates of Bogenfels belong to the middle Tertiary; quite the same results were obtained by Schwarz concerning his Alexandra formation. If I add that in 1911 I discovered a series of porphyries, porphyrites, tuffs, and conglomerates underlying the Nama formation and overlying the primary formation with breaks, in the districts of Maltahöhe and Bethanien, in Namaqualand, stretching from latitude  $24^{\circ}$  to  $26^{\circ}$  in a long strip on the  $16^{\circ}$  of longitude, which I named Konkip formation, and correlated with the Ventersdorp system of the Transvaal, the sequence of the strata in German South-West Africa compared with other parts of South Africa may now be shown as follows:—

<i>German South-West Africa.</i>	<i>British South Africa.</i>
Kalahari Surface Deposits .. .. .	} Kalahari System.
Botletle Beds .. .. .	
Middle Tertiary of Luderitzland	Alexandra Formation.
Karoo Formation .. .. .	Karoo Formation.
Nama Formation .. .. .	} Waterberg System. Transvaal System.
Konkip Formation .. .. .	
Primary Formation .. .. .	Ventersdorp System.
	Primary Formation."

In 1681 the Hottentots brought pieces of copper ore, which they declared they had broken off in their native mountains, to the Boer Governor, Simon van der Steel, who, four years later, explored and reached the copper mountains of Little Namaqualand. Eighty years later white men crossed the Orange River and embarked upon the first economic enterprise of German South-West Africa. In 1760 Captain Hendrik Hop, commanding a party of Boer Cape Militia, penetrated Great Namaqualand, and returned with the news that rich copper was to be found there. In 1791 another party of Boer prospectors, who went to search for gold, returned with the news that there was copper in the Namib. In 1793 another party landed at Possession Island, Angra Pequena and Walfisch Bay, and more copper was found, but not gold, as was expected. Mining began to develop in earnest in 1850. These first efforts to penetrate South-West Africa are of interest, as showing that they were undertaken with a view to mining.

The export of copper in the first half of 1913 to the value of £156,106—as against £118,228 in 1912—makes copper mining, after diamonds, the most important mineral industry in the Protectorate. The best known copper mines now working are the Otavi Mines in North Hereroland, the Pot Mine on an island in the middle course of the Swakop, the Matchless Mine on the Komass Highlands west of Windhoek, and the Hope and Gorob Mines in the Namib.

The Otavi Mining and Railway Company is still

the colony's principal exporter of copper, and the following particulars, derived from the British Consular Report, give a comprehensive idea of the progress of the industry. During the year ended March 31st, 1913, the Otavi Company mined 54,000 tons and shipped 44,500 tons, with an average of 13 per cent. copper, 25 per cent. lead, and 230 grammes of silver per ton. During the same period 665 tons of copper matte, containing 48 per cent. of copper, 25 per cent. of lead, and 400 grammes of silver per ton were shipped, as well as 400 tons of crude lead, containing 98 per cent. of lead and 910 grammes of silver per ton. The reduced ratio of lead to copper shipped is explained by the fact that a considerable amount of galena, which was formerly used in the process of smelting, was sold at a good price, and iron pyrites substituted in its place.

The rate of shipment was accelerated during the six months ended September 30th, 1913; 25,660 tons of copper, 507 tons of copper matte and 45 tons of crude lead being exported. The prospects of the company have been improved as the result of development work. The continuity of the ore to greater depths in the Tsumeb Mine has been proved. It has also been ascertained that the copper ores in the Otavi Valley, which contribute some 2,000 tons to the total shipped by the company, belong to the same formation as the Tsumeb occurrence. The strike of the pockets is along a line of weakness forming an ore-bearing zone in the surrounding dolomitic country rock. The formation makes the company hope that

the Otavi Valley mines will prove payable to greater depths, and that fresh mines may be opened up in the zone between the Otavi Valley and Tsumeb and west of that place.

Working costs were reduced from £1 3s. to £1 per ton in the Tsumeb Mine. A tandem hoisting engine and an electric alternate plant, driven by a Diesel motor, were added to the equipment of the mine. Successful experiments with a new method of treating the eruptive rocks, in which some copper ore also is contained, by wet mechanical process, were carried out in Germany. An installation capable of treating 50 tons per diem, and combined with an up-to-date sorting plant, has been ordered.

The Otavi Exploring Syndicate, which is engaged in development work, and the Otjozongati Mine also shipped a small quantity of copper ore during 1913.

Development work has been resumed in the Henderson Mine in the Khan Valley, the Ida Mine near Huseb, and the Sinclair Mine in the Maltahöhe district. The Khan Copper Mine has been opened up along a length of 1,200 feet and to a depth of 690 feet. The reef is a little over 6 feet in width and contains from 7 to 8 per cent. of copper. There is a junction line from the Otavi Railway to the mine, which is equipped with a main engine (fuel, crude oils) driving a central electric plant capable of developing 560 horse-power. The concentration plant was to have been ready in April, 1914, when the mine was expected to become a factor in the German South-West African copper mining industry.



New discoveries, which promise well, have been made in the Bobos Mountains in the Tsumeb district and on the farm at Okatumba West in the Windhoek district.

According to Professor Dowe, the Kaokoland copper ore belongs to the same zone as British Little Namaqualand. Its occurrence has been known for some time, and it has been worked in some places. The occurrence of copper ore is connected with seams of other ores that intersect the gneiss. The most usual form of the occurrence is known throughout the whole of South Africa as a "nest." Although many experts ridicule the theory that the ore occurs in this form only, it does not follow, if correct, that these "nests" contain only small quantities of ore. The celebrated copper mines of Ookiep, in Cape Colony, are, according to Schunk, only "nests," and many "nests" of considerable extent have been found in the Protectorate.

The general features of the ore "finds" in Damaraland and the neighbouring districts have been theoretically connected by Dr. Schultze as follows: The copper ores originally equally distributed throughout the crystalline schists—the origin of which is uncertain—were dissolved by the circulation of water and set in motion. Cracks in the crust of the earth decided the formation of these ore-strata. Quartz seams and lenticular deposits filled the cracks; mineral solutions trickled into them and deposited their ores. Denudation of the impregnated rock and oxydation gave rise to further

changes of form in the upper strata. General though this description may be, it presents the deposits of Damaraland—so varied individually—in a clearer light.

The existence of gold in South-West Africa has been proved at a number of places, but whether it occurs in sufficient quantities to justify mining is a question to which no definite answer can yet be given. At times active prospecting work was proceeding on the extensive auriferous and argentiferous quartz lodes at Kunjas (about 110 km. north of Auas), where 206 precious metal claims were pegged out. Near Zwartmodder, in the Rehoboth district, prospecting for gold was started on claims selected by the Deutsche Kolonial Gesellschaft, and nuggets have been found in the alluvial of the Neineis Tinfields. No systematic development work, however, has been done on the Kunjas claims, and hopes have been so often raised and disappointed in connection with gold discoveries in the Protectorate that there is a tendency to become sceptical about the prospects. Dr. Karl Dowe makes the confident, if cautious, assumption that the composition of the South-West African rocks can hardly be as rich in gold as those on the eastern side of South Africa; but he agrees with Schenk that the gold-bearing rocks are connected with the strata in which the copper of the country is found. If richer gold-bearing lodes should be discovered, Professor Dowe declares, one thing must be emphasized, and that is the probable absence of that form of occurrence in which the metal

can be most easily extracted from the ground, i.e., extensive washing-fields. "In a country where the rivers rush rapidly to the coast, bearing with them masses of decomposed rock from the higher mountains," he writes, "extended and rich gold strata can hardly be counted upon. That these have been found, small in size, and in isolated places, cannot be denied. A little river gold was actually found, for instance, in the bed of the estuary of the Swakop River in 1892. But a few months after the discovery was made, a thorough examination of the place proved that the strong current then running had washed the whole gold-bearing sandbank down to the sea. If gold-bearing sands such as these can be counted upon, they must be limited especially to the western area of the colony; for the further one proceeds eastwards, and meets with considerable tracts of disintegrated soft soil, the deeper must they lie below the surface.

"The expense of extracting ore from the primary rock makes it impossible for poor, individual miners to attempt it; only companies with large capital at their command, such as those of the Transvaal, can work such mines. The opening up of gold mines would give as great an impetus to the prosperity of the country as did the discovery of diamonds. I agree with von Bulow and others that there is more probability of their being discovered by granting a number of prospecting rights to a number of more or less experienced diggers than by forming one big exploratory expedition."

In February of the present year the *Deutsche Sudwest-Afrikansche Zeitung* announced that in the stanniferous Neineis district some finds of gold, including several nuggets as large as walnuts, had been made. Great importance was said to attach to these discoveries locally, and a number of tin areas were converted into gold claims and worked as such. Up to the present the announcement lacks official confirmation.

The tin discoveries in the colony have not yet led to the establishment of an important industry, although during the first six months of 1913, 101 tons of concentrated tin ore, valued at £16,340, were exported. The tin was obtained from alluvial ground, found in the neighbourhood of outcrops of pegmatite and quartz, which are a frequent occurrence in the hinterland of Swakopmund. A considerable amount of money has been sunk in examining these reefs, and it has been found, so far, that the tin content is too irregular and patchy to be payable. Attention has therefore been concentrated upon the alluvial deposits, which are found in a good many places, and promise to form a steady source of profit for some years to come. Lode tin has been produced in small quantities by the Anglo-German Tins, Limited, on their Etemba claims. The crude ore, averaging 66 per cent., was reduced by hand separation to concentrates and slimes containing from 60 to 69 per cent. metallic tin. The erection of a reduction plant with a capacity of 100 tons daily, estimated to cost 200,000 marks, was started in

October, 1912, but no reports of the progress of the work have been published.

The latest information respecting the Anglo-German Tin venture, contained in the Directors' Report, issued in July, 1914, is not particularly satisfactory. It appears that the shareholders, having declined to subscribe further capital to provide for the company's pressing liabilities, resolved to abandon all the original Dawib claims and to leave the matter of the offer to tribute in the hands of the directors to make the best arrangement possible. A tributing agreement was accordingly entered into with William Weber, the consideration being the payment by the tributors of all the company's outstanding liabilities in German South-West Africa at the end of the year, plus payment of the German Government royalty of 2 per cent. and a tributing royalty to the company of  $7\frac{1}{2}$  per cent. on the proceeds of all tin sold as returned by the smelters in Europe. This agreement is still in force, and the tributors are actively working the claims. Advices show that 23 tons of concentrates were shipped in February and March, 1914, whilst at the end of May a further nine tons was bagged ready for shipment, but this was held against an anticipated rise in the price of tin.

## DIAMONDS AND THE DIAMOND INDUSTRY

### THE SOUTHERN DIAMOND FIELDS

THE progress made in German South-West Africa during the last few years would have been impossible had it not been for the discovery of the diamond fields in 1908. When Luderitz built his factories at Angra Pequena, and two years later secured the protection of the Imperial Government for them, he based his hopes on mining enterprise. He even had diamond washing carried on in the Orange River. But the fact that he sought for treasures which lay in quantities at a short distance inland in the sands of the desert did not enter anyone's head. Many times he and his men explored the Namib without discovering the wealth hidden at their very feet.

Persistent rumours of the finding of single diamonds in the Gibeon district, in which the occurrence of blueground pipes were well known, led in 1903 to the founding of a German company which succeeded in obtaining a concession for the systematic prospecting of the Gibeon and Berseba region. These operations met with no success, and in 1910 the enterprise was abandoned. Meantime, further rumours spoke of the existence of minerals in the coast area between the Orange River and Luderitzbucht. In 1905 and 1906 guano workers on the English coast islands were said to have found

diamonds. It was at this time that the English "expeditionary" ship—the *Xema*—appeared off the coast for the purposes of exploration, but although the expedition landed and explored various places on the mainland, the enterprise met with no success. Thereafter all expectation of finding diamonds in the colony was abandoned until the spring of 1908, when an incredulous world learnt that not only had rich discoveries been made, but that the first stones had been found in a district which, in consequence of Hottentot risings and railway construction, had been traversed by hundreds of soldiers and railway employees. The discovery was actually made in April, 1908, by a Cape "boy," a former employee of the De Beers Company, who, while working on the railway line in the vicinity of Kolmanskop, picked up several stones, which he at once recognised to be diamonds. The stones eventually got into the hands of a railway official of the name of Stauch, who has been described by Dr. Meyer as the "intellectual discoverer" of the Luderitzbucht diamond fields.

In 1907 August Stauch was appointed railway superintendent on the Luderitz-Auas Railway, and was responsible for keeping the line clear of sand in the dune region. In the course of his duties he realised the possibility of discovering valuable minerals, both in the primary rocks that rose to the surface, and in the conglomerates which partly covered great areas. The desert between the 12 and 17 kms. of the railway is of peculiar interest to the traveller. It consists chiefly of flugsand intermixed

with micaceous laminæ, and particles of quartz worn away by the wind from 3 to 4 mm. in thickness, rock crystal, agates, ferruginous quartz, and magnetic iron ore. Not only the uninitiated, but men of science were struck by the unusual appearance of this sand, and were incited to examine it. Dr. Lodz, the geologist, who was stationed at Luderitz Bay during the rising, sent samples of the sand to Geissen for examination after the actual discovery of diamonds at Luderitzbucht, but no traces of diamonds were found in it.

Stauch was sufficiently optimistic to procure two prospecting licences and to instruct the native navvies to bring him any curious or unfamiliar stones they happened upon in the course of their work on the railway line. The natives laughed at the idea of diamonds being found, but some of them seem to have kept a sharp look-out, and a fortnight after the order was issued the first Luderitzbucht stone was discovered.

Stauch immediately pegged out claims, and set himself to discover the origin of the stones; it was not to be supposed that the existence of a solitary diamond justified the prospect of profitable mining operations. He knew that the sands are always shifted by the regular and violent sandstorm which rages in October in the prevailing direction of the wind from south to north, and he prospected the district in a southerly direction. On the strength of another licence, obtained from the Deutsche Kolonial Gesellschaft, he laid out as a claim a tract of country



about 3 km. broad, commencing 2 km. north of the railway, to the spot about 7 km. south of the railway where the original stone had been discovered amongst the decomposed rubble. He camped out on his claim, and quickly realised that it was quite possible for diamonds to occur in the masses of sand in the valleys, independently of the existence of blue ground. In Luderitzbucht the news was received with the utmost scepticism, and Stauch was ridiculed as a dreamer. On the 20th June, 1908, he arrived in Swakopmund, and showed his find—in accordance with the prospecting regulations—to Dr. Range, the Government geologist, who confirmed the opinion of the Cape "boy" and the lucky railway official.

This confirmation was followed by a great rush on the part of the inhabitants of Luderitzbucht to participate in the wealth which had been literally spread out at their feet. In an incredibly short space of time all the ground open for pegging in the vicinity of Luderitz Bay had been taken up, and some of the bolder spirits now began to organise prospecting parties, which, in the face of enormous difficulties, explored the desert in all directions, and were rewarded by the discovery of exactly similar deposits in the littoral, both to the north and to the south of the area in which the original finds had been made. The search was subsequently taken up by large expeditions sent out by the various companies which had been formed to exploit the gravel occurrences, and within eighteen months of the date of discovery the whole of the dreaded coastal belt between

Walfisch Bay and the mouth of the Orange River had been more or less thoroughly prospected. Attempts were also made by an enterprising syndicate to dredge the sea-bottom off Elizabeth Bay and Pomona, until work of this nature was prohibited by an Imperial Decree, which vested all rights for the search of diamonds on the ocean floor in the Colonial Treasury.

In the meantime Stauch had not been idle, but had pushed south and pegged out a large claim as far as Elizabeth Bay. When he arrived at Elizabeth Bay his operations towards the south came to a standstill, as the diamondiferous ground seemed to have dived under the sea. In consequence of this he limited his efforts to general prospecting in the district bounded on the south by Elizabeth Bay; on the north by the great shifting dunes; on the west by the sea coast; and on the east by the Elizabeth Mountains.

The diamond fever soon abated owing to the lack of transport, water and vegetation, and various prospecting companies, such as the Swakopmund-Schuerf Gesellschaft, the Keetmanshoop Diamanten Gesellschaft, &c., took the place of men from Luderitzbucht and Cape Colony. A remarkable event which took place at this time was the discovery by Klinghardt, of the Bogenfels Diamond Fields, in October, 1909, and the discovery of diamonds in the Pomona district, by Prof. Scheibe and Stauch. The former attracted attention owing to its great distance from the spot where the first

"find" was made, and the latter because of the enormous diamondiferous richness of the place, and the number of large-sized diamonds secured. Klinghardt, then employed by the Deutsche Kolonial Gesellschaft, recollected having seen a peculiar gravel formation on the Kubub Farm, which he had formerly managed, and he subsequently succeeded in inducing his chief to form a camel corps and to prospect the country. Klinghardt started from Kubub, and passing through Kaokausib in the direction of the Bogenfels, ascertained that the diamondiferous deposit extended into the Bogenfels district. Later discoveries confirmed the fact that it stretches even further south, and the last spot where diamonds were discovered by Stauch and Professor Scheibe, of the Mining Academy of Berlin, is in the vicinity of Sinclair Island, about 150 km. south of Luderitzbucht.

Dr. Percy A. Wagner in his *Diamond Fields of South Africa*, from which the following description is largely derived, writes that the diamondiferous deposits, hitherto located within the littoral of German South-West Africa, extend intermittently from Conception Bay, latitude S. 24 deg., to Angras Juntas, latitude S. 28 deg., a distance as the crow flies of about 270 miles. In no portion of this tract of country have the gravels been found at a greater distance than 12 miles from the coast, which circumstance, coupled with the previously recorded occurrence of diamonds on Possession Island, renders it clear at the outset that the deposits must in some way stand related to the sea. Owing to the small

average weight of the diamonds which they yield, and their shallow and patchy nature, none of the extensive tracts of gravel between Luderitz Bay and Conception Bay have as yet proved worthy of exploitation, and this account concerns itself more particularly with the deposits situated to the east and south of Luderitz Bay.

Within the area under review, the rock-bound coast, swept by the powerful Benguela Current, rises rapidly from the sea, being in places bordered by precipitous cliffs up to 200 feet in height. Farther inland one finds broad naked ridges and isolated chains of hills, with a prevalent north-to-south trend, alternating with flat-bottomed valleys and hollows occupied by sand and detritus. To the east of Luderitz Bay there is a considerable depression which extends from Gallovidia Bay, some miles to the north of Luderitzbucht, to Elizabeth Bay; being traversed by the Keetmanshoop railway between kilometres 16 and 17. Within this depression and in a minor valley, by which—to the south of the railway—it is parallel on the east, are situated the important Kolmanskop, Stauch (Koloniale Bergbau Gesellschaft), and Fiskus claims. Forming the eastern boundary of these claims is a mighty belt of sand-dunes which stretches without a break from Elizabeth Bay to Walfisch Bay. To the north of Luderitz Bay the dunes extend almost in a straight line along the coast, and in several localities border directly on the sea. South of Elizabeth Bay, where a dry river bed coming from far inland enters the sea,

the country assumes a more rugged character, and in the Pomona area the diamondiferous deposits are confined to a number of persistent valleys hemmed in by steep-sided hills. The entire coastal belt, for a distance of about 80 miles inland, is to all intents and purposes a rainless desert, practically destitute of vegetation, and before the discovery of diamonds shunned by mankind. The principal agency of denudation is a violent south wind which blows with terrific force throughout the summer months, and has been largely instrumental in the formation of the diamondiferous gravels. Admirable illustrations of wind erosion are in evidence on every hand, and there are probably few regions on the face of the earth where this form of rock sculpture in all its various aspects can be better studied.

The geological formations entering into the structure of the area are as follows : Ancient gneisses and crystalline schists with intrusive granite ; ancient limestones, quartzites and phyllites with intrusive foyaite ; sandstones, grits, marls and clays of Tertiary age ; recent deposits and accumulations of sand and gravel. The ancient crystalline rocks, greatly in evidence on the Luderitz Bay fields, comprise gneiss, augen-gneiss, amphibolite and biotite schist, which have been extensively invaded by granite and are much veined with aplite, pegmatite and quartz. To the south of Prince of Wales' Bay the granitic and gneissoid complex is replaced by a series of limestones, quartzites, quartzitic conglomerates and phyllites which are also believed to be of pre-

Cambrian age. Intersecting these rocks to the south-east of Pomona is a huge intrusion of elaeolite syenite (foyaite), which is accompanied by satellitic dykes of tinguaita, camptonite and monchiquite; the syenite being admirably exposed in the so-called Granitberg. Throughout the littoral the strike of the ancient crystalline and sedimentary formations is approximately north-and-south, and to this circumstance, without doubt, the prevalent north-and-south trend of the principal surface features is due. Remnants of very much younger sedimentary rocks occur in different parts of the area. To the east and south-east of Bogenfels and at Buntfeldschuh they take the form of horizontal sandstones, marls, clays, and conglomerates. To the east of Elizabeth Bay there is a large outcrop of sandstone, capped by onyx limestone; and sandstones generally of a reddish colour also occur on the Stauch claims, to the south of Kolmanskop, and at the foot of the Nautilus Berg, near Luderitzbucht. The present distribution of these rocks clearly indicates that they must at one time have filled most of the depressions of the littoral, and there is direct evidence to show that the material, of which the diamondiferous deposits are composed, has been derived in considerable part from their disintegration—under the influence of desert weathering. The sandstones are of particular interest in this respect, for they are seen in places to consist largely of grains of agate and chalcedony—conspicuous constituents of the diamond-bearing gravel, and, according to Scheibe, they have

actually been proved to contain diamonds. With regard to the age of the beds, which are fossiliferous, no definite conclusion has as yet been reached. Merensky, as a result of his determination of gastropods found near Elizabeth Bay, has co-related the sandstones there exposed with the Umtamvuna Series of Pondoland (Upper Cretaceous). Professor Böhm, on the other hand, to whom fossils from the exposures to the east of Bogenfels were submitted, inclines to the view that these are of Middle Tertiary age. As yet the exact relationship in which the Elizabeth Bay sandstones stand to those at Bogenfels has not been determined, and it is quite possible that both Cretaceous and Tertiary rocks are represented. Still younger marine deposits in the form of shingle terraces and raised beaches are developed all along the coast, and attest to more recent upheavals.

The diamondiferous deposits are confined to certain valleys and depressions, their elevation ranging from a few feet above sea-level to over 500 feet on the Fiskus claims, to the south-east of Kolmanskop. The diamond occurs in a superficial bed or layer of variable thickness composed of from 60 to 80 per cent. of fine yellow sand and from 20 to 40 per cent. of coarse particles, ranging from 1 to 10 millimetres in diameter. The coarse material, derived partly from the destruction of the sandstones and partly from the disintegration of the ancient rocks of the basement system, is made up of rounded and faceted particles of milky quartz, white felspar, yellow chalcedony, banded agate, red jasper, red

garnet, epidote, magnetite, and specular iron, generally accompanied by fragments of granite and gneiss. The uppermost portion of the deposit, which as a rule has been lashed by the force of the wind into regular waves or miniature dunes, is always found to be composed entirely of the coarse material, the finer particles having all been blown away. This process of natural concentration proceeds continuously, the per centage of coarse particles being thereby steadily increased while the sand goes to swell the vast volume of the dunes. As a result of the same action, the diamonds scattered through the sand and gravel slowly find their way to the surface of the deposit and into the crests of the waves, where a considerable enrichment is invariably found to have taken place. In the Pomona area, and particularly in the celebrated Ida Tal, this concentration has proceeded to such an extent that not only the sand but most of the larger particles have been swept away, and there remains in places but a single layer of comparatively coarse and fabulously rich detritus, spread irregularly over the wind-scoured surface of the underlying limestone. Apart from the superficial enrichment, one frequently finds a considerable concentration of diamonds to have taken place on the windward side of obstacles, such as the outcrops of resistant dykes and quartz veins, which rise above the general level of the deposits; and also at the head of valleys facing the direction of the wind. The thickness of the diamond-bearing material does not as a rule exceed 3 or 4 inches, but in portions of the Kolmanskop



and Stauch claims it is as much as 8 metres. In sections afforded by these deeper workings one generally sees alternations of fine sand and gravel; some of the lower layers of gravel having apparently been enriched in the same manner, though not to the same extent, as the superficial portion of the deposit. The distribution of the diamond through the detritus is on the whole very irregular. On the Stauch and Fiskus claims there are persistent, well-defined strips of payable gravel, up to 350 metres in width, extending along the lowermost portions of the depressions in which the claims are situated. As a rule, however, one finds rich patches alternating with practically barren areas, sometimes of considerable extent; and in many instances the diamonds appear to be confined to narrow streaks or "runs." It is on this account an extremely difficult matter to assess, even approximately, the probable yield of any particular gravel deposit, and most estimates of this nature that have been made have proved quite incorrect. The diamond content of the gravel at present being worked on different sections of the field varies between wide limits. The highly concentrated detritus in the Ida Tal at Pomona yields up to 60 carats per cubic metre, and on the claims of the Deutsche Diamanten Gesellschaft, to the south of Pomona, there are also rich patches of gravel averaging 10 carats to the cubic metre. Such values, however, are quite unusual, and in most instances very much poorer material is being treated. On the Kolmanskop claims, for example, an average of 1,500

carats of diamonds was, during the year 1912, recovered per hectare of ground exploited. The average quantity of gravel obtained per hectare amounted to 3,886 cubic metres, and the average yield per cubic metre was therefore only .386 carat, equivalent to .175 carat per load.

In addition to its occurrence in the normal sand and gravel deposits, the diamond has also been found in peculiar terraces of shingle. The best illustration of a deposit of this nature is to be seen about a mile to the south of the Bogenfels camp, where a narrow crescent-shaped ridge of shingle—clearly of the nature of a "storm-beach"—stretches across what, at no very distant date, must have been a shallow tidal lagoon. The ridge, about 8 feet in height, is built up largely of flattened pebbles of chalcedony, jasper and agate, many of which show very little wear. The diamond appears to be practically confined to an agate layer near the base of the deposit.

It may be stated that the leading South African experts are agreed that the German South-West African diamonds are wholly unlike those of any known source of production—primary or alluvial—in British South Africa. This view is endorsed by the Antwerp and Amsterdam cutters, who maintain that the stones in their physical properties more closely resemble the product of the Brazilian fields. The quality, which is much the same throughout the littoral, is exceptionally good, which accounts for the fact that, notwithstanding their diminutive size, enormous numbers of these stones are absorbed by

the world's markets. As regards crystallization, rhombic dodecahedra, with somewhat rounded faces, predominate, though octahedra and octahedral (twins) are quite common, and cubes are also said to occur. Cleavage fragments are comparatively rare and bort almost entirely absent. Fully 85 per cent. of the stones are fit for cutting. In consequence of the violent attrition to which they have been subjected, many of the crystals show unmistakable signs of wear, but typically water-worn stones, such as are so common on the Vaal River Diggings, do not appear to occur. The diamond is found in all shades of colour, clear white crystals predominating. The following analysis of a parcel of 1,558 stones is particularly informative in this connection: Stones of clear white colour or with a slight yellow tinge, 819; stones of delicate yellow colour, 136; stones of lemon yellow, 87; stones of pale pink, 116; stones of dark red, 9; stones of bluish, 30; stones of greenish, 5; stones of blackish, 9; stones showing various colours, 68; stones showing impure and turbid shades, 62; cleavage fragments, white and pink, 217; total, 1,558. In weight the diamonds range from  $\frac{1}{20}$  carat, and less, to 34  $\frac{1}{8}$  carats in the case of the largest stone hitherto found; the average for the claims at present worked being almost exactly  $\frac{1}{8}$  carat. Considering the field as a whole, Dr. Wagner at first thought that it had been established that there was a steady increase in the average size of the diamonds as one proceeds from north to south, until the Pomona area is reached, but in the light of more

recent investigations by Dr. Karl Krause, he has abandoned his original opinion that there are three definite areas within which the diamonds attain a maximum average weight. To the south of Pomona there is again a falling off in this respect, as witness the following table, in which the weights of the largest stones hitherto found in the more important localities are also given :—

<i>Locality.</i>	<i>Average Weight (Carats).</i>	<i>Weight of Largest Stone (Carats).</i>
Conception Bay and Spencer Bay	$\frac{1}{10} - \frac{1}{12}$	1
Kolmanskop .. .. .	$\frac{1}{8} - \frac{1}{6}$	$2\frac{3}{8}$
Stauch and Fiskus Claims ..	$\frac{1}{5} - \frac{1}{6}$	$3\frac{1}{2}$
Pomona .. .. .	$\frac{1}{25} - \frac{1}{3}$	$34\frac{3}{4}$
Bogenfels .. .. .	$\frac{1}{4} - \frac{1}{6}$	$17\frac{1}{4}$
Frohe Hoffnung .. .. .	$\frac{1}{5\frac{1}{2}}$	3
Angras Juntas .. .. .	$\frac{1}{5} - \frac{1}{6}$	1

The distribution of diamonds in country running parallel to the sea from Pomona northwards to Spencer Bay has led to the supposition that the sea has either thrown them up or has left them behind when it receded from the land. Dr. Schultze regards it as possible that the blue-ground of the Kimberley district may yet be found in the Namib under the detritus of the desert. Another opinion is that when this blue-ground was destroyed long ago by the sea, its diamondiferous remained, and the older diabase were buried in the seas of the chalk age. Chalk strata occur in the south of the Namib at Buntfeldschuhkorn opposite Plumpudding Island and

Sinclair Island. It is thought that the diamonds from these deposits may have been carried by the action of storms into the sands of the desert. It has also been stated that diamonds may have been transported from the far off Vaal River;—the Orange River conveying them to the sea, and that the Benguela Current washed them along the coast to where they now are.

Dr. Wagner deals with the four main theories that have been put forward with regard to the source of the gems, as follows. The first theory, tentatively advanced before the true nature of the deposits was properly understood, that the diamonds were released by weathering from the crystalline rocks of the basement system, has been definitely disproved by the entire absence of diamonds in the detritus derived exclusively from the destruction of the ancient rocks, which has been carefully tested all along the littoral. The second hypothesis, that the diamonds were derived from the denudation of the primary deposits of British South Africa, carried down to the sea by the Orange River and distributed along the coast by the agency of the Benguela Current, is effectually disposed of by the difference between the German diamonds and those of the Union of South Africa, as well as by the fact that no diamondiferous deposits exist between Angras Juntas and the mouth of the Orange River, or in the lower portion of the Orange River Valley. To the third view that the diamonds were carried down to the sea from sources believed to exist within the interior of

German South-West Africa, Dr. Wagner advances several serious objections. In the first place, as is now definitely known, the diamondiferous areas are confined to the immediate vicinity of the coast, and no alluvial deposits have, as yet, been discovered away from the littoral. In the second place, the various dry-river beds coming from the interior have so far failed to yield a single diamond. Thirdly, river-worn diamonds appear to be entirely absent in the German South-West African products. In this connection we have also the important testimony afforded by the grains of agate, by which the diamond is invariably accompanied. The constant association of the diamond with small grains of agate is one of the most striking features in connection with these remarkable deposits. It is more than likely that this association may be purely accidental, but in view of the fact that there is a fairly close relationship between the average size of the diamonds and the size of the agates occurring on any particular section of the field, it is quite evident that these minerals have been derived from the same locality and distributed by the same agencies. The agates are accepted as representing the siliceous amygdalates of a vesicular rock. No rock of this description is known to occur in the littoral or in the interior, but agates are being cast up along the coast at the present day, and there can, therefore, be no question as to their submarine origin.

The fourth theory, that the parent rock of the diamonds lies submerged off the present coast is the

one to which the facts appear, in Dr. Wagner's opinion, to lend themselves most readily. It has already been pointed out that the diamonds attain a maximum average weight in the Pomona area, and this circumstance clearly indicates that the centre from which the gems were distributed is situated in closer proximity to Pomona than to any other section of the field. Dr. Wagner is thus led to conclude that the German diamonds have been derived from a primary deposit or deposits, which now lie buried beneath the sea somewhere off Pomona. On the supposition that the stones shed from the deposit were spread along the littoral by a powerful northward ocean current, similar to the one by which the coast is now swept, at a time when the littoral was still submerged, and thus found their way into the sediments there accumulating, all the previously recorded phenomena could be satisfactorily explained, with the exception of the decrease in average weight to the south of Pomona, and this might be accounted for by postulating a temporary reversal in the direction of the current.

The methods adopted for testing the payability of a likely looking patch of gravel are simple in the extreme. In the first place a number of natives are set "picking," that is, crawling over the deposits on all fours collecting such diamonds as they find on the surface. The uppermost layer of gravel has invariably been enriched by natural concentration, and should the "picking" fail to yield fair numbers of diamonds, it is concluded that the material is too

poor to repay exploitation. In the case of very shallow layers of gravel this is the only method of sampling resorted to, but if the results of the "picking" have been at all favourable, it is supplemented by further testing work. This generally takes the form of digging trenches, about a metre in width, right across the deposit, and carefully washing the excavated material. Owing to the sporadic distribution of the diamond through the gravel, such test washings, except where the trenches are fairly closely spaced, are apt to prove misleading, and estimates based upon them have in many instances proved quite erroneous.

The mining and dressing operations are equally simple. The usual practice is to excavate the gravel by hand, using ordinary shovels, and then to screen it by means of swinging sieves or trommels with a view to eliminating the fine sand and of obtaining a sized product for concentration. The screened gravel was originally hand-jigged and gravitated in small circular sieves, or treated in hand-operated movable sieve-jigs. It was found, however, that the loss of diamonds by either of these methods amounted to from 30 to 40 per cent., and they were, on this account, completely superseded by treatment in central plants equipped with mechanically-operated concentrating devices.

The exploitation of the detrital deposits at the outbreak of the war was practically in the hands of six large companies, the output of the several smaller companies being quite insignificant. In 1910 an



agreement was entered into between the Government and the Deutsche Diamanten Gesellschaft to the effect that prospecting for minerals in the area known as the Sperr Gebiet would, from and after April 1st, 1911, be reserved to a company with a capital of £30,000, to be held in equal shares by the contracting parties. The Government share, £15,000, was provided in supplementary estimates for 1913. The company was to be known as the Halbscheid Gesellschaft, and was to confine itself to prospecting work so as not to complicate the problem of the diamond market.

The Vereinigte Diamant Minen possess claims north of the local harbour, which are situated at the base of a chain of sand dunes. The gravel is contained in strata of soft conglomerate, which are overlaid by thick masses of dead sand. The sand has been successfully removed in places by a bucket dredger, which is now engaged in loading the gravel into trucks which are hauled up to a washing plant—the first large plant to be erected on these fields, and quite unique in its way. The Kolmanskop Company have erected a similar but improved dredger to excavate beds of gravel, which are in places over 20 feet deep. Under favourable weather conditions the dredger should be able to deal with about 160 loads per diem, enabling inferior grade gravel to be worked at a profit. The washing is done in three Schiechel plants, which are fitted with up-to-date improvements. The site of each plant was determined by the surface configuration of the property.

The Koloniale Bergbau Gesellschaft have a large block of claims situated in a wide, low valley, all parts of which are easily accessible. It has all but completed a large central plant, capable of dealing with 3,000 loads per diem. The plan is to strip all the gravel, including that which has already been washed, from the rock floor of the valley and to treat it in the central plant. Where the deposit is deep enough, an electric "navvy," that can scoop up four loads at a time, will be employed to load trucks of equal capacity, which will be drawn by an electrically-driven locomotive to a tip station, to be automatically emptied into buckets travelling on an aerial gear. The gear communicates with the top floor of a four-storeyed crushing house. Three storeys are occupied by crushing machines of three grades, the coarsest above and the finest below. The finer gravel is sent direct to the bottom of the building without passing through the crushers. The next quality goes to the lowest crusher, the medium to the crusher on the second floor, while the coarse conglomerate is reduced in size by the uppermost crusher, and transmitted to the floors below, where the process is repeated. At the bottom of the building the gravel, reduced to the requisite size, drops upon an endless concave belt, which conveys it to the bunkers. The bunker capacity will be sufficient to keep the washing plant running for a day and a half in case a stoppage occurs in the operations just described. From the bunkers the gravel will be carried to the main washing plant, where, after the

elimination of the sand by means of trommels and *spitzkasten*, the material will be sized and deposited on the ground floor in large reservoirs. The pure gravel from the reservoirs will be treated on Harz jigs and Schiechel pulsators. The concentrates, after subjection to a wet magnetic process for the separation of iron ore, will be transmitted to the sorting room, where the diamonds will be handpicked out of the residue. It is hoped that the large plant will reduce working costs and replace hand labour, which can be beneficially employed elsewhere. Very few persons will be brought into contact with the diamonds, and the leakage, through theft, which is said to be considerable, will be practically stopped. A similar plant, with half the capacity of the above, and somewhat different in detail, was under construction on the Government block of claims, which are worked by the Koloniale Bergbau Gesellschaft under contract.

Rains, which seldom fall, and the more frequent fogs and heavy dews seriously handicap the work on the diamond fields. The salty soil cakes and gets sticky, clogging the sieves which separate the soil from the gravel. Much time is wasted waiting for it to dry: 1913 was a particularly bad year in this respect. Usually the damp only penetrates to a depth of 15 to 20 inches at most, but in 1913 a thickness of 10 feet was moistened. The Koloniale Bergbau Gesellschaft plant has been designed to treat wet gravel, and introduces a revolution into local methods.

Away from the railway ambitious schemes have been out of the question, owing to the cost of transport. The Deutsche Diamanten Gesellschaft, whose principal claims lie south of Prince of Wales' Bay, has had to overcome great difficulties. Goods were transported by sea and landed in a poor harbour at great cost. A railway was constructed from Kolmanskop to Bogenfels, a distance of sixty-six miles, during 1913. It runs through diamondiferous country practically all the way, and will facilitate the exploitation of the Deutsche Diamanten Gesellschaft claims, as well as many which it passes *en route*. The Pomona mine is traversed by the line, and will appreciate the benefit thereof when the inevitable day comes when more labour and machinery will be required to maintain a dwindling output. The locomotives employed on the line will be driven by electricity generated on the engines themselves, with benzol as fuel.

The Luderitzbucht electric works extended their premises during 1913 and doubled the amount of power generated. Contracts have been entered into with the Vereinigte Diamanten Minen, Kolmanskop, Limited, and Koloniale Bergbau Gesellschaft to supply them with all the current needed for motor power on their claims. The company provides the lighting for Luderitzbucht and Kolmanskop. Several workshops, as well as the Luderitzbucht wireless station and the Elizabeth Bay pumping plant, are supplied with electricity.

When machinery was less efficient it was necessary

to select the richer deposits for working, and the gravel had to be washed repeatedly before the diamonds were all extracted. It was difficult to state whether any particular area had been finally dealt with. Now that the good can be taken with the bad, and diamonds can be extracted without leaving more than a negligible percentage in the tailings, it will be possible to place on record how many acres are exhausted annually, and to base estimates of future output on more reliable data. A considerable acreage was finally dealt with in 1913, while on the other hand areas formerly considered unworkable have been added to the list of profitable propositions.

One of the great problems by which the engineers on the diamond fields were originally faced was the question of obtaining an adequate supply of water for treatment and domestic purposes, but by putting down shallow wells at likely spots, moderate supplies have in many instances been obtained. The water is brackish and unfit for human consumption, but animals soon get used to it. Most of these wells were drawn upon to such an extent that the water stored up by nature in the superficial deposits was rapidly exhausted, and a large pumping station has been erected at Elizabeth Bay from which sea-water is pumped to Kolmanskop through a pipe line 17 miles in length. Water for drinking purposes is derived from condensers erected at the coast, the water being conveyed to the distant fields in carts and to the outlying claims in small tanks carried by animals.

Working costs vary considerably according to the scale on which operations are conducted and the situation of the claims. At Kolmanskop the total expenses per cubic metre of gravel washed—exclusive of administrative charges and depreciation—during 1912, amounted to 6s. 8·7d. In the case of the Koloniale Bergbau Gesellschaft, working on a more extensive scale, the costs are somewhat lower. On the outlying claims, like those situated to the east of Bogenfels and at Frohe Hoffnung, operating expenses are, on the other hand, so high that the exploitation of gravel carrying over 2 carats of diamonds per cubic metre has, in some instances, proved unprofitable.

The cost of production per carat, which naturally depends not only upon the operating costs but upon the diamond content of the material worked, ranges from about 1s. 6d. in the case of the rich Pomona deposits to 15s. in those of the Bogenfels and Frohe Hoffnung claims of the Deutsche Diamanten Gesellschaft. Even the latter figure compares favourably with the cost of production at most of the mines in British South Africa; and were it not for the small weight of the diamonds which they produce, the discovery of the West African field, in Dr. Wagner's opinion, must have wrought havoc with the Union diamond industry.

During 1912, the original system of taxation, under which imports and royalties claimed from 46½ to 50½ per cent. of the gross value of the diamonds produced, was transformed into a tax on

profits. Under this arrangement the Government exacts 66 per cent. of the total value of the diamonds sold, less 70 per cent. of the cost of production, plus 2 per cent. of the total revenue on behalf of the Diamond Régie; the working costs to include an allowance of 10 per cent. of the amount spent and not written off on plant and machinery. Assuming, for example, that a company produces diamonds to the value of £10,000, and that the total working costs, including the 10 per cent. allowance, amount to £4,000, the cost is £6,600—£2,800+£200=£4,000, or 40 per cent. When the cost of production amounts to 95 per cent. or more of the total revenue, no tax is payable. This reform in the method of taxation had far-reaching results, for while under the old system it paid the companies best to work off the rich patches of gravel and to leave the poor deposits alone, the new system made it far more profitable to exploit the rich and poor material together in a rational manner. The new taxation accordingly led to the adoption of a wholesale policy of mining, in place of the selective policy previously practised.

The British Consular report says: "It is still impossible to forecast the life of the fields with any degree of certainty. Some engineers are inclined to estimate it roughly at a further twelve to fifteen years. The difficulty in the way of making an estimate is apparent when one considers the superficial area over which the diamonds are scattered. One company alone has approximately 90,000 acres

of claim. A great portion of this area consists of barren sand and rock, and it takes time merely to ascertain the extent of the diamondiferous gravel, which may be thinly spread upon the bed-rock, or be 30 feet deep, or any thickness between these two extremes."

Dr. Wagner, in his concluding remarks upon the future of the South-West African diamond field, writes: "Notwithstanding the fact that an enormous amount of prospecting work has been carried out by the different companies, no important gravel deposits have been discovered in the littoral of German South-West Africa since 1910; and the area of the field is therefore not at all likely to be increased. With regard to the claims now being worked it may be safely affirmed that, except in so far as the Pomona area is concerned, the cream has been skimmed; or, in other words, that the richest and most accessible areas of gravel have been worked out. The deposits in the Ida Tal at Pomona, while of phenomenal richness, are very shallow and of limited extent, and their importance appears to have been greatly over-rated. As against the foregoing, there can be no question that vast resources, in the form of low-grade gravel, are still available; and now that the exploitation of this material has been rendered feasible by the new method of taxation, and the Government has wisely decided to keep the output within reasonable limits, a long and prosperous career may confidently be predicted for the German diamond industry."



## THE NORTHERN DIAMOND FIELDS

When in October, 1908, Bernberg placed prohibitive restrictions on the southern diamond fields, many prospectors left them for the less popular diamond fields north of the 26 parallel of latitude. Prospectors who coasted along in a cutter first found diamonds in Spencer Bay, and the news of the discovery attracted numberless expeditions from Luderitzbucht, Swakopmund and Windhoek, and many men risked all their savings in companies, hoping to reap profits on the same scale as those of the southern fields. These hopes have been bitterly disappointed. In 1909, after about 5,000 claims had been occupied, it was found that the fields in general were poorer than those in the south, and that great obstacles stood in the way of their development, including the enormous distance from Luderitzbucht and the difficulty of transport. Especially it was realized that the heavy taxation, then 33%, on the proceeds of sale, not only excluded all chance of profits, but meant working at a loss. The owners' prospects were not rosy, and over 2,000,000 marks had been already lost. At this time the Diamantfelder-Verwertungs Gesellschaft Konzistronbucht was formed, and with the assistance of various other companies, combined efforts were made to put matters on a better footing. In April, 1914, Dr. Krause, a mining engineer, began the construction of a railway from the landing place at Conception Bay to the foot of the great girdle of dunes. The water-conduit (from Conception Bay)

was also undertaken, and when these are completed, two of the greatest difficulties will be overcome.

The one outstanding advantage possessed by these northern diamond fields, which is not to be under-estimated, is the sufficient supply, on the spot, of water that is only slightly brackish and can even be used for watering animals. But they are less favourably endowed by nature than the southern fields, and operations can only be persevered with if the miners receive generous consideration and support from the administration.

## THE DIAMOND RÉGIE

**I**N the first few months of 1913 the sufficiency of Ovambo labourers on the Luderitzbucht diamond fields, the settlement of outstanding grievances, and the reform in the system of taxation, put the industry on a better basis, and an era of prosperity and contentment appeared to have set in. During the second half of the year, the hated shadow of a compulsory restriction of output hung over the mining companies, and caused intense dissatisfaction, but, from a purely mining point of view, the year was most satisfactory, as the following table of output since the fields were discovered will show :—

					<i>Carats.</i>
1908	..	..	..	..	39,375
1909	..	..	..	..	483,268
1910	..	..	..	..	867,296
1911	..	..	..	..	747,152
1912	..	..	..	..	985,882
1913	..	..	..	..	1,570,000

The enormous increase in the returns for 1913 was principally due to the inclusion of the Pomona mine in the list of producers. The Pomona began operations in September, 1912, and immediately took the leading position in the local industry as regards quantity and quality of output. During 1913, 617,038 carats were obtained from the company's

claims, though the plant and the number of labourers employed was less than that required by certain other companies to produce one-tenth of the Pomona output. The slight improvement in the production of the older mines was made possible by the relief afforded by the altered system of taxation and the improvements introduced in machinery and the methods of mining.

The improvements in the machinery enables the miners to recover practically all the small, discoloured and misshapen stones that used to escape detection, and tends to reduce the average size and quality of the output while increasing the quantity. Although this tendency was observable in 1913, the claims in the Elizabeth Bay district, on which work was done in 1912, produced stones which raised the general average of the output for 1913 to a higher level than that of the previous few years. While the average of some companies was from 8 to 10 stones to the carat, the Pomona average was 2½ stones to the carat. Individual diamonds of fair size and value were discovered, including the record stone of nearly 35 carats, found just outside the Pomona boundary. During 1913, 1,284,727 carats were sold for £2,153,230, an average price of £1 13s. 6d. per carat. as against the sale of 902,157 carats in 1912 for £1,303,092 or an average of £1 8s. 8d. per carat. Although only 1,284,727 carats were sold out of a production of 1,570,000 carats in 1913, better prices were obtained in spite of the fact that a large stock of unsold diamonds had to be locked up in Berlin.

From 1908 to 1912 the German mining companies produced diamonds to the full capacity of their claims and machinery and, as the world's demand for the precious stones continued to increase, the high-class mellee which forms the German output found a ready sale, and the Antwerp syndicate, who had contracted to purchase the diamonds, raised no warning voice against the danger of over-production. But the greatly increased monthly output of 1913 came as a surprise, and the syndicate were unable to take over the whole of each shipment. The Board of the Régie was unable to determine whether this inability was due to the state of the market or to the weakness of the Antwerp syndicate, and the controversy which raged over the question split the directorate of that body into two irreconcilable parties.

The Diamond Régie was a company founded by Government decree in 1909 to take delivery, after March 1st in that year, of all diamonds found in the German South-West African fields, to place the output on the market, and to distribute the proceeds among the parties concerned, after deducting taxes, royalties and commission. The fear that the purchase of the German output by the London Diamond Syndicate would give that corporation the control of the market, was the obvious reason for enjoining the delivery of the stones to the Antwerp Diamond Syndicate at prices to be agreed upon from time to time between the Régie and the syndicate. The principal shareholders in the Régie were leading

German bankers, and the manner in which the diamonds were sold was left entirely to their discretion. The actual owners were not represented in the company, and their property was disposed of without their having anything to say in the matter. This complete severance of the selling business from the producing business was bound to lead to serious complications. From the outset there was much dissatisfaction on the part of the producers, and by dint of constant agitation the Reichstag was induced to pass a resolution early in 1912, calling upon the Colonial Office to make provision for the adequate representation of the diamond mining companies in the deliberations of the Régie. In March, 1913, the wish of the Reichstag was carried out to a certain extent. The producers were allowed to take over practically half the Régie shares, though the Government in its capacity of producer, and the bankers between them, retained a small majority, which still gave them the control of the company's operations.

The producers, who had all along maintained that their output was being sold at less than market values, immediately made their influence felt when they were admitted into the Régie. They caused tenders to be submitted, not later than May 15th, 1913, for the purchase of the next 1,000,000 carats to arrive from German South-West Africa after the expiration of the Antwerp syndicate's contract, which ran out in that month.

The Antwerp Diamond Syndicate with a tender of 46 marks per carat, basis price, was successful,

The next highest tenderers were the London Diamond Syndicate, with 45 marks per carat. The competition seems to have had beneficial results, inasmuch as the average price paid by the Antwerp syndicate in 1912 had been about 29 marks and in 1911 25 marks. After making due allowance for the improved quality of the output, the price, class for class, advanced by about 15 per cent.

The general satisfaction with this result was marred almost immediately by the discovery that the Antwerp syndicate had been privily given an assurance that, although the output was averaging 130,000 carats per month, it would not be expected to take delivery of more than it required, and the rate of delivery was actually reduced to about 100,000 carats a month. As all the diamond fields in South Africa were working at full capacity to enable the United States to fill up stocks before the new tariff came into force, the producers entered a vigorous protest against this undertaking, to which they were not a party. They argued that if this condition had been made in the case of other tenderers, the competition would have been keener and prices higher; that the Antwerp syndicate was placed in a privileged position at the producers' expense; and that by availing themselves of this permission to take a limited delivery, they were acting detrimentally to the interests of the German industry.

The Régie replied that the state of the market made it imperative, in the interests of the German

diamond industry, that the output should be restricted and the producers were called upon to limit their production voluntarily. This they refused to do. They maintained that they only produced a fraction of the world's output, and if they consented to limit it without entering into an understanding with the principal foreign diamond merchants, overproduction on the part of the other diamond companies would follow, and that any understanding they might arrive at in the future would be determined upon the basis of their previous production. Meantime the Balkan War, tightness of money and the temporary slackness of American buying, necessitated some arrangement being arrived at between the leading diamond interests in Africa, London and Berlin, and the question of a conference on the subject of restriction was mooted. The difference between the members of the Régie developed into a deadlock, and the German Government, whose interest in the revenue derived from diamonds was greater than those of the producers themselves, determined upon a decisive line of action. They acquired a majority of votes in the Régie by taking over the shares belonging to the bankers, and when, on December 6th, 1913, the Government announced its intention of carrying on the business, the Régie, in its old shape, ceased to exist. The decision upon the subject of the quantity of German diamonds that should be sold for each producer was abrogated by the Government as from January 1st, 1914. The maximum for 1914, from all companies combined,



was fixed at 1,038,000 carats, or 86,500 carats a month, and each company was informed what its share would be. It was not possible to prevent the companies from producing more than their quota, but if the ordinance was strictly enforced, the retarded conversion of the diamonds into cash would act as an automatic check upon production by reducing the amount of cash available to pay for it. The producers protested against what they describe as high-handed and illegal action, and took proceedings against the Government. Subsequently these were withdrawn, pending the result of negotiations with a view to a settlement, mutually satisfactory to the Government and the producers. These negotiations terminated successfully, and the Régie was re-organized, half the shares being held by the Government and half by the mining companies. The Board was composed of eight members, four of whom were to be selected by the Companies and four to be nominated by the Government.

The Régie was thus re-constituted under the management of the parties directly interested in the revenue derived from the sale of the diamonds. But the mining representatives were not convinced that a restriction of output was necessary, and the mines carried on their work as usual. Neither the Government nor the shareholders could afford to adopt a policy that would tend to diminish the profits of the industry, and it was thought that measures, decided upon by the Régie, would be backed up by definite instructions to the mine managers. In these circum-

stances it became possible for the Régie to enter into a conference with representatives of the diamond industry in other countries, as it was in a position to guarantee the fulfilment of agreements arrived at with the view of keeping the market steady and maintaining or improving prices.

Having outlined the Régie controversy and the position of affairs at the beginning of the war, it may be of interest to append a statement showing the output and values of diamonds during the last three years from mines in the Union of South Africa and of the German South-West African mines during the same period. In the case of the German diamonds the figures quoted are taken from the Régie reports. The British South African figures are from Government statistics :—

## QUANTITIES.

<i>Country.</i>	1911. <i>Carats.</i>	1912. <i>Carats.</i>	1913. <i>Carats.</i>
Union of South Africa	4,891,998	5,071,882	5,163,546
German S.W. Africa	816,296	902,157	1,284,727
Total ..	5,708,294	5,974,039	6,448,273

## VALUES.

<i>Country.</i>	1911. £	1912. £	1913. £
Union of South Africa	8,746,724	10,061,489	11,389,807
German S.W. Africa	1,019,444	1,303,092	2,153,230
Total ..	9,766,168	11,364,581	13,543,037

A comparison of the 1913 figures with those of 1911 shows that the Union of South Africa increased its annual output by 271,548 carats, valued at £2,643,083. During the same period the German South-West African sales went up by 468,431 carats, valued at £1,133,786. But on December 31st, 1912, the Régie had approximately 350,000 carats of unsold diamonds on hand. The increase over 1911 in the amount of the German output was roughly 820,000 carats.

Whatever may be the future in store for the diamond fields, it is certain that the discovery of diamonds came in the nick of time and had the effect of completely reforming the business and the Budget of the Protectorate. It goes without saying that the rise of a great industry would have the greatest effect upon its local centre—Luderitzbucht. Special stress must, however, be laid upon the fact that the influence of the diamond mining is not only local, but has wide-reaching effects over the whole colony. Luderitzbucht, which was only a settlement in 1904, with three firms, few white people, and only two or three officials, and in 1908 was only a modest township, had, at the commencement of the war, 1,000 white inhabitants, fine buildings, churches and schools. The Namib Plains, which were an absolutely unknown district until 1908, was, in 1913, inhabited by hundreds of engineers, miners, merchants, &c., besides about 3,000 natives.

The increase in population coincides with the increase in trade, especially in food, drinks,

machinery, hardware, mineral, oils, &c., and the diamond industry, which during the last five years has produced two-thirds of the total revenue, has made its beneficent effects felt in numberless ways. Luderitzbucht has been rebuilt, a railway has been constructed, and the demand for washing machinery has transformed the local locksmith's shop into the Luderitzbucht Machine Factory. The demand for the daily necessities of life roused the enterprising spirit of the tradesmen and the hotel-keepers. Although a certain amount of the money earned by employees, &c., found its way to the mother-country, far the greater part of it was spent in the Protectorate. Other benefits following upon the discovery of the diamonds, that cannot be calculated by figures, are the transformation of a trackless, unknown, untrodden wilderness into a "workable," well-mapped district, traversed by a 600 mm. gauge railway. The great sums of money accruing from it that have been placed at the disposal of the Protectorate made it possible to construct the Amboland Railway, which will serve, in the first place, for the transport of diamond miners, but will also be a means of opening up this valuable district, with which there is no other means of connection. A considerable sum will have to be spent on the construction of reservoirs, which will supply large tracts of country with water and make the settlement of a denser population possible. This will bring increased prosperity to the whole country, for which it will have to thank the diamond industry even if, in time, no trace of the latter remains.



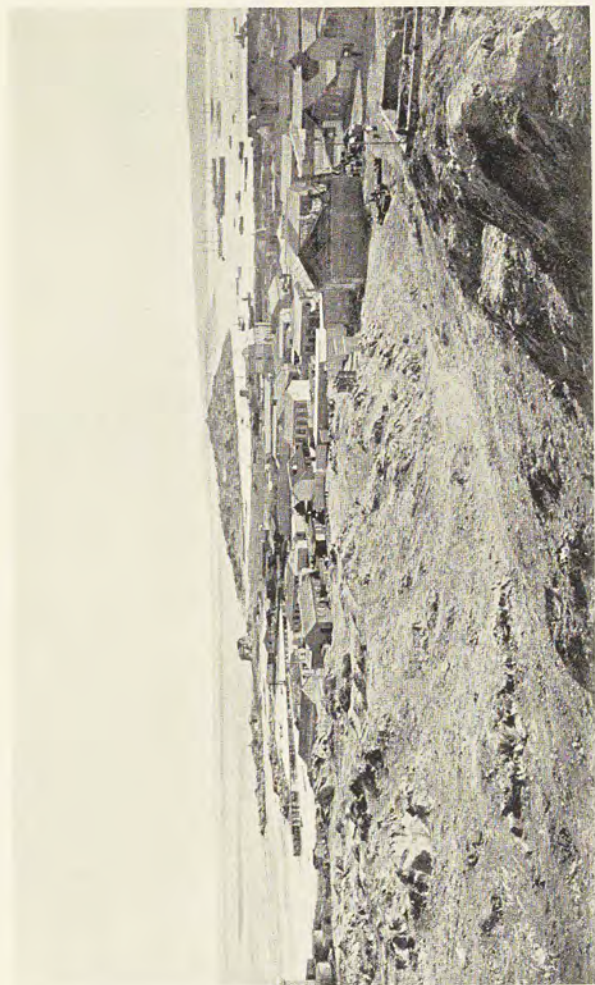


LUDERITZBUCHT.

PLATE 2.



LUDERITZBUCHT, 1912.



LUDERITZBUCHT.



PLATE 4.



GERMAN BANK AT LUDERITZBUCHT.

PLATE 5.



LUDERITZBUCHT RAILWAY STATION.

PLATE 6.



KAPP'S HOTEL, LUDERITZBUCHT.

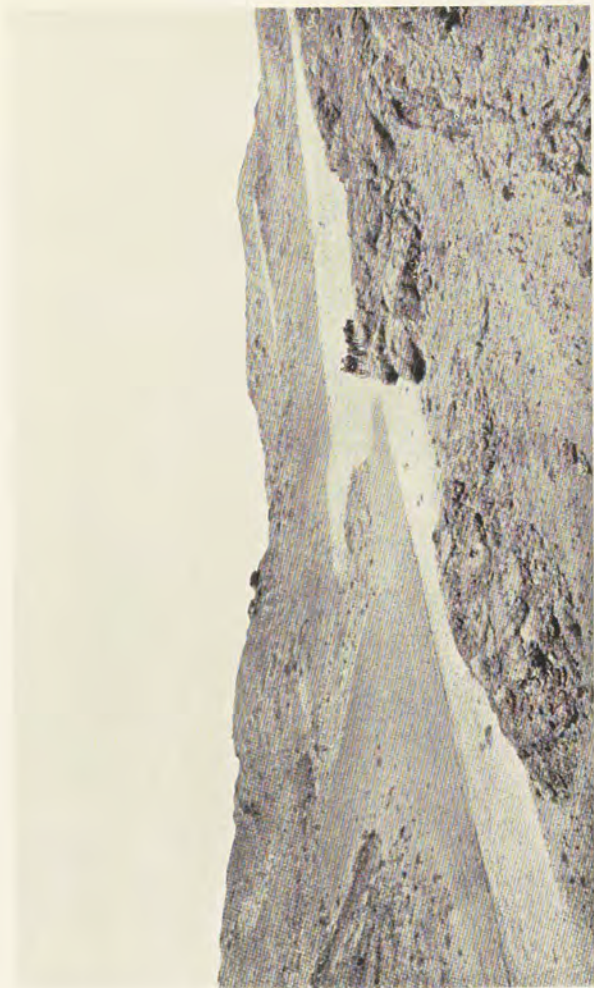
PLATE 7.



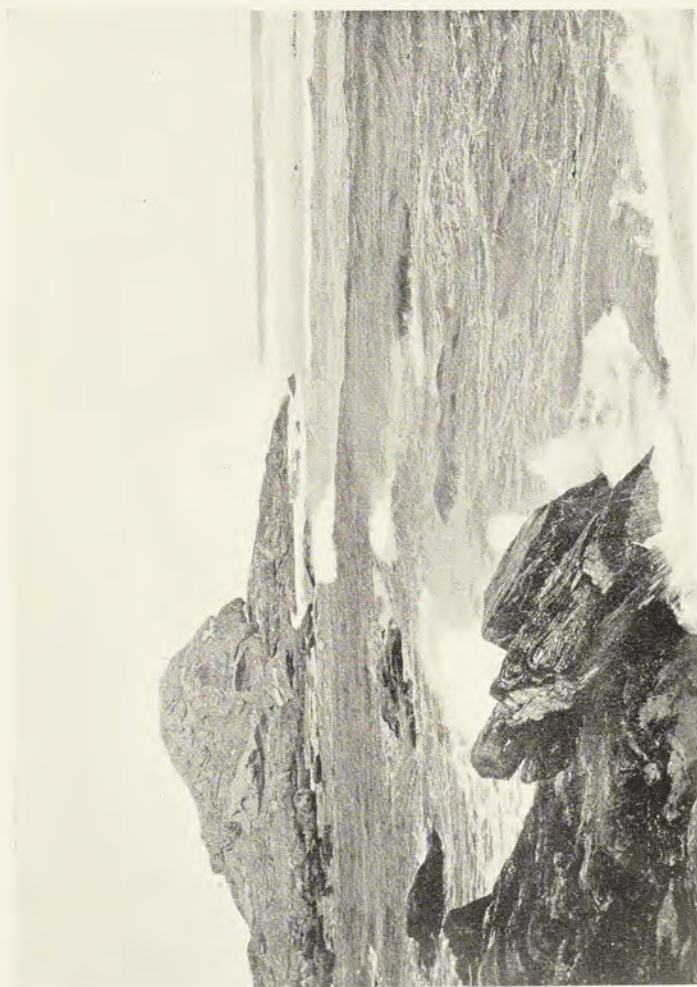
POST OFFICE, LUDERITZBUCHT.



LUDERITZBUCHT. VIEW FROM SHARK ISLAND OVER THE HARBOUR AND TOWN.



ROCKY DESERT SOUTH-EAST OF LUDERITZBUCHT.



COAST SCENERY NEAR LUDERITZBUCHT.



ROCKS ON THE COAST NEAR LUDERITZBUCHT.



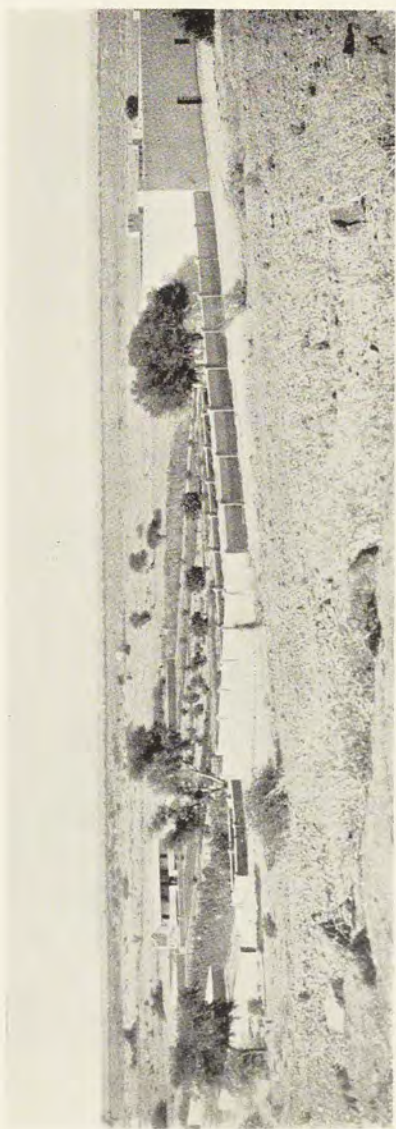
THE BOGEN ROCK (OVER 150 FEET HIGH) SOUTH OF LUDERITZBUCHT.



GREAT SHIFTING SAND DUNE AT GRASPLATZ, NEAR LUDERITZBUCHT.



PLATE 14.



VIEW OF BETHANIEN, IN THE SOUTH.

PLATE 15.



GOCHAS FORT, IN THE SOUTH.

PLATE 16.



VIEW OF AUAS ON THE ROAD TO THE SOUTH.

PLATE 17.



VIEW OF WARMBAD, IN THE SOUTH.

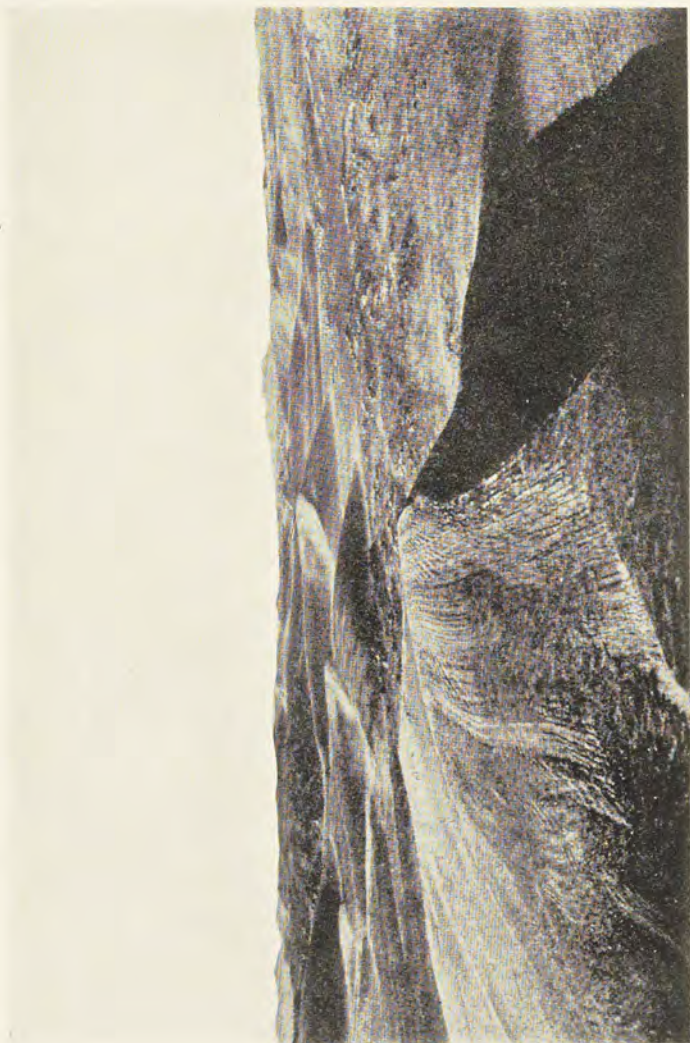
PLATE 18.



STONY COUNTRY NEAR WARMBAD.



ROCKS PARTLY COVERED BY SHIFTING SAND AT HOTTENTOT BAY.



SAND DUNES IN THE NAMIB DESERT ON THE RAILWAY FROM LUDERITZBUCHT TO KEETMANSHOOP.



VIEW OF KEETMANSHOOP.



THE SLANGKOP, S.W. OF KEETMANSHOOP, AS SEEN FROM THE SOUTH.



OX WAGGON ABOUT TO LEAVE KEETMANSHOOP.





VIEW OF THE ORANGE RIVER IN S.W. AFRICA.



VIEW OF THE ORANGE RIVER FROM HOHENFELS POBELI STATION.



THE ORANGE RIVER AT RAMAN'S DRIFT.

PLATE 27.



RAMAN'S DRIFT, ON THE ORANGE RIVER.

PLATE 28.

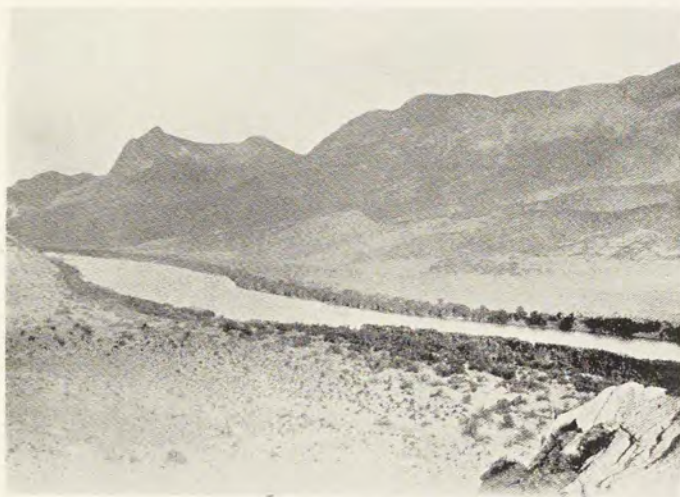


RAMAN'S DRIFT, IN THE SOUTH.



POOL IN THE LITTLE KARAS MOUNTAINS.

PLATE 30.



THE ORANGE RIVER.

PLATE 31.



THE GREAT FISH RIVER.

PLATE 32.



IN THE GIBEON DISTRICT, GREAT NAMAQUALAND.  
PLATE 33.



GIBEON, WITH FORT ON TOP OF THE HILL.

PLATE 34.



SCENERY NEAR KUIBIS, ON THE ROAD TO THE SOUTH.

PLATE 35.



VIEW NEAR GIBEON.

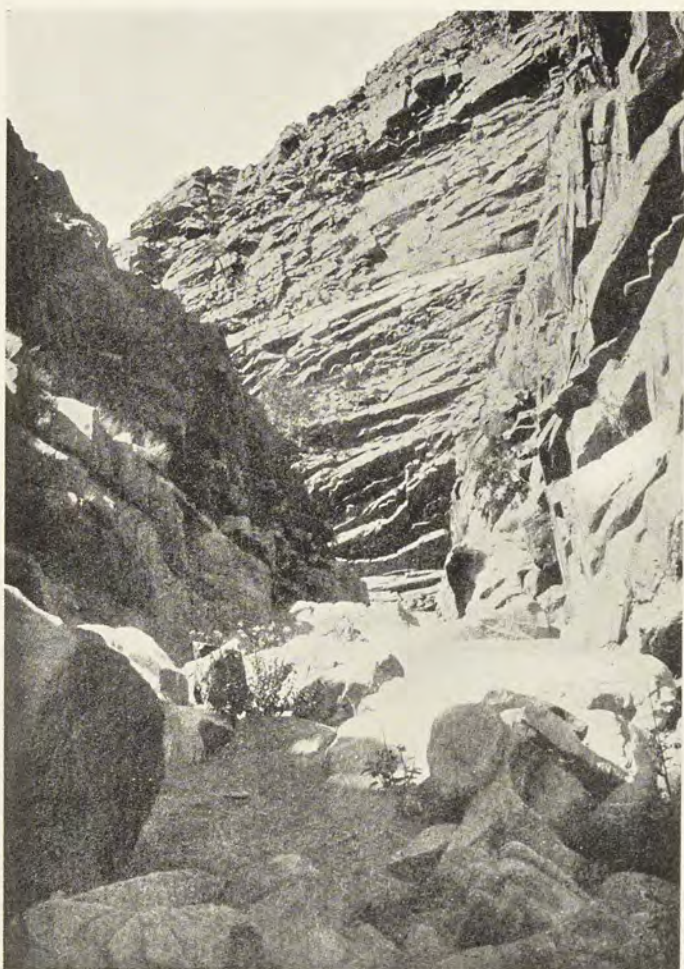




VIEW OF THE NAUKLUFT MOUNTAINS.



HORSES ON ABBABIS FARM IN NORTH-WEST NAMAQUALAND.



ROCK FORMATION IN NAMAQUALAND. THIS GORGE IS A RUSHING  
TORRENT AFTER A STORM.

PLATE 39.

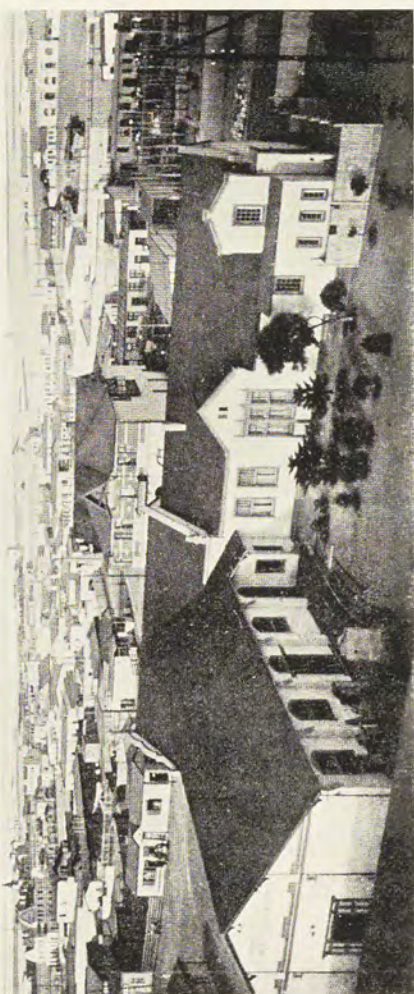


NAMA CATTLE.

PLATE 40.



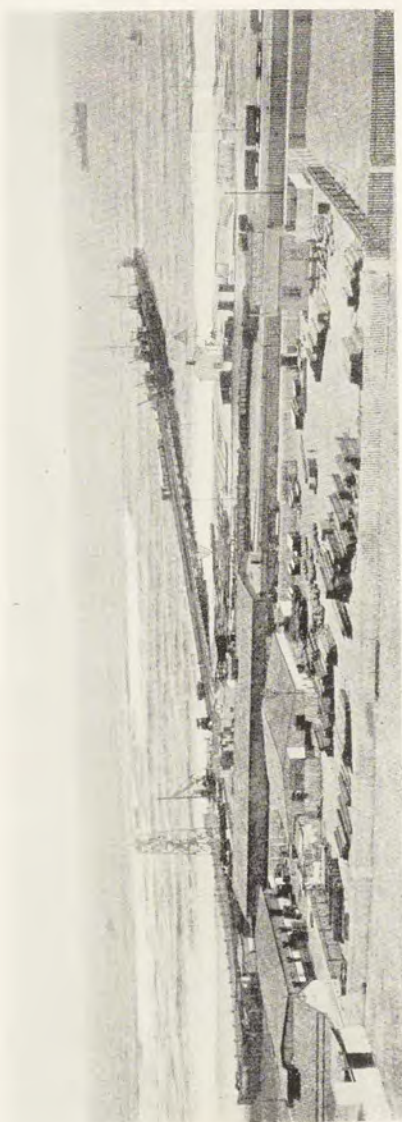
SCENERY IN THE GREAT KARAS MOUNTAINS.



SWAKOPMUND FROM THE WEST, NAMIB DESERT IN THE BACKGROUND.



SWAKOPMUND.



A VIEW OF SWAKOPMUND.

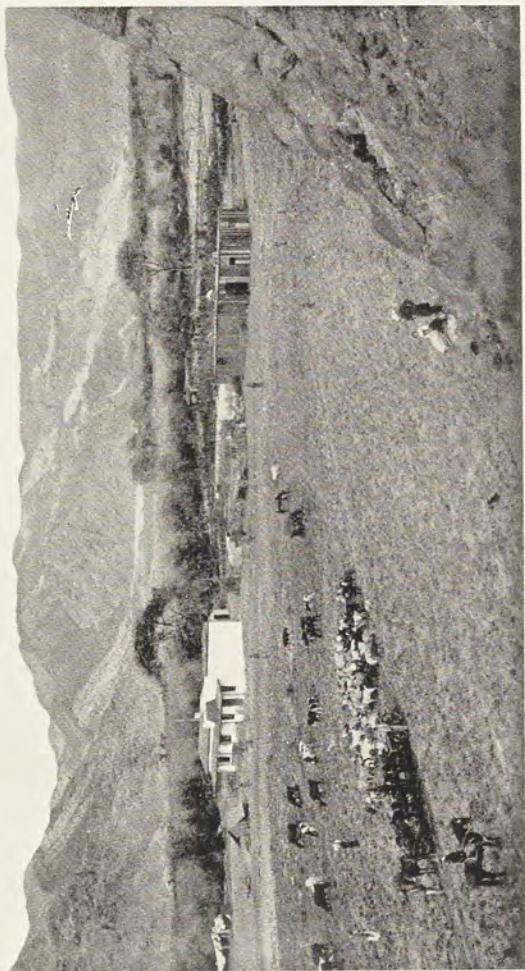


VIEW OF SWAKOPMUND.

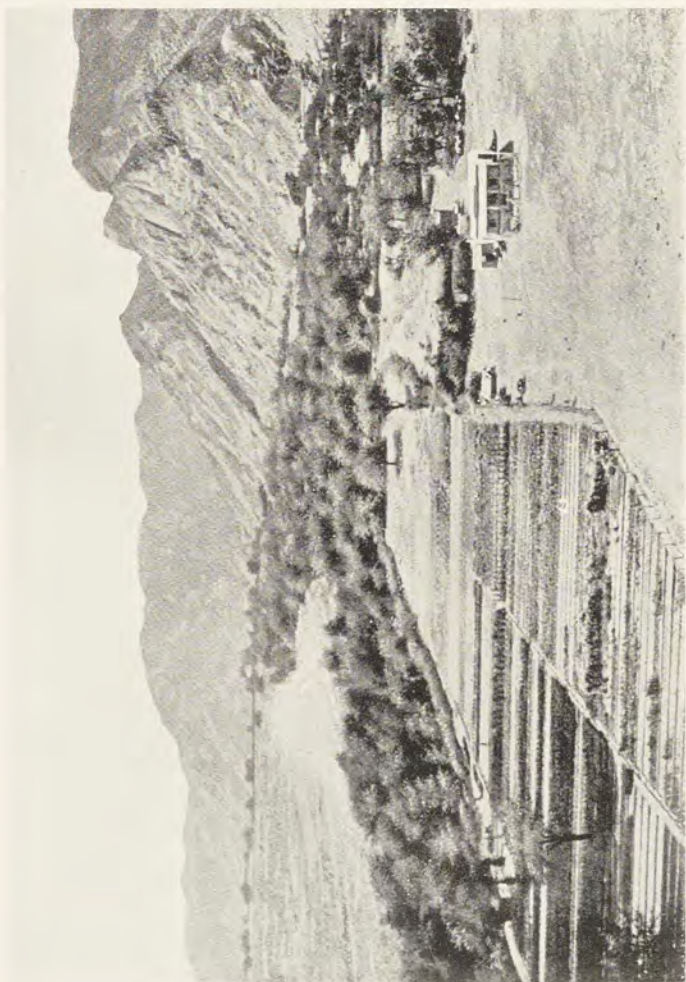




VIEW ON THE SWAKOP RIVER, NEAR OKAHANDJA,  
WITH GIRAFFE AND HEBECLADA ACACIA ON THE LEFT.



GERICKE FARM AT GOANIKONTES, IN THE SWAKOP VALLEY.



SMALL HOLDINGS. BROCK FARM, AT GOANKONTES, ON THE SWAKOP RIVER.

PLATE 48.

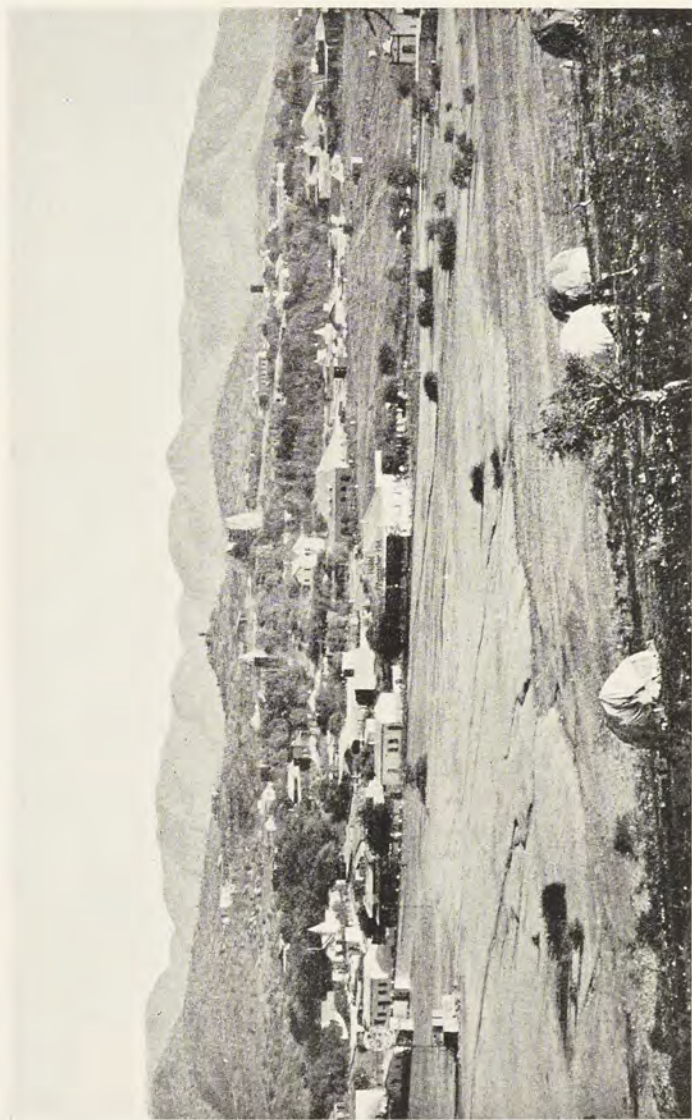


RUINS OF A JAM FACTORY AT SANDFISCHHAFEN, BURIED BY  
THE SHIFTING SANDS.

PLATE 49.



GOVERNMENT OFFICES AND MONUMENT TO THE FLEET,  
SWAKOPMUND.



VIEW OF WINDHOEK.



WINDHOEK.



PLATE 53.



GOVERNMENT HOUSE, WINDHOEK.

PLATE 54.



KAISER-WILHELM-STRASSE, WINDHOEK.



PLATE 55.



VIEW IN THE PUBLIC GARDENS, WINDHOEK.

PLATE 56.



VIEW IN THE PUBLIC GARDENS, WINDHOEK.

PLATE 57.



THE WATERWORKS, WINDHOEK.

PLATE 58.



VIEW ON THE SWAKOP RIVER.



WATER DAM ON THE VOIGTLAND FARM, NEAR WINDHOEK, WITH AUAS MOUNTAINS IN THE DISTANCE.

PLATE 60.



SMALL HOLDINGS, LITTLE WINDHOEK.

PLATE 61.



LUDWIG FARM, LITTLE WINDHOEK.

PLATE 62.



HAN'S FARM, NEAR WINDHOEK.

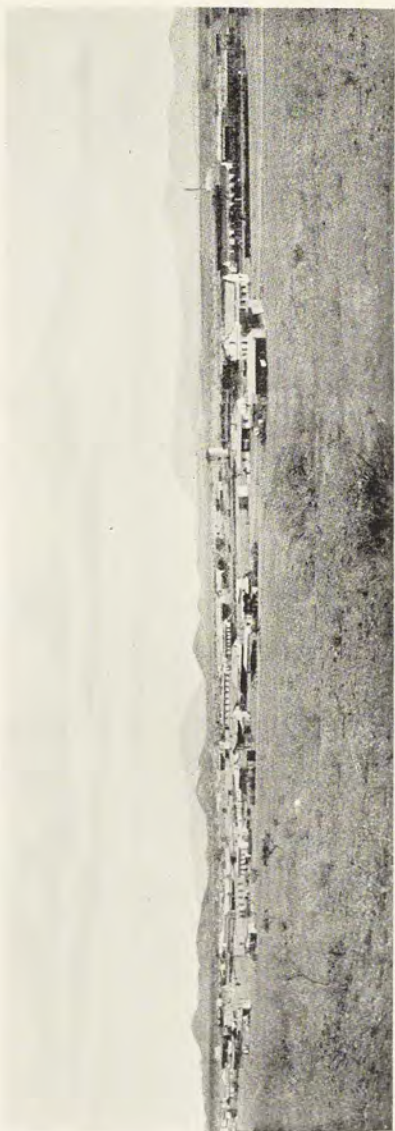
PLATE 63.



VINES AT LITTLE WINDHOEK.



A NATIVE VILLAGE NEAR WINDHOEK.

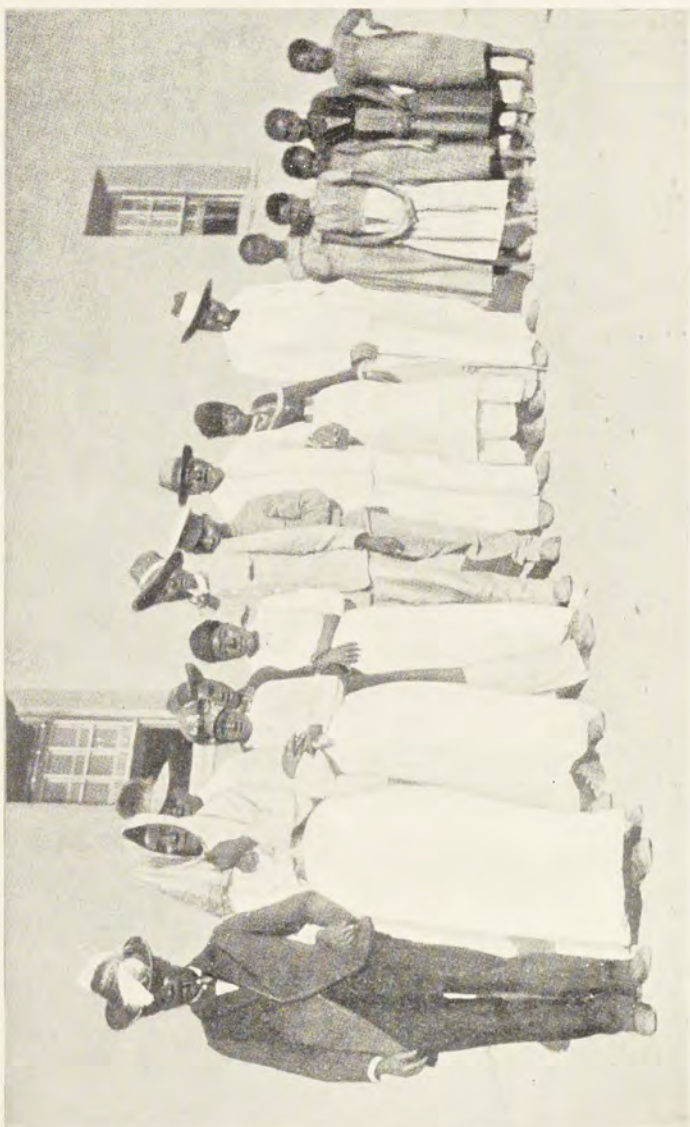


VIEW OF KARIBIB, DAMARALAND.



SCHOOL AT MOUNT DAMARA.







NATIVES OF MOUNT DAMARA.

PLATE 69.



ETIRO FARM, NEAR KARIBIB.

PLATE 70.



MOUNT DAMARA CHILDREN, WITH CURIOS.



OMARURU KOP, WHICH WAS USED AS A SIGNAL STATION DURING THE NATIVE RISING.

PLATE 72.



THE OMARURU RIVER BED DURING THE DRY SEASON.



SMALL CATTLE WATERING AT WATER DAM AT MERCKER'S FARM.

PLATE 74.

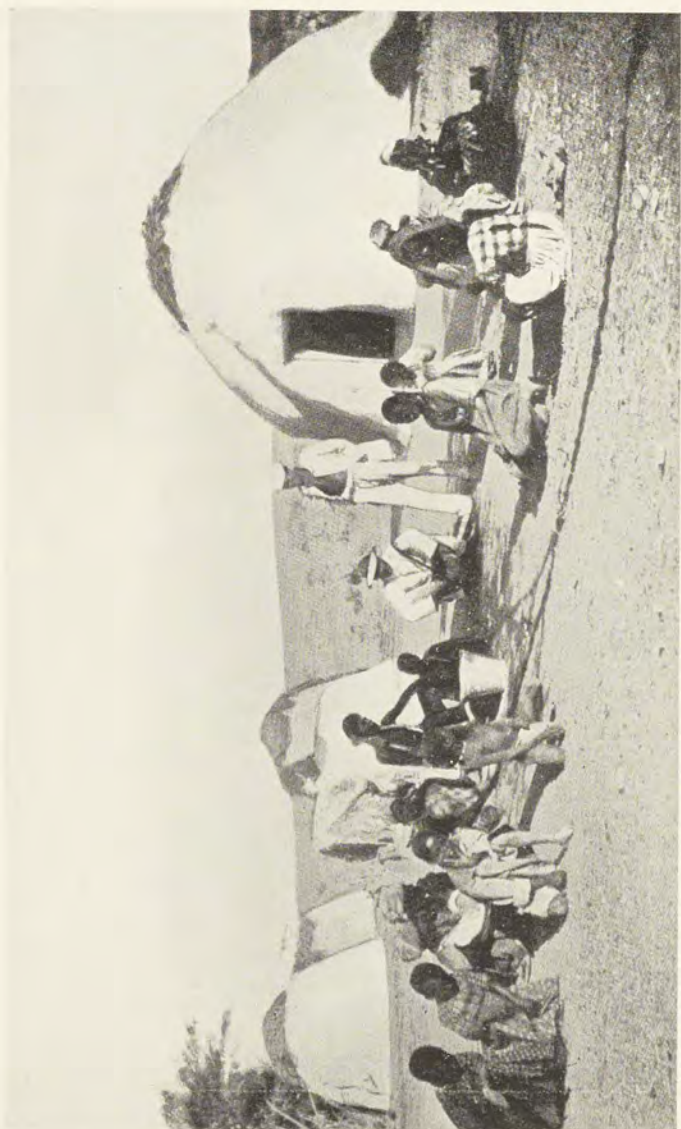


OX WAGON, WITH HERERO DRIVER, AT MERCKER'S FARM.

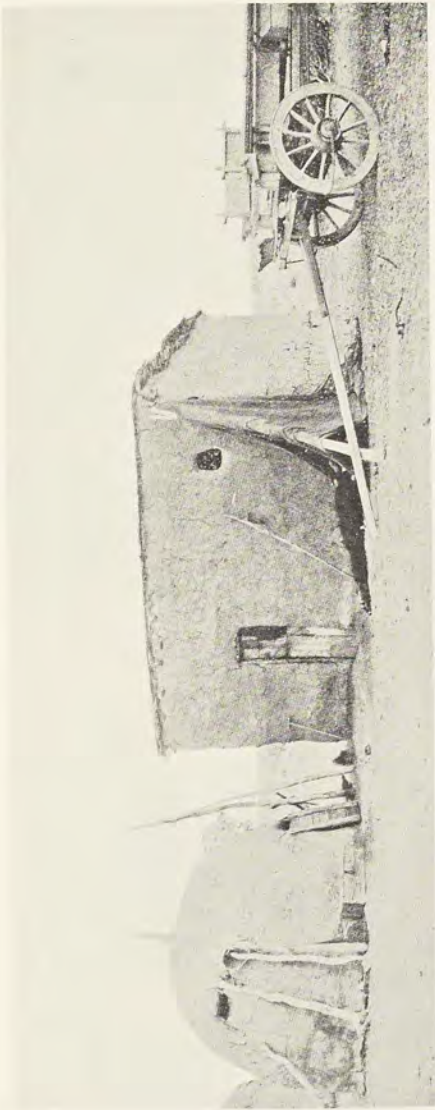


AFTER DINNER ON NEIMALS STATION IN OKOMBAHE.





THE SUNDAY WASH ON NEMALS STATION IN OKOMBAHE.



THE BUREN FARM.

PLATE 78.



FLOWERING BRAMBLE

PLATE 79.



STREET IN OMARURU, DAMARALAND.

PLATE 80.



THE OMARURU RIVER IN THE DRY SEASON.

PLATE 81.



THE OMARURU IN THE RAINY SEASON.

PLATE 82.



IN THE AUAS MOUNTAINS.

PLATE 83.



PALMS IN A SMALL WOOD, OKOMBAHE.

PLATE 84.



OKAHANDJA AND MT. KAISER WILHELM, DAMARALAND.

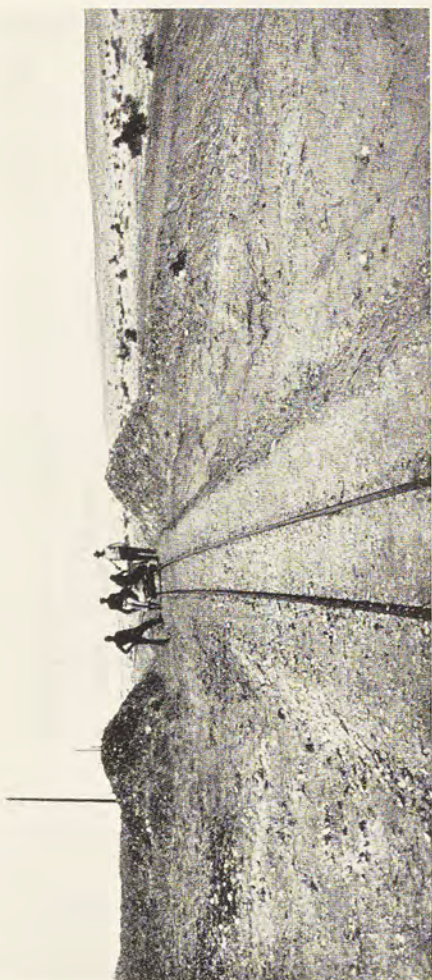
PLATE 85.



VIEW OF GOBABIS.

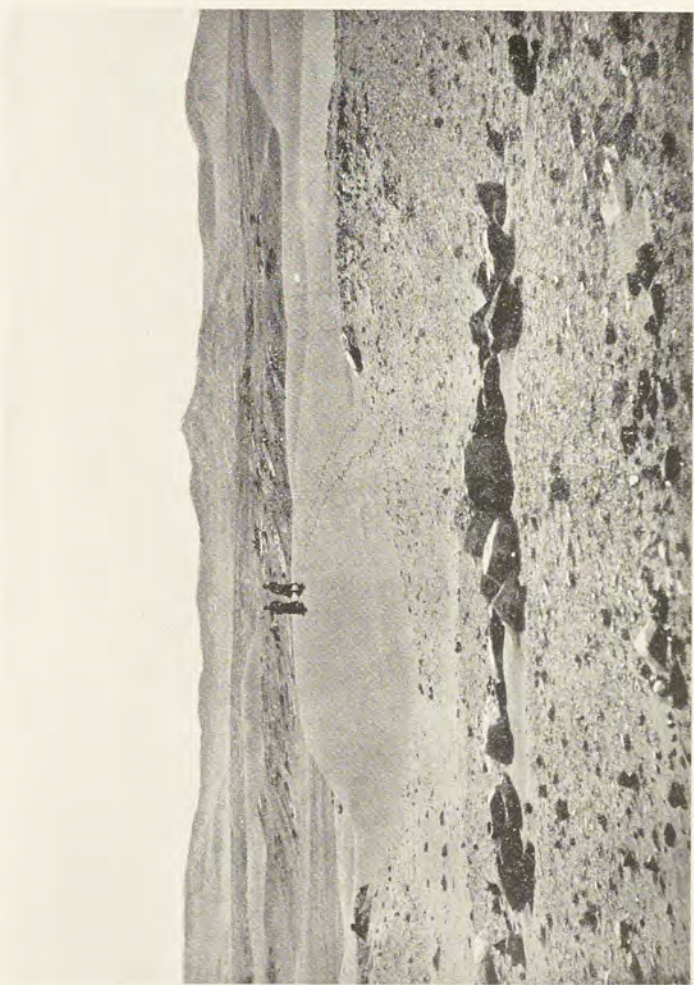


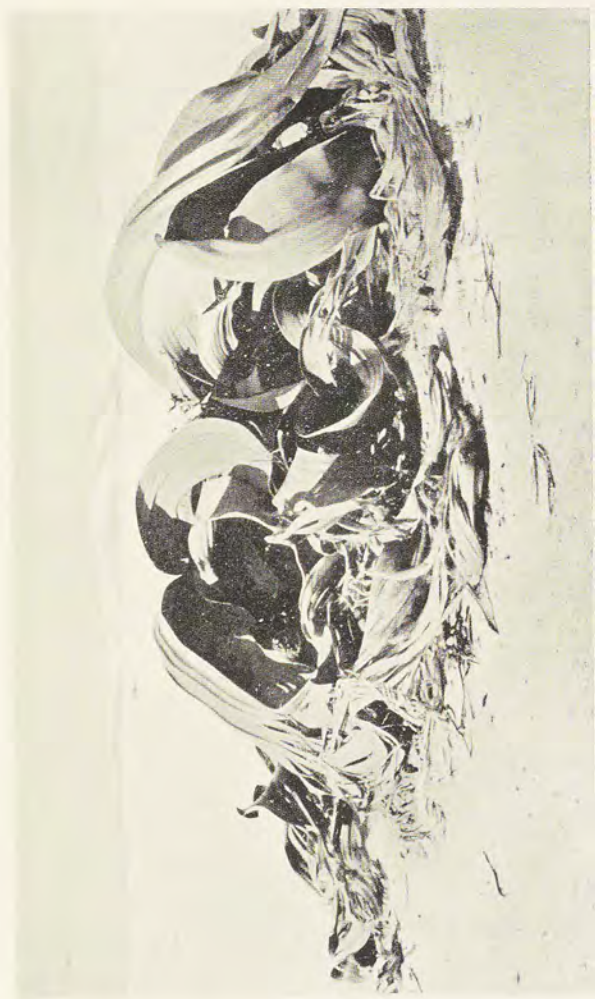
GENERAL VIEW OF OTJIMBINGWE.



THE NAMIB AT THE 5,380 KILOMETRE OF THE OTAVI RAILWAY.

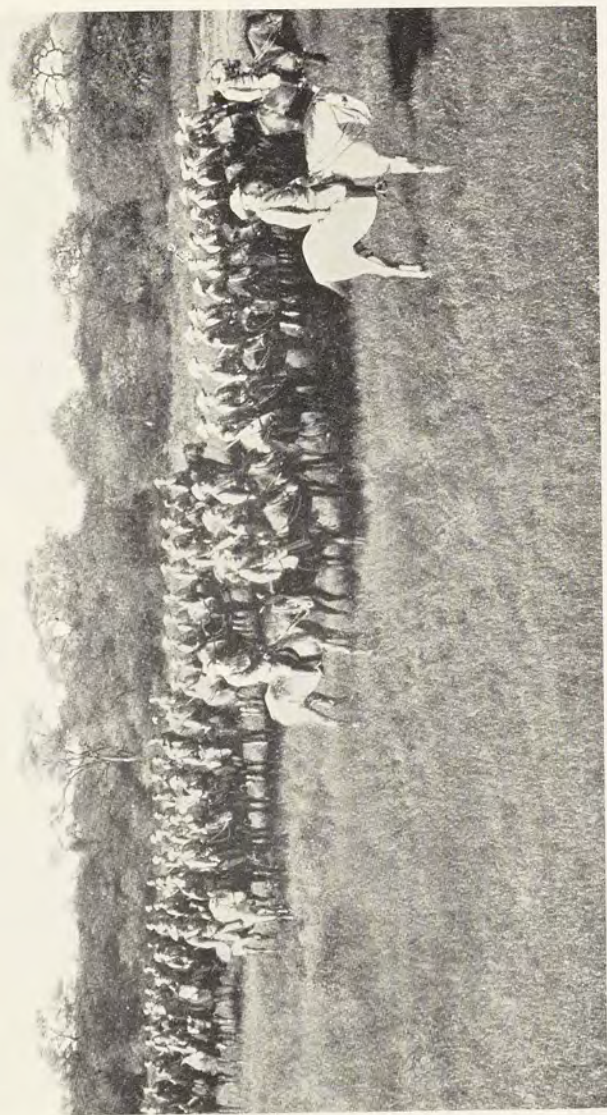






FLOWERING WELWITSCHIA MIRABILIS AT WELWITTOCH, IN THE NAMIB.





COMPANY OF GERMAN COLONIAL FORCE.

PLATE 92.



CAMEL PATROL.

PLATE 93.



"PAROLE HEIMAT."

PLATE 94.



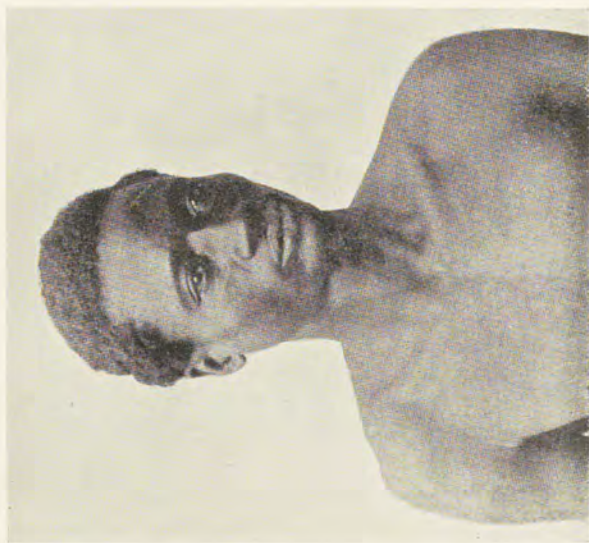
GERMAN MOUNTAIN BATTERY.

PLATE 95.



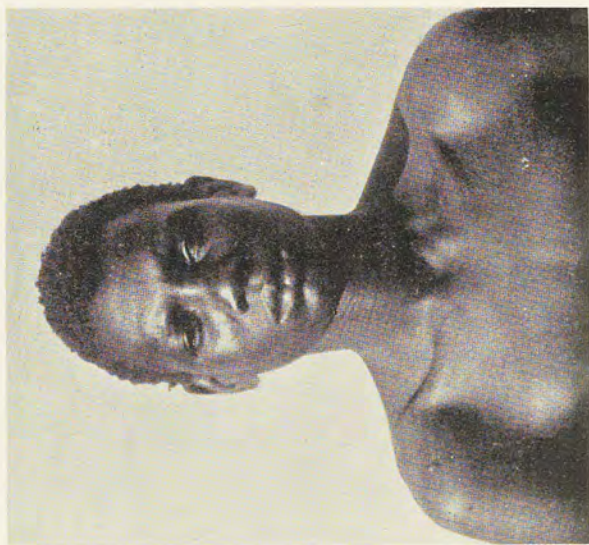
ONE YEAR GERMAN VOLUNTEERS.

PLATE 96.



A HERERO NATIVE.

PLATE 97.



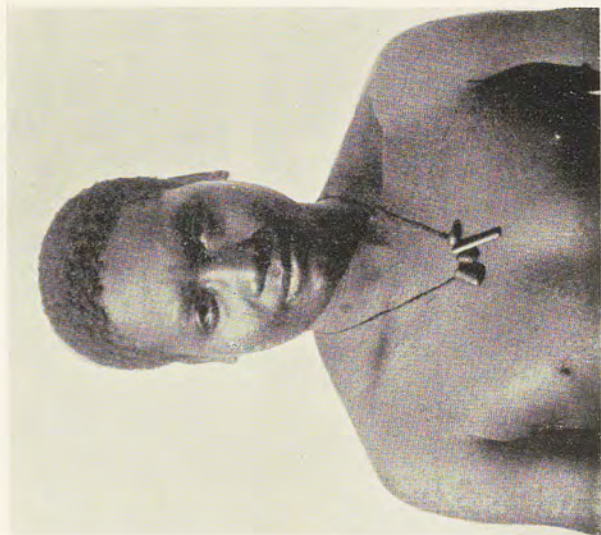
A NATIVE OF BERGDAMARA.

PLATE 98.



A BUSHMAN.

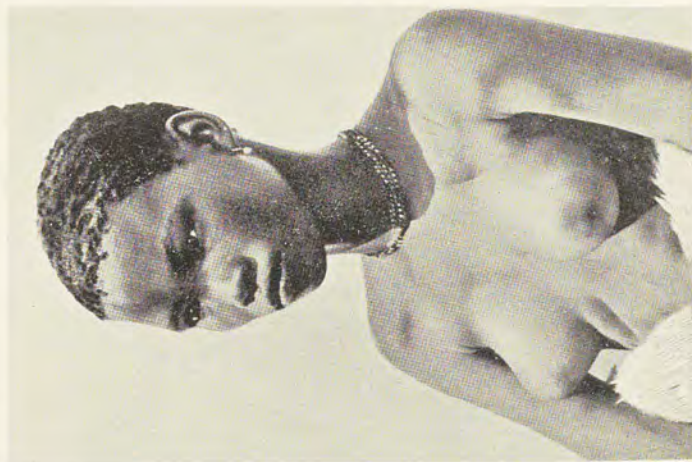
PLATE 99.



AN OVAMBO NATIVE.



PLATE 100.

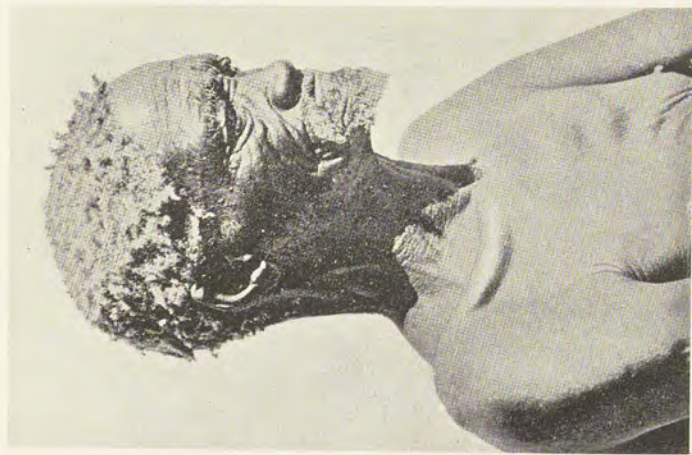


A 15-YEAR-OLD GIRL OF THE TOPNAAR  
HOTTENTOTS.

PLATE 101.



A TOPNAAR NATIVE.



AN OLD HOTTENTOT.



CHIEF OF THE TOPNAAR HOTTENTOTS.

PLATE 104.



A YOUNG HERERO.

PLATE 105.



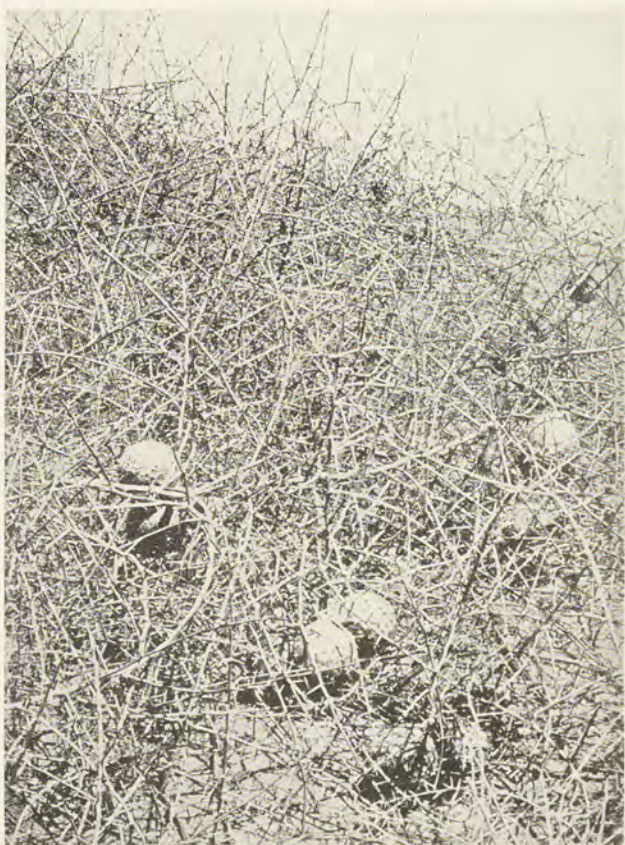
A MAN FROM KARIIBIB.



NATIVE OF SOUTH KALAHARI.



NATIVE OF SOUTH KALAHARI.



NARA BUSH WITH RIPE FRUIT, IN THE KUISEB RIVER.



ALHAGI SHRUB (THE CAMEL'S THORN). ON THE GROUND ARE  
"TSAMAS."



THE NAMIB DESERT, NEAR ARANDIS, WITH ALOES IN FOREGROUND.

PLATE 111.



THE GOWARIB GORGE.

PLATE 112.



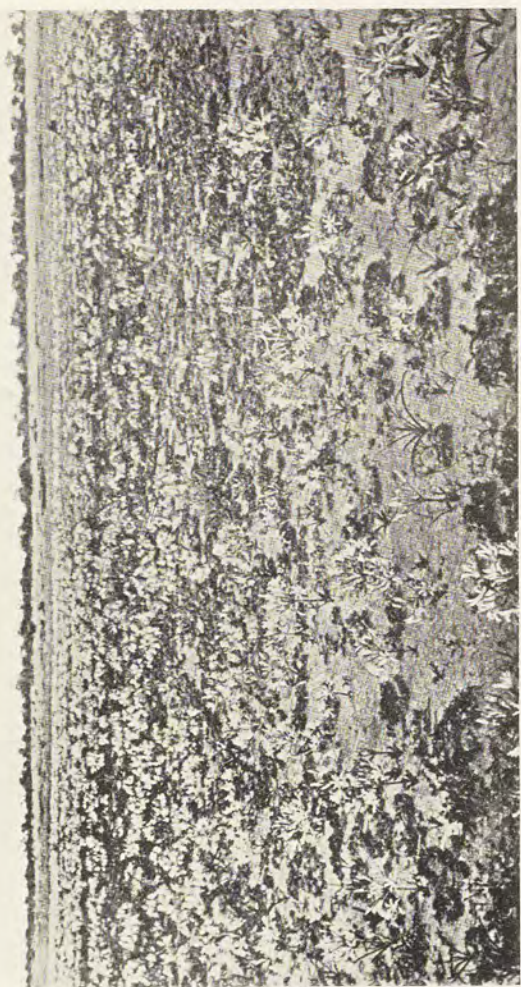
RESERVOIR AT PAVIANSFONTEIN.



SEKGOMA DISTRICT OF THE KALAHARI.







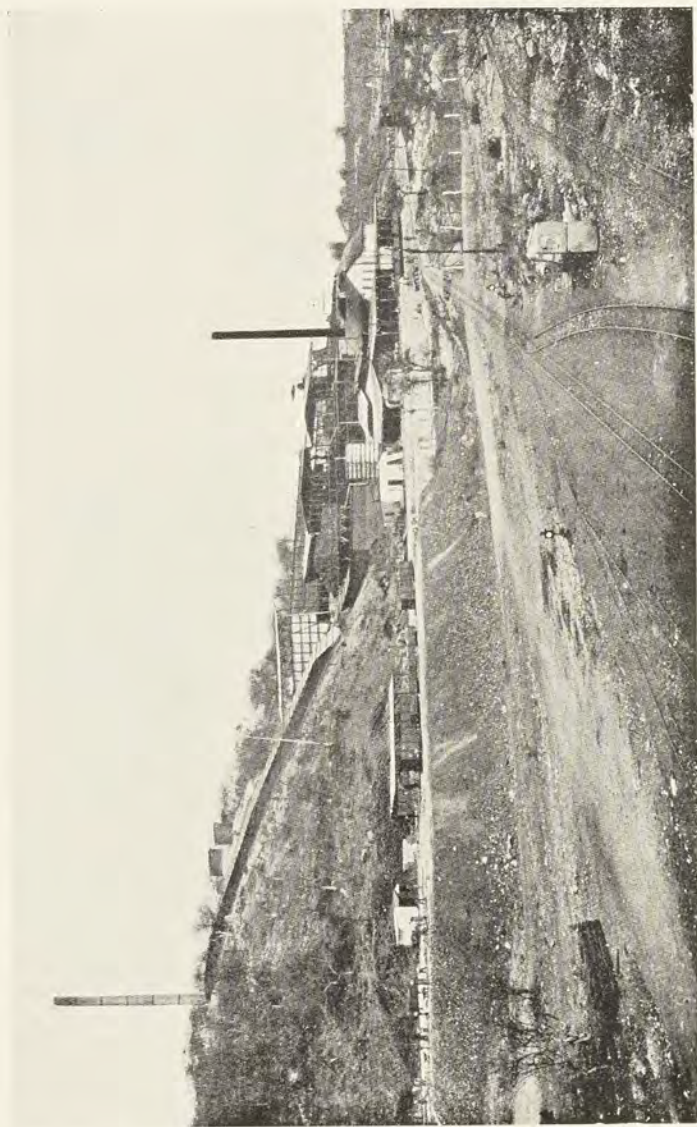
SPRING VEGETATION (BRUNSWIGIA) IN THE BOUCHE AREA OF THE KALAHARI.



OTJIKOTO LAKE—LANDSLIP BASIN IN THE OTAVI CHALK. THIS SUPPLIES TSUMEB WITH WATER. J



OTJIKOTO LAKE, WEST OF TSUMEB.

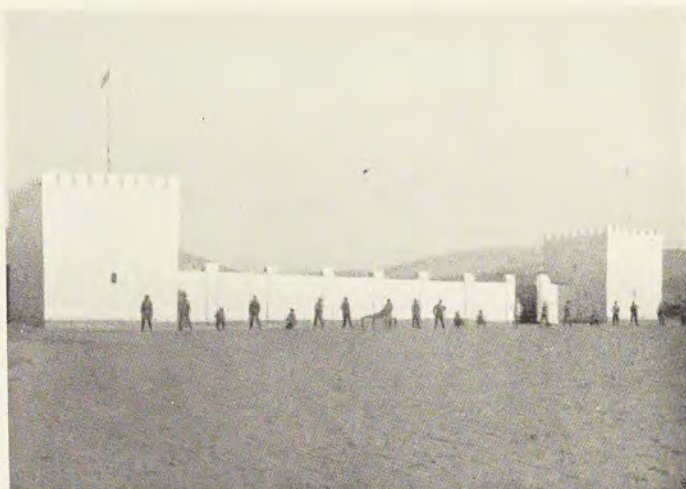


VIEW OF THE TSUMEB MINE.

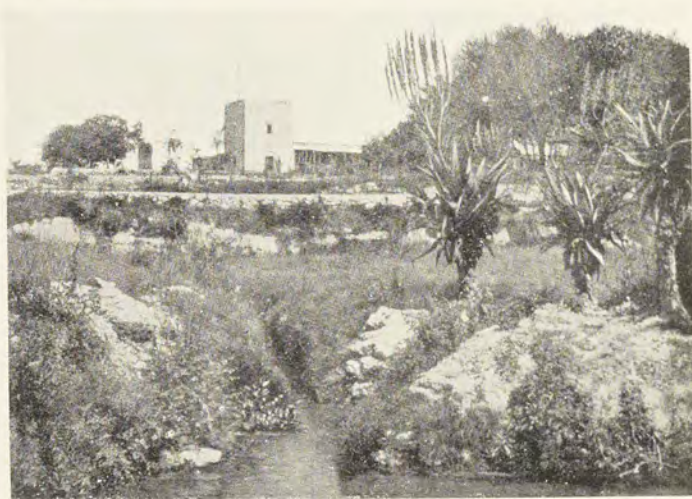


NATIVE WORKMEN IN THE TSUMEB LIMESTONE QUARRY.

PLATE 120.



MILITARY STATION AT ZESFONTEIN, IN THE NORTH.  
PLATE 121.



MILITARY STATION AT GROOTFONTEIN, IN THE NORTH.

PLATE 122.



NAMUTONI FORT, IN THE NORTH.

PLATE 123.



VIEW OF OUTJO, IN THE NORTH.





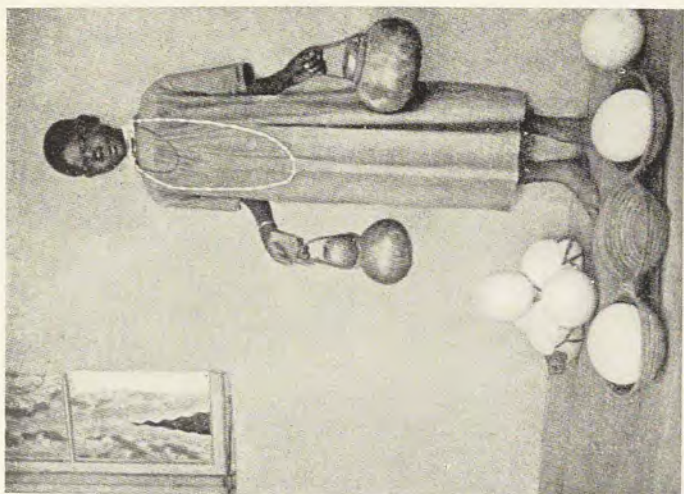
KHAN BRIDGE OVER THE OTAVI RIVER, NEAR ISAKOS. THE KHAN RIVER IS DRY, BUT THERE IS WATER BELOW THE SURFACE.



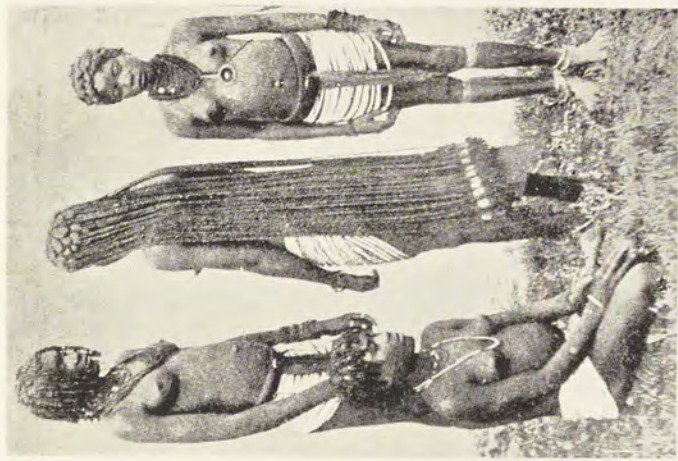
A SYCAMORE TREE (*FICUS DAMARCUSIS*) NEAR OTAVI.



HERERO GIRLS DANCING AT OTAVIFONTEIN.



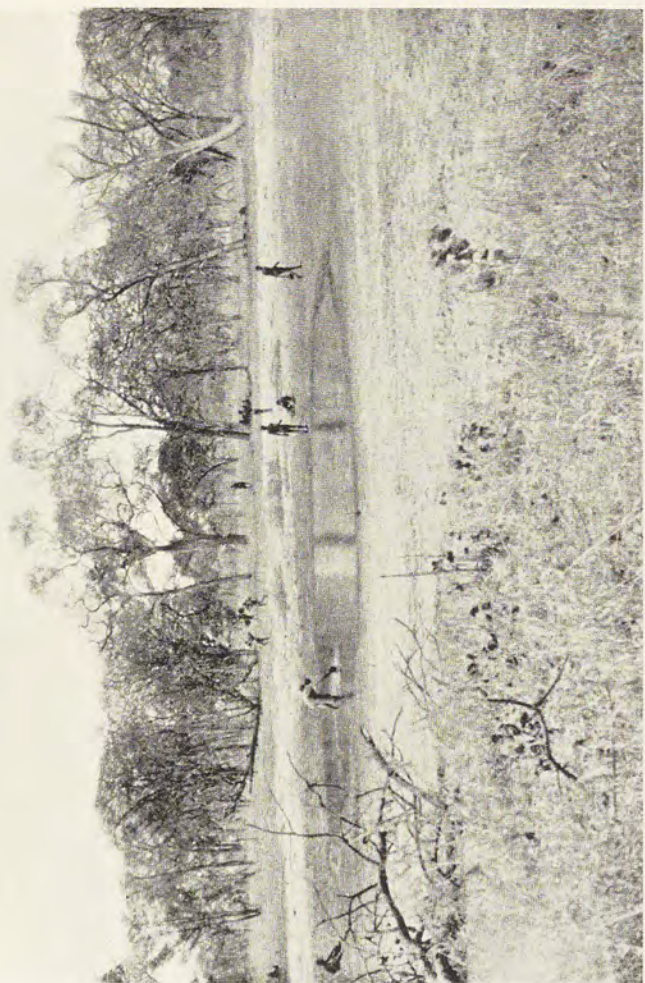
OVAMBO GIRL, WITH OVAMBO CALABASHES  
AND BASKETS.



OVAMBO WOMEN.



LOW COUNTRY WOOD ON THE OKAVANGO, NEAR LIBEBE.



THE MOSQUITO POOL IN THE ESTUARY DISTRICT OF THE SELINDA.

PLATE 131.



NATIVE GRANARY IN THE NORTH OF OVAMBO.  
PLATE 132.



THE OKAVANGO RIVER.

PLATE 133.



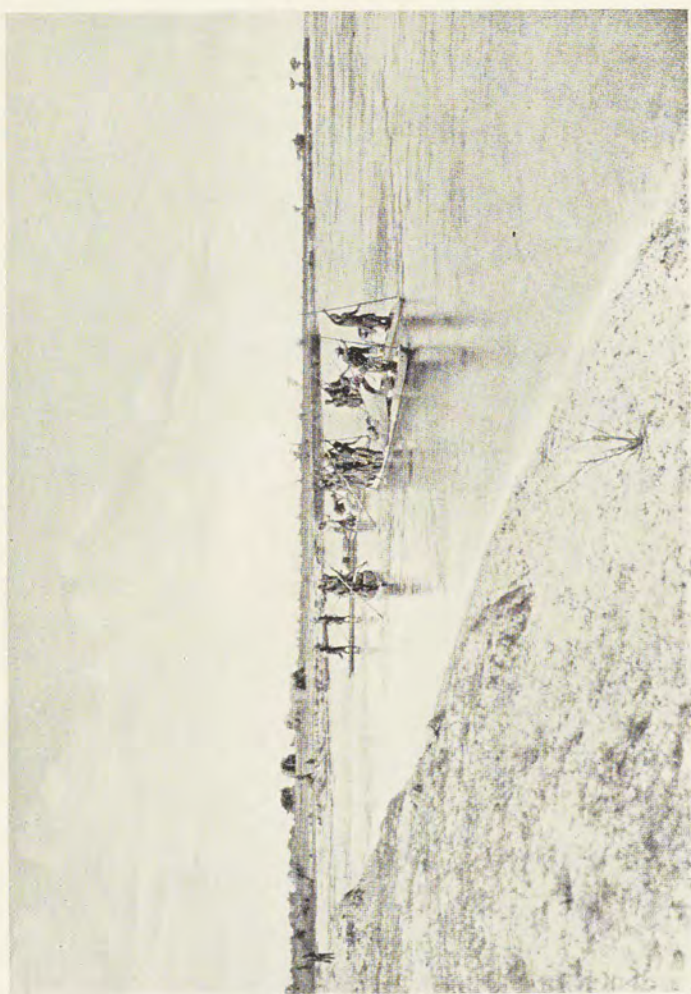
CULTIVATED LAND IN THE LINYANTI BASIN, CAPRIVIZIPFEL DISTRICT.

PLATE 134.



SWAMP ON THE KWANDO, CAPRIVIZIPFEL DISTRICT.





FREIGHT BOATS OF THE MASSUBIANS ON THE ZAMBESI, NEAR SESCHEKE.



VEGETATION OF THE LINYANTI.

PLATE 137.



VIEW IN THE KAOKOFELD.

PLATE 138.



GARDEN AT RIETFONTEIN FARM.



THE BED OF THE KASCHANGA IN THE FLOOD AREA OF THE LINYANTI.

PLATE 140.

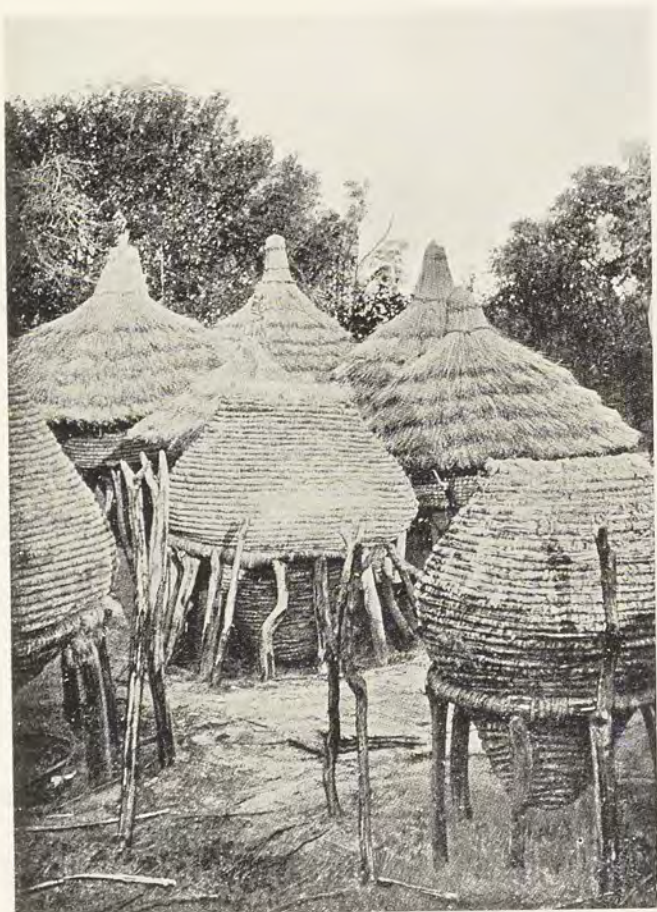


SCENE IN AMBOLAND.

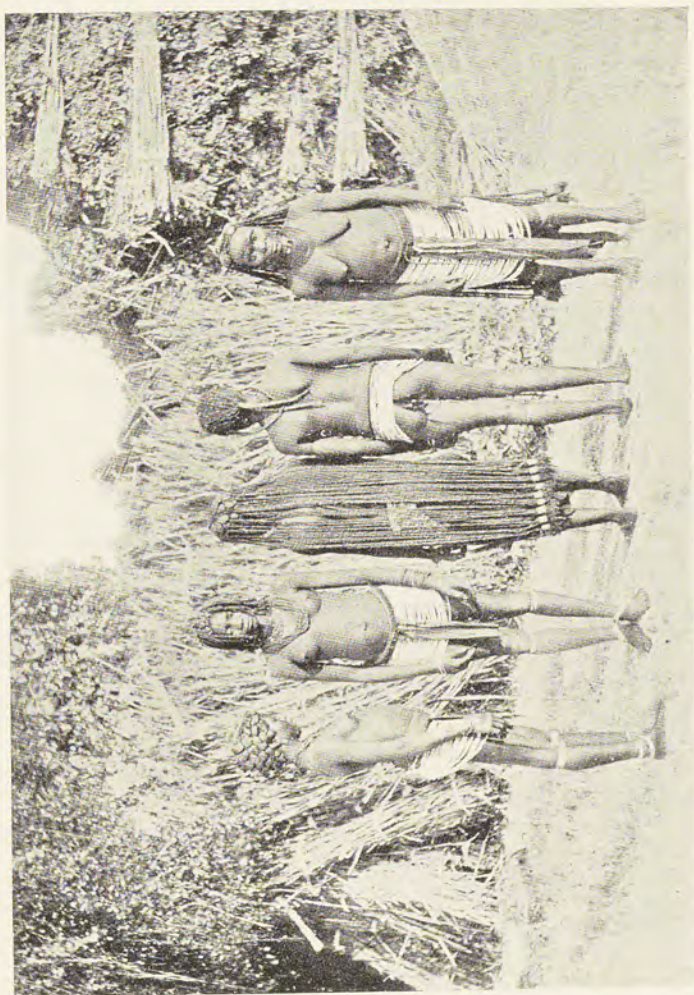
PLATE 141.



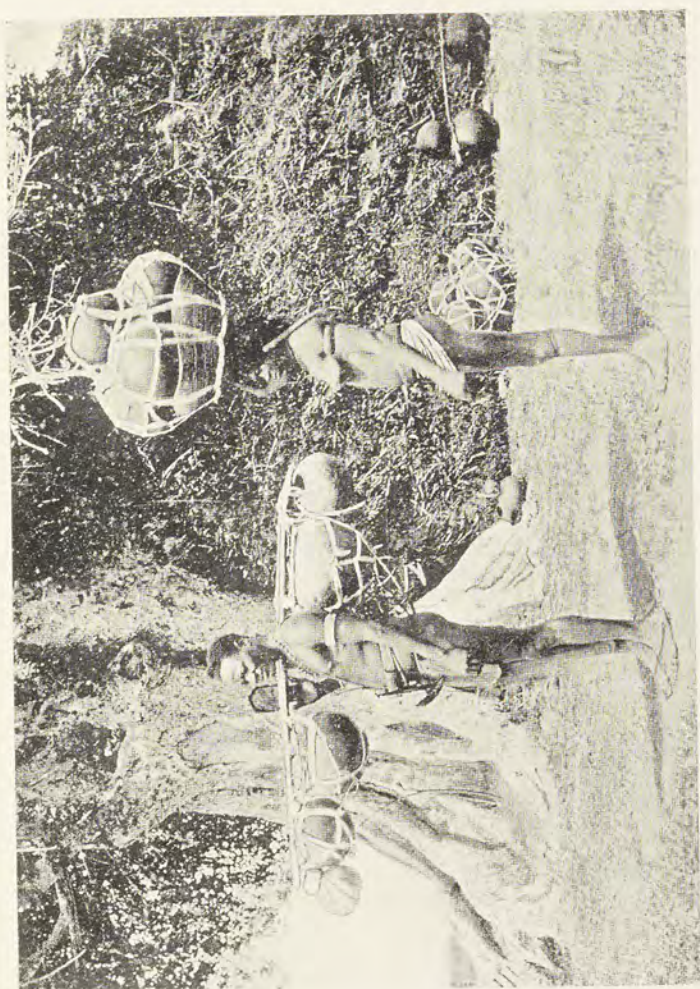
ON THE UPPER ZAMBESI, CAPRIVIZIPFEL DISTRICT.



GRANARIES IN AMBOLAND.



WOMEN'S COSTUMES AT OLUKONDO, IN AMEOLAND.



POT SELLERS, AMBOLAND.



PLATE 145.

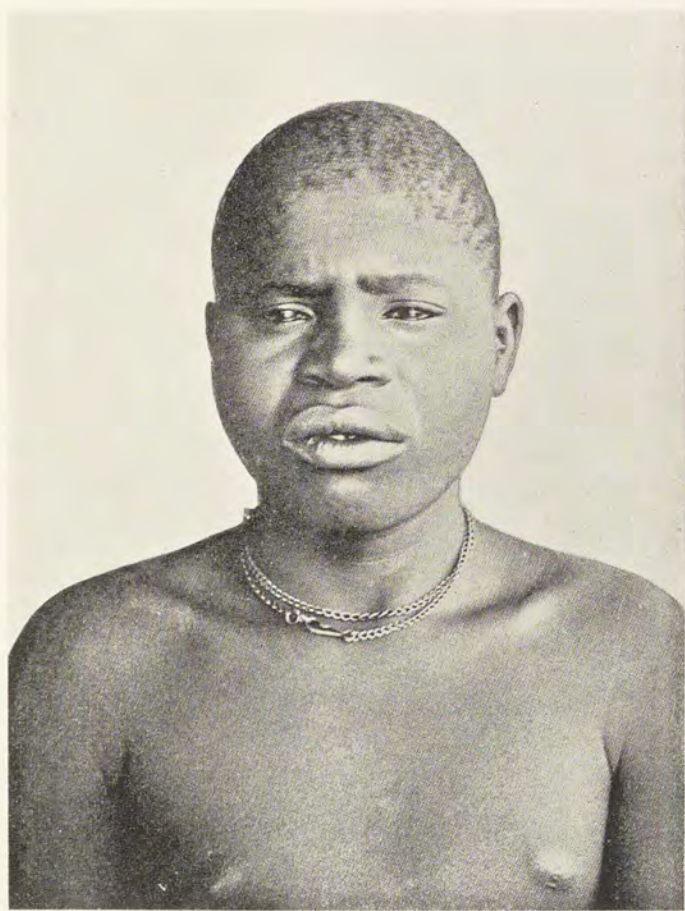


VEGETATION ON THE RIVER.

PLATE 146.



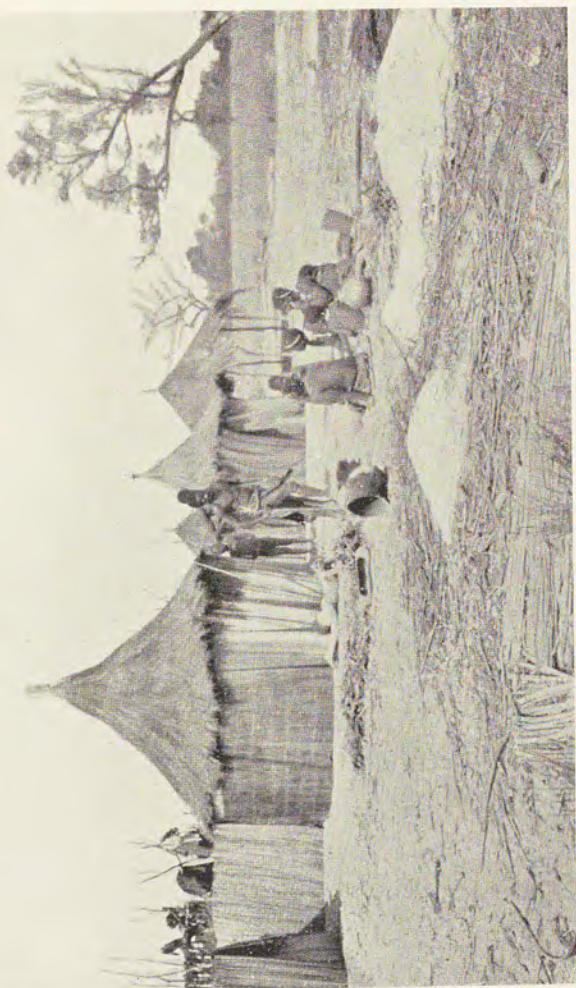
THE CUNENE RIVER.



YOUNG AMBO NATIVE.



HUKWE WOMEN ON THE BED OF THE GANGU.



MBALA, A SUMMER VILLAGE OF THE MAFU.

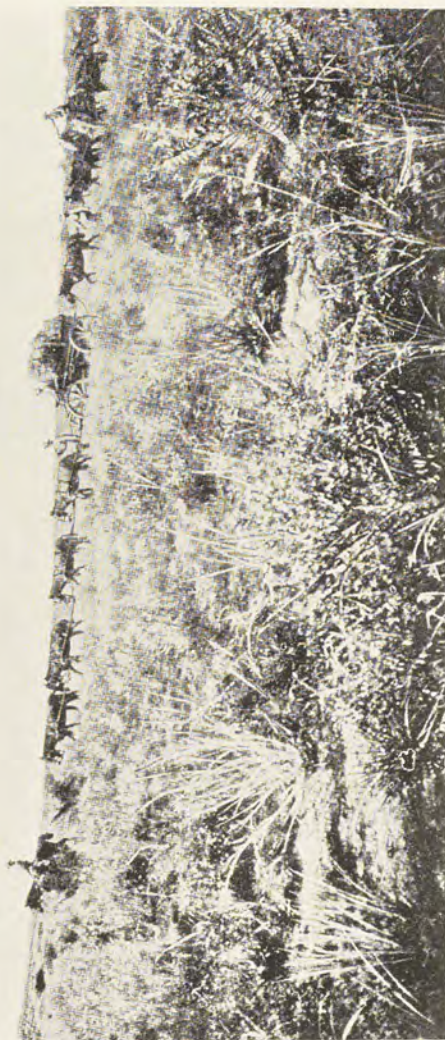
PLATE 150.



STEEP SLOPE DOWN TO THE RIVER OF THE KOANKIP, NEAR CHANIS RIVER BED.



GALIANKILE, A SUMMER VILLAGE OF THE MAMBALANKWE.



WAGONS CROSSING THE SOUTH-WEST AFRICAN GRAZING STEPPES.



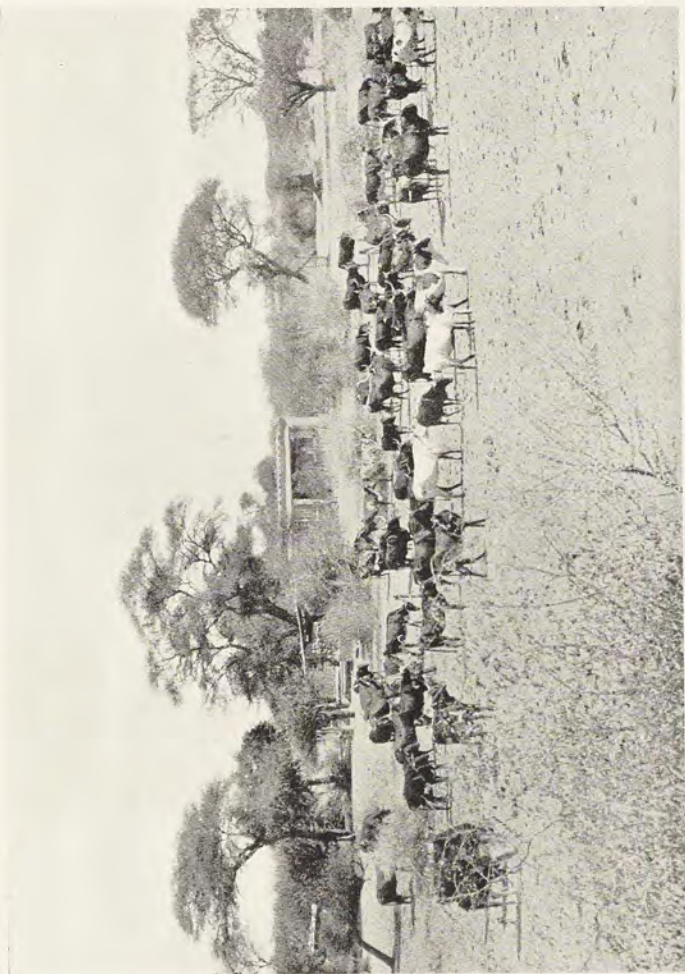
MULE CARTS USED FOR FAST TRAVELLING.



PLATE 154.



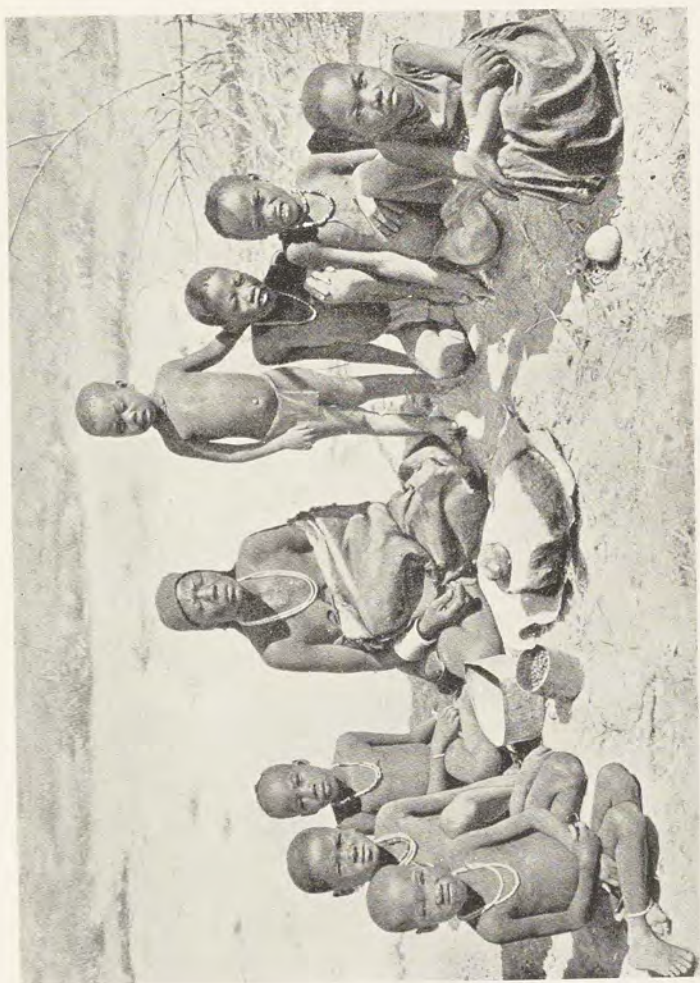
OX WAGON ON THE "PAD."



HERD OF CATTLE IN SOUTH-WEST AFRICA.



FIELD HEREROS, WITH THEIR WOMEN, IN FULL DRESS.



HERERO WOMAN WITH HER CHILDREN.



HALF-CASTES IN FRONT OF THEIR "PONTOKS."



HERERO "PONTOKS" ON A CLEARING. THE POINTED LEATHER CAPS WERE FORMERLY THE SIGN OF A MARRIED WOMAN.

PLATE 160.



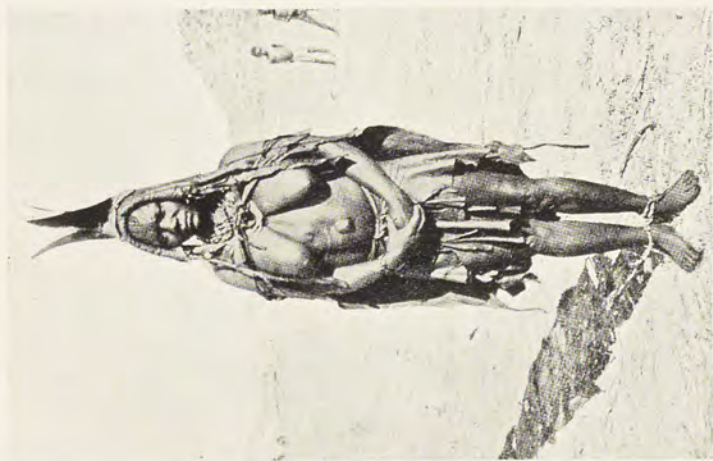
HENDRIK WITBOOI WITH HIS SONS AND HEADMEN.



OPEN-AIR SERVICE FOR RAILWAY WORKMEN. THE SERMON IS PREACHED BY A HERERO  
NATIVE MISSION HELPER.

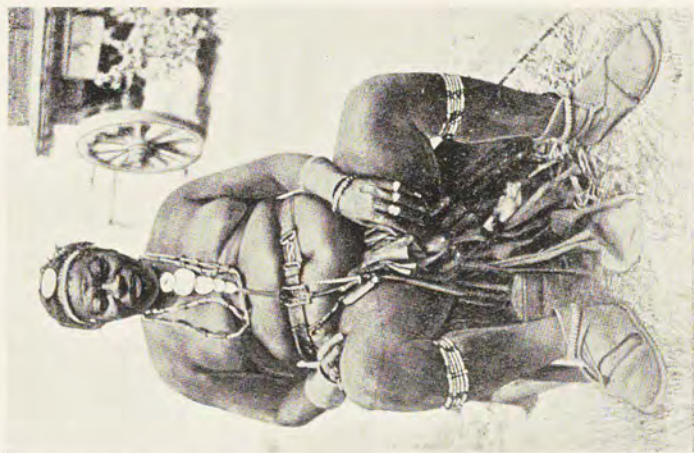


PLATE 162.



HERERO WOMAN.

PLATE 163.



BANJO, THE HERERO CHIEF.



NATIVES FISHING.



HERERO CHIEF, KAMBASEMBI.



A MAMBUKUSCHU, ADORNED FOR THE DANCE.

PLATE 167.



NATIVE BUSHMAN'S CAMP.

PLATE 168.



HERERO "PONTOK," OR NATIVE DWELLING.



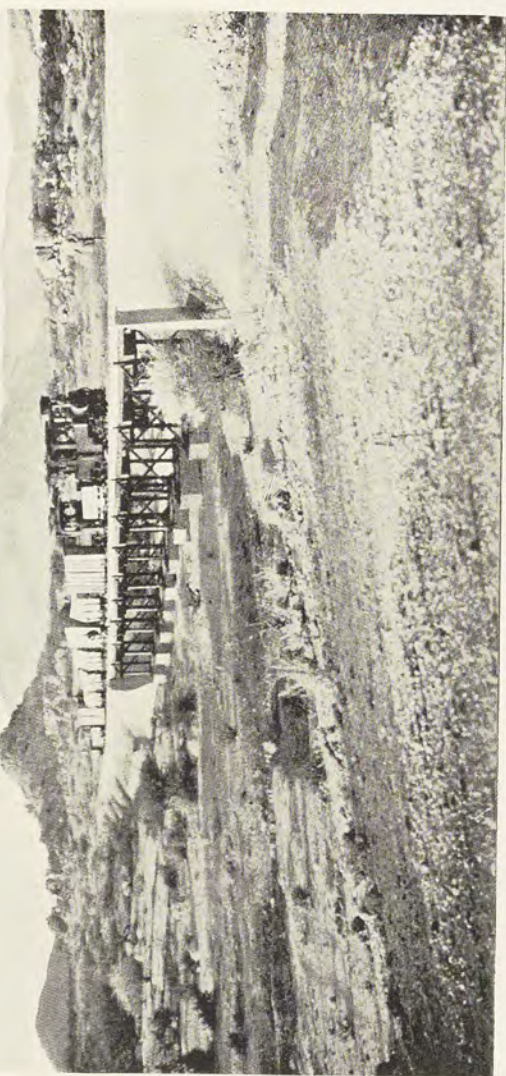
OVAMBO CORN.



HERERO WARRIORS.



SIEDLUNG IN HEREROLAND.



BRIDGE OVER A RIVER IN SOUTH HEREROLAND.





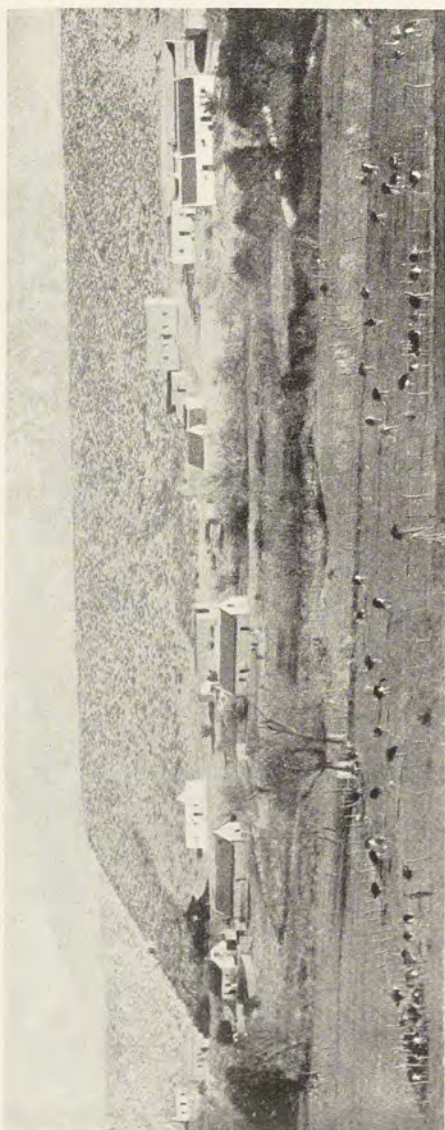
A LAGGIES' PUMP FOR ARTIFICIAL IRRIGATION.



POMEGRANATE TREE.



FIG CACTUS HEDGE.



OSTRICH FARM.

PLATE 177.

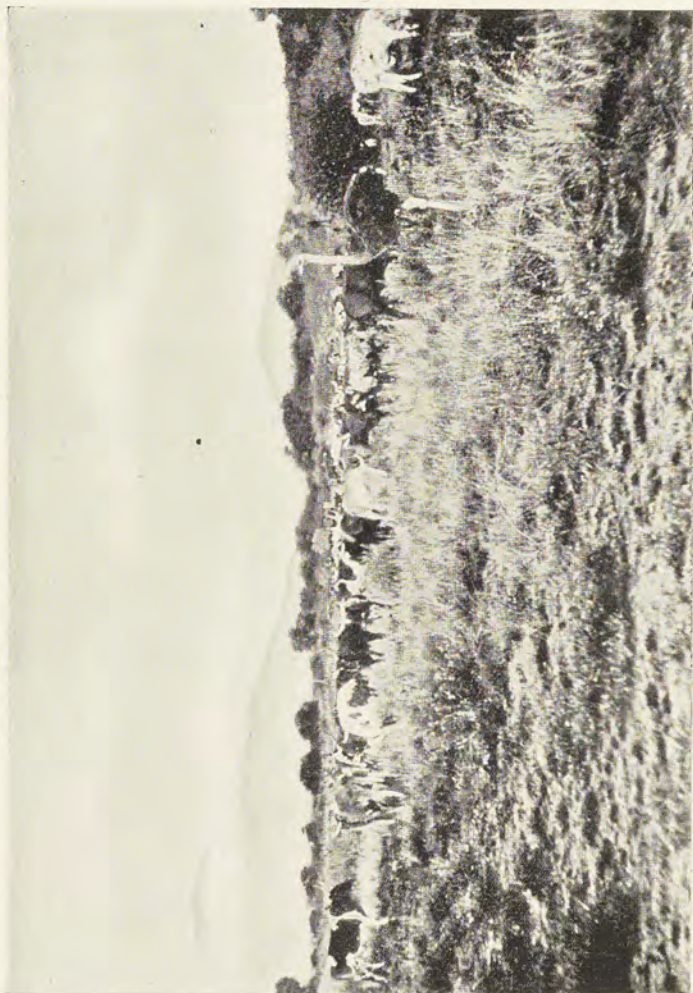


OSTRICHES WITH YOUNG BIRDS.

PLATE 178.



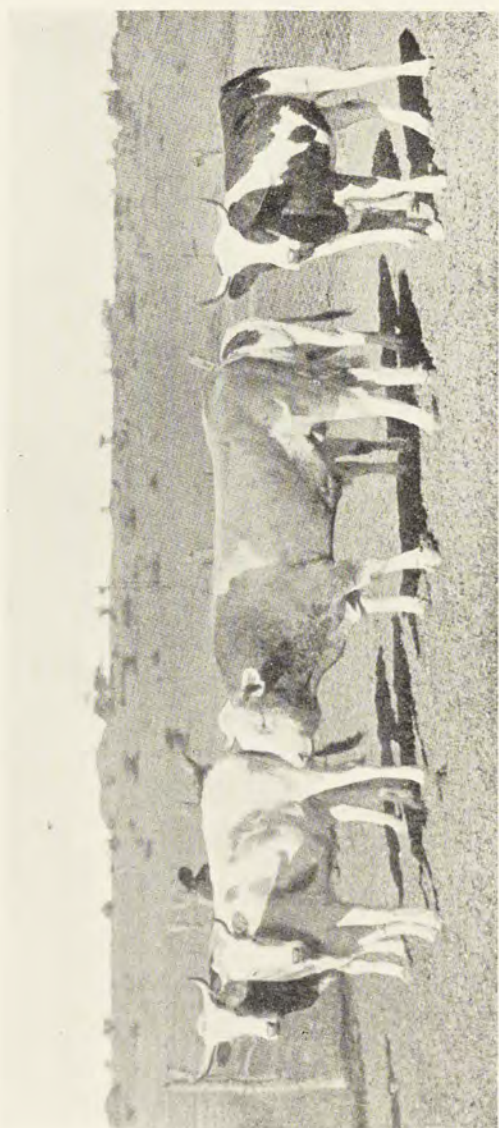
OSTRICH FARM. A NEST.



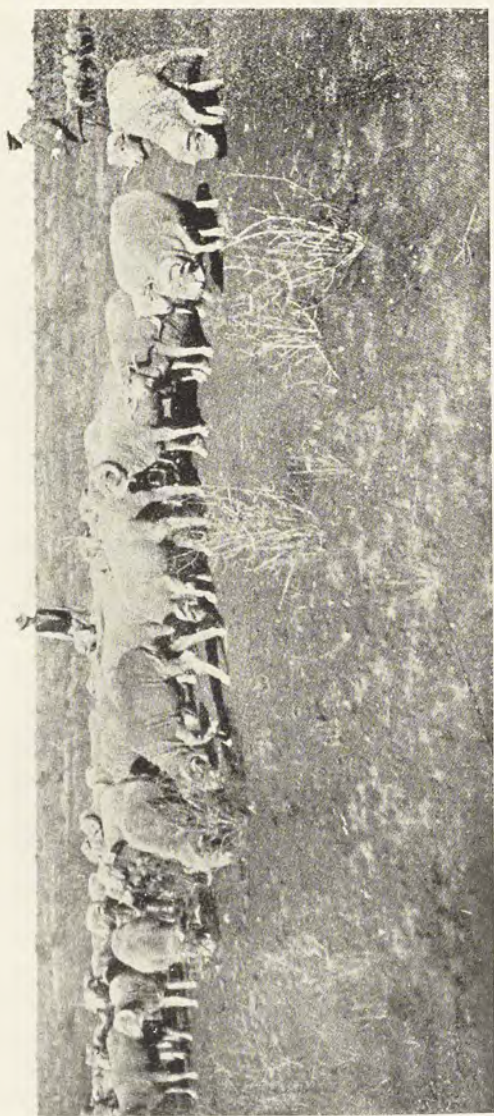
CATTLE AND OSTRICHES GRAZING.



OSTRICHES ON A SOUTH-WEST AFRICAN FARM.



IMPORTED THOROUGHBRED BULL, FROM SIMMENTAL, WITH HALF-BRED COWS.



MERINO RAMS ON THE RAMTSAS STATION, 1912, CROSSED WITH ELECTORALS FROM OSCHATZ.



PLATE 183.



PRIZE CROSS-BRED COWS.

PLATE 184.



CROSS BETWEEN AN AFRICAN AND AN ANGORA GOAT.

PLATE 185.



HERERO OPENS AND CLOSES THE DAMS.

PLATE 186.



WATERING CATTLE.

PLATE 187.



TOBACCO GROWING. THE BEDS.

PLATE 188.



RIPE TOBACCO FIELD.



TOBACCO GROWING. PLAITING THE DRY LEAVES.



TOBACCO GROWING. STRINGING THE LEAVES.

PLATE 191.



CAMELS IN THE DESERT.

PLATE 192.



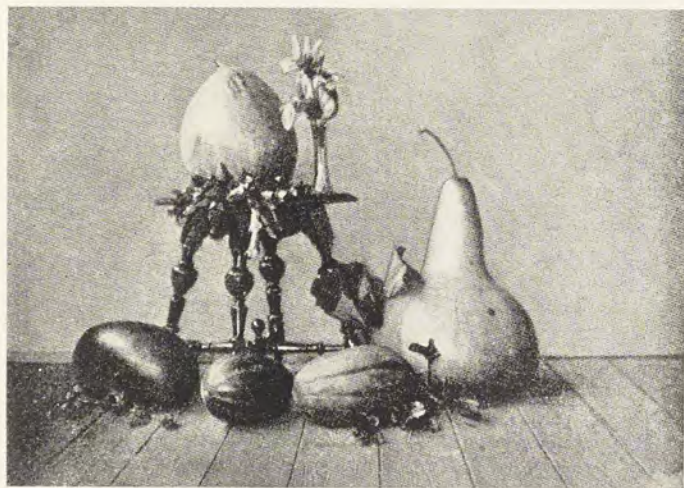
MAIZE FIELD.



AFRICAN FRUITS.

TOMATOES, GRAPES, FIGS, FIG CACTUS, OVAMBO CALABASH WITH  
BLOSSOMING BRANCH AND FRUIT OF THE EGG FRUIT TREE.

PLATE 194.



AFRICAN FRUITS.

KAFFIR MELON, SPANSPECK, WATER MELONS, CALABASH PUMPKIN,  
TOBACCO BLOOM.

K

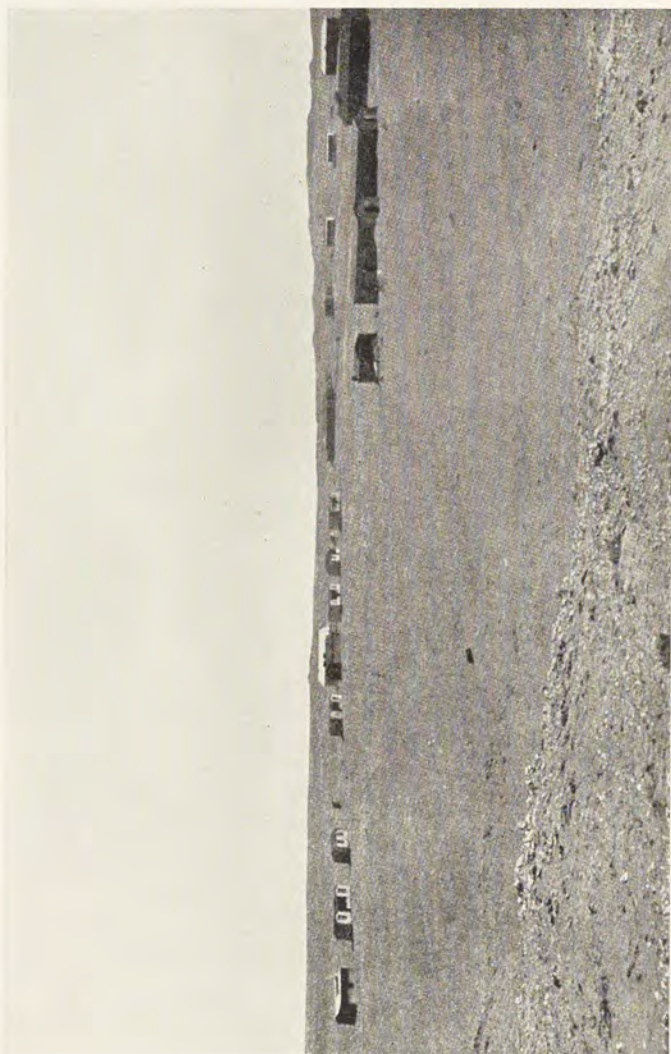


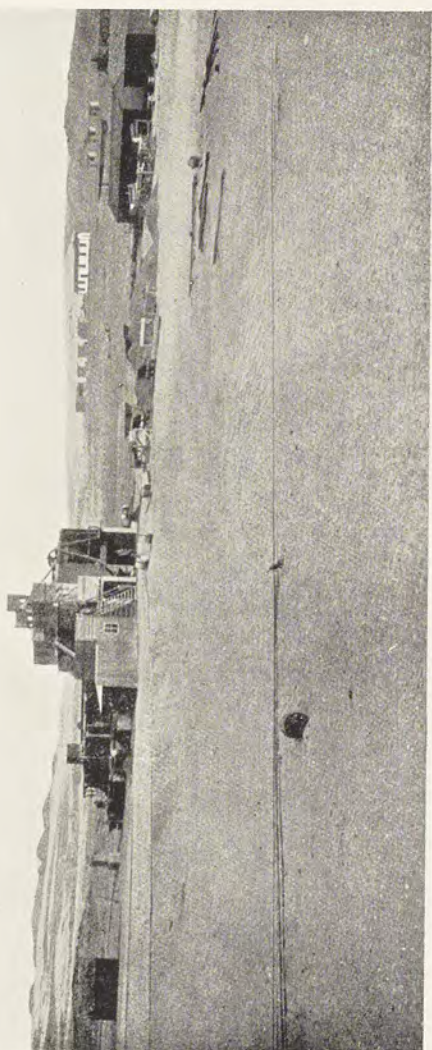
TYPICAL VALLEY IN THE NAMIB, NEAR LUDERITZBUCHT, SHOWING DIAMONDFEROUS GRAVEL. THE LIGHT COLOURED STRATA CONSIST OF FINE QUARTZ GRAVEL IN WHICH THE LOOSE DIAMONDS ARE FOUND.



SEARCHING FOR DIAMONDS AT LUDERITZBUCHT.







DEUTSCHE DIAMANTEN GESELLSCHAFT. SCHECHEL PLANT, AND THE GRANITBERG SETTLEMENT, 1914.

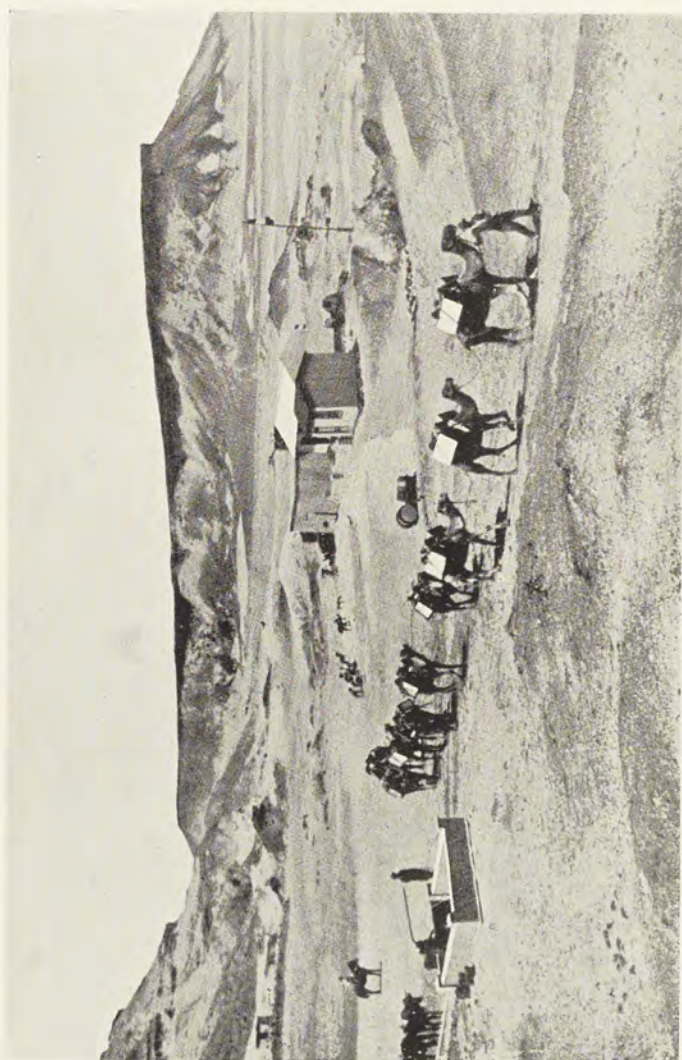


PLATE 200.



"HOTEL" ON THE DIAMOND FIELDS.

PLATE 201.



DIAMOND WASHING WITH HAND SIEVES.

PLATE 202.



WORKING WITH A JIG ON THE DIAMOND FIELDS.

PLATE 203.



KOLMANSKOP DIAMOND MINES, LTD. SIFTING GRAVEL.

PLATE 204.

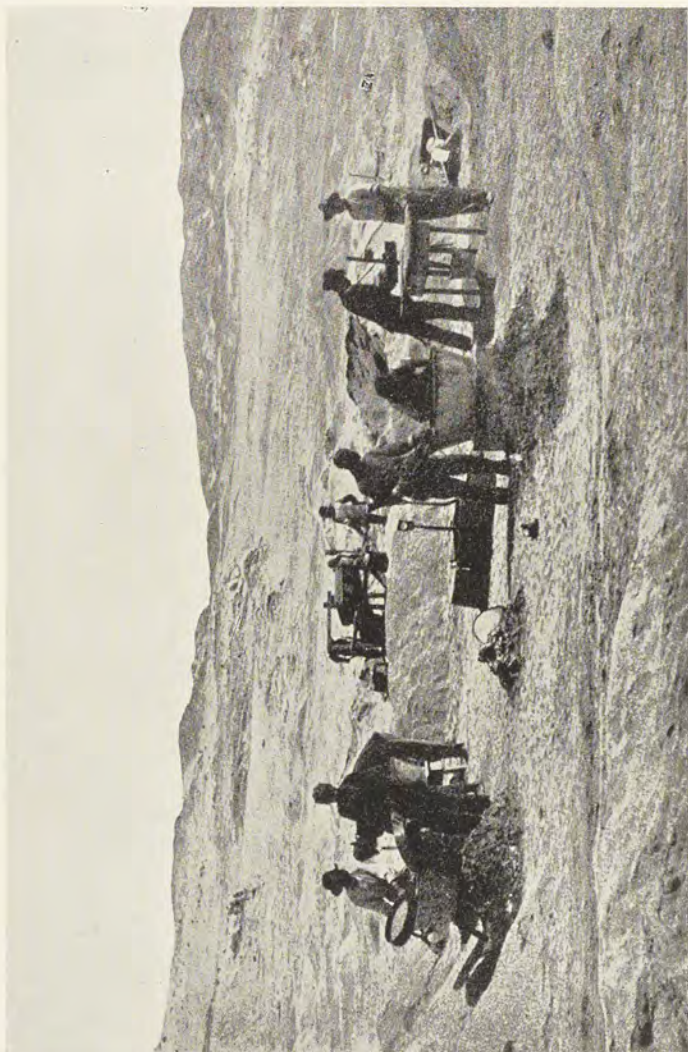


AT THE DIAMOND WASHING MACHINE.

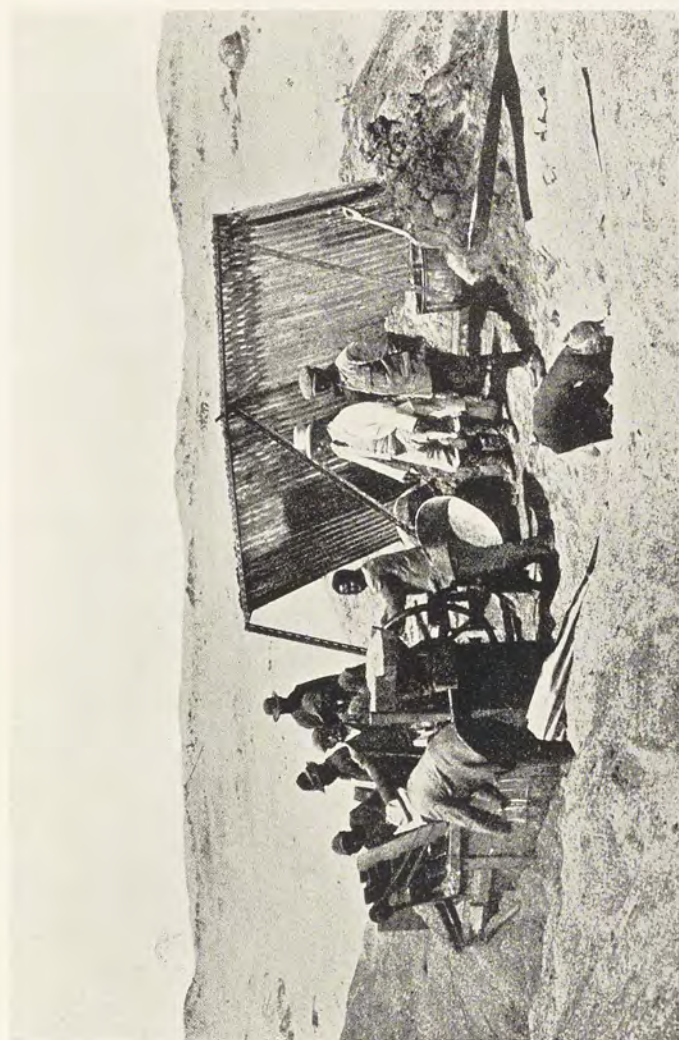
PLATE 205.



SEARCHING FOR DIAMONDS IN THE CONCENTRATES.

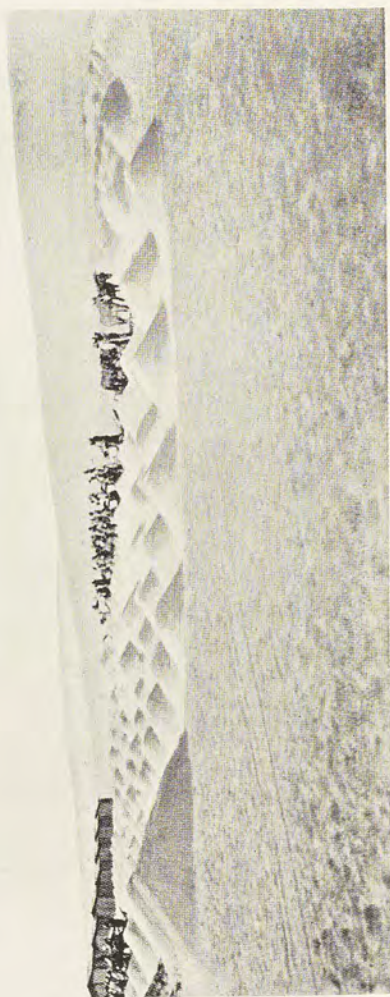


KOLMANSKOP DIAMOND MINES, LTD. HAND-WASHING AND SMALL SIEVE IN THE CHARLOTTE VALLEY, 1908.

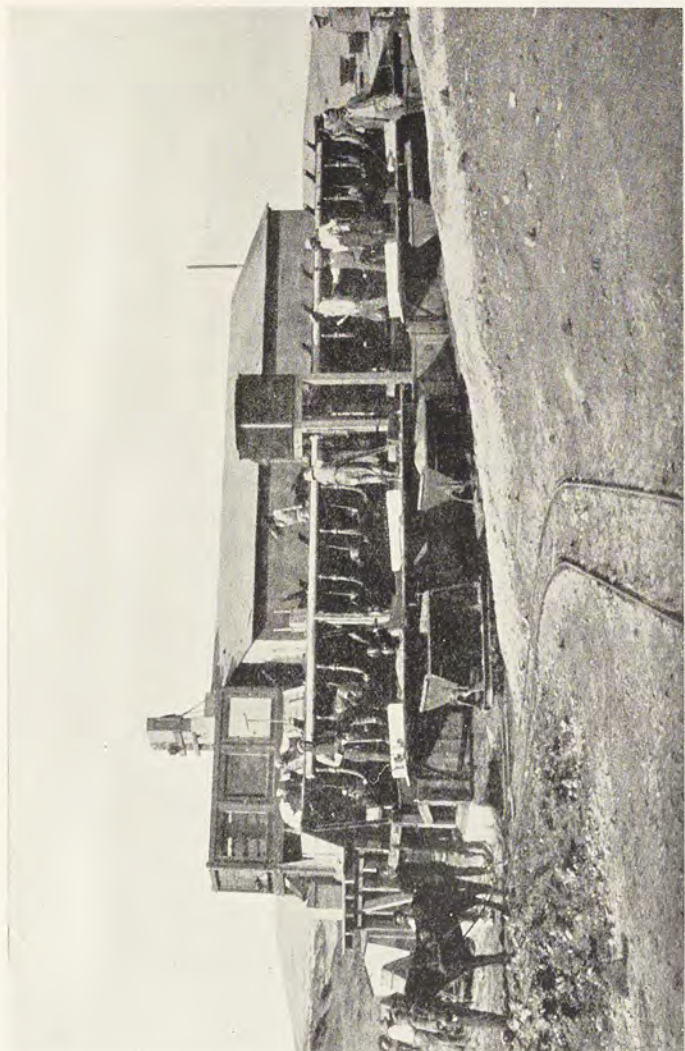


KOLMANSKOP DIAMOND MINES, LTD. HAND-WASHING MACHINE, 1909.

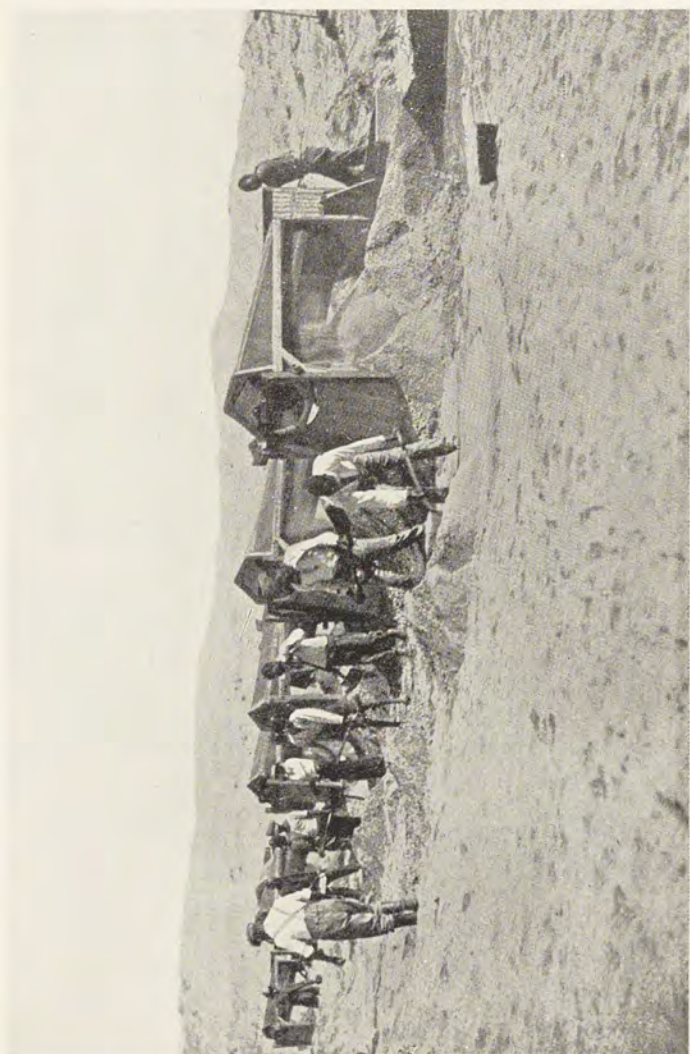




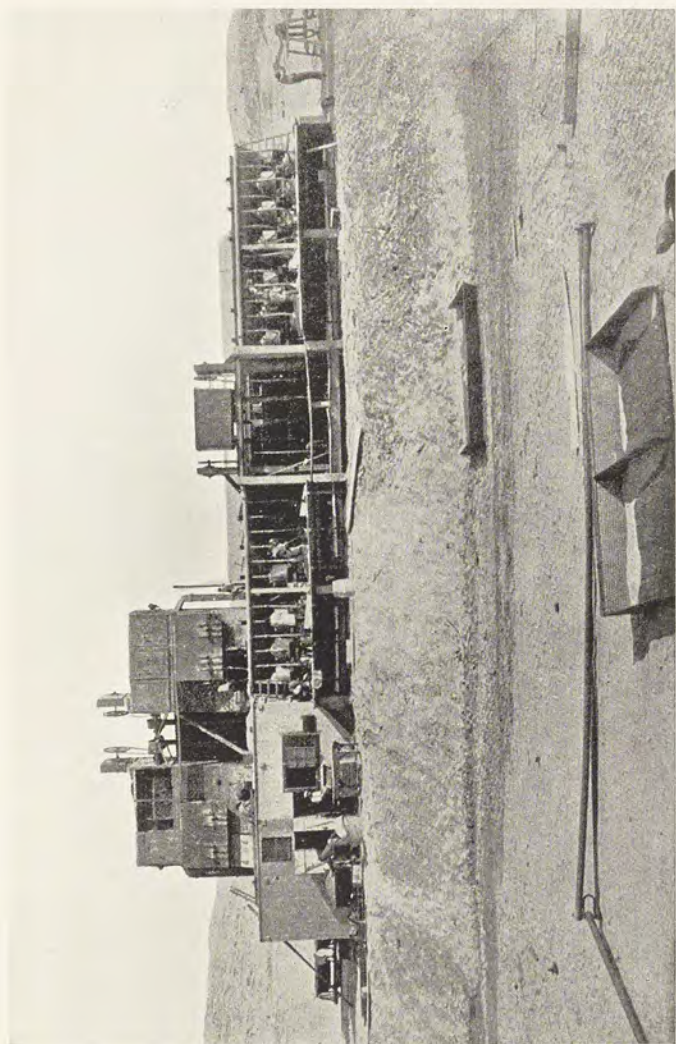
KOLMANSKOP DIAMOND FIELDS.



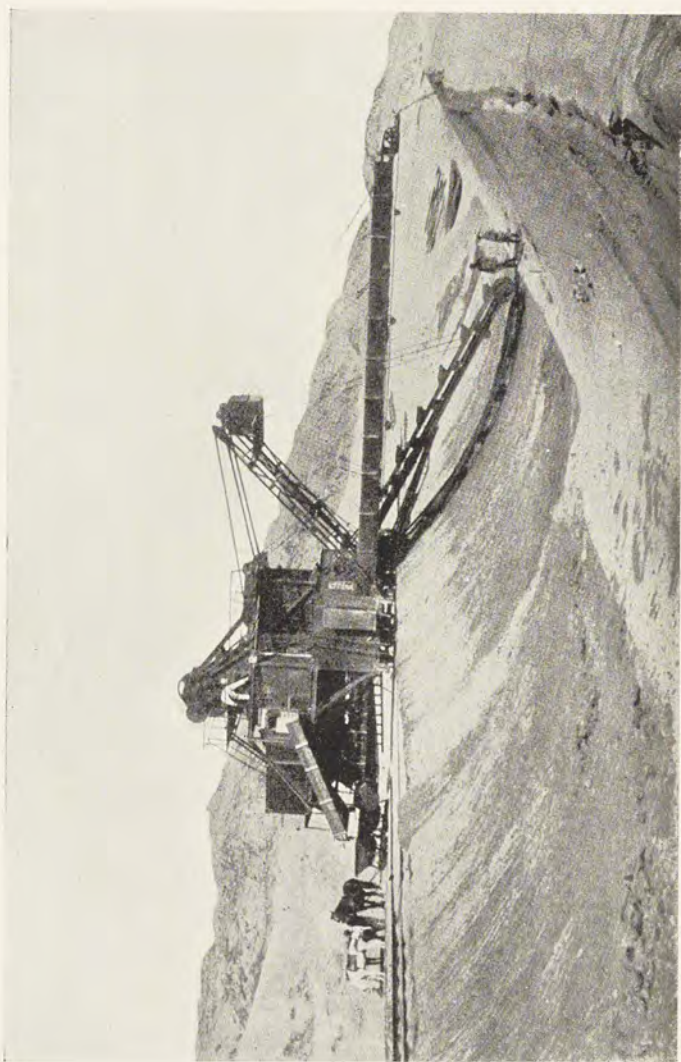
KOLMANSKOP DIAMOND MINES, LTD. A SCHIECHEL PLANT, 1910.



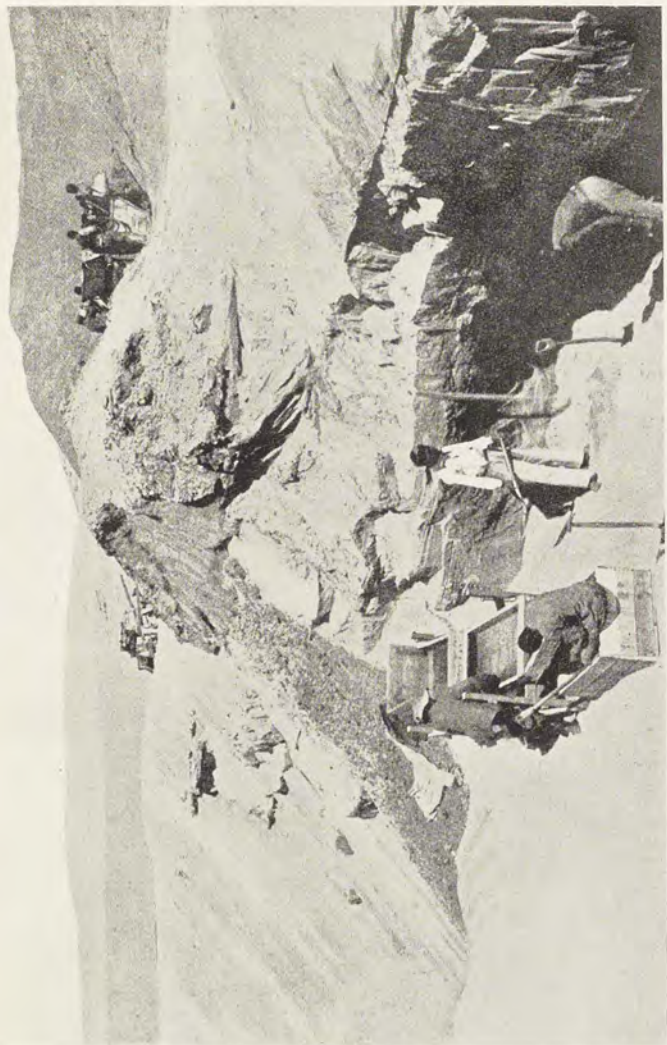
KOLMANSKOP DIAMOND MINES, LTD. A SIFTING GANG AT WORK.



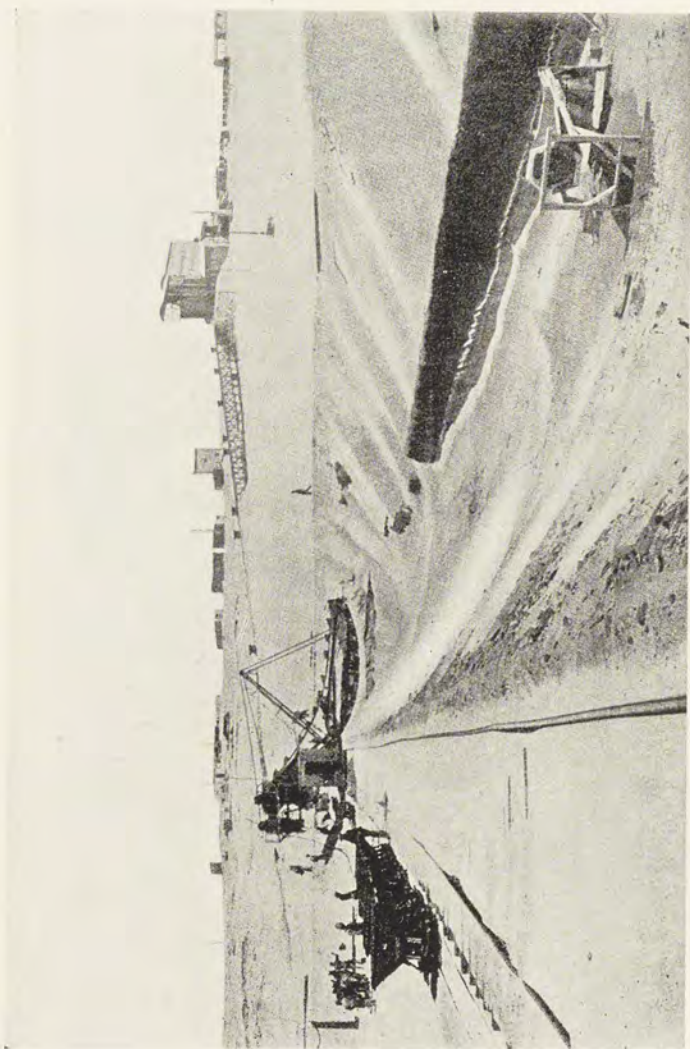
KOLMANSKOP DIAMOND MINES, LTD. A SCHIEHEL PLANT, 1912.



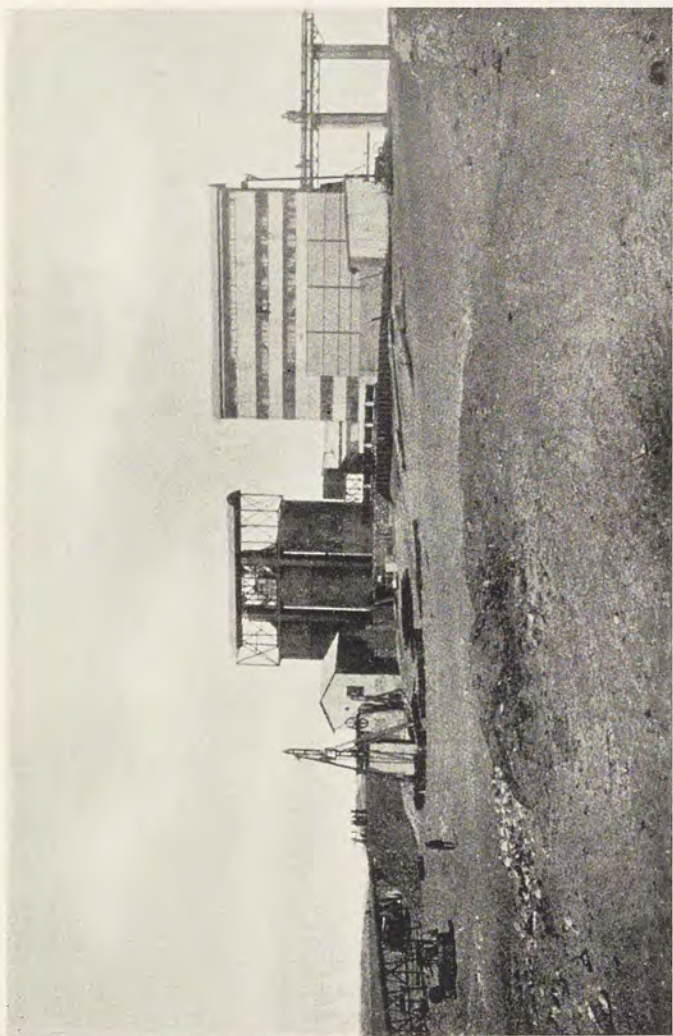
KOLMANSKOP DIAMOND MINES, LTD. DREDGER WITH DRUM SIEVE, WORKED BY ELECTRICITY, 1913.



VEREINIGTE DIAMANTMINEN, LUDERITZBUCHT. EARLY METHOD OF HAND-WASHING FOR DIAMONDS  
ON THE SCHMIDTFELD.



VEREINIGTE DIAMANTMINEN, LUDERITZBUCHT. BUCKET DREDGER AND WIRE ROPE RAILWAY ON THE SCHMIDTFELD.

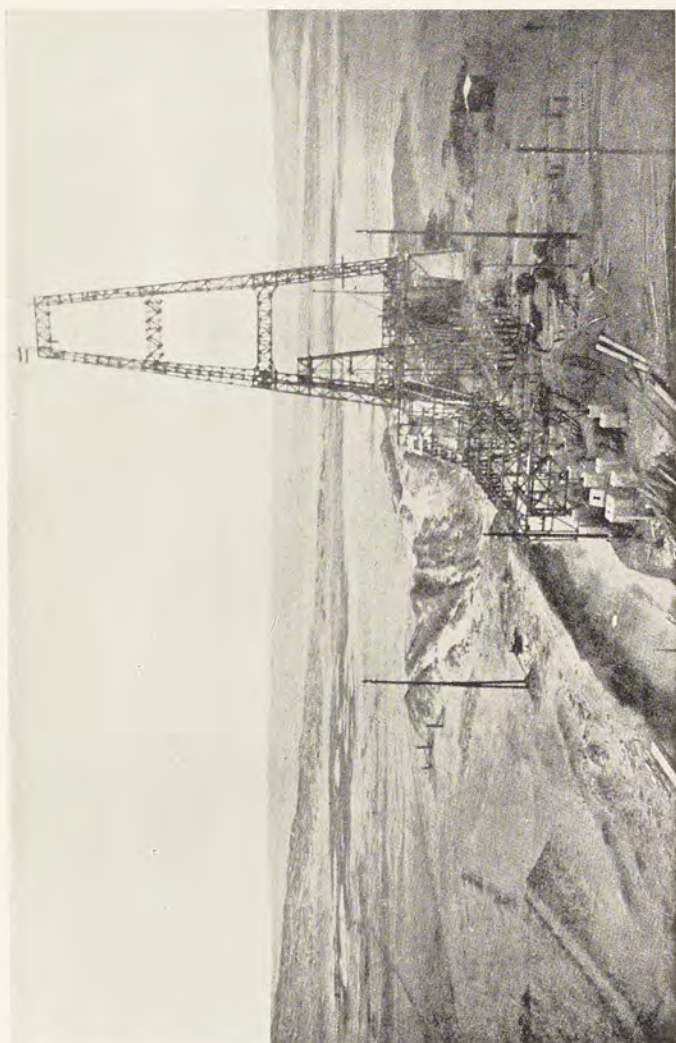


VEREINIGTE DIAMANTMINEN, LUDERITZBUCHT, STORAGE OF COARSE SAND AND GRAVEL,  
ALSO HEATMENT PLANT AT THE SCHMIDTFELD.

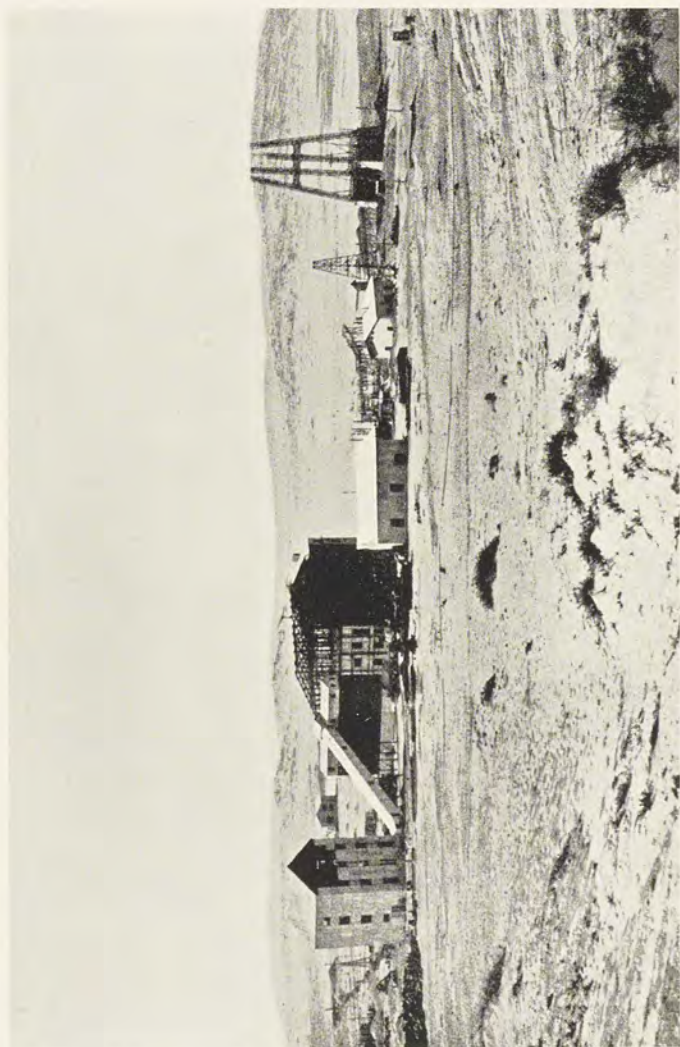




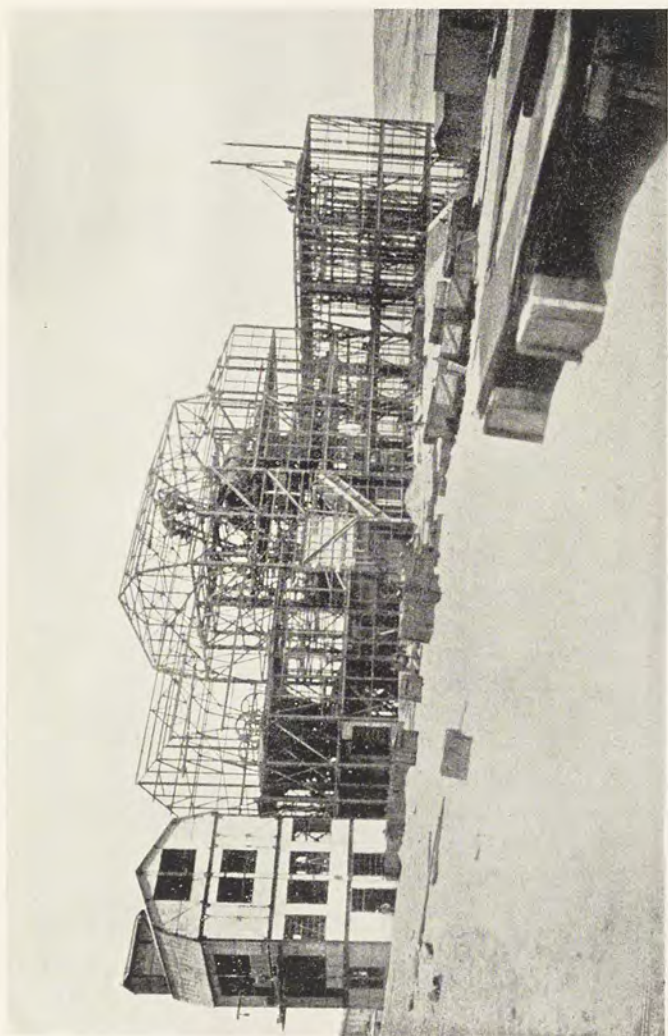
KOLONIALE BERGBAU GESELLSCHAFT. ORIGINAL METHOD OF WASHING THE DIAMONDIFEROUS GRAVEL AT LUDERITZBUCHT.



KOLONIALE BERGBAU GESELLSCHAFT. CONSTRUCTION OF RAILWAY TO THE DUMPS.



KOLONIALE BERGBAU GESELLSCHAFT, WASHING HOUSE, NORTH BLOCK, 1914.



DIAMANTEN-PACHT-GESELLSCHAFT. CONCENTRATION PLANT.



KOLONIALE BERGBAU GESELLSCHAFT. SETTLEMENT AT KOLMANSKOP, 1914.

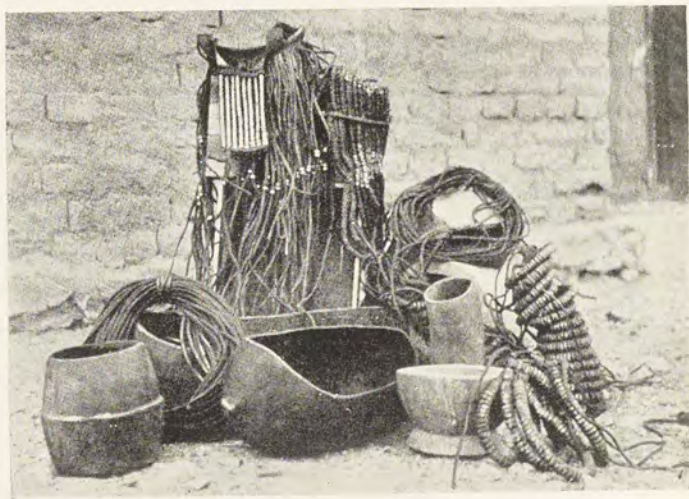


DIAMOND DEPOSIT IN THE POMONA DISTRICT. PORPHYRY ROCKS PARTLY HIDDEN BY SHIFTING SANDS.

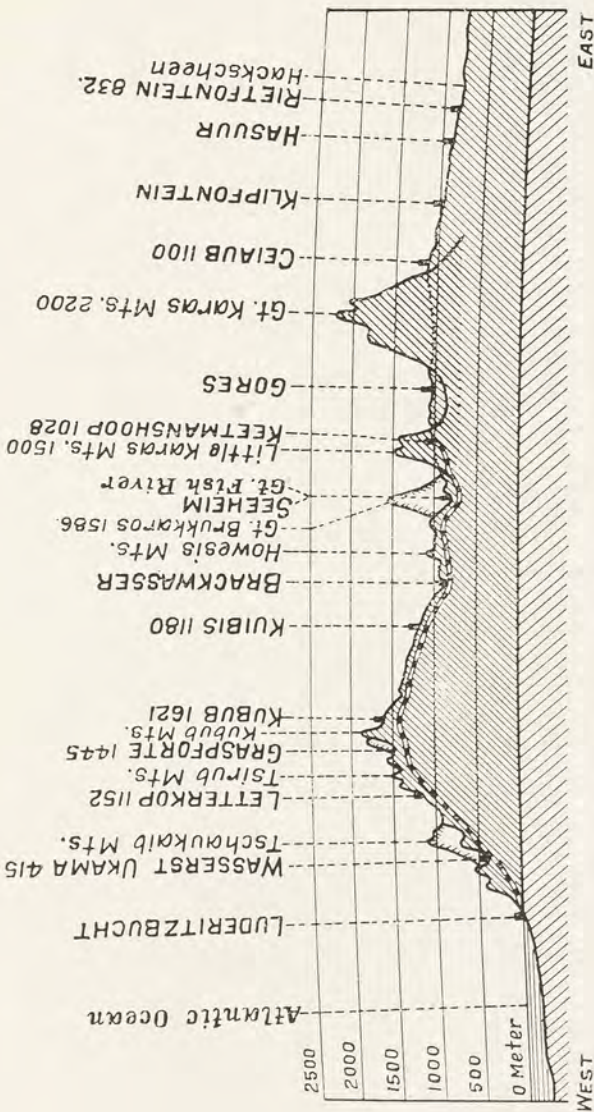
PLATE 222.



ON THE WAY TO WORK AT THE DIAMOND FIELDS.  
PLATE 223.

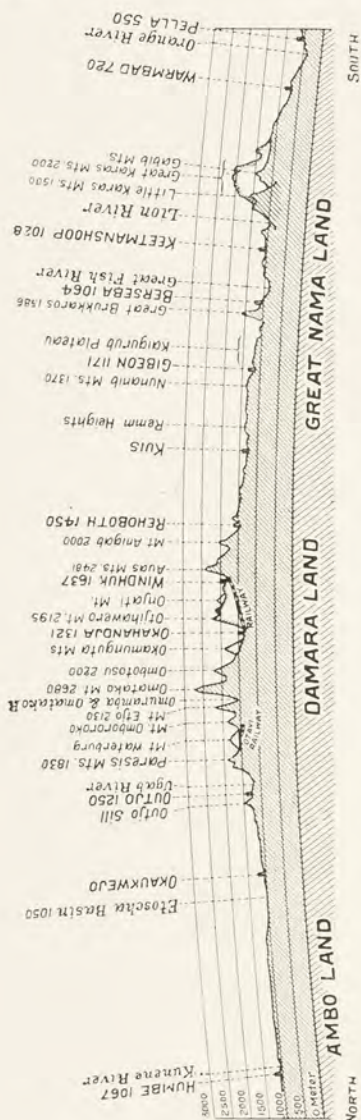


ORNAMENTS OF THE HEREROS.

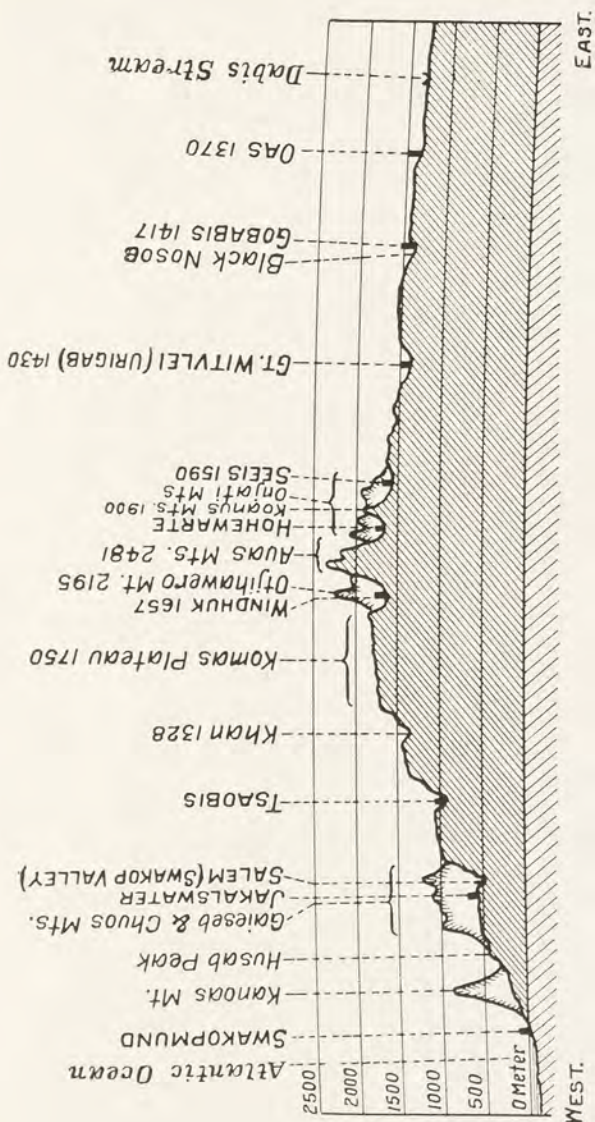


SECTION THROUGH GREAT NAMAQUALAND FROM WEST TO EAST.



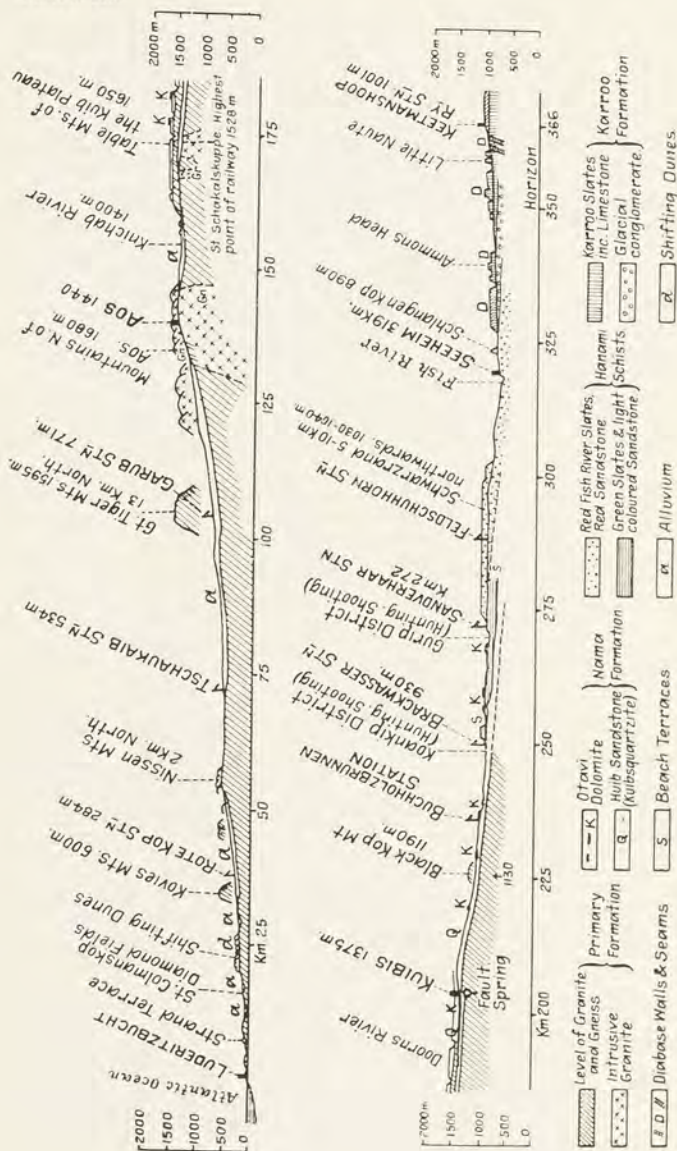


SECTION OF GERMAN SOUTH-WEST AFRICA FROM NORTH TO SOUTH, SHOWING HEIGHTS OF THE THREE PRINCIPAL COUNTRIES.

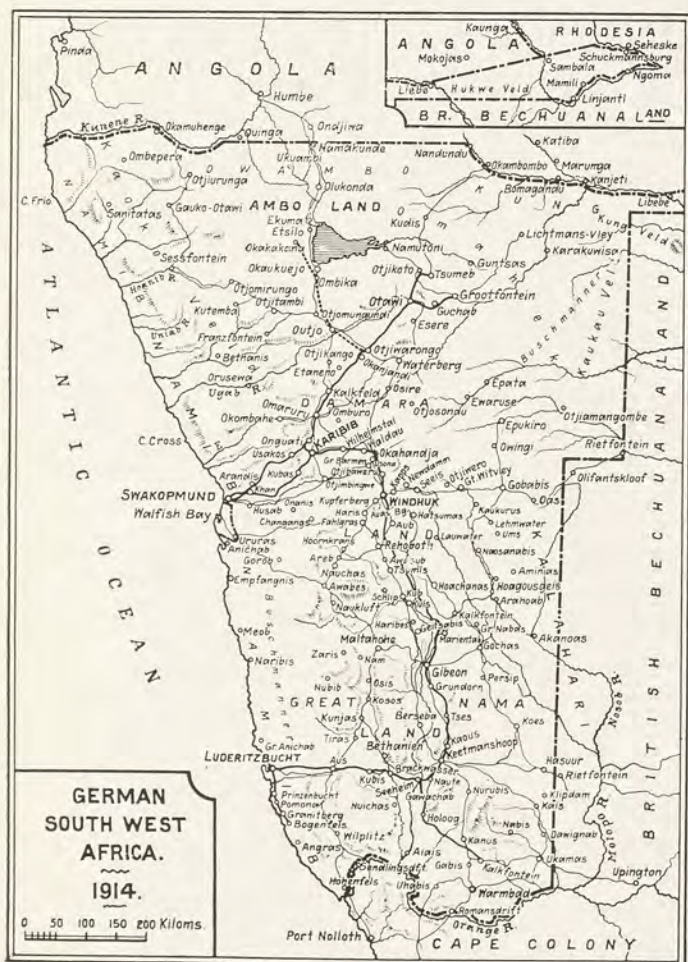


SECTION OF DAMARALAND FROM WEST TO EAST.

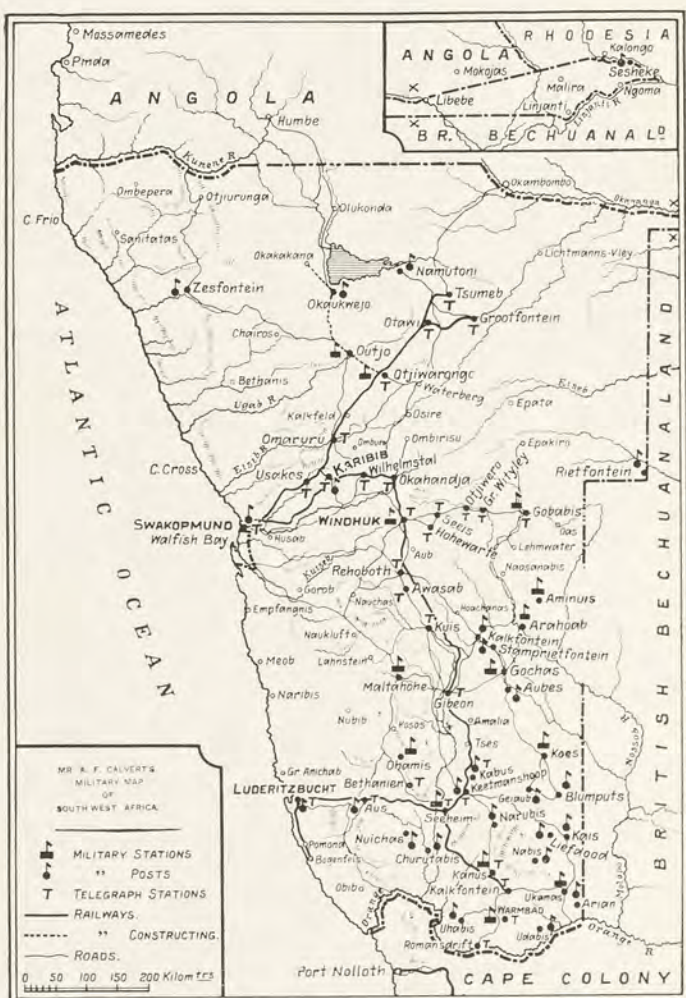
PLATE 227.



SKETCH GEOLOGICAL PLAN FROM LUDERITZBUCHT TO KEETMANSHOOP.



A. F. CALVERT'S MAP OF GERMAN SOUTH-WEST AFRICA.



A. F. CALVERT'S MILITARY MAP OF GERMAN SOUTH-WEST AFRICA.



A. F. CALVERT'S MAP OF AFRICA, SHOWING THE GERMAN COLONIES.











