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Bonnie Scotland, Postwar Style

With 14 Illustrations and Map

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## Bonnie Scotland, Postwar Style

BY ISOBEL WYLIE HUTCHISON

*Honorary Editor, Royal Scottish Geographical Society*

*With Illustrations by Staff Photographer B. Anthony Stewart*

"THERE'S guid gear in sma' bulk," says the Scottish proverb, meaning that outsize isn't everything. It is a saying appreciated by Scotsmen, whose country of about 30,000 square miles, with a population of some five million, is among the smallest in Europe.

From the 4,406-foot summit of Ben Nevis, the highest point in the British Isles, the climber can view on a clear day (but the average annual rainfall up there reaches 151 inches!) that part of the Land of Bens, Glens, and Heroes which stretches from the Moray Firth in the northeast to the Atlantic peaks of Jura (Paps of Jura) in the southwest.

The scene is one of grandeur, of rugged heights and dark precipices, of green islands set in silver, and of sea lochs running far inland, the latter a fact of considerable benefit to commerce (map, pages 552-3).

On the lonely shingles of the Outer Hebrides the crested breakers thunder in straight from Labrador. Direct flight across the ocean to Prestwick did much to maintain close contact between the New World and Britain during war years.

Though one cannot see Prestwick from Ben Nevis, some idea may be gained of the geography of the country which the Roman invaders of the first century A.D. called "North Britain," or Caledonia.

### Colonists Came, and Then the Cross

It may be divided into four parts: the Southern Uplands south of the Forth and Clyde, the industrial belt, northeast Scotland, and the Highlands and islands.

The sea brought the first well-known settlers to Scottish shores perhaps as long as seven thousand years ago. These were roving bands of colonists from the Mediterranean, who left a green memory in the chambered cairns which they erected for their dead.

Scotland is also rich in stone circles left by the Bronze Age people, but perhaps her most remarkable prehistoric relics are the "brochs," circular towers of dry-built masonry designed for use as strongholds.

The Roman invaders of later times left surprisingly little outward trace upon the country, parts of which they occupied intermittently for some three centuries as a military outpost. They conquered Scotland not with the sword but with the Cross. Down one of the straight military roads of the Romans the Gospel was first carried to this last frontier, though none can say who bore it.

The first Christian name to shine out of the pagan darkness is that of St. Ninian, born about 360 A. D., son of a Christian chieftain of Solwayside.

### Scots Cherish "the Jewel of Liberty"

The morrow of V-E and V-J Days, with gasoline and tires still strictly rationed, films unobtainable, and such hotels as were not still requisitioned by the Government filled to capacity with holidaymakers, might seem no easy moment to select for a tour of Scotland.\*

But Mr. Stewart had brought films and flash bulbs with him from the New World in bulky

\* See "Scotland in Wartime," by Isobel Wylie Hutchison, NATIONAL GEOGRAPHIC MAGAZINE, June, 1943.

cartons, and our difficulties of transport and accommodation were smoothed through the kind offices of the Ministry of Information.

As we were leaving St. Andrew's House, Edinburgh, someone pointed out to us from the window the statue of Abraham Lincoln in the Old Calton graveyard.

Scotland and America have a good deal in common. Their bond is perhaps symbolized by this little-known monument, which commemorates Scotsmen who died in the American War Between the States "to preserve the jewel of liberty in the framework of freedom."

The Scot, like the GI—two of whom we found reverently inspecting the statue—is an independent fellow who likes to be his own master. His finest hour came on the 24th of June, 1314, when, after a long and bitter struggle headed by the national heroes, William Wallace and Robert Bruce, Scotland wrested her freedom from England at the Battle of Bannockburn.

Though it preceded "the shot heard round the world" by more than four and a half centuries, the shout of that great victory still skirls through Scottish history.

At a meeting of the Scots Parliament held in Arbroath in 1320, a dignified protest to the Pope against the excommunication of King Robert Bruce concluded with these noble words:

"It is not for glory, riches, or honour that we fight, but for that liberty which no good man will lose but with his life."

#### Prestwick, New Aerial Gateway

Scotland is usually approached from the south at Gretna Green, once famous for its runaway marriages welded by the blacksmith, or from Berwick on Tweed, where the Countess of Buchan was confined by the English for four years for having crowned Bruce King of Scots.

In coming years many transatlantic visitors to Scotland will probably do neither. They will fly straight into the warm heart of Scotland at her international airport, Prestwick, within a few miles of the spot which cradled her national poet, Robert Burns.

Once famous for its golf links, Prestwick has risen during the war to become one of the largest flying centers in the world, a turn in its history which would have delighted Scotland's 15th-century kings, in whose reigns it was enacted that:

"Fute ball and golfe be utterly cryit downe and nocht usit," and "in na place of the Realme there be usit fute ball, golfe, or uther sik unprofittable sportes . . . under the paine of fourtie shillings."

Under Lend-Lease legislation Prestwick airport played a highly important part in the "defence of the realm," being the first terminal for transatlantic transport in Great Britain and a receiving center for bombers flown across the Atlantic. In one period of 1944 it also handled 13 passenger services daily in both directions between Ayr and New York and Washington, D. C.

During the redeployment months of 1945 Prestwick was a main ATC "funnel" for shifting personnel from Europe to the Pacific, and consequently its flight figures soared.

Ayr is a bustling town, center of a populous county famed not only for cows, cheese, and bacon, but also for carpets, lace, hosiery, and woollens, shipbuilding, and explosives.

But its tourist industry alone must be tremendous, for this is the heart of the Burns country. Two miles south of Ayr stands the thatched cottage which is the mecca of Scotsmen from all over the world (Plate VIII). Here the cold blast of January 25, 1759, "blew hansel in on Robin,"\* the bard whose 37 years of life were to yield so much poetry and song.

At the time of Burns's birth his father was gardener to Mr. Ferguson of Doonholm, and it was on "the flowery banks o' bonnie Doon" that the poet's youth was spent.

#### \$5,000 for 75-cent First Edition

The country for miles around Alloway is full of interest for the Burns enthusiast. At Tarbolton he met his first love, Ellison Begbie, a servant lass who declined the honor of the poet's hand. At Irvine he studied the art of the flax dresser. At Kilmarnock John Wilson published in 1786 that famous first edition which deflected the author to Edinburgh instead of Jamaica and made him for the first time master of £20.

A copy of this edition of Burns's poems, which sold in 1786 for three shillings, stands in a case in the cottage museum at Alloway. It was purchased in 1903 for £1,000—roughly \$5,000 for a 75-cent book.

Leaning one afternoon on the parapet of the Auld Brig o' Doon (Plate XXXII), the bridge where tipsy Tam o' Shanter's gray mare Maggie left her tail in the hands of the witches in Burns's hilarious poem, I watched the people passing. Young and old, to and fro they went. Hardly for two minutes was the brig, closed to vehicles, without its quota of pedestrians.

What did Rabbie Burns mean to them all? (No Scotsman, by the way, ever refers to his

\* From "There Was a Lad," by Robert Burns. "Hansel" or "handsel" signifies a gift as a token of good luck.



D. W. Anderson

### Kilted Lassies Dance the Reel o' Tulloch, Which Resembles the Highland Fling

Legend dates the dance from a winter day in a country church where the congregation, waiting for the minister, danced to keep warm. So swiftly do these four dancers weave in and out that the camera is able to catch only three; a seemingly surplus pair of legs appears.

national bard as "Bobbie.") Was he a reality to them or merely a tradition?

Above all, what would Burns himself have felt about such homage? Probably sheer surprise that on the morrow of the global war men and women still worshiped at a poet's shrine.

#### By the Low Road to Galloway

The hill road over the shoulder of the Merrick, which at 2,766 feet is the highest summit in the Southern Uplands, was shrouded in dark rain clouds; so we took the coast road southward from Ayr to Galloway.

The Merrick overlooks lonely Loch Trool, now the property of the Forestry Commission, which owns 40,000 acres of this wild and romantic neighborhood. It is a region little known even to Scots themselves, although it

bears the proud title, "Cradle of Scotland's Independence." Here Robert Bruce began his victorious career in 1307.

This southland is also the cradle of Scotland's faith and culture. Carlyle—whom a recent critic calls "the embodiment of the Scottish intellect at its finest"—the great Sir Walter Scott, and many others had their homes in these border shires.

Robert Louis Stevenson used the name of the pretty village of Ballantrae in the title of one of his best novels. Beyond the village, at Glen App, the road sweeps downward through fine woodlands to Loch Ryan.

Before the war I had spent a holiday at Cairn Ryan on the shores of this lovely Wigtown loch. I looked eagerly for the whitewashed cottage I had known, but it was





British Information Services

### Culzean Castle, Eisenhower's Scottish Home, Perches on a Seaside Cliff

Grateful Scots, acting through their National Trust, gave the general a lifetime use of an apartment here. Culzean, built near Ayr in 1777, overlooks the Firth of Clyde. Three "haunted" caves extend beneath it.

gone, swept out of existence by the avalanche of war. A clattering naval base, complete with derricks and railways, occupied the sea frontage, for Stranraer is close to Ireland and was a center of naval activity in wartime.

No part of Scotland which we afterwards visited seemed to me to have suffered such a disastrous "sea change" as quiet Cairn Ryan. For I confess that my tastes are reactionary: I like wild roses better than derricks.

#### The Cave of a Scottish Saint

At Isle of Whithorn we seemed to have reached the end of the world. A street of white cottages clustered round a deserted pier. Rain teemed from gray skies. Only one hatless woman, with the dark hair and gypsy-black eyes of the Kennedy country, was abroad in the empty street.

We inquired the way to St. Ninian's Cave, the earliest Christian shrine in Scotland. She looked at us pityingly.

"You need to appreciate history," she said,

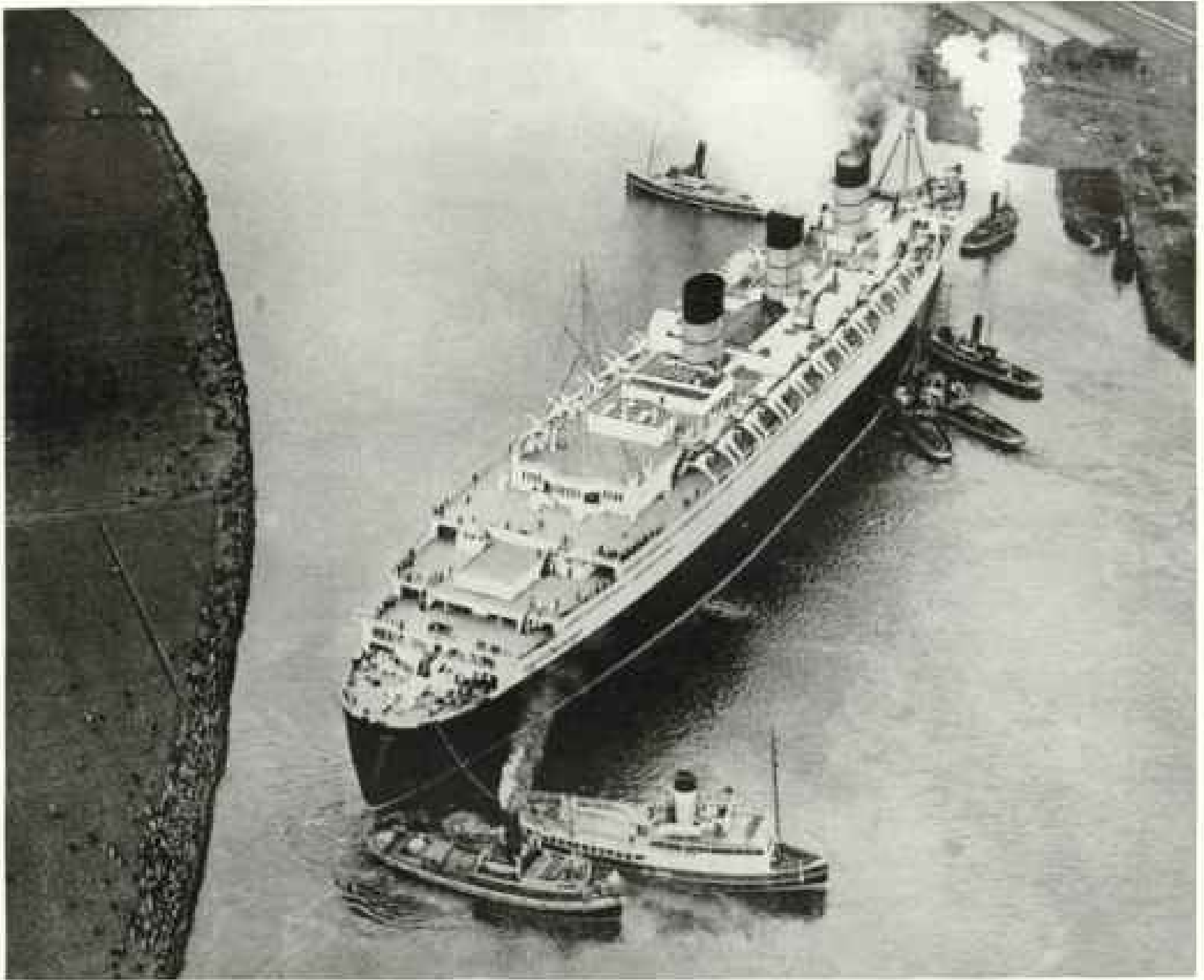
"to visit these places on a day like this. You should be here in summertime when the pilgrimages come."

To reach the cave we had to return some distance down the road we had come that afternoon from Stranraer. Splashing through the puddles, we took a wrong turning and landed in a farmyard. On a misty headland still farther west the farmer indicated our destination.

"You'll need to leave the car at the top," he said. "It's a walk of half a mile through the glen. Bad weather for the cave today. You should be here in summertime when the pilgrimages come."

A broken gate opened on a bramble-fringed path and a dripping fern-hung glade where late honeysuckle bloomed amid glossy bramble sprays. Yellow mimulus and blue forget-me-nots flashed in the burn as it neared the shore. Shining ivy lacquered the gray rocks.

We saw the cave nearly as soon as we saw the sea. It was protected by a grille and His



APWA

Seven Tugs Puff and Grunt; the 1,018-foot *Queen Mary* Backs into the 800-foot Clyde

On March 24, 1936, the pride of Britain's merchant fleet draws out of a fitting basin in the John Brown yards at Clydebank, her birthplace (pages 558-9, 581). Three "typhoon sirens," audible five miles but not distressing to human ears, gave pilots' commands to tugs. As the tugs fluttered around, changing positions, rumor spread among the thousands on shore that the liner had stuck. *Queen Mary* still holds the blue ribbon for the North Atlantic run.

Majesty's Office of Works. But the grille was open at one corner, and, descending a couple of steps, we stood on the rock trodden by the Saint's feet fifteen hundred years earlier.

This is almost certainly the authentic spot to which St. Ninian retired for prayer and meditation from the troubles of his "White House," the Candida Casa near Whithorn, where in 397 he established the first "cultural college" in the country. The inscribed and cross-marked stones in this district are the earliest Christian monuments in Scotland.

Grandfather of the U. S. Navy

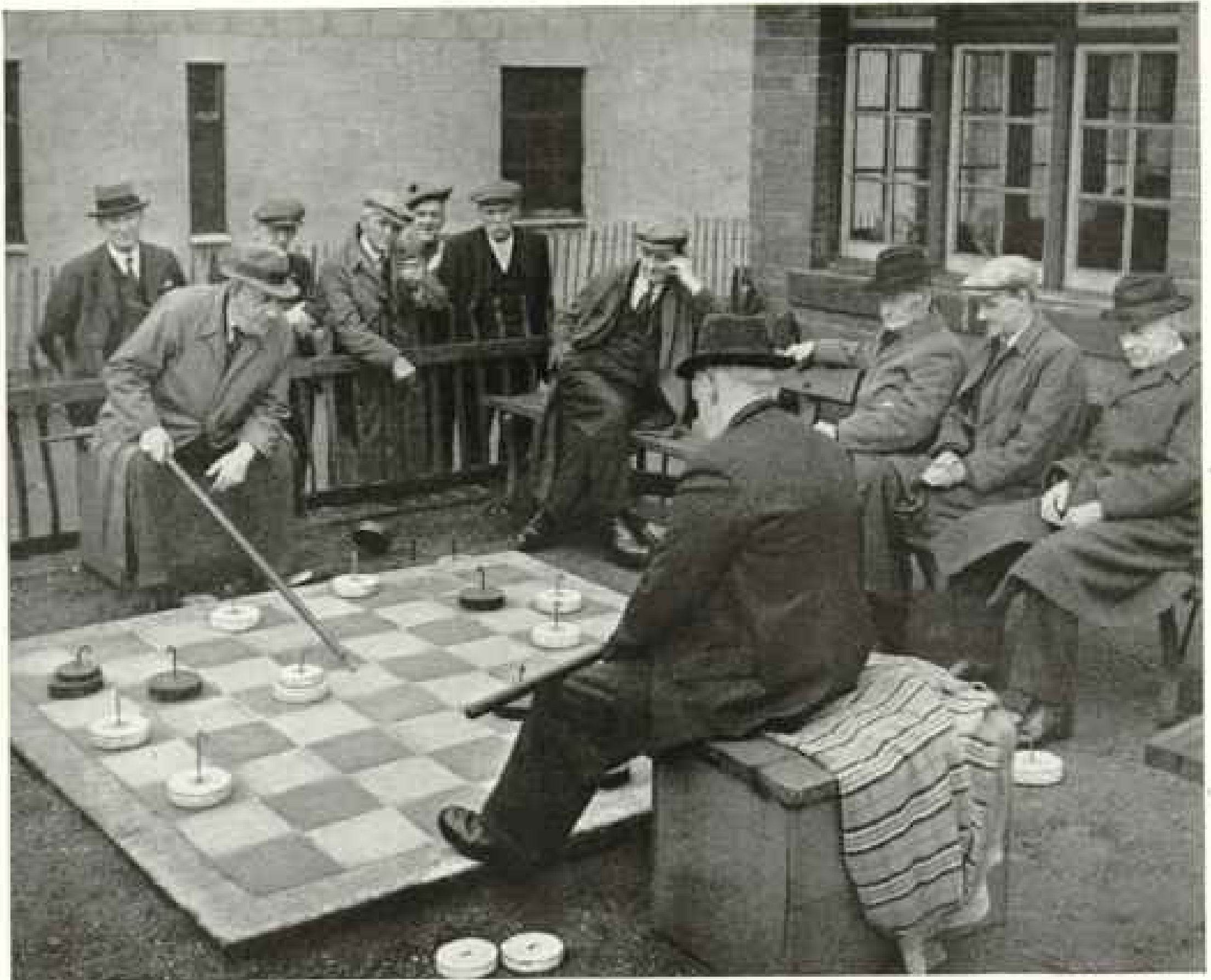
The cave was dry and cozy on this wild afternoon, its sole furniture an ancient stone with curious leaflike markings and another which the drippings of centuries (or perhaps the labor of a Saint) had hollowed into a cup.

Galloway is rich in contrasts. At Kirkcubright, tranquil county town of a lovely shire and a center of modern Scottish art, we found fishermen mending their lobster pots on the banks of Dee and lunched in Paul Jones Cafe.

Like Burns, John Paul Jones, the famous naval hero, was a Scottish gardener's son. John Paul, the father, is buried at Kirkbean, a charming Solwayside village which, as a neighboring minister remarked, seems to have a strangely New England atmosphere.

His son's body, discovered in a Paris cemetery in 1905, was escorted across the Atlantic by a United States naval squadron, to be reinterred at Annapolis as "the Father of the American Navy"—which makes the gardener its grandfather.\*

\* See "Annapolis, Cradle of the Navy," by Lt. Arthur A. Agerton, NATIONAL GEOGRAPHIC MAGAZINE, June, 1936.



### Glasgow Plays Checkers with Mighty Wooden Men and Calls the Game Draughts

Disks, moved with sticks, provide physical as well as mental exercise in Alexandra Park. Absorbed, the players seldom say a word. If excited, they jump up to make their moves. One walked all over the board! Spectators follow the play intently. Only two acknowledge the camera's presence (page 560). The National Geographic Society has many members in Scotland—as of March 7, 1946, Glasgow, 1,277; Edinburgh, 880; Aberdeen, 141; Dundee, 113; Paisley, 75; etc.

Contemporary Scotland regarded the younger Jones in a more ambiguous light, for he embraced the cause of the American Colonies and in 1778 made a hostile descent, in a sloop of 18 guns, upon his native Solway.

"Of this person's character his parish cannot boast," wrote the worthy minister of Kirkbean in 1795.

But the whirligig of time brought its revenge when, on July 15, 1945, a baptismal font was presented to the church of Kirkbean by the officers and men of the United States Navy in honor of their distinguished progenitor.

We reached Kirkbean during the lunch hour and found the school children at play. Perhaps they, too, like the village, had inherited something of John Paul Jones, for they swooped upon photographer Stewart with piratical cries and bore him off to the churchyard to hunt for the flat tombstone under which the father

of the daring seaman sleeps his quiet sleep, "universeally esteemed."

Nor would the bairns return to school when the bell rang, despite irate warnings from those sent to fetch them. Uncle Sam was again to blame, for again he was "shooting" Kirkbean!

### Electric Light from the Harnessed Dee

The Galloway Hydroelectric Scheme came into force some years ago, when five stations were opened to supply the district by harnessing the Dee.

At the remote village of Auchencairn we found electric light and a landlady with a kitchen as well equipped as any in the city. Here too we found that wide interest in other lands which characterizes the Scot.

The photographer, whose sharp eyes had spotted a nice-looking subject for his camera behind one of the windows, asked me to knock

at the door and beg its wearer to bring her pink apron and herself into his color scheme.

She answered my knock grasping—by a freak of chance—a pile of familiar yellow magazines. She had been a member of the National Geographic Society for some years.

Such a remarkable introduction merited a celebration, and we were soon drinking tea with her and her sister in their hospitable parlor.

The school children of Auchencairn, pouring homeward presently down the brae, were also interested in adventure. They were reciting *The Wreck of the Hesperus*:

And he watched how the veering flaw did blow  
The smoke now west, now south,

"Dinna blaw up, blaw doon!" A motherly voice interrupted the recitation, as its youthful owner held out a very communal pocket handkerchief to "dicht" the nose of her wee sister.

But the baby, her round blue eyes firmly fixed on the strange cameraman, refused (unlike the "veering flaw") to operate in either direction.

#### "Preaching Cross" Buried for 150 Years

Dumfries, on the Nith, is the largest town in the border counties. Using it as a base, one might spend weeks exploring the ruined castles and abbeys of this historic region. Many of these fine buildings were "dung down" in the name of religion by the ruthless reformers of the 17th century.

Fortunately, one priceless treasure, the Ruthwell Cross, has survived by the craft and astuteness of one of its early custodians, the Reverend Gavin Young (Plate XII). This magnificent specimen of Anglo-Saxon art dates from about 680.

When we pushed open the door of the little church of Ruthwell and peeped in on this treasure early one morning, it took our breath away. There it blazed like a great flower, sunk several feet in a well in the floor because its height outtopped the low roof.

Before it, on the altar, pink and blue flowers shone. The light falling through the small stained windows of the apse colored the stone tenderly.

The present guardian of this treasure, the Reverend M. W. McCaul, was another far-traveled Scot, for he and his wife had spent many years in Mukden, Manchuria.

He told us the strange story of the cross while Mr. Stewart busied himself with flash bulbs to take its picture in color for probably the first time in 1,265 years!

This great "preaching cross" was designed by its unknown architect to tell to the generations the story of Christ, and marked the spot consecrated for divine worship. Around the extreme margin of the sculpture a remarkable poem is inscribed in old Anglian runes, in which the cross is personified.

In 1640 the reformers ordered all "idolatrious monuments found in parish kirks" to be destroyed. But Mr. Young, with remarkable courage, saved his cross at Ruthwell by throwing it down, breaking it in two pieces with tender care, and burying it in the clay floor of his church.

There the cross lay for 150 years, almost side by side with its preserver, who died in 1671, aged 85. He rests in Ruthwell churchyard with his 48-year-old wife, Jean Stewart, a lady perhaps no less remarkable than her husband, for their epitaph states:

Far from our own  
Amid our own we lie,  
Of our dear bairns  
Thirty and one us by.

Torrents of rain were falling when we reached Dumfries that evening, but a magnificent sunset tossed upon the murky sky great shovelfuls of fire, which flamed again in the "drumlie" (turbid) waters of the Nith.

Crowds of children jostled along the riverside where the gilded caravans of a traveling circus were assembling near St. Michael's churchyard. There Burns, who died in Dumfries, sleeps beneath his laurel wreath in a glassed-in mausoleum. The flaming skies reflected in the glass seemed a fitting symbol of the brief, tempestuous life of Scotland's warm-hearted genius, the plowman poet.

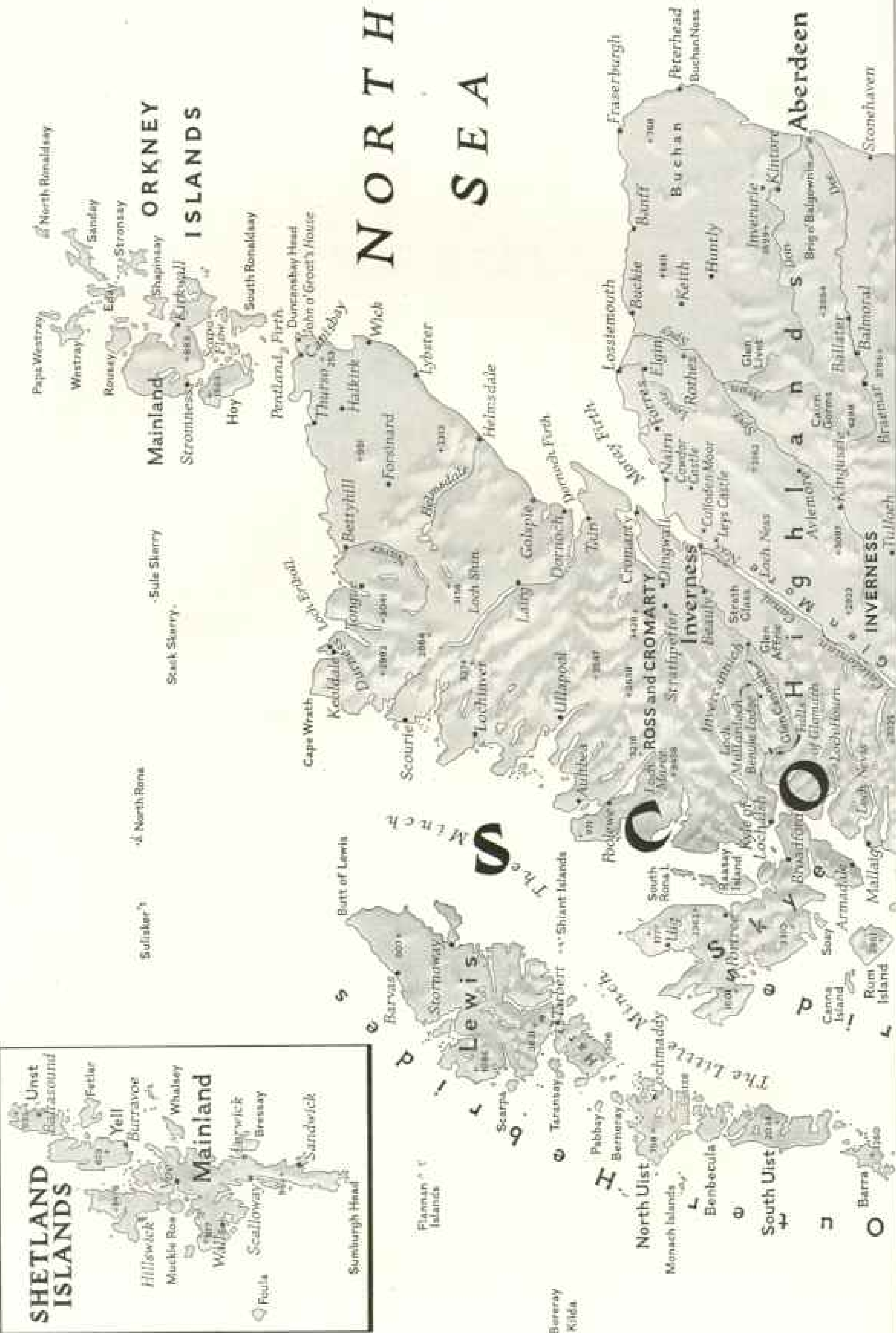
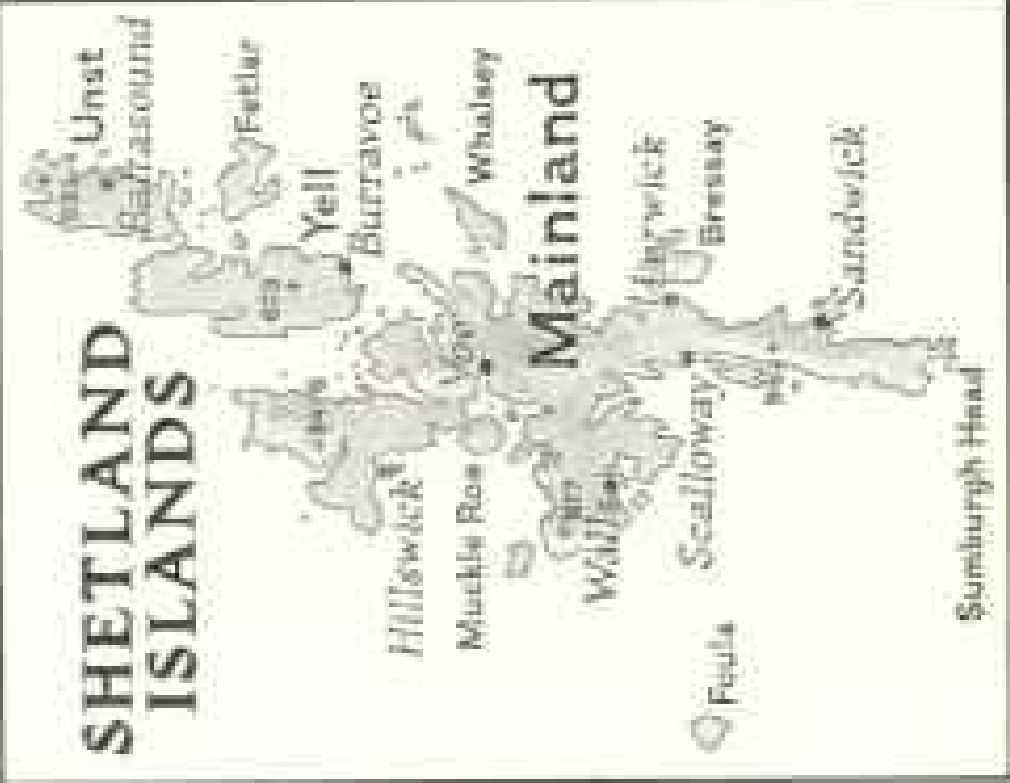
#### Misspelling Gave Tweed Its Name

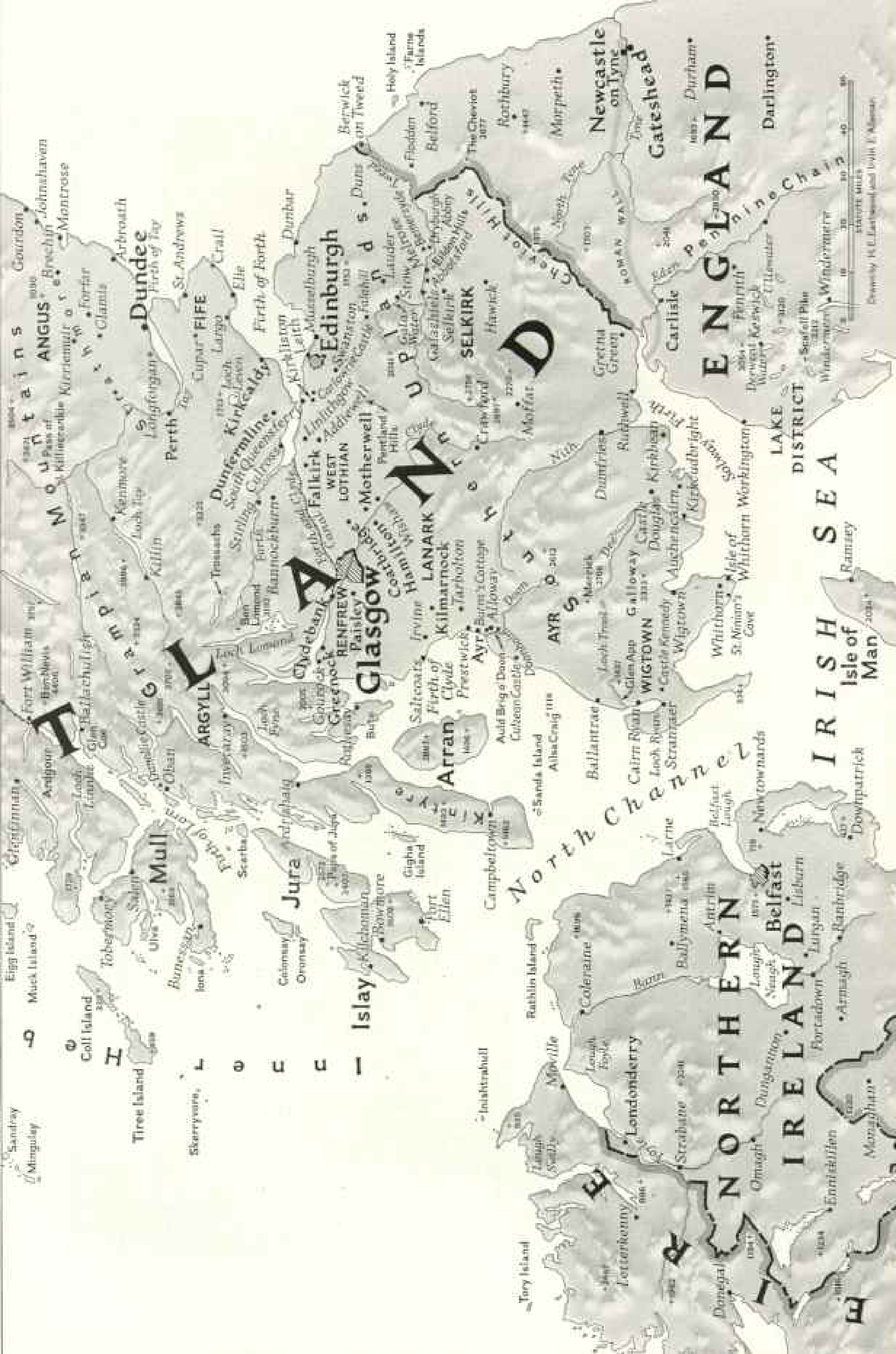
The name "tweed," we are told, has nothing to do with the famous salmon river of the borders. It is a misspelling of the word "twill," which was written "tweel" in Scotland.

A Selkirk firm claims to make the finest tweed in the world today, but American visitors to the little county town may be equally interested in a tomb in an aisle of the old roofless kirk. Within lies a Scot of the Murray clan, known in his day as "the outlaw of Falahill," from whom the late President Franklin D. Roosevelt claimed direct descent.

Selkirk also cherishes a statue of its famous African explorer, Mungo Park, and in its courtroom Sir Walter Scott, as sheriff of Selkirkshire, administered justice for almost 30 years.







ANGUS  
Brechin  
Johmahaven  
Mentrose

DUNDEE  
Firth of Tay  
St. Andrews

EDINBURGH  
Musselburgh  
Dunbar

GLASGOW  
Glasgow  
Glasgow

LANARK  
Kilmarnock  
Galloway

WIGTOWN  
Wigtown  
Wigtown

Perth  
Cupar  
Fife

Falkirk  
Motherwell  
West Lothian

Hamilton  
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Arran  
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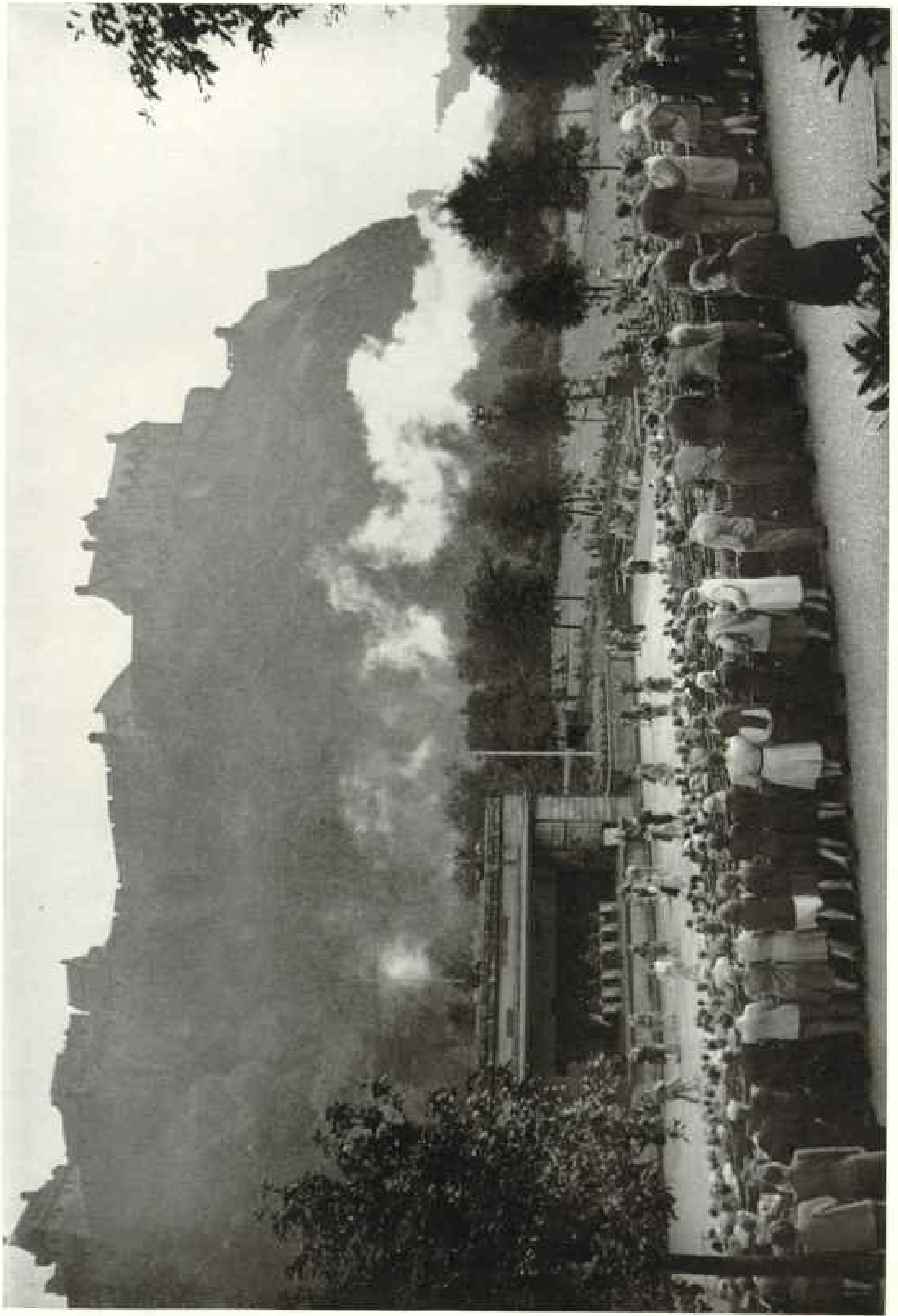
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STATUTE MILES  
0 10 20 30 40 50  
Drawing by H.L. Eastwood and Hugh E. Adams



Edinburgh Dances in Princess Street Gardens. "Clouds" Below Castle Rock Drift from a Locomotive (Plates II and III)



At St. Andrews, Parliament of the Golf World, a Dog Finds a Lost Ball and Delivers It to His Master

The Royal and Ancient Club (left) draws up the British game's laws, which strongly influence American rules. Since its founding in 1754, the course has been a mecca for golfers. Other buildings, all devoted to golfers, contain hotels and shops. The man and his dog are supported by tips from baffled searchers.





"See What I Caught, Daddy"

Col. Kenneth Mackessack, of the Seaforth Highlanders, inspects an 8-pound salmon taken by his son, David, from the River Lossie, near Elgin. Colonel Mackessack, British Military Attaché in Washington, D. C., is here home on leave. Fishing rights on most Scottish streams are controlled by the river-bank owners, who charge rents.

Over all this fair Tweedside country the presiding genius is the great Sir Walter, Laird of Abbotsford. It would be difficult to estimate the debt Scotland owes to Sir Walter.

The mansion house which Scott compiled but by bit, like the chapters of a novel, stands three miles from Melrose on a height above "Tweed's fair river, broad and deep" (Plate XXVI). It is now the home of his great-great-grandson, Maj. Gen. Sir Walter Maxwell-Scott, C.B., D.S.O., but some of the rooms occupied by the poet and novelist are shown to visitors.

In the armory hangs the picture of "Muckle-mou'd Mag," a Scott ancestress of such grim

personal attractions that the gallant who was given his choice of marrying the lady or being hanged had much ado to decide for the altar rather than the halter!

Scott is buried in the beautiful ruins of Dryburgh Abbey, near the river he loved. Not far away lies the hero of a later century, Earl Haig of Bemerseyde, Field Marshal in World War I.

As we wandered through the abbey's deserted cloisters, the haunted silence was cheerfully broken by the accents of America, and a bus from Edinburgh spilt a crowd of boisterous GI's down the yew-fringed walks.

We came upon further traces of army presence in crossing the moorland next day between Lauder and Stow, for in 1945 the war was still being tidied up in Scotland as elsewhere. The moor was scarred and torn by gun practice, and smiling, dark-eyed Poles lurked beside camouflaged guns as we lurched slowly down the ruts of war.

Fortunately, the heights on which Edinburgh sits enthroned do not lend themselves readily to the builder of unsightly bungalows and "council houses." The great Castle Rock, towering above Princes Street, with the buildings of the old town upon its ridged back, gives the capital an unsurpassed air of romance.\*

#### Edinburgh and the Industrial Belt

Southerners may inveigh against the Scottish climate, but the artist knows that nowhere else in the world is such a tender subtlety of light and such moist variety of hue as in this

\* See "Edinburgh, Athens of the North," by J. R. Hildebrand, in the NATIONAL GEOGRAPHIC MAGAZINE, August, 1932.

homeland of the tartans and the Paisley shawls.

From the castle esplanade can be seen not only the city but much of Scotland's industrial belt, an area of some 2,000 square miles, stretching from Fife to Ayr and enclosing three-quarters of the population and nearly all the large towns.

Though Edinburgh's "face is her fortune," she is becoming an increasingly important industrial center, and her school of medicine is famous. The surgeon-barbers of Edinburgh were incorporated by royal charter in 1505 under James IV, when it was required that they be able to read and write and that, together with a knowledge of anatomy, they have "a perfect knowledge of shaving beards!"

As befits a university town, printing and publishing is one of Edinburgh's chief industries. *Blackwood's Magazine*, published continuously since 1817, *Encyclopaedia Britannica*, *Chambers's Encyclopaedia*, etc., originated here.

Before the war the rubber industry in Edinburgh—the largest firm in the east of Scotland—employed some 3,500 workers.

Edinburgh is also an important engineering city. Ships are built at Leith, whose shipping record during the war is a proud one. Seven of the vessels which took part in D Day operations in Normandy belonged to one Leith firm alone.

Large breweries and distilleries are situated in Edinburgh, and the capital of the "Land o' Cakes" has also a high reputation in food-producing. Edinburgh biscuits, shortbread, and rock are famous the world over (Plate



#### Here Was Born the Scottish-American Inventor of the Telephone

This plaque at 16 South Charlotte Street, Edinburgh, was unveiled in 1937 by Sir George Lee, Engineer in Chief of the General Post Office of the United Kingdom and President of the Institution of Electrical Engineers. The memorial address was delivered by Dr. G. W. O. Howe, Professor of Electrical Engineering, Glasgow University, with which famous institution James Watt, inventor of the modern condensing steam engine, and Lord Kelvin, one of the greatest physicists of our time, were associated. Today the house contains offices—among them, appropriately, that of the English-Speaking Union (lower sign).

XIII). A pleasant addition to the visitor's usual itinerary is a stroll down Leith Walk, which links Edinburgh with her port.

But the favorite route of the pilgrim to Edinburgh is from Scotland's beautiful War Memorial on the summit of the Castle Rock down the Royal Mile to Holyrood Palace. To write of the men and women who have passed along the Royal Mile, one of the most historic streets in Europe, would be to write the history of Scotland.

Many a picturesque pageant still takes place with Old World ceremony at the "Mercat"

Cross by St. Giles's Church amid the narrow closes and tall "lands" (tenement houses) of the old town. Like New York, it was confined within strict geographical limits and had to expand upward instead of outward.

The new town, with its magnificent terrace of Princes Street (Plate II) and its orderly squares and crescents, also has its story of poets and writers and of those who helped to make Scotland in the great industrial age.

R. L. Stevenson, born in Howard Place, has more association with the picturesque thatched village of Swanston in the lark of the Pentlands, where he spent happy summers (Plate XI).

#### Inventor's Return

An inscription on a house at 16 South Charlotte Street marks the birthplace of Alexander Graham Bell, the inventor of the telephone (page 557).\*

Dr. Bell's visit to the city in 1920 to receive the freedom of Edinburgh on St. Andrew's Day is still remembered with pride by some of her leading citizens, notably Mr. R. T. Skinner, formerly head of Donaldson's Hospital, a well-known institution for the deaf, which Dr. Bell visited on October 29 of that year.

We sat at tea one afternoon with Mr. Skinner while he recalled the occasion.

"He asked me for a copy of my book *The Royal Mile*, and whilst I was inscribing it for him the telephone bell rang.

"Dash!" I exclaimed.

"What!" said Dr. Bell with a twinkle. "Dash my pet?"

"Shall I call you 'Doctor'?" I asked. (He had multiple claims to the title—LL.D., Ph.D., M.D., D.Sc.)

"Very well," he said, "but we in America lay little stress on distinctions. I have had to work for what I have got, and I have done all my best work between 10 p. m. and 4 a. m.! I have received many honors in the course of my life, but none that has so touched my heart as this gift of the freedom of my native city, Edinburgh."

#### Red Pyramids of Oil-shale Waste

Once the garden of Scotland, West Lothian is still an agricultural county, but the reddest roses in her garden are now the immense crimson "bings" of spent shale towering above her villages.

These pyramids against a spectacular sunset have an Egyptian grandeur.

Setting out one day from Kirkliston in West Lothian to visit Scotland's famous beauty spot, the Trossachs, we ended up in-

stead amid the less publicized bings of Addiewell. Some 85 years ago James Kelly founded near here the Scottish oil industry, which reached peak production during World War I with an annual output of three and a quarter million tons of oil shale.

From Addiewell we crossed West Lothian and lost sight of the bings for an hour in the historic county town of Linlithgow, whose royal palace, birthplace of Mary Queen of Scots, has long been a picturesque ruin, dreaming dreams of former glory on a green height above its placid loch (Plate XXIII).

Eight miles from Linlithgow is Falkirk, center of the Carron ironworks, which have supplied the British Army with guns since the days of Waterloo. Falkirk has its own coalfield, south of which are the coalfields of Lanark. It is estimated that part of the latter will be exhausted within twenty years.

Scotland's coal output has gone down gradually since 1910 from about 41 million tons to 30½ million tons in 1939. Only by increased output from other districts can this prewar level be maintained. There are still large untapped resources in Fife and elsewhere, which it is proposed to develop.

#### Glasgow Made Clyde, and Vice Versa

The great city of Glasgow is second only to London in the British Isles. The saying goes that "Glasgow made the Clyde and the Clyde made Glasgow." In the late 18th century the Clyde at Glasgow was so shallow it could be forded. Now, thanks to continual dredging, it is wide and deep enough to hold the largest liner in the world (Plate XXII).

Two-thirds of all British vessels are built on the Clyde (pages 549, 581). Henry Bell's famous *Comet*, the first public passenger steamer on the European side of the Atlantic, was launched on the river in 1812 to ply between Glasgow and Greenock.

The Gourock Ropework Company, founded in 1736, supplied the hauling lines both for Bell's *Comet* and for the *Queen Mary*!

At Greenock, busy outer port of Glasgow, many a fine vessel has been launched. None is more renowned than the bark which eventually became the American Coast Guard cutter *Bear*. This famous vessel was built in Greenock in 1874 for the sealing fleet, one of a type known as "Dundee sealers."

She was constructed of solid oak and strongly braced to cushion the shock of ice.

\* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Pre-historic Telephone Days," by Alexander Graham Bell, March, 1922; "Miracle of Talking by Telephone," by F. Barrows Colton, October, 1937; and "Voice Voyages by the National Geographic Society," March, 1916.



Gillbert Grosvenor

### Edinburgh's Royal High School Cheers a Distinguished Alumnus, Alexander Graham Bell

"I was greeted by a yell from 600 well-trained yelling voices," wrote Dr. Bell, who here tips his hat. "I made them a speech about my Royal High School days from 1857 till 1862. The yelling power of the boys, I was gratified to hear, was no less than in my day." Later Dr. Bell met a few surviving school fellows. At an imposing municipal ceremony, Lord Provost Chesser presented to him the freedom of the city of his birth—a parchment scroll in a silver casket (opposite page). This, his farewell visit to Edinburgh, was made in 1910. Two years later he died.

Purchased by the United States Navy, she was first to reach Lt. A. W. Greely, marooned on Arctic ice in 1883-84.

Stefansson, Amundsen, Captain Bob Bartlett, and other explorers have paced her staunch decks. Later, the sturdy vessel, renamed the *Bear of Oakland*, was used by Admiral Byrd in his Antarctic explorations. The *Bear* is now laid up at Boston.

Glasgow's citizens seem imbued with a genial kindness and generosity. Ask the way of a Glasgow man and as likely as not he will go out of his own to show it to you, talking the while with that Glasgow lilt so infectious that strangers acquire it unconsciously.

But the shrewd Glaswegian can also hold his tongue. It was one of the war's miracles that when the monster liner *Queen Elizabeth* slipped downriver from her birthplace in the

yards of John Brown and Company, Ltd., at Clydebank on February 26, 1940, bound ultimately for New York, no hint of the passage of this leviathan reached the outside world.

#### Where Mighty Ships Are Born

Having obtained Admiralty permission to visit this famous shipyard, where a mighty battleship was outfitting, we passed through the gates at Clydebank one morning.

In the model room we inspected a replica of the *Queen Mary*, and, pressing a switch on a miniature launching platform, under the tuition of the Company's director, Sir Stephen Pigott (who was born in Cornwall, New York), we launched a model, thus experiencing some of the thrills of the great folk who set mighty vessels in circulation.

In the yards massive cranes soared against



a sky that had changed suddenly from gray to blue, and the horizon was blocked by the giant battleship outfitting in a dock to match her size. Workmen and several workwomen (who make excellent electricians and welders) swarmed upon the decks, which rose tier upon tier within hail of the green fields and white farms of Renfrew.

Our guide and Mr. Stewart climbed to the summit platform of the mightiest crane, which stood holding out its robot arm in the Fascist salute above the bristling gun turrets of the battleship. There I could see their dwarfed figures bent against a gale which less adventurous mortals evaded.

At 5:15 the 10,000 workmen employed in the yard raced for their trams. Refreshed by tea served in the manager's office on long ships' tables, we said goodbye to our hospitable host and took up stations in a window overlooking the gateway to watch.

The deluge began at 5 o'clock in a slow trickle of women, for the chivalrous rule of the sea is the rule at John Brown's. By 5:10 the trickle had become a steady masculine flow which presently merged into a shouting, gesticulating mob of humanity in dungarees racing for the gates (page 581).

The photographer's eyes were popping as briskly as his shutter.

"What an afternoon!" he shouted above the din. "And then for *this* to happen!"

#### Playing "Checkers" Out-of-doors

We caught a glimpse of Glasgow in lighter vein next day. It was playtime for the group of old men in a corner of Alexandra Park.

Two of them sat pontifically upon wooden box seats intent upon their game of draughts (checkers) played out-of-doors on a mighty board with huge wooden "men" (page 550). Each checker held a ring by which the player could lift it with a long hooked stick. On surrounding benches other ancients leaned forward, watching intently.

Fascinated, I joined the throng leaning against the railings, while photographer Stewart hunted for a pair of steps. On these he established himself precariously a few yards away from the players, but neither paid the slightest attention. With supreme indifference to everything but their game, they forked and hooked and slung and poked in utter silence.

At last the stouter player, with the faintest trace of a smirk curling his double chin, forked his hook into his opponent's last disk and slung it, with a sublime expression, off the board.

Silently the victor rose, gave his pole to one

of the waiting watchers, and a new game began. Mr. Stewart climbed down.

The famous University of Glasgow, second oldest university in Scotland, was founded in 1450. It occupies the summit of Gilmore Hill, the finest situation in the city. Some of the world's greatest physicists have been associated with the university—James Watt, inventor of the condensing steam engine, Lord Kelvin, 53 years professor of natural philosophy in the university, and many others.

#### Robinson Crusoe Born in Largo

Mungo Park and David Livingstone, missionary, penetrated darkest Africa; Scottish traders and explorers wrote their names on Canada; Dundee and Aberdeen sailors carried their national dances and the skirl of their pipes into every port; even Robinson Crusoe was a native of Fife, and his statue may be seen in the little town of Largo (Plate XVI).

Isolated between the estuaries of the Tay and the Forth, the "lang-heided" folk of Fife are a race apart. "He that will to Cupar maun (must) to Cupar" is a saying about Fife's county town which reflects something of its inhabitants' stubborn individuality.

It was probably a Fife voter who said at the general election, "Mony's the time I've changed my opeenion, but *never* my vote!"

Stirling, the gateway to the north, is also one of the gateways to Fife. Its historic castle was both a royal palace and a fortress from the ramparts of which the whole extent of Scotland at her narrow waistline can be seen on a clear day from Ben Lomond to Edinburgh Castle.

On the north side of the Forth not far from Stirling stands "an almost perfect example of a small Scottish trading burgh" of the 17th century, picturesque red-roofed Culross, a film of which was exhibited at the New York World's Fair. Near Culross is Dunfermline, Scotland's ancient capital, burial place of King Robert Bruce and birthplace of Charles I and Andrew Carnegie.

To the latter, above whose "treasure house" is inscribed the motto, "The gods send thread for a web begun," Scottish students owe a deep debt of gratitude for his many benefactions to their universities. His gifts to his native town include the fine park and glen of Pittencrieff, where we found many of the inhabitants sunning themselves when we visited it on a brilliant Sunday morning.

Near the extremity of the Fife peninsula stands Scotland's Oxford, St. Andrews. Here the first Scottish university was founded in 1411.

## Heather Paints the Highlands



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—Lenses Offer by H. Anthony Stewart

### Clansmen Put on Highland Dress to Honor a Cause Their Forefathers Lost 200 Years Ago

Here at Glenfinnan Prince Charles Stuart launched his tragic quest for a throne in 1745. Sir Donald Cameron of Lochiel (left) is a descendant of the "gentle Lochiel" who told the clans that the Prince had "cast himself naked upon their honor." Lady Cameron stands between him and Donald Macphail (Plates IX and XVII).



© National Geographic Society

Photograph by H. Arthur Bennett

**One-sided Princes Street, Pride of Edinburgh, Is "But Half a Street," as an Envious Glasgow Man Pointed Out**

Princes Street honors two sons of George III. Shops, hotels, and offices face the famous Gardens (Plate VIII). The 100-foot Gothic spire shelters a statue to Sir Walter Scott, who called Prince Street the most magnificent in Europe. Promenaders look up at Castle Rock. Below it is the National Gallery (left).



© National Geographic Society

Illustration by H. Anshelm, 1904-1905

### Sight-seers Haunt the Castle, Resort of Royalty since Edinburgh Began

In the 7th century a King Edwin fortified the hill and called it Edwin's burgh. St. Margaret's Chapel (right) honors a queen who died there in 1033 on learning her husband had been slain. In filled Argyll's Tower the condemned Marquis of Argyll spent his last days. "Mons Meg, the 'iron murderer'" (left), was captured here by Cromwell.





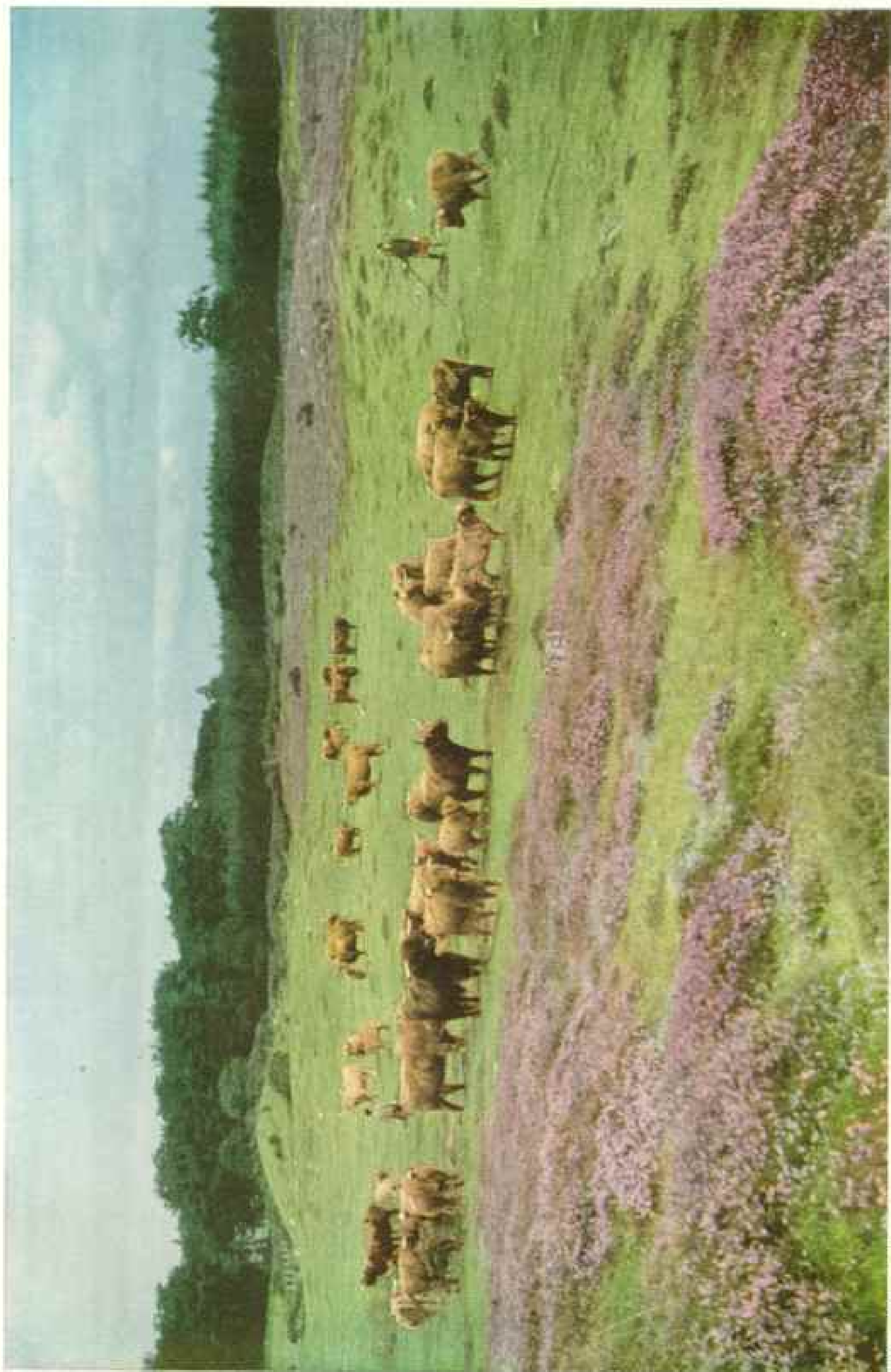
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Restaurants by B. Anthony Stewart

### Home from the War, the Earl of Cawdor Joins His Countess in a Stroll Through Their Garden

Cawdor Castle preserves a thorn tree which figured in the builder's strange dream five centuries ago. In a dungeon below the tower the author saw the tree, rooted but lifeless, and heard the story of the Thane of Cawdor's vision. Shakespeare to the contrary, the Castle did not exist in time for Macbeth to slay Duncan there.



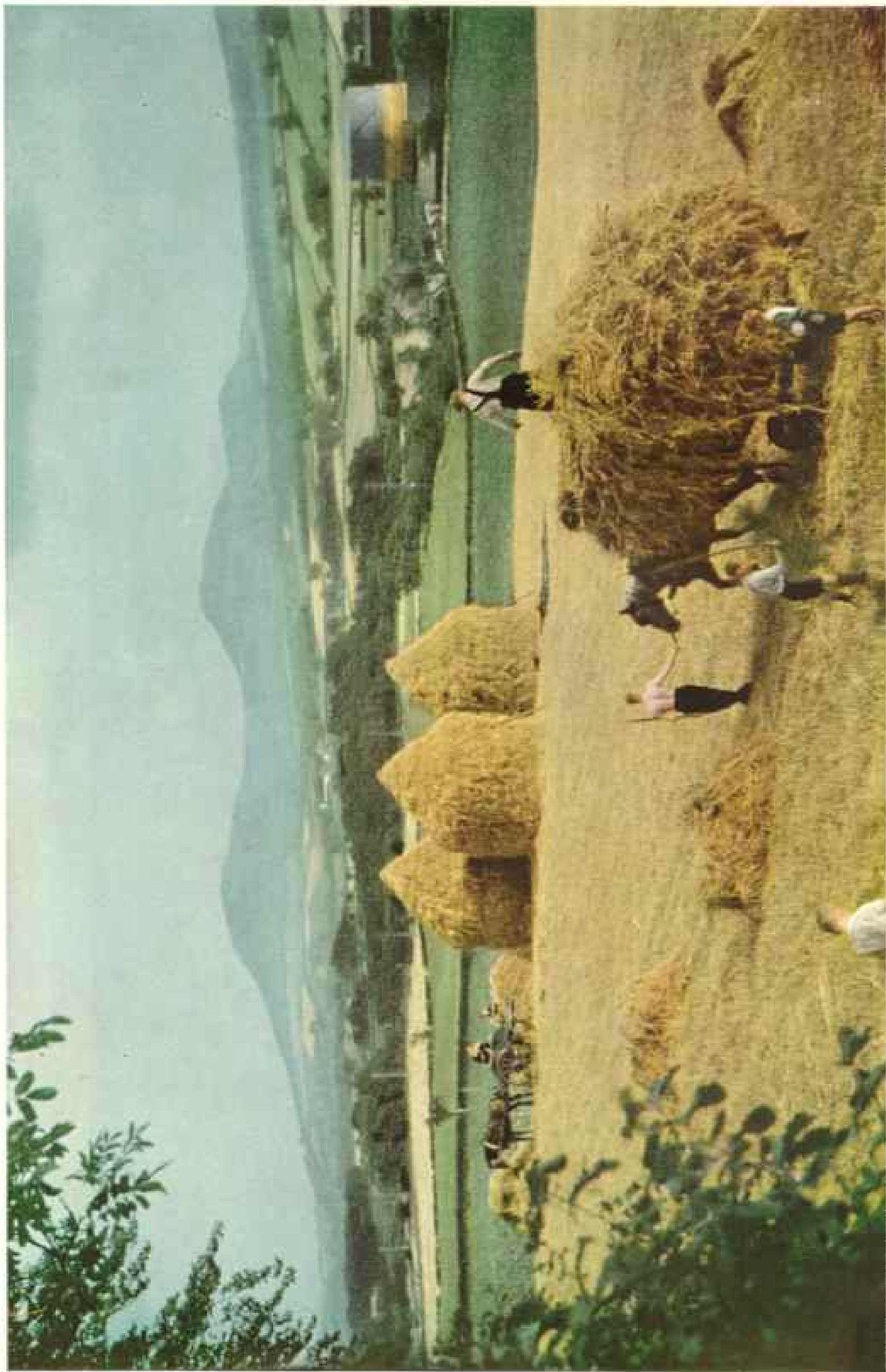


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Reproduction by H. Arthur Brown

**Shaggy West Highland Cattle, Whose Origin Goes Back to Prehistoric Times, Graze on a Heathery Moor near Inverness**

No British breed surpasses the Highlanders in ability to withstand winter. Not many were bred in wartime, as they mature slowly. Though they produce premium beef, few have found their way to America. Herdsmen here wear unaccustomed kilts to accommodate a Hollywood movie director (Plate XXV).



© National Geographic Society

Scots Harvest Outs below Eildon Hills, Andrew Lang's "Three Crests Against the Saffron Sky Beyond the Purple Plain"

Reproduction by H. Anthony Bryant

Seeing this sight again, the dying Sir Walter Scott was delighted. "I can stand on the Eildon Hill," he told Washington Irving, "and count 43 places famous in war and verse." Romans called the triple peak Trimontium. Border legend says King Arthur lies asleep in "Eildon's caverns vast."



© National Geographic Society

Reproduction by H. Anthony Stewart

**From St. Andrews, University of the Scarlet Gown, Young Men and Women Stroll to the Water Front Each Sunday**

Medieval St. Andrews town saw "heretics" burned to death. John Knox thundered against "images" in the 12th-century Cathedral (spires, right). Time, not bombers, accomplished its ruin. The square tower marks the venerable Church of St. Rule. Founded in 1411, the University is Scotland's oldest.



**Scots Hold No Castle in Deeper Reverence than the Robert Burns Cottage at Alloway**

In this "auld clay biggin" Scotland's national poet was born in 1759, son of a gardener. Later his home became a drinking place. It was rescued by a public trust. Each year it attracts some 30,000 pilgrims.



© National Geographic Society

Reconstruction by W. Anthony Stewart

**Edinburgh's Clock of 14,000 Flowers Keeps Excellent Time**

This timepiece has stood in Princes Street Gardens since 1905. An underground mechanism moves the hands around the floral dial. The gardener achieves a reddish effect by planting dwarf red beets.



## Heather Paints the Highlands

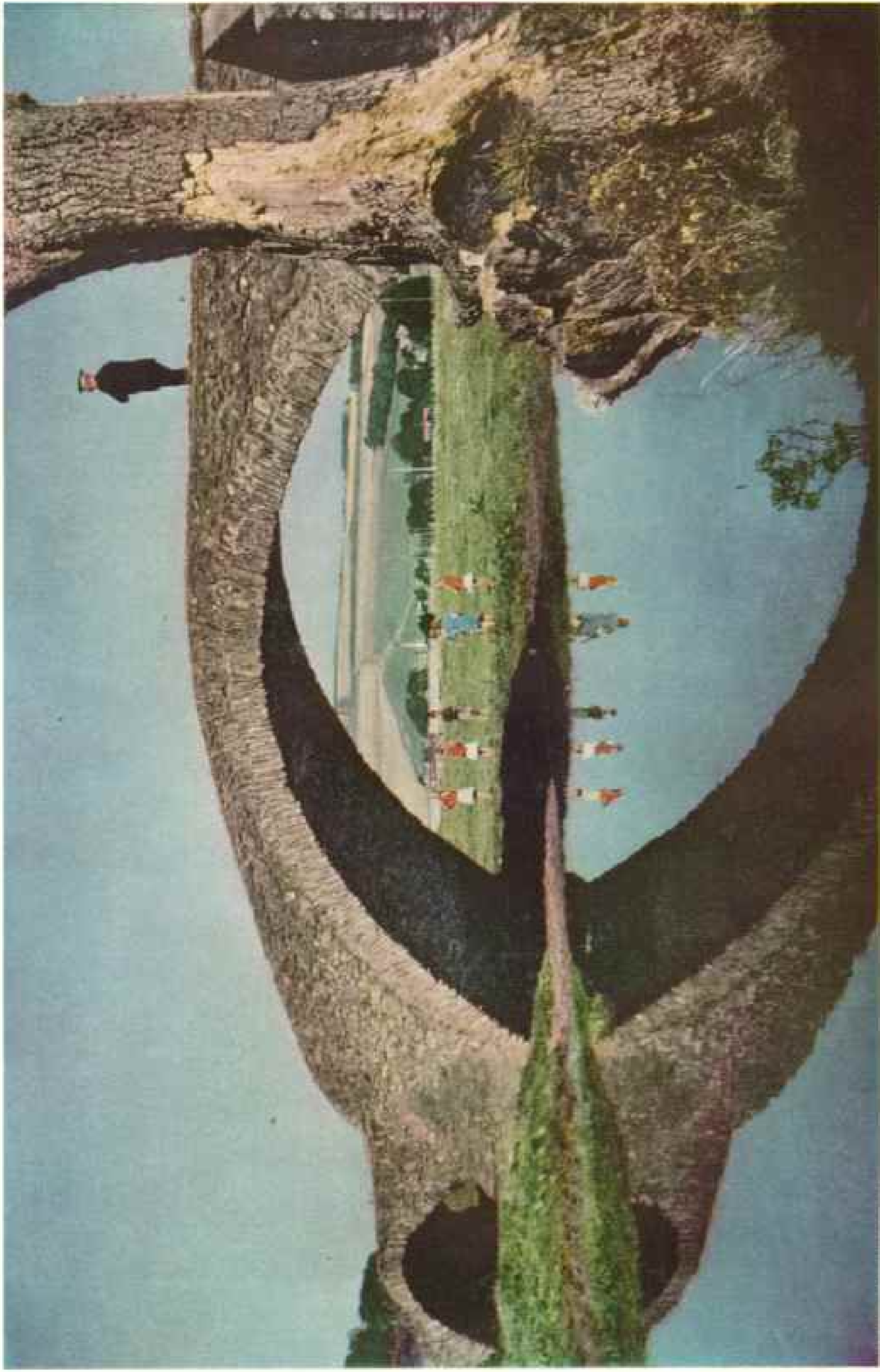


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Across Color by B. Anthony Stewart

### A Glenfinnan Piper in Bonnet and Kilts Plays a Lament for Bonnie Prince Charlie

He wears the Camerons' tartan (Plate I). Each clan treasures its checkered cloth, an identification like a coat of arms. After the Prince's defeat at Culloden (1746), Parliament prohibited Highland dress as a badge of insurgence. To win the Scots' loyalty, the English later encouraged "the wearing."



© National Geographic Society

**Framed by the Arch of an Old Stone Bridge, School Children Play at Noon Recess in Stow**

Stow formerly was called Woodale (Dale of Woe). There King Arthur is believed to have fought the pagans. Many "braw, braw lads" of Galla Water, which flows below the span, died in the Battle of Flodden (1513). More gave their lives in the two World Wars. Covered with moss, the bridge is abandoned.

Illustration by E. Anthony Bennett

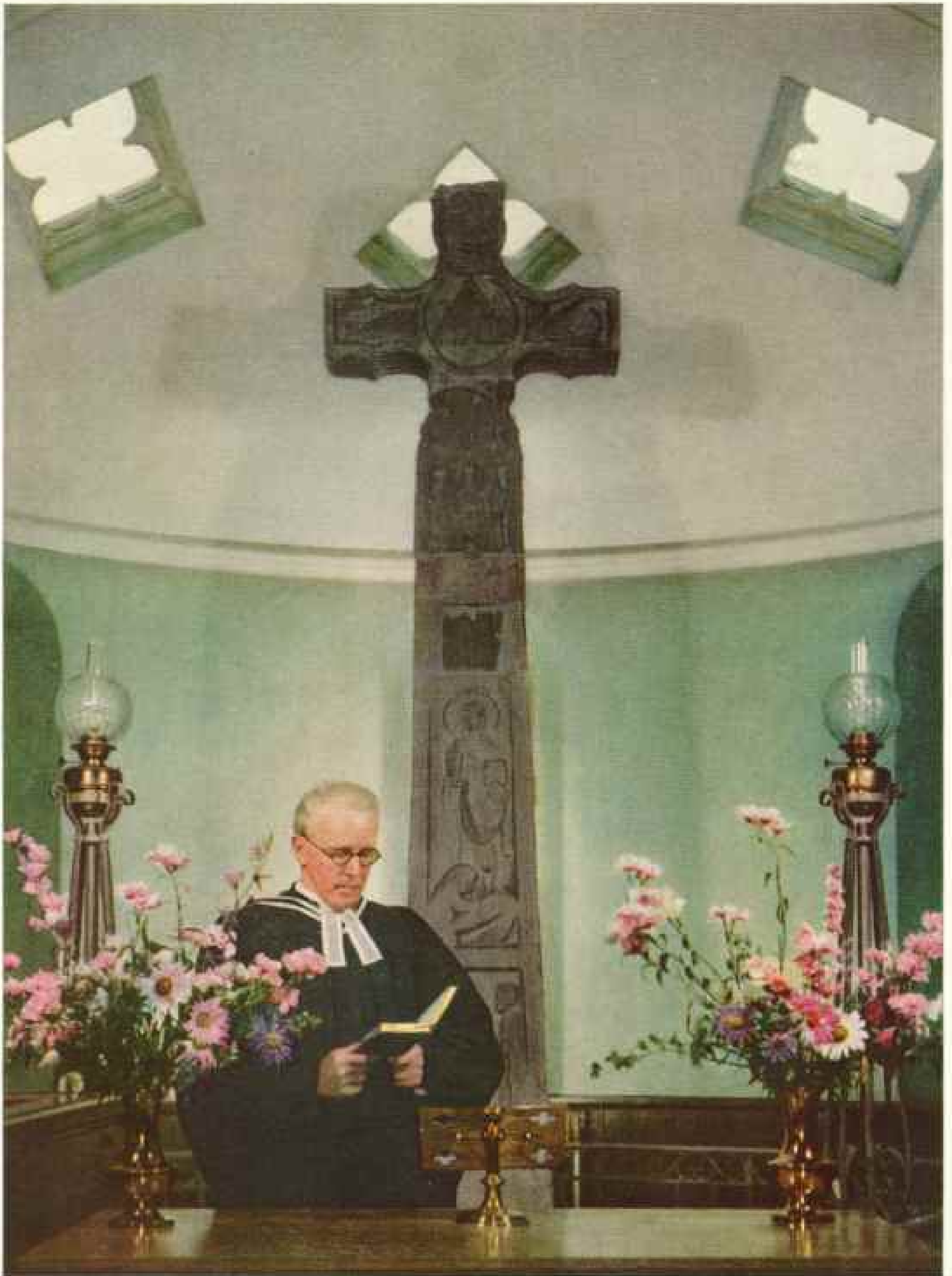


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**Beloved by Robert Louis Stevenson, This Thatched Community Plays a Romantic Part in "St. Ives"**

At Swanston, Stevenson's parents leased a summer cottage for the sake of their delicate son. From it he roamed the moors and glens of Pentland Hills. In Samoa he pined for these "Hills of Home," writing: "The tropics vanish and museum that I . . . dreaming, gaze again." Modern Edinburgh encroaches on sequestered Swanston.

Reproduction by H. Arthur Rowan



© National Geographic Society

Restoration by E. Arthur Hinnart

### 12 Centuries Ago a Saxon Runestone Artist Carved the Ruthwell Cross

To save the cross from 1640's "idol" smashers, a Protestant minister buried it beneath his church in Ruthwell. For 150 years it lay there, broken. Mended, its face depicts the washing of the Saviour's feet. Too high for the roof, the 17-foot monument is sunk in a floor well. Its custodian is the Reverend Matthew W. McCaul.



## Heather Paints the Highlands



### Scotland Is the "Land o' Cakes," and Edinburgh Grills 'Em

Even during the war Scots kept up their reputation for oatcakes. They're not as sweet as the American variety. These girls, having cooked one side, turn the cakes for further firing.



© National Geographic Society

Photographer by B. Anthony Stewart

### "Auld Willie" Ward Has Given 60 of His 70 Years to Scottish Woolens

At his Edinburgh loom he draws warp threads through the beddle eyes by means of small hooks in his right hand. An assistant, facing him, "hands in." Weft, or filling, threads will be inserted later.



© National Geographic Society

**Mountains, Glen, and Loch—a Sample of Scotland's Wild and Lonely Highlands**

A shepherd's cottage beside Loch Mullardoch is the only sign of habitation in Glen Clinnich. His sheep dot the brae. Horses take a path to Bernada Lodge. Asked if he did not deem the scenery grand, a canny native told the author: "Yes—if there's a living in that."

Illustration by B. Arthur Stewart



© National Geographic Society

**During Fruit-lean War Years They Were Grapes of Delight**

These Black Hamburg grapes grow under glass at the author's home, Carlisle, near Kirkliston. Joe Munro, the gardener, clips bunches for market. War-time's hothouse fruits fetched high prices.



Contributed by H. Anthony Stevens

**Flowers and Dogs, Not Crime, Occupy the Constable at Stow**

William Small's law-abiding village requires so little policing that he has leisure to cultivate his snapdragons. Beside him sits his pedigreed spaniel, Terry of Wedale. Mr. Small keeps an eye on the bairns in Plate X.



© National Geographic Society

Kodachrome by B. Anthony Stewart

**Robinson Crusoe in Goatskins Surveys the Sea from His Birth Site in Largo**

Alexander Selkirk, inspiration for Defoe's fictional castaway, was marooned four years on a lonely Pacific island. His statue was erected by kinsmen, some of whom still live in Largo. In 1695 the village was scandalized by young Selkirk's behavior in church. Summoned, he did not appear, "being gone away to the sea."



St. Andrews was the ecclesiastical capital of Scotland for many centuries. It is also the capital of golf. No golfer's education is complete till he has sampled the old course at St. Andrews, where even the dogs are taught to reclaim lost golf balls! Their sense of scent makes them superhuman retrievers (page 555).

#### "Bottle Dungeon" for Heretics

The bishops built their castle on a rock jutting out into the sea and bored in the rocky floor their terrible concentration camp for Reformation martyrs—the "bottle dungeon."

The custodian lowered his lantern into the bowels of the rock until at 25 feet it touched bottom.

"Fifteen feet from side to side," he said. "No light. No sanitation. One man was in here two years before he went mad and died."

He hauled up his light again. "There's only one other bottle dungeon in the world," he said proudly, "and that's in Rome."

A few minutes later we awakened the genie in the bottle, the shade of the student martyr, Patrick Hamilton, who in 1528 perished at the stake.

"You're standing on it," said the lady I had stopped in the street to ask the spot. I jumped hurriedly aside and saw the letters "P.H." woven into the cobbles.

"And you ought to see the thorn tree Queen Mary of Scots planted. It's in the quadrangle at St. Mary's College," this walking Baedeker added briskly.

Peering under an old archway to look for the thorn, we evoked the principal of St. Mary's himself, the Reverend George Simpson Duncan.

After that our fortunes were made. Principal Duncan arranged that we should spend the night at one of the students' hostels, dine at their own long tables, and share the amenities of university life (which included at that moment ice-cream "sliders") in the gray city by the sea, made gay by the scarlet gowns of its undergraduates.

On Sunday morning we attended service with these same red gowns in their chapel of St. Salvator's and heard the "singing university" singing.

After service, following their time-worn practice, the students filed slowly down through the sunlit archway of the lovely "Pends" to the Old World harbor, where they streamed out along the cobbled jetty, their brilliant gowns radiant against the blue waters (Plate VII).

It is this close association with the sea which makes Scotland's Oxford so different. The tang of salt is in the air; the students live on the edge of far horizons. Our taxi driver summed up St. Andrews for us when we made our regretful way to the station.

"You get a bit of everything at St. Andrews," he said. "Golf, swimming, education, walks." And he named them in that order.

On a misty morning, bound for the north, we crossed the Forth at South Queensferry by the steamer which plies beside the giant straddle of the great railway bridge constructed more than fifty years ago. This bridge is nearly as high as the dome of St. Paul's in London, and like St. Paul's it defied all German bombers (page 582).

That afternoon we reached the ancient city of Perth, which claims an origin in Roman times and is today pre-eminent in the dyeing and cleaning industries.

Like many towns on Scotland's eastern seaboard, Perth was full of Polish troops. These exiles Scotland has taken very literally to her heart, and the marriage rate between Scots and Poles is high.

Peering down the dim aisle of St. John's ancient church, we found a wedding in progress. Before the high altar a white-robed bride knelt in a dusty sun shaft.

We came in for another end of the war at Dundee next day, 22 miles down the estuary of the Tay. As we stood admiring its famous steeple, St. Mary's Tower, a workman with a ladder removed from the lamppost beside us the notice "Air Raid Shelter." The war was over for Dundee!

Dundee is Scotland's second city in commercial importance and the center of Britain's jute trade, but also popular for its marmalade.\*

The well-known house of James Keiller & Son had a romantic origin in 1797 when a Spanish vessel arrived in the Tay with some bitter oranges for which there was no sale. Mrs. Keiller had the happy thought to make a preserve of this strange fruit. She did so, and thus started a mighty industry in her back kitchen (Plate XXV).

Despite her preoccupation with commerce, Dundee is perhaps best known by a song. It was from Dudhope Castle that Claverhouse ("Bonnie Dundee") set out "wi' the bonnets o' bonnie Dundee" to his death at Killiecrankie.

We motored on from Perth next day past golden harvest fields where strapping Angus

\* See "Low Road, High Road, Around Dundee," by Maurice P. Dunlap, NATIONAL GEOGRAPHIC MAGAZINE, April, 1936.

women worked with their men, pitchforking the shocks into the carts.

At last we came to a strange and rather forbidding village, like no other we had passed, whose reticent houses and high walls seemed to watch us suspiciously. We had reached Glamis.

#### Glamis Cradled Britain's Queen

We obtained a permit from the factor's office, and presently the gates of its noble castle, childhood home of Britain's present Queen, were opened to us and we passed down the long drive.

A magnificent 17th-century sundial adorns the lawn in front of the ancient home of the Earls of Strathmore, the central tower of which dates from the 15th century. The sunless autumn day seemed to suit the mood of the place; all was shrouded in silence, for Glamis was at the moment empty save for its ghosts.

Here, according to legend, the Lord of Glamis and his guest, "Earl Beardie" of Crawford, sold themselves to the Devil. Sunday morning had chimed, but they refused to stop their game of cards. Instead, they swore a terrible oath that they would not stop till the game was ended, though it should last till "the crack of doom."

The Devil, so the story goes, still holds them to this contract and meets with them each year in a secret room of the castle, where they continue the game. And so they must do till the Great Judgment Day.

From Glamis it is only a few miles to the "window in Thrums" at Kirriemuir and the humble home where James M. Barrie, the author of *Peter Pan* and *The Little Minister*, first saw the light. He idealized his native town as "Thrums," familiar to all who know his works.

No district is more interesting than this Barrie country, once occupied by the Picts who carved its stones with their mysterious symbols.

"I never realized Scotland was so large," said Mr. Stewart.

We were approaching Aberdeen by way of Brechin and Montrose.

At Brechin we had paused to visit the famous round tower, one of three in Scotland, which stands a little apart from the Cathedral like a neatly folded umbrella. Built nearly a thousand years ago, it probably served the Culdee priests as a place of refuge from the Danish incursions of that period.

At Montrose we found ourselves at the tail end of a cattle market, and the farmers of this fine agricultural district still crowded

the amphitheater where the beasts are auctioned.

Now we had paused once more to look down on the picturesque fishing village of Gourdon, in a lurk of the beach far below the high-road (Plate XIX). Its cloud of gulls was unbelievable; the waves were white with them, the air shrill with their lamentable cries.

The gulls of Gourdon must be Sabbatarians. "If you come back here on Sunday," the fishermen told us, "you won't find a gull!"

By these pleasant loitering ways we looked down at last upon Aberdeen. The Silver City stands between the mouths of the famous salmon rivers Dee and Don. For more than six centuries the Don has been crossed at Balgownie by its picturesque bridge, of which Scotland's wizard, Thomas the Rhymer, predicted in the 13th century:

Brig o' Balgownie, wight's your wa';  
Wi' a wife's ae son and a mare's ae foal  
Doun ye shall fa'.

The poet Byron, who was an only son and lived at Aberdeen in his youth, is said always to have walked his horse across the Brig o' Balgownie lest it prove to be "a mare's ae foal" and cause the bridge to fall.

#### Aberdeen Jokes and Gravestones

Aberdeen's most popular manufactures are its jokes. The best are made by the generous Aberdonians themselves.

Many of us have heard of the Aberdeen wedding held in the backyard so that the chickens could eat the rice; also of the Aberdeen bridegroom who won his £5 bet that he would not utter a sound on his airborne honeymoon, no matter what provocation the pilot gave him, but confessed on landing that he "nearly let oot a yell when Maggie fell oot!"

If Aberdeen, more than any other Scottish city, has added to the gaiety of nations, it has also commemorated their serious moments. Polished granite monuments from Aberdeen are sent all over the world.

Visitors gaze with fascinated awe into the great Rubislaw pit out of which Aberdeen has been largely built. It is 400 feet deep and has been working almost continuously for nearly 175 years.

But to most strangers the chief sight in the city is the fish market, which must be seen to be believed. It is a peculiarly masculine world. The trawlers begin "at skreich o' day" to unload their catches onto the quays, where they are auctioned amid an indescribable babble and are then trundled off to waiting trucks.

It is all over with surprising speed, and the spectator is left with an extraordinary memory



Here Tam o' Shanter Sat "Bousing at the Nappy, an' Getting Fou and Unco Happy"

A new oat thatch rises over Tam's inn, a public house in Ayr. A bar now stands in the room where Burns's hero "got planted unco right." At Tam's elbow sat Souter Johnny, "his ancient, trusty, drouthy crony." A painting over the door depicts Tam's leaving for his witch-haunted ride (Plate XXXII).

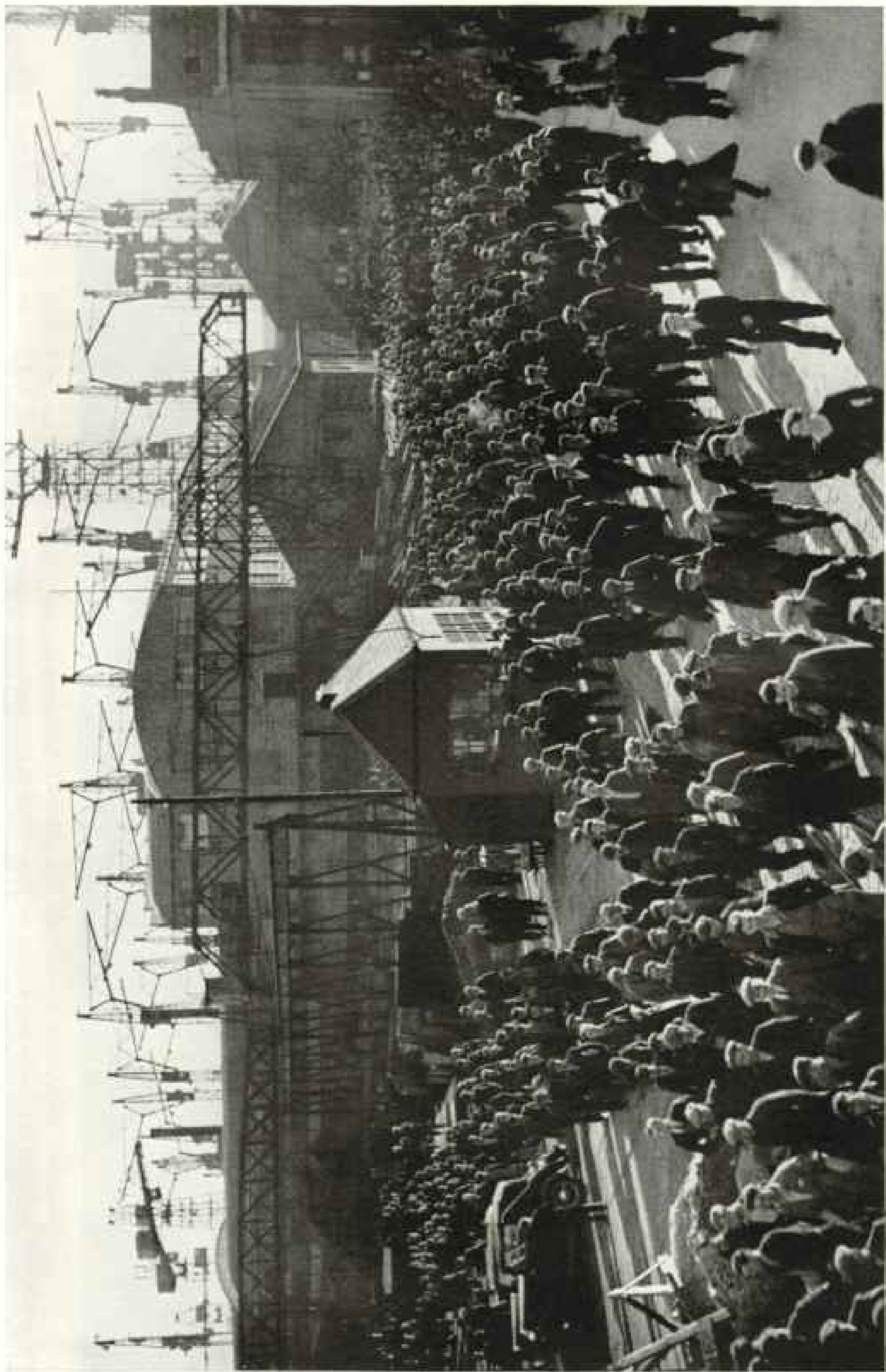


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**School Lets Out in Musselburgh. Happy Children Follow Drummer and Pipers as Americans Would a Circus Parade**

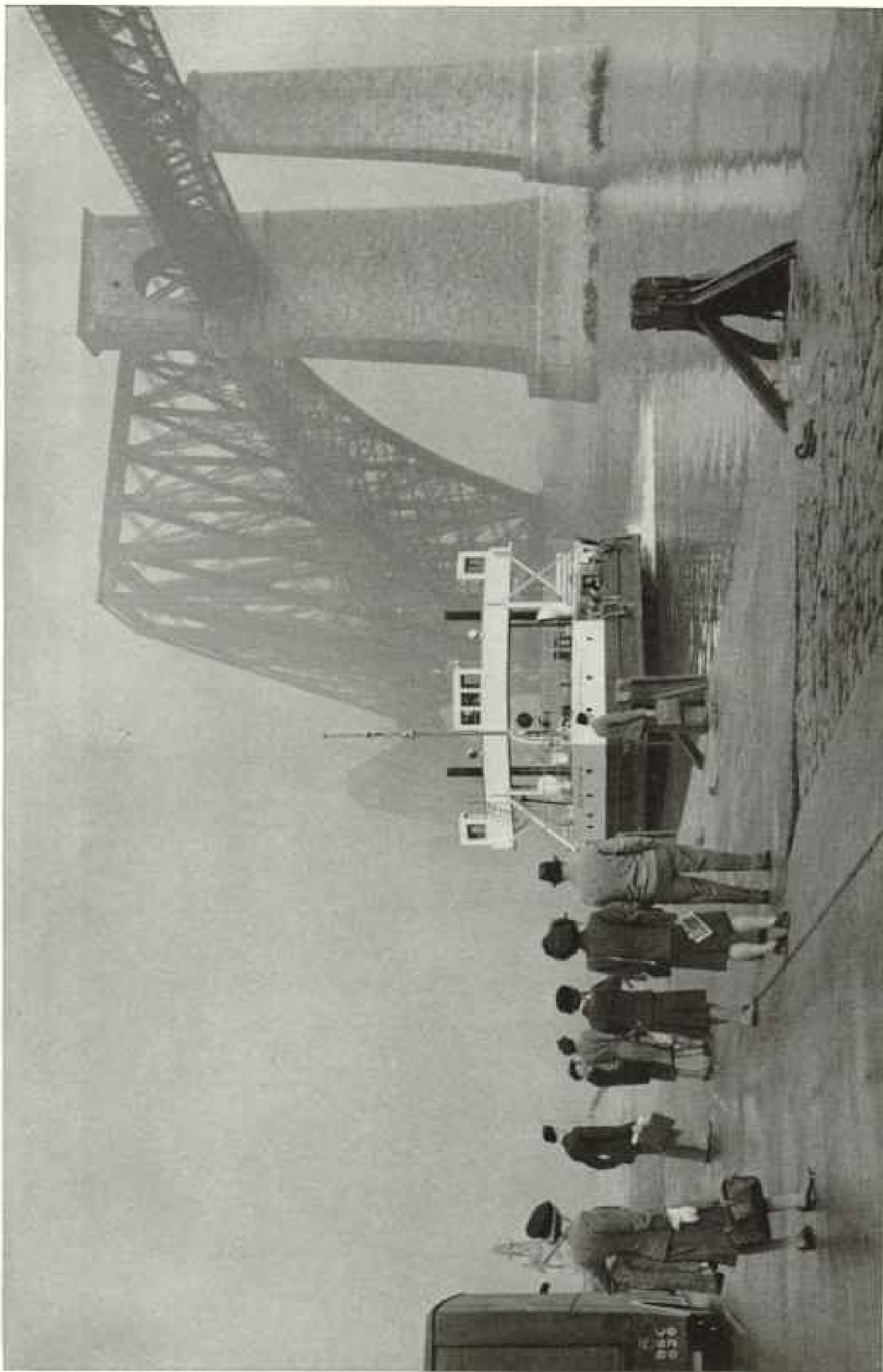
Carrying his staff, the drum major wears a leather bonnet, red jacket, plaid (cloak), kilt, white gauntlets, pipe-clay belt, half hose, spats, and brogues. A brooch is clasped on his shoulder. His sporran, or ornamental purse, holds down the kilt on windy days. Kilts, so prominent in World War I, were reserved for ceremonies in 1940-45, as the bright tartans proved too conspicuous. Kilted pipers played some Highlanders into battle, however.





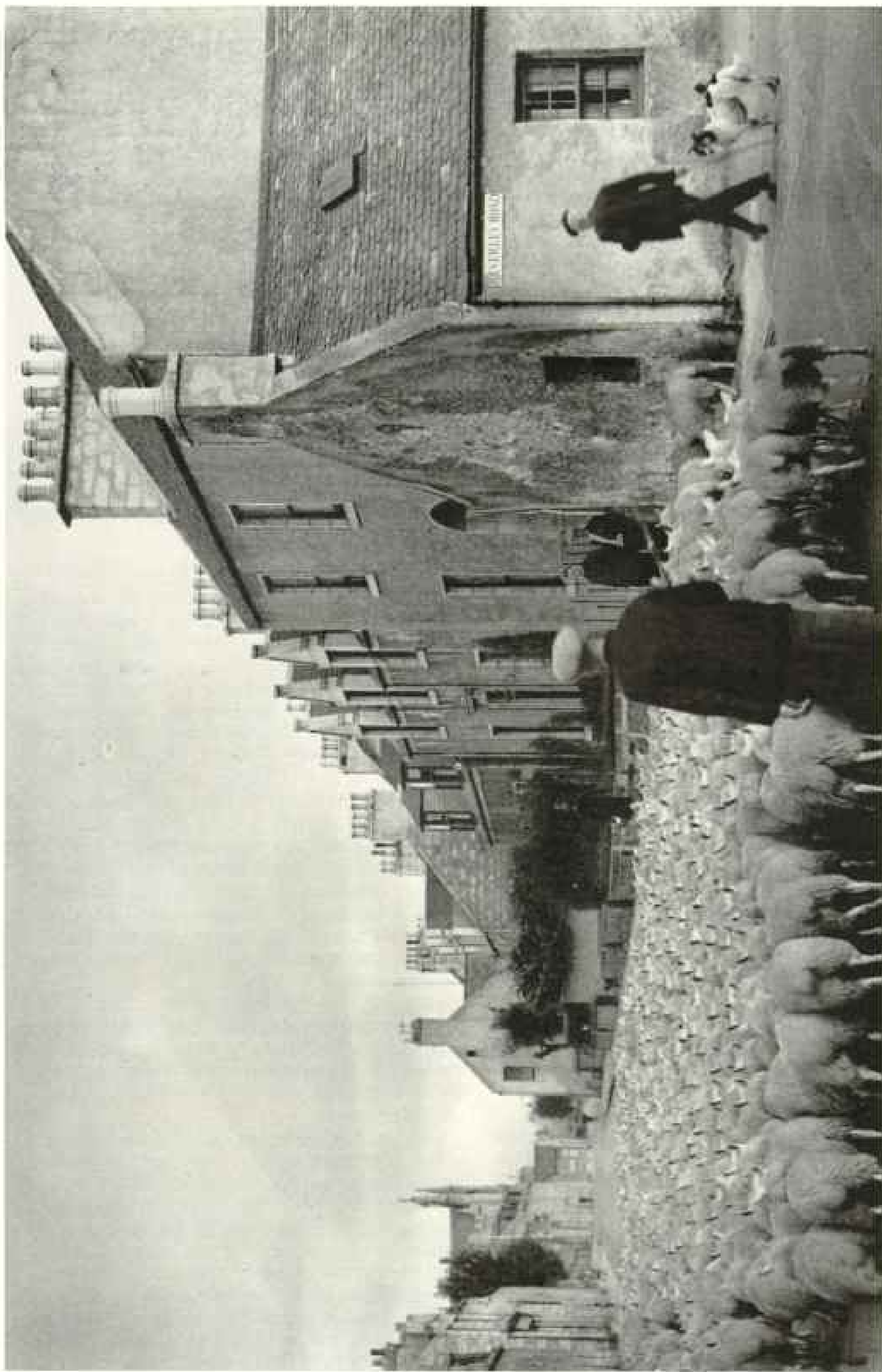
At 5:10 p. m. a Clydebank Shipyard Explodes with Human Projectiles Racing for Trams and Buses

During the war John Brown and Company completed the battleship *Duke of York*, which sank the *Schönhorst*; the carrier *Indefatigable*, which served off Iwo Jima; and cruisers and destroyers. It built the two Queen liners, *Mary* and *Elizabeth*. Recently these men finished work on the battleship *Vanguard*.



**Railroad Bridge and Automobile Ferry Serve Edinburgh as Short Cuts to the Firth of Forth's North Shore**

Finished in 1890, the bridge is  $1\frac{1}{2}$  miles long and 361 feet high. From it, train passengers sometimes pitch pennies for luck. In the first Luftwaffe raid on Britain, a down bomber struck in vain at the span. At South Queensferry, *Robert the Bruce* glides into her dock (page 577).



**Moving to Fresh Pasture, Sheep Clog the Main Highway in Inverurie. They Stop for Nothing; Pedestrians Step Aside**

A dog, one of six with the flock, cocks his ears for the shepherd's commands. Shep responds to whistles like a robot plane to radio control. He performs so many super-canine miracles that his master describes him as a genius. Chimney pots denote the number of fireplaces in each house.

of a quarter of a mile of fish and a certainty, as he picks his slippery way homeward, that he does not want fish for breakfast that morning!

On our way from Aberdeen to Inverness we passed through fine hill country, whose towns still swarmed with Polish troops, and in the long street of Rothes viewed the local "Bridge of Sighs" at Glen Grant Distillery. This slender pipe carries the raw spirit across the street, and under it the old men of Rothes do some wishful thinking.

During the busy years from 1922-33 more than 210 million gallons of whisky were made in Scotland, of which about 140 million gallons were pure malt whisky, Scotland's best-known and most valuable export.

Other countries, including Japan, have tried in vain to imitate Scotch. Its peculiar flavor is sometimes attributed to the character of the peat water, sometimes to variations in technique by the maltmen who prepare the malt.

Scotch whisky is exported to the ends of the earth, but her biggest customer is Uncle Sam. When the United States went dry, there were repercussions on Speyside.

#### Two-thirds of Scotland Called "the Highlands"

A line drawn from the Clyde diagonally across Scotland to Aberdeen cuts off two-thirds of the country to north and west, which is generally known as "the Highlands." This area is again sundered by the Great Glen (Glen More) at Inverness, through which the Caledonian Canal, more than 60 miles long, links the North Sea with the Atlantic.

The waterway, completed in 1847 at a cost of over a million pounds, passes through a chain of natural lakes, of which Loch Ness is the largest.

Neptune's Staircase, a series of eight locks near Fort William, forms the entrance to the canal from the west (Plate XVIII).

There are no large towns or manufactures in the scenically magnificent Highland area. Crofting (tenant farming) and fishing occupy its not very numerous population.

Oban, in western Argyll, with its beautiful bay, is one of the largest tourist centers. This resort's annual average temperature of 48.2° F. is only one degree colder than Bournemouth, on England's south coast.

Because of the warm currents which wash the west coast, the climate is remarkably mild, and palms, aloes, and other foreign shrubs flourish in sheltered gardens as far north as Ross-shire.

The last road in Scotland twists along the

edge of the map to Cape Wrath. The scenery grows ever wilder and grander.

At Bettyhill the broad salmon river Naver enters the ocean beside a mountain of white sand, and in the short turf of this delightful seacoast the plant lover may find in early summer Scotland's own flower, the fairylike *Primula scotica*, which grows nowhere else in the world.

"There is scarcely a day here without wind," remarked the keeper of Cape Wrath Lighthouse as we stood within the prisms which flash their light 31 miles to seaward.

Gazing out to sea, I found myself thinking of the great Stevenson family of lighthouse builders, who erected on Scottish headlands so many famous beacons and whose genius reached its flashpoint in the immortal R.L.S.

Some of the most magnificent scenery on the Scottish mainland lies between Cape Wrath and Fort William—Loch Hourn, Loch Nevis, and the 370-foot Falls of Glomach, highest in Britain.

#### Bagpipes Wail for Bonnie Prince Charlie

Lonely Glenfinnan was invaded on August 18, 1945, by a gathering of the clans, under the auspices of the National Trust for Scotland, owners of the ground, to commemorate under its tall monument, not V-J Day, but the bicentenary of the landing on these shores in 1745 of Prince Charles Edward Stuart, the "Young Pretender" (Plates I, IX, and XVII).

Bonnie Prince Charlie was defeated at Culloden eight months later and became a hunted refugee with a price on his head.

He eventually escaped to France and is buried under the great dome of St. Peter's in Rome. However, the enthusiasm of the gathering of hundreds of clansmen at Glenfinnan in 1945 shows that, though Prince Charlie never gained a throne, he is still "King o' the Hieland herts."

Returning to Inverness from this gathering in the dusk of a perfect day (described by natives of this wettest region as "a miracle"! ) we seemed in another world from the one which had awakened that week to V-J Day celebrations.

Past the flag-bedecked cottages we rolled in a bus chartered by the National Trust for its members, to the strains of "Fairyland." For Lochiel's head pipers sat in the front seat playing pathetic Jacobite laments.

As they played on, the sun sank softly behind the forest of Affric (page 601) like the fading glory of a lost cause, fingering the higher tops and retreating up and up, till only the summit was golden and a deep cobalt shadow lay across the loch and the far hillside.



## Heather Paints the Highlands

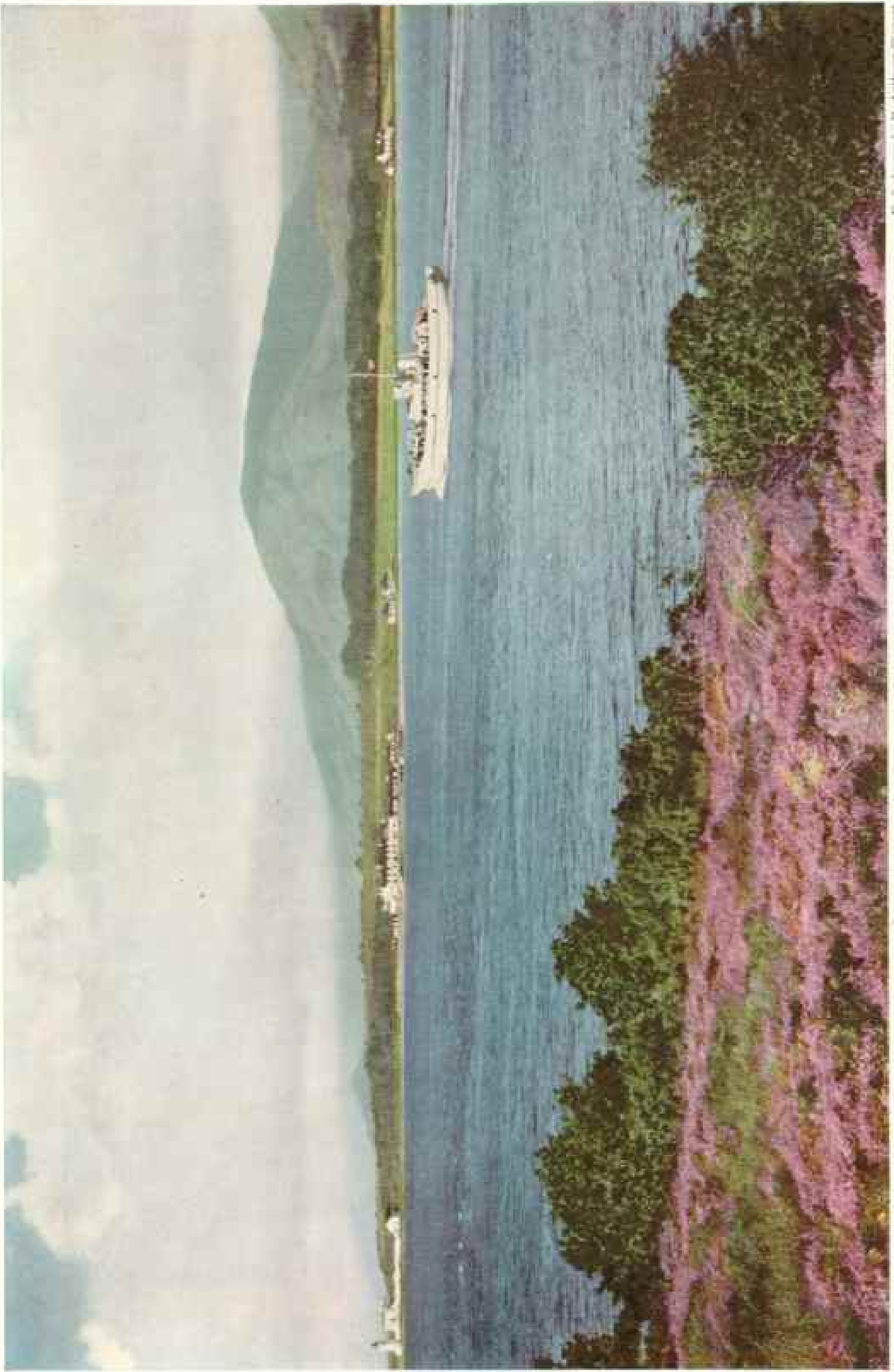


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Reproduction by H. Anthony Stewart

### Prince Charlie Atop His Monument Looks South to the England He Hoped to Conquer

St. Andrews Cross, Scotland's "blue blanket," flies at Glenfinnan, where the Young Pretender raised his standard in 1745 and rallied some 1,200 clansmen (Plates I and IX). Several times that number attended the 1945 anniversary. Choirs sang in Gaelic, as of yore; speakers used a microphone (center).

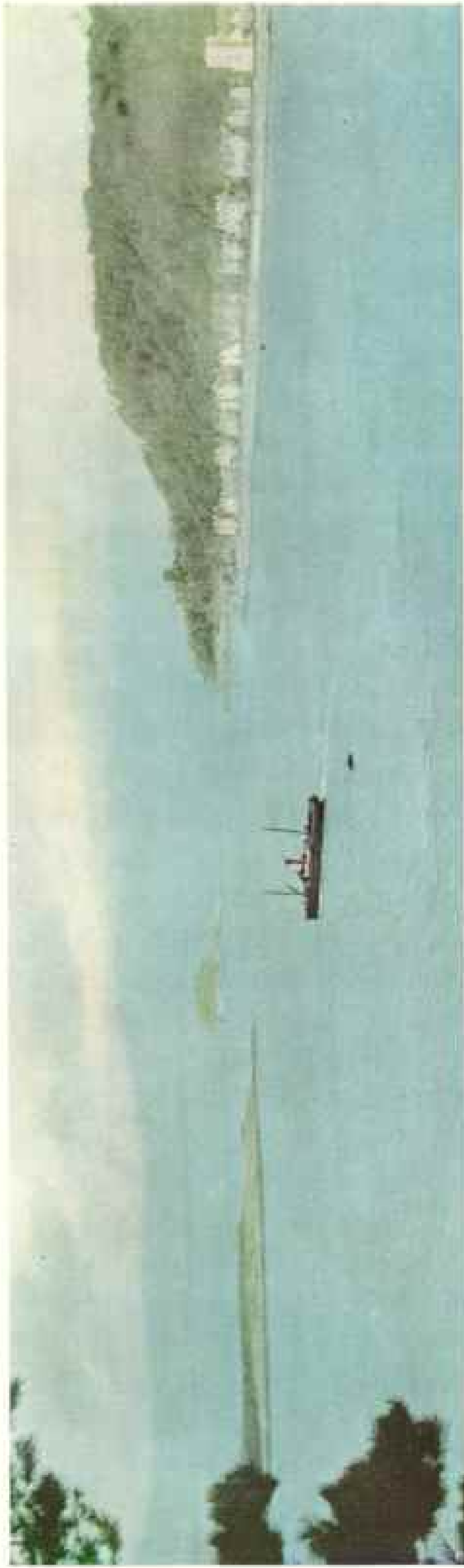


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**Heather-rimmed Loch Linnhe, Together with Its Companion Lochs, Splits Scotland in Twain.**

Argyll's hills of Ardgour are seen from Inverness-shire. Corran Light (left) guards the narrows, where strong tides race. The motor launch moves Atlanticward. Behind it lies the Caledonian Canal, a short cut saving 400 miles. Dug through Scotland's Great Glen, the canal leads up Neptune's Staircase to the North Sea.

Reproduction by H. Anthony Bonarts



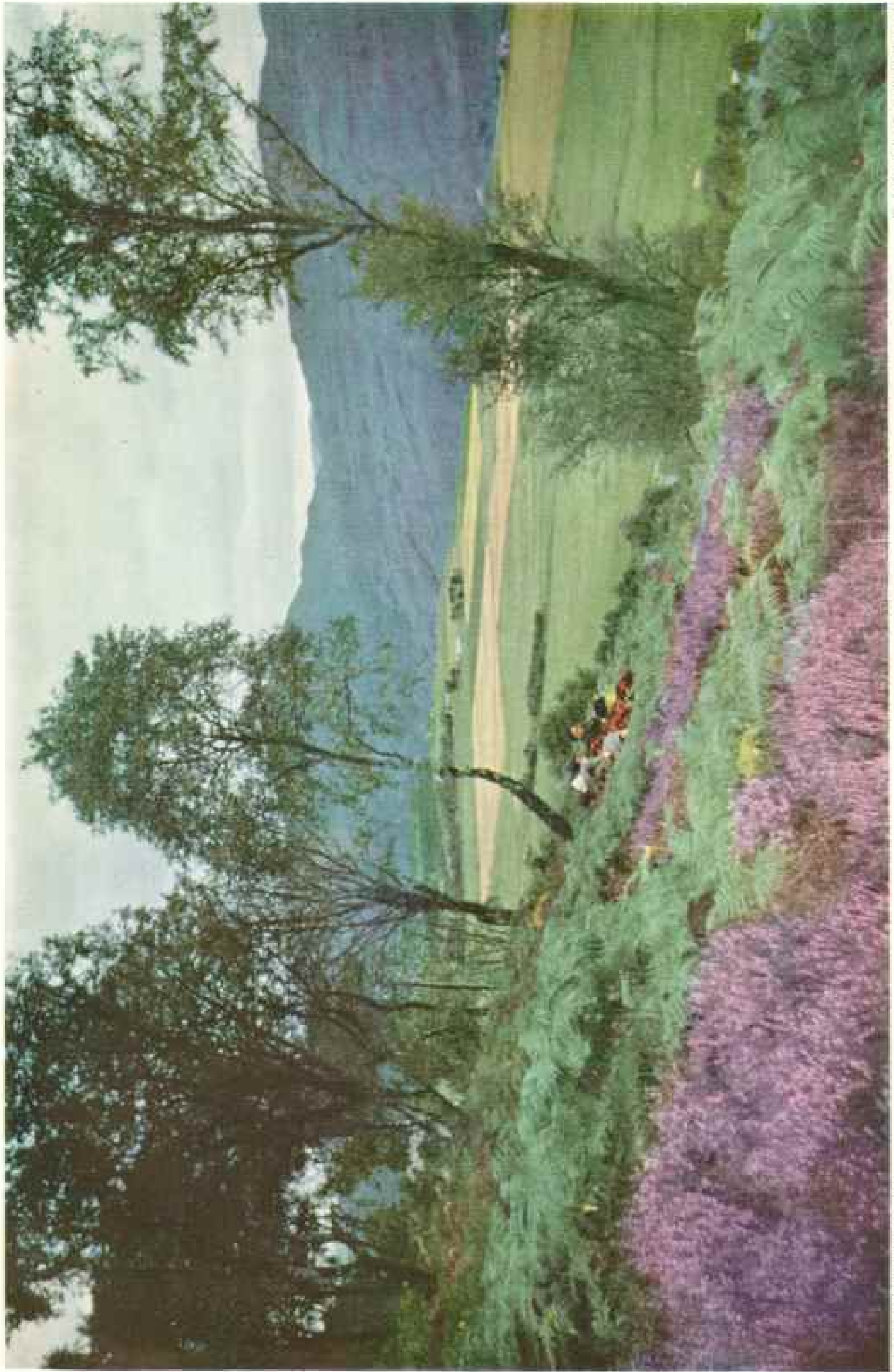
A Steamer Leaves Oban for the Hebrides. On a Headland Stands Dimollie Castle, Dungeoned Stronghold of the MacDougalls



© National Geographic Society

Scrubberies by B. Anthony Stewart

Gulls Whiten Sea and Breakwater at Gourdon on a Weekday. By Sunday, When Fish-packing Ceases, They'll Be Gone



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Reproduction by Dr. Anthony Sennart

**"How Green Is My Valley!" A Picnic Party, Carpeted by Bracken and Heather, Gazes into Scenic Strath Glass**

Strath Glass is the land of the Chisholm clan, whose name is stamped on the American cattle trail. Its name derives from the old Gaelic: *strath*, meaning valley, and *glas* (stream) or *glas* (green). At Inverrannich (left) the River Glass begins at the confluence of the Cannich and Affric. Oats grow in the fields.



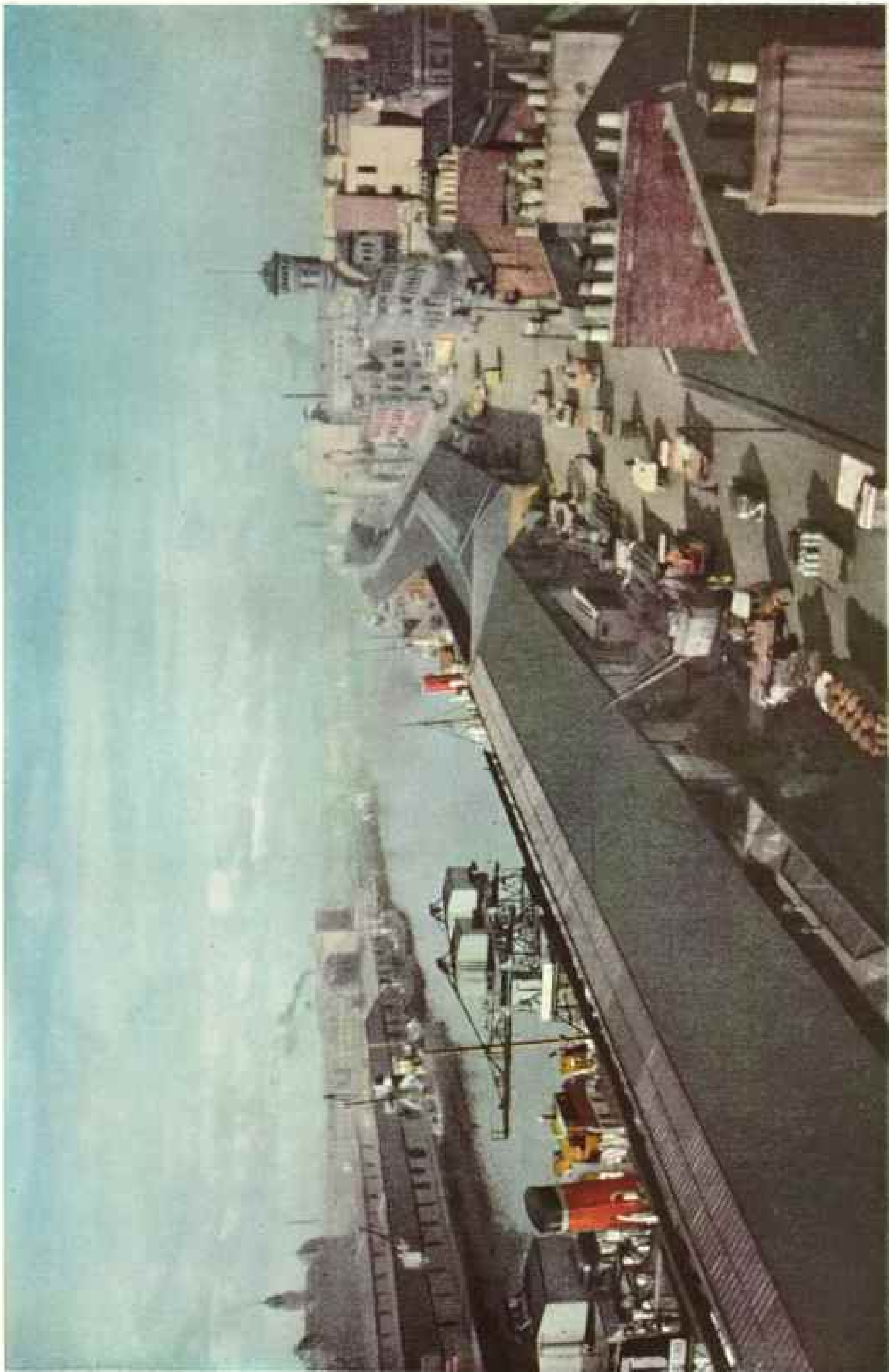


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**Below White Birches the Bonnie, Bonnie Heather Dyes the Roadside in Glen Cannich**

Contributed by Dr. Andrew Brown

Useful heather makes the rural Scot's brooms and baskets; his emergency hatch and mattress. Decaying, it forms his peat. Seeds and flowers nourish grouse and bees. Heather honey is delicious; heather ale brewing is a lost art. The evergreen plant beautiful sterile moors; homelick Scots long for the sight.



© National Geographic Society

Reproduction by H. Anthony Stewart

**Neither Castles nor Palaces Spread Glasgow's Fame; Britain's Second City Owe Its Rank to the River Clyde**

Two centuries ago boys waded the stream, and Glasgow numbered a few thousands. Today ocean liners serve the city's 1,100,000. Its expansion is the reward for some \$50,000,000 spent on dredging the Clyde. This quayside is the Broomielaw, where coastwise steamers berth.



Ben Nevis, Britain's 4,406-foot Summit, Is Lost in a Scotch Mist. Its Small Brother Peeps Through the Clouds



© National Geographic Society

Reclustering by H. Anthony Hayward

Linlithgow Palace, Birthplace of Mary Queen of Scots, Has Stood in Ruins Since a Fire in 1746



© National Geographic Society

Redrawn by R. Anthony Everett

**By Showing Their Colors, Glasgow Trams Reveal Their Routes at a Glance**

"Let Glasgow flourish," the city's motto, came true when Virginia tobacco made its merchant princes wealthy. Later, steam sent Glasgow-built ships scouring the world for treasure. Ironically, smoky Glasgow's name means "dear green spot." At noon, shoppers pour into Renfield Street.



## Heather Paints the Highlands



### Dundee, City of Jute and Jam, Serves Its Own Creation, Orange Marmalade (right)

When a Spanish ship in 1797 brought unsalable bitter fruit, Dundee's Mrs. Keiller originated the preserve. Her name is borne by the restaurant where these girls work. During wartime many Scots went without their jam.

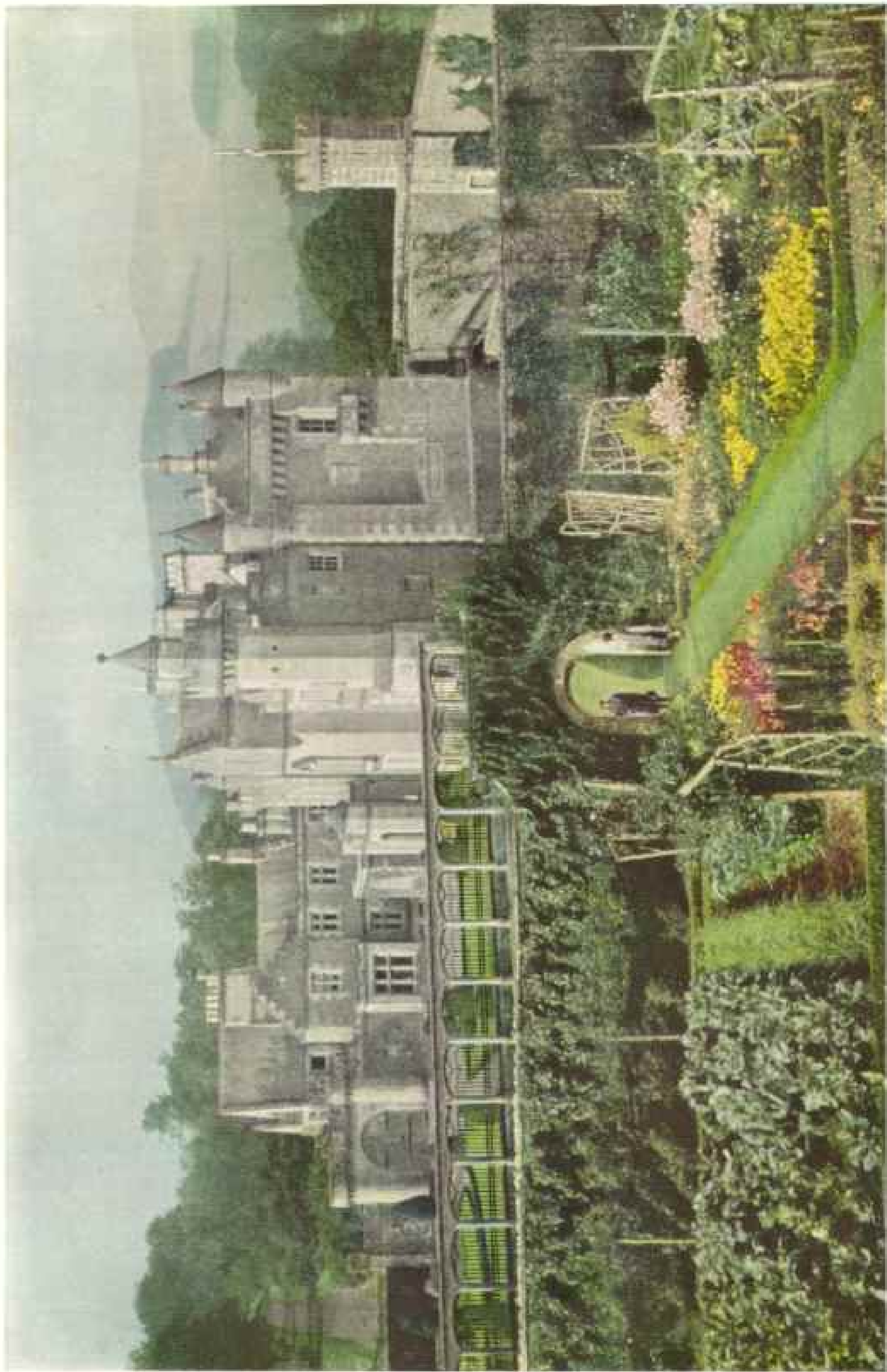


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Illustration by B. Arthur Stewart

### Jock of Leys Castle, a Champion Ton of Beef, Has Bangs Combed for His Picture

This bull demonstrates why the West Highland breed is an artists' favorite model. Jock is gentle despite formidable 5-foot horns. He won first prizes at London and Edinburgh. His pasture is near Inverness.



© National Geographic Society

Reproduction by H. Anthony Bonart

**Close to a Spot Where Medieval Abbots Crossed the Tweed, Sir Walter Scott Built a Castle and Called It Abbotsford**

Turreted Abbotsford, 30 miles from Edinburgh, is the novelist's "romance in stone and lime," where he died in 1832. His rooms contain Napoleon's pistols, Rob Roy's weapons, Montrose's sword, Queen Mary's seal, Prince Charlie's drinking cup, and Burne's toddy tumbler. Scott's descendants still occupy the castle.



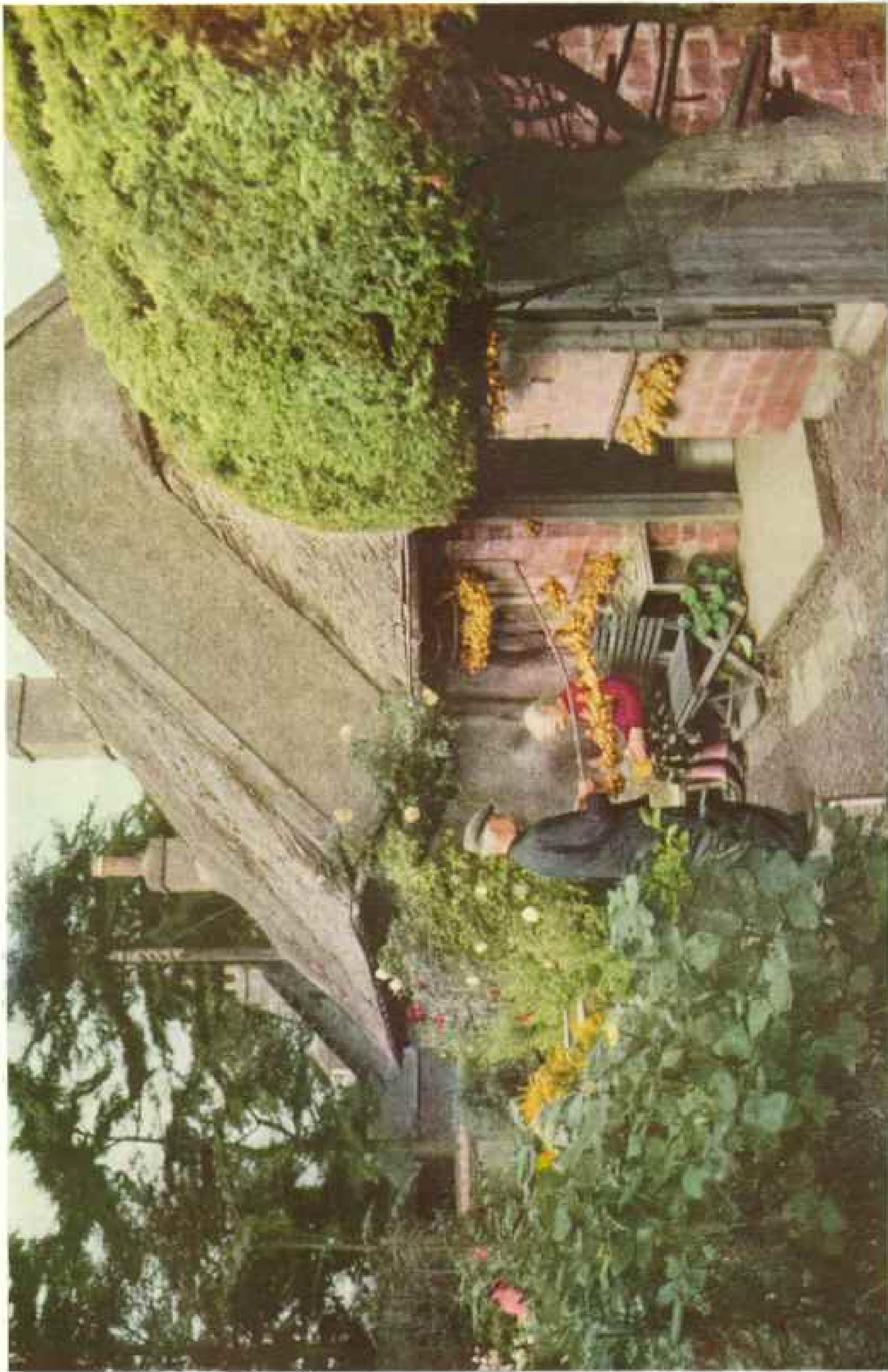
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Illustration by B. Anthony Huntart

**A Passer-by in Duthie Park, Aberdeen, Picks a Spray of Lavender to Crush and Sniff for Fragrance**

"Lavender! sweet lavender!" is a sales cry often heard on London streets. Dried, the aromatic leaves are used for perfuming linen. Formerly, "to lay away in lavender" meant to pawn one's possessions. *Lavender* is derived from the Latin *lavare* (to wash), referring to its use in bath perfumery.





© National Geographic Society

**Mr. and Mrs. Thomas McFarlane String Onions from the Walls of Their Thatched Cottage in Longforgan**

Their home stands on or near the ruins of a sixth-century religious house. Mr. McFarlane is the caretaker of Longforgan village hall. When off duty, he likes to exercise his "green thumb." Scottish gardeners are renowned for their skill.

Illustration by H. Anthony Brown





© National Geographic Society

**Norval Scrymgeour Gives Rapt Attention to a Book, but Careless Hands to His Wife's Yarn**

Reproduction by Dr. Arthur Hays Sulzberger

Justice of the Peace Scrymgeour is an author, antiquary, and collector. He writes on the history and romance of Scotland. He collects his country's many nonprecious stones. His home in Longfordian contains pieces of Napoleon's china, Empress Eugenie's necklace, and other relics of royalty.



© National Geographic Society

Like a Bathub Flotilla, the Fishing Fleet Careens at Low Tide in the Toy Harbor at Stonehaven

Illustrations by B. Arthur Hewitt

Old Stonehaven is pinned against its harbor by the new town, a holiday resort. Natives pronounce the name *Steenhivie*. Lying on the North Sea, the town did not escape air raids; roofs still show bomb damage (left). Here fishing boats are known as liners because they employ lines rather than nets.

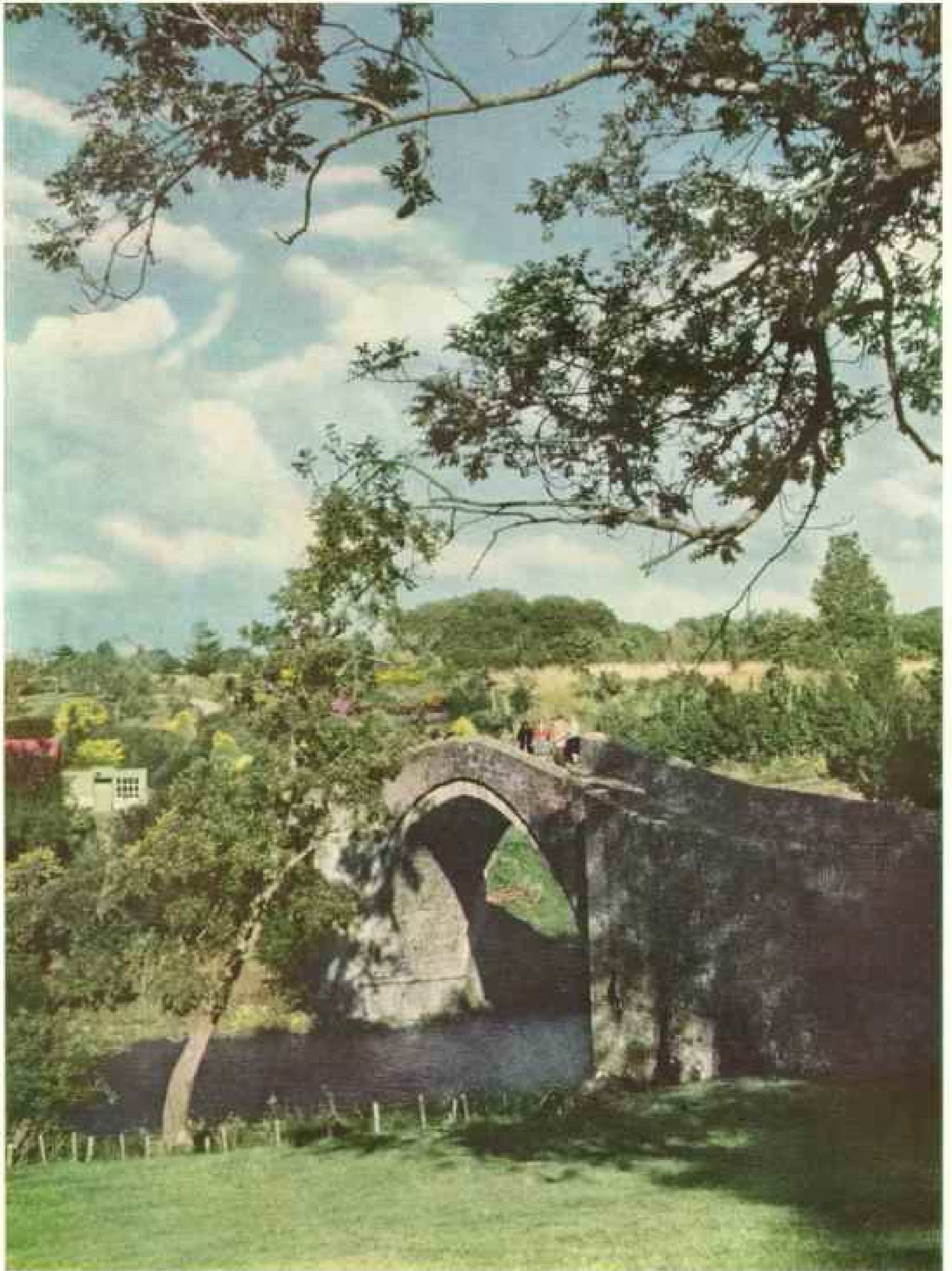


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Reproduced by B. Arthur Bennett

**Hip-booted Father, His Wife, and Three Helpers Mend Nets in Johnshaven, a North Sea Fishing Village**

Father skips a fishing boat. Mother raises flowers in her two-foot-wide garden. Daughter plays with her doll. Tiny Johnshaven is not all that it used to be. Press gangs of the 18th century ruined the town when they seized many of its hardy sons to fight with the Navy.



© National Geographic Society

Kodachrome by B. Anthony Stewart

**Auld Brig o' Doon Is Preserved as a Memorial to Tam o' Shanter's Eerie Ride**

Here, near Alloway, Robert Burns's tipsy Tam gained safety from the pursuing witches, who dared not cross the Doon's running water. At the keystone Tam's mare "left behind her ain grey tail; the carlin clautt her by the rump and left poor Maggie scarce a stump." Only pedestrians use the bridge now.



Gaelic songs are not all melancholy, as the Gaels' vigorous reels and strathspeys testify (page 547). Nor can the Gael lay unique claim to the bagpipe. Its origin is unknown, but the "Scottish" bagpipe of today is highly cosmopolitan in its make-up. In the catalogue of a recent industrial exhibition held in Edinburgh it may surprise many to learn:

"In peacetime bagpipes are exported all over the world. They are made of ebony from Ceylon and West Africa, African blackwood, or brazilwood from South America; ivory from Africa, or imitation ivory or nickel silver are used for ornamentation. The reeds come from Spain or the south of France, and the bags are made from Iceland sheepskin."

#### At Inverness Celt and Norseman Meet

Some say the soft-voiced natives of Inverness speak the purest English in Great Britain. Their pretty town on the Ness with its islands and bridges is a meeting place for east and west Highlands, whose inhabitants are of different stock. Scandinavian influence predominates on the east, Celtic on the west.

We saw Inverness from an unusual angle. A Hollywood company making a Scottish travelogue had just arrived to film the town. By the kindness of our hotel proprietor, we were welcomed to the party and admitted with it to the distinguished company of Jock of Leys Castle, 11-year-old Highland bull champion of Smithfield, with a 5-foot 3-inch spread to his horns and a weight only 18 pounds short of a ton.

With hair combed from his liquid eyes and horns polished till they shone, Jock, the gentlest of creatures, posed for the camera like a mannequin, turning his curls this way and that and rolling his glad eyes at the photographers (Plate XXV).

Next day—this time without Hollywood—our host sent us many miles into the wilds of the forest of Affric.

The hills of this wild region nourish thousands of sheep. We watched the dogs shepherding the long flocks down the braes for sheep dipping, and at Benula Lodge enjoyed once more our host's open-handed hospitality at a Highland high tea, which, even on the edge of wartime, included "shell eggs" and heather honey!

As we neared the town again an old countryman thumbed a lift. We remarked on the beauty of his country (Plate XIV).

"Oh, yes," he agreed, "the place is full of scenery, if there's a living in that."

"How's life up here?" we queried.

"Oh, sometimes not so bad. And sometimes [with a twinkle] very bad!"

We dropped him outside his cottage.

"And have you been far?" he queried, with the natural curiosity of lonely places.

"Right up to Benula Lodge."

"Then indeed you have been far. And thank you kindly for the lift. And I will be looking for you in Inverness, and you can ask me for a dram!"

#### "No Ghosts at Cawdor, but . . ."

Some of Scotland's ancient castles and mansion houses have been converted into Youth Hostels. Those who wish to explore Scotland in the best way, on foot, may do so very cheaply if they are members of this admirable association.

Other castles are still happily inhabited by their owners. One of the oldest of these is Cawdor, some five miles from Nairn, where we found, as at Inverness, that Highland hospitality was a reality and no mere name (Plate IV).

We arrived, by kind invitation, on the afternoon of Victory Sunday and found the Earl and Countess listening in to the great Thanksgiving service at St. Paul's in London, perhaps the most memorable strains that have ever reached these ancient halls.

The castle's history goes back five centuries to the days when the Thane of Cawdor, having saved up sufficient money to build a house, placed the coffer on his ass's back and set out, being warned in a dream to build where his ass should lie down. The ass passed by two thorn trees but lay down under a third, and the Thane built his castle around the third thorn.

"And there," said the Countess, unlocking an iron grille in the heart of the castle, "is the thorn tree!"

Unbelievable, but there it was! And there it has spread its now leafless boughs through the centuries, protected latterly from the depredations of souvenir hunters by a cage.

The Earl, who is an enthusiastic photographer, unhooked a stepladder from the wall and helped Mr. Stewart to carry it across the ancient drawbridge to the flowerlit garden for picture taking, while the Countess showed us her beautiful domain.

"If you are a lover of truth, as I am," she said, "you will know that Shakespeare's King Duncan could not have been murdered by Macbeth at Cawdor, for this castle was not built till more than four centuries later. No, there are no ghosts at Cawdor, but I like to think it is a place of peace and poetry, haunted only by the gentler spirits of hospitality and friendliness."

# Servicing Arctic Airbases

BY ROBERT A. BARTLETT

**M**Y FIRST love is the *Effie M. Morrissey*, my schooner; my second, the Arctic, whose icy waters I have sailed for nigh on to half a century.

War did not separate us. Together we served the interests of my adopted country, the United States.

During the summers of 1942-45 northern Quebec, Baffin Island, and Greenland beckoned to me and the *Morrissey*.

The two-masted, 98-foot *Morrissey* has been my home, office, and magic carpet for 22 years. She is a product of the Essex, Massachusetts, yards. Her hull is sheathed in ice-withstanding greenheart. More than once I have owed my life to her seaworthiness. Though she is 51 years old, this confirmed bachelor cherishes her as he would a wife (Plates I and VIII).

At the beginning of the war I chartered the *Morrissey* to the United States Army Transportation Corps, and offered myself as her skipper and my Newfoundland fishermen-neighbors as her crew. We found ourselves working on subarctic projects, under loan to the Navy's Hydrographic Office.

Leader of our expedition was Comdr. (later Capt.) Alexander Forbes, an indefatigable worker. He drove us as hard as himself, and my men loved him for it. They called him "Win-the-War Forbes." His son and sons-in-law were in the armed forces, and he wasn't going to let them down!

Under Forbes were Lts. Daniel S. Turner and Sherman A. Wengerd, who contributed the Kodachromes illustrating this article; Lt. Ed. Mohl, and several Navy enlisted men.

## Channels Through Uncharted Waters

Our job took us through uncharted channels leading to two American bases on Canadian soil.

These bases—combined airfields and weather stations—were stops on the Air Transport Command's route from Labrador to eastern Baffin Island. At its northern terminal this line joined the Hudson Bay-Greenland-Iceland-Scotland line (map, page 604).

The two meteorological stations, plus dozens of others, collected Arctic observations foretelling the weather days ahead of its arrival in Europe.

In the summer of 1943 we sailed into Hudson Strait, which separates Quebec and Baffin Island, dipped south into Ungava Bay, and entered the Koksoak (Big River). My orders were to pick up a party of Hydrographic Office

men at Crystal One, code name for an American base some 55 miles upriver.

To the navigator the Koksoak is a tide-swept, boulder-paved demon (Plate VII). It already had wrecked a number of American ships and tugs.

I steered the *Morrissey* toward the higher bank, knowing I would find deeper water there. For safety, a whaleboat crew preceded us and took soundings. So sharply did the channel twist, however, that we could not always follow. Drawing 13 feet of water, the *Morrissey* scraped bottom repeatedly. Like a billiard ball, she caromed from boulder to boulder, but, thanks to her stout hull, she arrived at Crystal as tight as a drum.

One of the Hydrographic men awaiting us remarked, ironically:

"Why bother to take soundings now? Our mission has been accomplished. Captain Bob already knows how deep the river is. He bounced all the way in."

That summer the Navy men took the Koksoak's measure. They established and marked a channel for cargo ships. They took some interesting observations on the tides. Mean range was 25 feet. Extreme tide at river mouth was 40 feet.

## Frozen Dinner on a Derelict

One immense rise swept away a tide staff which the Hydrographic Office had fastened to an abandoned steamer (Plate III). During a storm in 1942 the ship's anchors had failed to hold. Driven upright upon the rocks, she fitted a crevice like a tool in a vise. Low tide almost lapped her keel; high water made her appear to be afloat.

Her crew having returned to the United States, the derelict was left with all her supplies. A party of our men found her flooded hull frozen like a skating rink. Drums of oil intended for the airbase were iced in, defying salvagers. Dishes were still on the mess table. Breast of chicken, preserved as in a refrigerator, lay sliced on a platter.

After 12 days in the Koksoak, the *Morrissey* sailed for Baffin Island, directly across Hudson Strait (Plate II).

Baffin, the world's fourth largest island, takes its name from the English navigator, William Baffin (1584-1622). So indented are its shores that explorers long considered it an archipelago. Parts of the island received such names as Baffin Land, Foxe Land, and Cockburn Land, "land" meaning *terra incognita*.



From Capt. Robert A. Bartlett

### Hung and Crated, a Polar Bear Chews a Splinter from the *Morrissey's* Boom

A boat's crew lassoed this 170-pound cub in Melville Bay. He went into the box raving; at a zoo he learned to curb his temper. Preying on seals, his kind lives on the circumpolar ice. The author has seen bears on bergs drifting past Newfoundland. In 1910 he helped rope a full-grown male, which lived for 25 years in captivity.

Aside from a few Eskimos, traders, missionaries, and Royal Canadian Mounted Police, Baffin Island is inhabited by caribou, wolves, foxes, and polar bears. Blue geese nest around two large lakes in the interior. Walruses, seals, whales, and fish frequent the shores.

This maze of islands turned back the navigators seeking the Northwest Passage to India.

As I write this, Canadian and American Army officers in snowmobiles and four-engine planes are surveying the Arctic wilderness's possibilities as a military terrain. They call their project Exercise Musk Ox.\*

Our immediate goal was Frobisher Bay, a long indentation into east Baffin Island, where we intended to finish a survey begun the summer before.

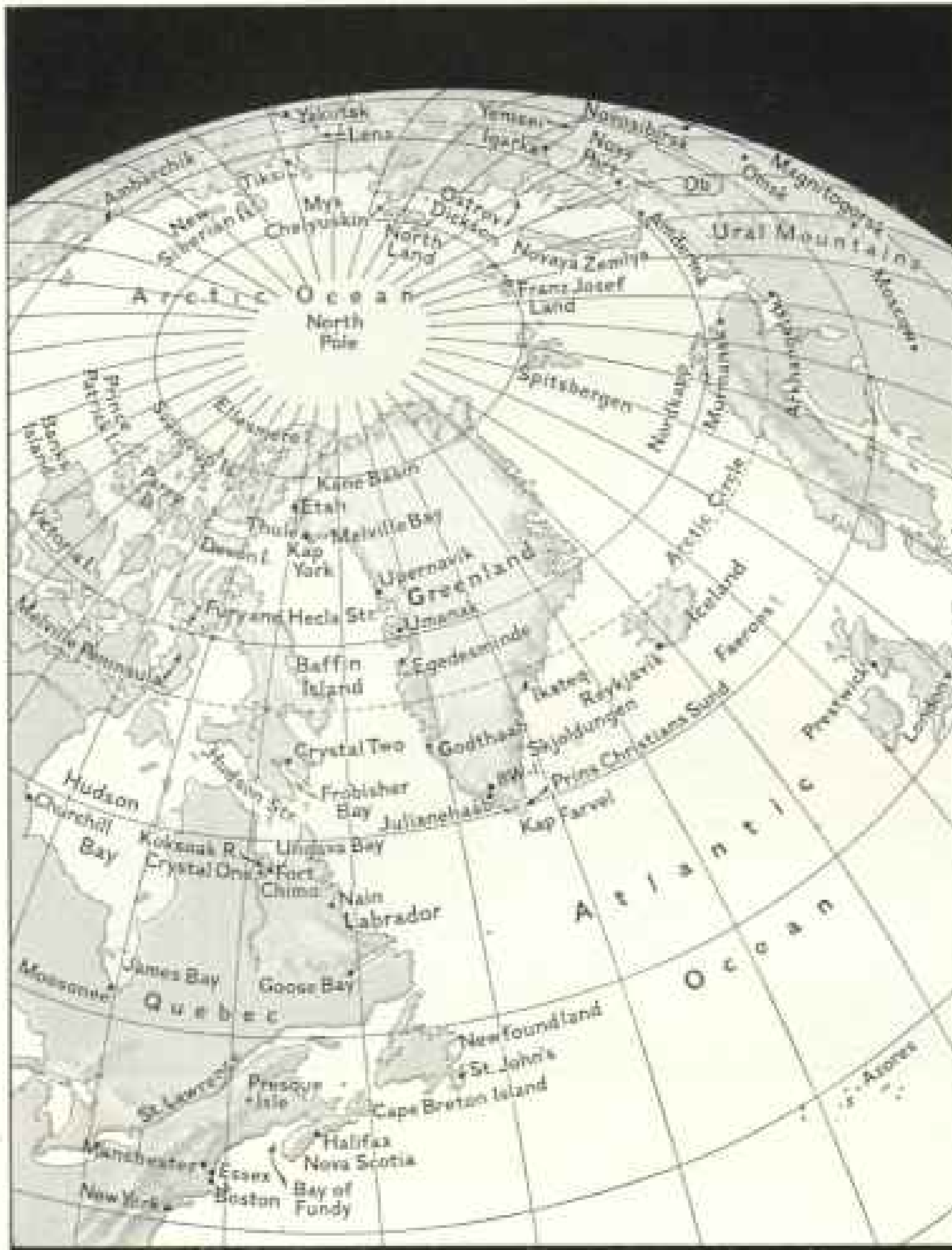
The bay is named for Sir Martin Frobisher, the Elizabethan navigator who discovered it in 1576 while seeking a short cut to India. He believed he had found a strait to the west.

Any one of the Eskimo natives, who decoyed away five members of his crew, could have told him he was in a blind alley.

While in the bay, Frobisher found a "black earth" which set London to crying "Gold!" Queen Elizabeth twice sent him back with miners. The mineral that so excited Frobisher lies disregarded today. Geologists call it iron pyrites—fool's gold. We saw samples.

Charles Francis Hall, an American, followed Frobisher's trail almost 300 years later. For more than two adventurous years he lived with the Eskimos. From them he learned that the "strait" was a white man's myth. His map, published in 1865 with his story, *Arctic Researches and Life Among the Esquimaux*, was the best guide to Frobisher Bay until the Hydrographic Office issued its new chart.

\* See "Value of Arctic Exploration," by Rear Adm. Robert E. Peary, NATIONAL GEOGRAPHIC MAGAZINE, December, 1903.



Drawn by Harry S. Oliver

### Bob Bartlett's World as Seen from 10,000 Miles in Space

Captain Bartlett devoted four summers to supplying American military bases near the Arctic Circle. His schooner, the *Morrissey*, helped chart tide-swept Frobisher Bay, Baffin Island, and ventured into the Koksoak, an unruly river in northern Quebec. Off Greenland the author dodged icebergs; he saw the dark fiords explored with radar (page 608).

Hall honored his native guide, Koojessé, by naming for him an inlet at the head of the bay.

How astonished Hall and Koojessé would have been could they have seen Crystal Two, the American airstrip established there!

### Frost Shortens Baseball Season

At the time of our visit this base contained, I judged, some 1,500 civilian workers and 100 Army personnel living in tents and Quonset huts. For recreation the men built a baseball field, but frost closed it nine months out of the year.

Our task was to sound out a channel to the base. To help us we had the fathometer, an

echo-sending, depth-measuring device. It times a sound's trip to bottom and return and makes a record on a graph (Plate VI).

At times the reliable hand lead line was used as a check, for the fathometer was deceived by spire-shaped, needle-sharp pinnacle rocks which relayed double echoes. One novice attendant, seeing the graph suddenly retreat from 90 fathoms to 0, was convinced the *Morrissey* was passing over a herd of whales. He blanched when told that his "whales" might have sunk us.

Once when we were out in a motor whale-boat we did sight a herd of white whales.\* Shallow coastal waters and bays are the white whales' favorite haunts. Some have been seen hundreds of miles up the Yukon and St. Lawrence. Eskimos use their flesh for food and their blubber for lamp oil.

Our whales were hunting cod and crustaceans in the bay. Suddenly they appeared all around us. The water foamed as they breached near our boat. We counted hundreds.

I am convinced that it was another kind of toothed whale, the blackfish, or pilot whale, that caused our submarine scare in the bay. A rookie, spreading the alarm, reported that he had seen one. Immediately all armed vessels manned their guns. Nothing more happened. He was not alone in making such a mistake. Many a poor whale, I feel sure, suffered a bombardment intended for a U-boat.

Near the Army camp lived an Eskimo tribe undoubtedly descended from the natives whom

\* See "Whales, Giants of the Sea," by Remington Kellogg, NATIONAL GEOGRAPHIC MAGAZINE, JANUARY, 1940.



explorer Hall lived with in the 1860's. The modern generation had grown sophisticated. Trading ivory and skins for cigarettes and GI clothes, they drove sharp bargains with Americans.

Lieutenant Turner tells a story about an Eskimo who camped near the airfield.

"I was directing a work party setting up hilltop beacons," he said. "This job required the carrying of lumber, cement, and sheeting up a mountain.

"My men had set out, leaving a 90-pound sack of cement. I had reluctantly come to the conclusion that I would have to carry it, when I observed an Eskimo eyeing me with curiosity. Thick and muscular, he had the looks of a good porter. Using sign language, I persuaded him to shoulder my load.

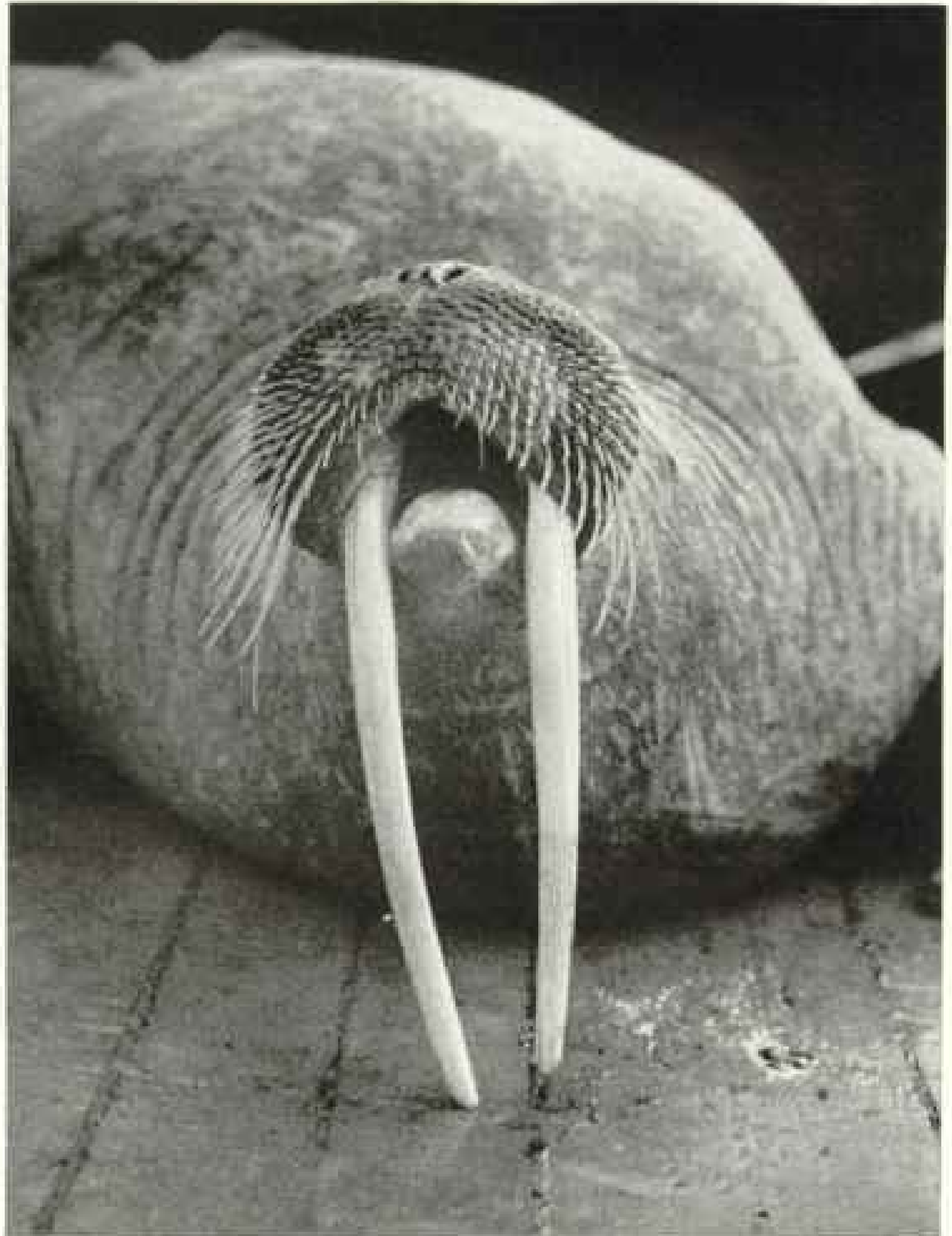
"At the mountaintop I gave him my cigarettes as payment. Then I fumbled for a match, thinking I would surprise him by the sight of the white man's magical flame. The Eskimo reached into his parka and pulled out a silver lighter! It worked, too. He had earned it working for the Army."

#### Frobisher's Terrific Tides

Frobisher's tides, like the Koksoak's, were terrific. The Hydrographic Office, which ought to know, says they did not exceed 45 feet. To my eye, they looked like 60-footers.

A party of my men had a tough time with a tide. I sent them ashore in a whaleboat to replenish our water. Going over a sand bar, they entered a river they judged to be 35 feet deep.

Before they could fill the casks, the ebb tide caught them. Turning around, they raced to keep up with the bore, which swept out of



FROM CAPT. ROBERT A. BARRETT

#### Walrus, a Ton of Blubber, Ivory, and Beard, Is a Clam Digger

Stretched on the *Morrison*, this Greenland specimen is as ungainly as it appears. Water transforms the walrus into an agile, dangerous opponent. Eighteen-inch tusks rip boats, dig shellfish, and help the beast climb ice floes. Zoo-bound walrus pups made amusing shipboard pets.

the river like water down a drain. The men were stranded more than six hours.

Explorer Hall discovered the tricky nature of Frobisher tides when, as he lay sleeping in an Eskimo snow house, salt water "came pouring into the igloo, threatening destruction to all within it."

At various times we visited the sights described by Hall. Grinnell Glacier, paralleling the south shore of the bay, discharges small bergs past President's Seat, a conspicuous mountain which the explorer named in honor of America's Chief Executive.

Silliman's Fossil Mount is, as Hall related, a cemetery of ancient marine life. Half a mile long and a hundred feet high, this lime-



FROM CAPT. ROBERT A. BARTLETT

### Mosquitoes Are Myriad but Not Malarial in Greenland

An archeologist, digging among Eskimo ruins on the east coast, carries gloves and head net; otherwise he might be driven almost mad. On Baffin Island American troops fought clouds of voracious mosquitoes.

stone hill struck me as an oyster-shell dump grown beyond all reason. From it I sent specimens to my friend, Dr. Waldo L. Schmitt, Head Curator of Biology of the U. S. National Museum.

Selections for the Museum's botanists we gathered from the fields, which in summer were ablaze with wild flowers. Bumblebees flew from flower to flower gathering honey. Even the nonflowering mosses were colorful. Wild blueberries pleased the eye and the appetite. These plants had a brief life, but it was filled with sunshine.

Our party took color photographs as late as 11:30 p. m.

Summer had one drawback. At times it seemed you could scarcely see the sky for the swarms of mosquitoes. We photographed thousands perched on a major's tent. Workmen wore gloves and head nets as protection.

We on the *Morrissey*, protected by the winds, were scarcely bothered at all.

### The *Morrissey* Sails for Greenland

When the ice started forming in October, we shoved off for New York and parted company with our friends at Crystal Two. The *Morrissey* wintered at Staten Island, New York.

We were working for the Army in the summer of 1944 when we sailed for Greenland.

Greenland's rugged coasts, marble glaciers, and skyscraper icebergs have not failed to thrill me since the first time I sailed with Admiral Robert E. Peary in 1898. There you can forget civilization's worries.\*

Four-fifths of its 827,300 square miles are locked beneath the icecap. This frozen sea covers all the interior to a maximum known depth of 8,850 feet. The thermometer sometimes sinks to 85° below zero in the lofty interior regions. Ceaseless winds raise a curtain of snow which works its way into explorers' clothes like icy water.

Along narrow ribbons of glacier-free coastline the Greenlanders, a mixture of Eskimos and whites, carry on their sealing, fishing, gardening, and mining. There were some 20,000 of them at the last count, and all but a few hundred lived on the west coast.

\* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Greenland from 1898 to Now," by Robert A. Bartlett, July, 1940; "Peary's Explorations in the Far North," by Gilbert Grosvenor, April, 1920; "Peary as a Leader," by Donald B. MacMillan, April, 1920; "Greenland Turns to America," by James K. Penfield, September, 1942; "Desolate Greenland, Now an American Outpost," 17 ill., September, 1941; and "Coast Guard Patrol in Greenland," 9 ill. in color, May, 1943.

Drifting polar ice bars ships from the east coast most of the year, and in some summers ships find navigation there almost impossible.

Our first Army assignment was to carry a soldier relief party and supplies to lonely east-coast weather stations.

To pick up our passengers, we put into BW-1, code name for the Air Forces' big west-coast base at Narsarsuaq. I had seen the place in 1941. It was then as Nature had made it—empty space.

What a difference three years had brought! Where we once hiked over rocks, we now took a bus, drove over a good highway, and entered a Red Cross club. The base had every convenience and comfort. Every few minutes, it seemed, a plane took off for Europe or the United States.

Taking aboard a party of GI radio and weather men, we set sail and entered Prins Christians Sund. There heavy Arctic ice hemmed in the *Morrissey*, opened her stern, and bent her propeller.

Back to BW-1 we went for repairs. These completed, we set out again, still carrying our GIs. We spent eight days dodging ice and bergs off southeast Greenland.

The men at lonely Skjoldungen, the weather station, were wild with delight at sighting us, their first visitors in nearly a year. Flares were lit as beacons. To meet us, two soldiers set out in a leaking rowboat. We carried most of these men, who were glad to be gone, to the east-coast airbase at Ikateq.

Their successors, whom we put ashore, had an even drearier experience in store. That winter a snow avalanche wrecked their shacks, buried their food, and ruined their radio. They had to sweat it out for ten months before relief came.

That's a sample of life on the east coast. Small wonder that only a small number of Eskimos care to live there!

We were glad to spend the summer of 1945 servicing Army stations on the west shore. At her farthest north the *Morrissey* sailed into Kane Basin almost to 80° latitude, but ice turned her back. Passing Etah, Admiral Peary's base, we found it deserted. Off Kap York we passed the Peary monument, a tall shaft which we had erected in 1932.

At Thule, almost 700 miles above the Arctic Circle, we visited a United States weather station manned by Danes. Thule, named for the ancients' Ultima Thule (Most Distant Unknown Land), is, as its name implies, one of the world's northernmost settlements. It was founded in 1910 by the late Knud Rasmussen as a trading station for the Kap York Eskimos. This tribe, long isolated when it was

discovered in 1818, believed it represented the world's only men.

War deprived Thule Eskimos of the white man's luxuries to which they had become accustomed. Their privations were a blessing in disguise. Wearing out store clothes, they returned to bearskins. Scattering out to hunt, they lived healthfully in the open.

Some old-timers, including three survivors of Peary's North Pole expedition, taught the younger generation how to live off the land and the sea. In place of easy-to-buy coffee, tea, and bread, they ate hard-to-catch seal, walrus, narwhal, white whale, and polar bear.

We caught a polar bear in Melville Bay, south of Kap York, skinned and refrigerated him. My log for August 15, 1945, reads:

"Our bear meat is not popular with the crew."

Personally, I have no prejudice against bear meat. Young bear is almost as palatable as pork and certainly cleaner.

Sophisticated Greenlanders unwittingly shared my liking. We served a party on board ship. Seeing the bear meat come out of our mechanical refrigerator, they believed it was a delicacy packed in the United States and ate it with relish.

#### "63 Pounds of Snarl and Growl"

One bear we did not consume. He was a cub, cute but ferocious, which we lassoed on an ice floe and dragged on board. It took almost my entire crew to cage him. Sixty-three pounds of snarl and growl, he was delivered protestingly to the New York Zoological Park in the Bronx.

While on the west coast we visited the hospital at Umanak, where Danish doctors strove to eradicate tuberculosis. I saw sun treatments being given during summer; in the long, dark winter ultraviolet rays were used.

At Egedesminde we photographed the schoolmaster's garden. He had turnips, radishes, tomatoes, and lettuce, all maturing under the sun. Gardens are not unusual in Greenland; I have seen them as far north as Upernavik.

At Julianehaab, far to the south, my crew was astonished to find lemons, oranges, and even cactus growing under glass.

Near by we saw Greenlanders cutting hay beside the Norse ruins. These stone walls, which have stood through a thousand years of rain and frost, bear witness to one of the world's greatest mystery stories: What became of the builders?

Eric the Red, sailing from Iceland with 25 boats, founded the colony in 986 near what is now Julianehaab.

A second settlement grew up near Godthaab. Together, the two contained some 3,000 settlers, who were banded together in a republic until 1261, when they swore fealty to Norway.

Somehow Norway lost communication with its colony. The last supply ship left Greenland in 1410. When explorers searched the coast in 1585 they found no trace of the colonists. Had they fallen victim to the Eskimos, who were migrating south, or had they perished of slow starvation? Their skeletons shed some light, showing malformation, rickets, and low stature.

In 1721 the first modern settlement was founded near Godthaab.

Today Greenland contains a few pure Eskimos, a handful of Danish agents, and a skeleton force of Americans. The vast majority are Greenlanders, of mixed stock.

Some of the Greenlanders operated radio and weather instruments for the United States. More and more they are giving up their skin-clad kayaks for motorboats.

Their womenfolk, dressing in American style, have abandoned the old-fashioned Eskimo topknot. The modern Greenland miss wears in her hair an ornament made in the United States. After work she loves to put on her brightest finery and promenade.

These people invest their money in wooden homes, cheerfully painted even to the rooftops. In them they keep nice china, comfortable furniture, libraries, pianos, and phonographs. They love music and dancing.

#### Radar Helps Greenland's Progress

War created a device which assuredly is going to contribute to Greenland's development. When winter darkens the fiords, Greenland's arteries, this marvelous invention will open them to ships like a powerful searchlight. I refer to radar.

Imagine that it is late fall and you wish to pilot your ship into a fiord, a deep, narrow indentation, perhaps a hundred miles long. Lofty mountains wall it in. Neither moon nor stars are out; the sky seems to crowd the water. It is as dark as Egypt, and you have to grope your way past icebergs.

In Peary's day I should not have dreamed of tackling such a venture. Recently the *Morrissey* followed a Coast Guard corvette into a Stygian fiord. I watched the corvette's radar screen. Mountains, shoals, and icebergs were outlined as if by a five-alarm fire!

I used to depend on landmarks, seals, birds, icebergs, the color and temperature of the water to tell me where I was. Now I have gyrocompass, fathometer, and radio for ship-

to-shore contact, and I wish I had radar. These instruments gave confidence to lads who scarcely a year before jockeyed plows or milk wagons.

When these devices all come into general use, think of what may happen to the seals. By day, flyers will spot them. At night, radar will guide hunters to their lairs on the ice floes. The poor old seals won't stand a chance. Whales face a similar fate.

Occasionally the *Morrissey* and her old man employed a routine that surprised the Navy's instrument-minded youngsters.

I recall a night so foggy that our schooner could no longer grope its way without danger of collision with the pack ice. Our anchor could not reach bottom.

#### Drifting with the Ice

Creeping up to a big pan, the *Morrissey* nudged into the ice. Two of my Newfoundlanders carried the anchor and chain to the center of the floe. There they dug a deep hole, buried the anchor, and let it freeze in. Attached to the line, the *Morrissey* drifted with the ice and not against it.

This device, which Newfoundland sealers call a mooring pan, surprised the Navy lads. In the morning they found themselves scarcely a mile off course.

I concede that the youngsters had more bounce, but could they endure hardships more willingly than some of our old-timers? I think of Will Bartlett, my brother and first mate, who is in his fifties.

As we were crossing the Bay of Fundy last November, the *Morrissey* shipped a sea. I was below deck, where I heard the heavy thud. My heart sank when I reached deck; Will was gone. A moment later his voice came to us from the water.

Luckily, as he went overboard he caught a coil of rope fastened to a mast. We found him riding the waves as if on a surfboard. He was dragged aboard scarcely any worse for 20 minutes' exposure.

I had some accidents of my own. The most serious was a wound to my dignity. This mishap occurred in December, 1945, as we put into Boston.

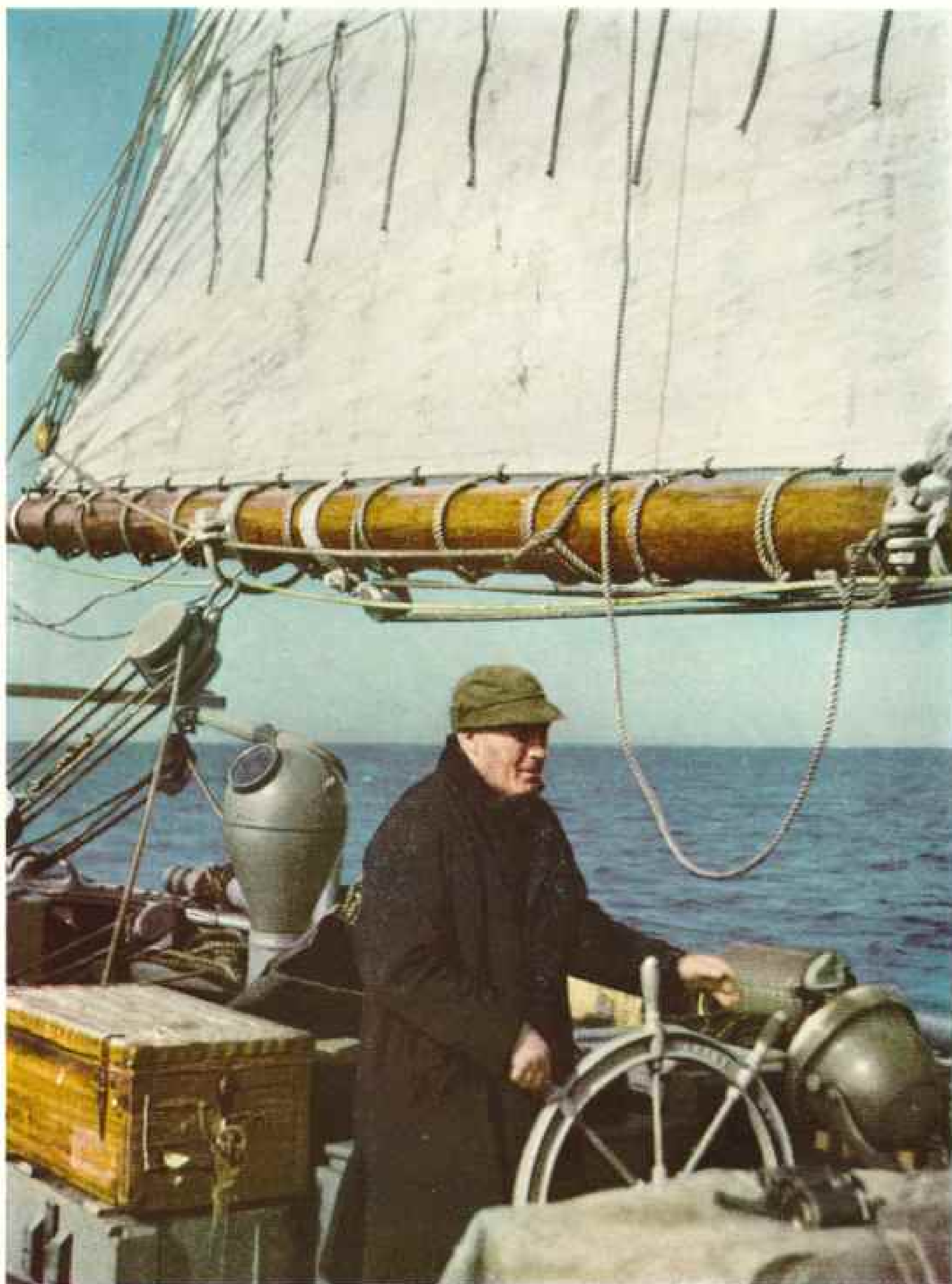
Stretched from a pier, a friendly hand let me fall into the oily harbor until my cap was afloat. That oil ruined the only suit of clothes I carried on the *Morrissey*.

As I had to report to the Customhouse at once, I borrowed one of Will's suits. He stands 6 feet 2 and has a 36 waist. I am 5 feet 10 with a 42 middle.

I pulled in my stomach, rolled up the trouser legs, and rushed to the Customhouse.



## Voyage of the *Morrissey*

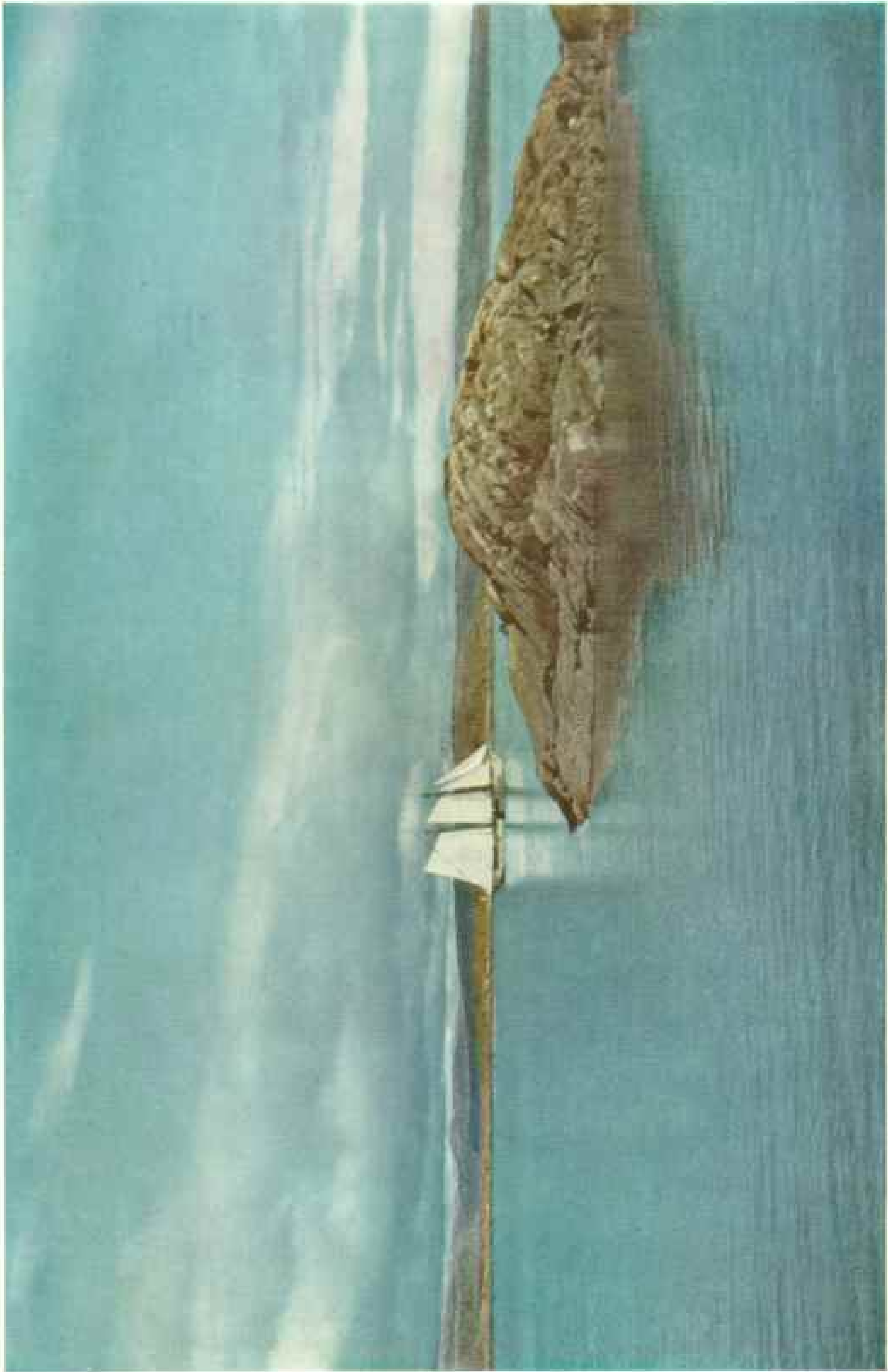


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Kodak from by Herman A. Wenzel

### Into the North Robert A. Bartlett Steers the *Effie M. Morrissey* on a U. S. Mission

"Captain Bob" started exploring the Arctic with North Pole discoverer Robert E. Peary in 1898. He served as the commander of Peary's supply ship, the *S. S. Roosevelt*, and was awarded the National Geographic Society's Hubbard Medal for attaining the Farthest North, 87° 48', March 31, 1909. Chests will hold museum specimens.



© National Geographic Society

Enslaving by Herman A. Weigert

**Her Sails Set and Drying, the *Morrissey* Lies Quietly at Anchor off Baffin Island, Canada**

Most hands are away in motor whaleboats charting Frobisher Bay for the U. S. Navy's Hydrographic Office. Their soundings enabled cargo ships to supply an American weather station and landing field. That northern base and others like it made meteorological observations vital to wartime's North Atlantic airways.



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### A Whaling Boat Manned by Eskimos Sails the Koksoak

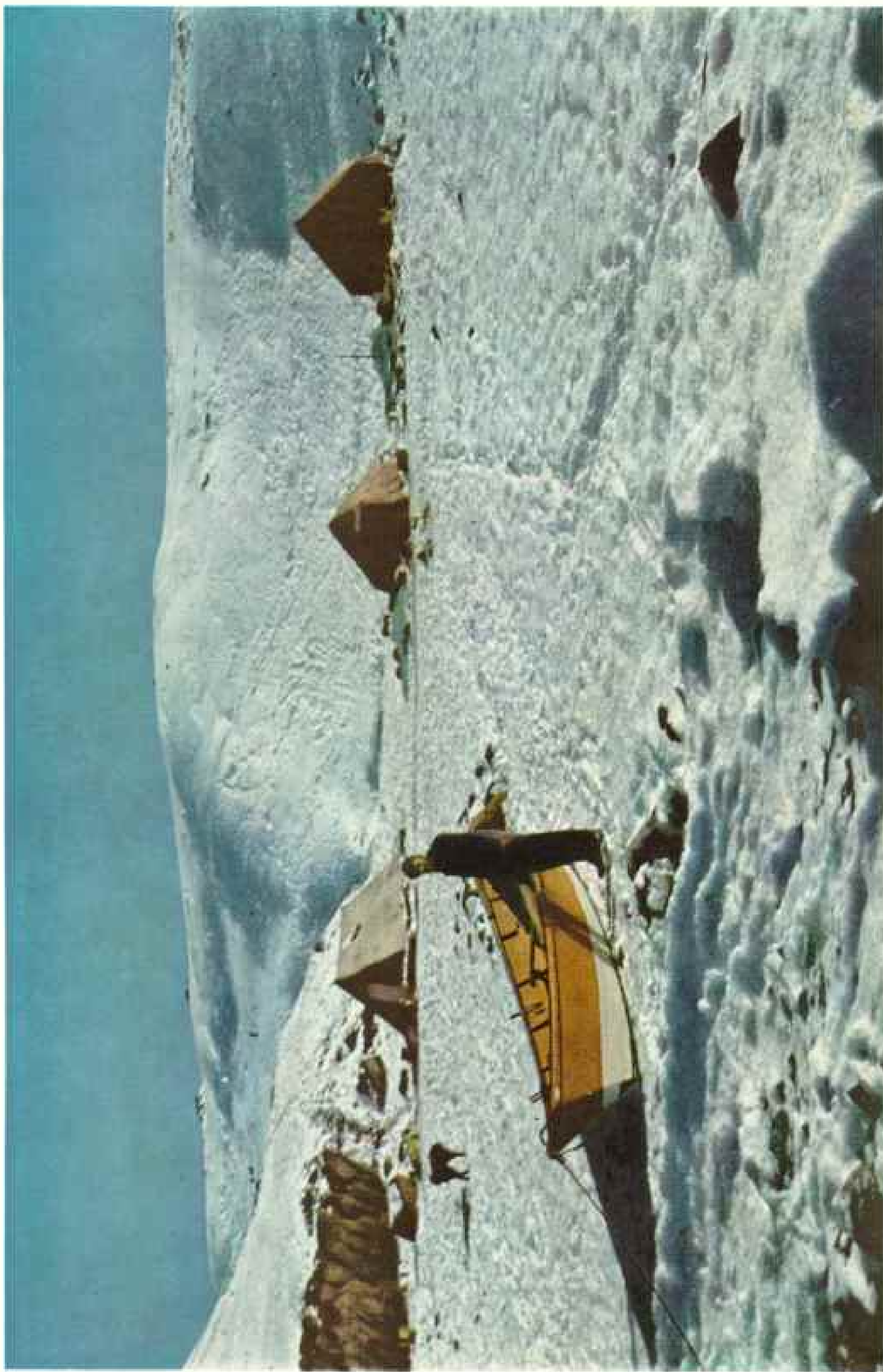
This craft, due duty around Fort Chimo, a Hudson's Bay Company trading post in northern Quebec. Whalers taught Canadian Eskimos to handle such boats. Scottish whalers used to carry entire tribes to work in the Arctic.



Contributed by Daniel W. Turner

### Navy Men Raise a Tide Staff Against a Wrecked Freighter

In the Koksoak (Big River), where extreme tide rises 40 feet, observations were made to guide vessels supplying an American weather base. A gale drove this cargo ship into the rocks as tight as a flogging in a louth.



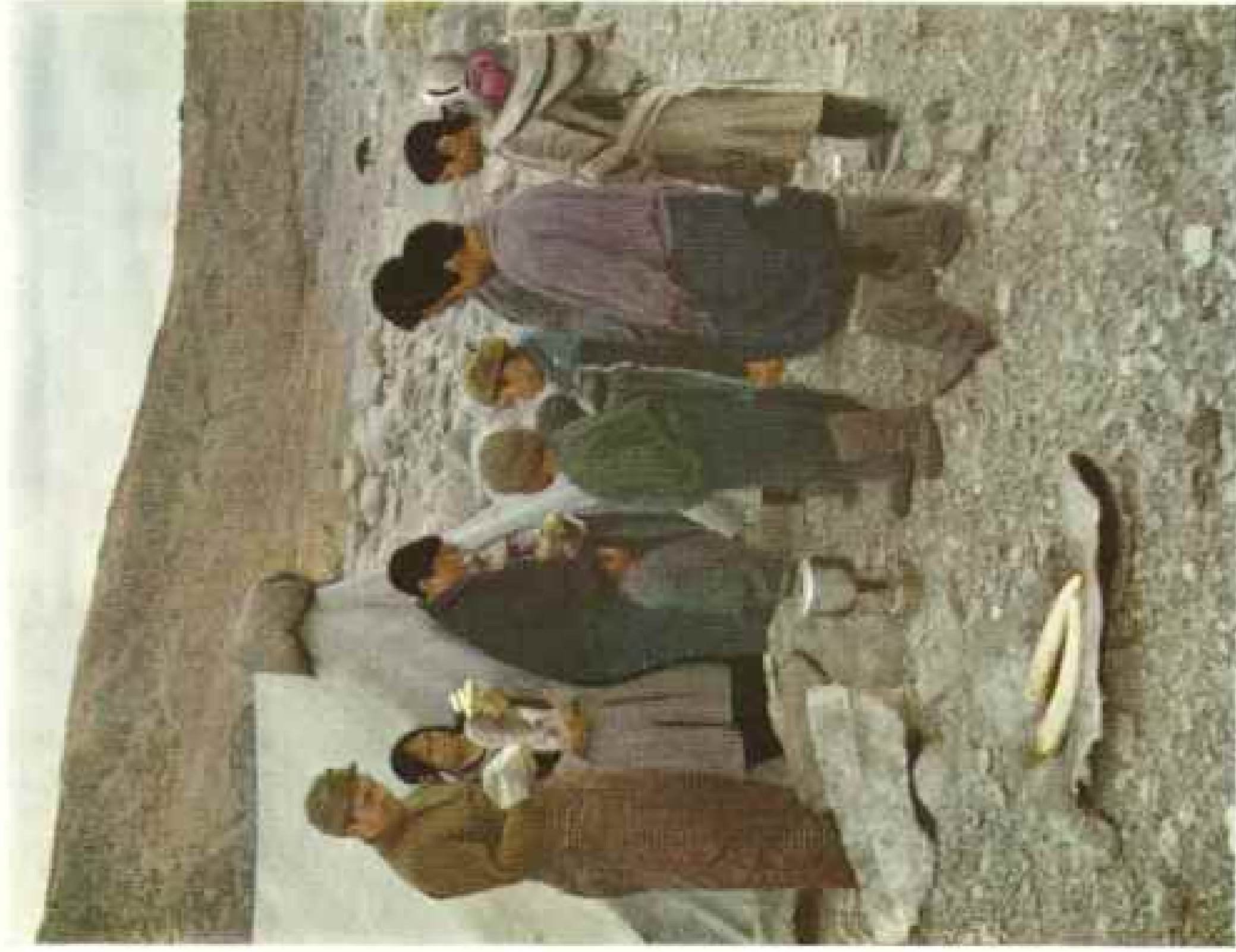
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Reference by David H. Werner

**Autumn's White Blanket Covers an Abandoned American Base in Frobisher Bay—Typical of Many Wartime GI Camps Today**

American flyers in 1941 spotted a prospective airbase on this island. Later a better field was found 30 miles away. For helping the camp-to-camp move, an Eskimo named Paluchi fell heir to this site, thereafter called Paluchi's camp. His tents are weighted down with stones because there is no soil for holding stakes.





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### **Eskimos and a Navy Officer Dicker over Skins and Walrus Tusks**

Baffin, the world's fourth largest island, is tenanted by some 1,400 Eskimos. This group came to Frobisher Bay to net and spear autumn's trout run. Having dealt with white men for a century, their tribe has become fairly civilized.

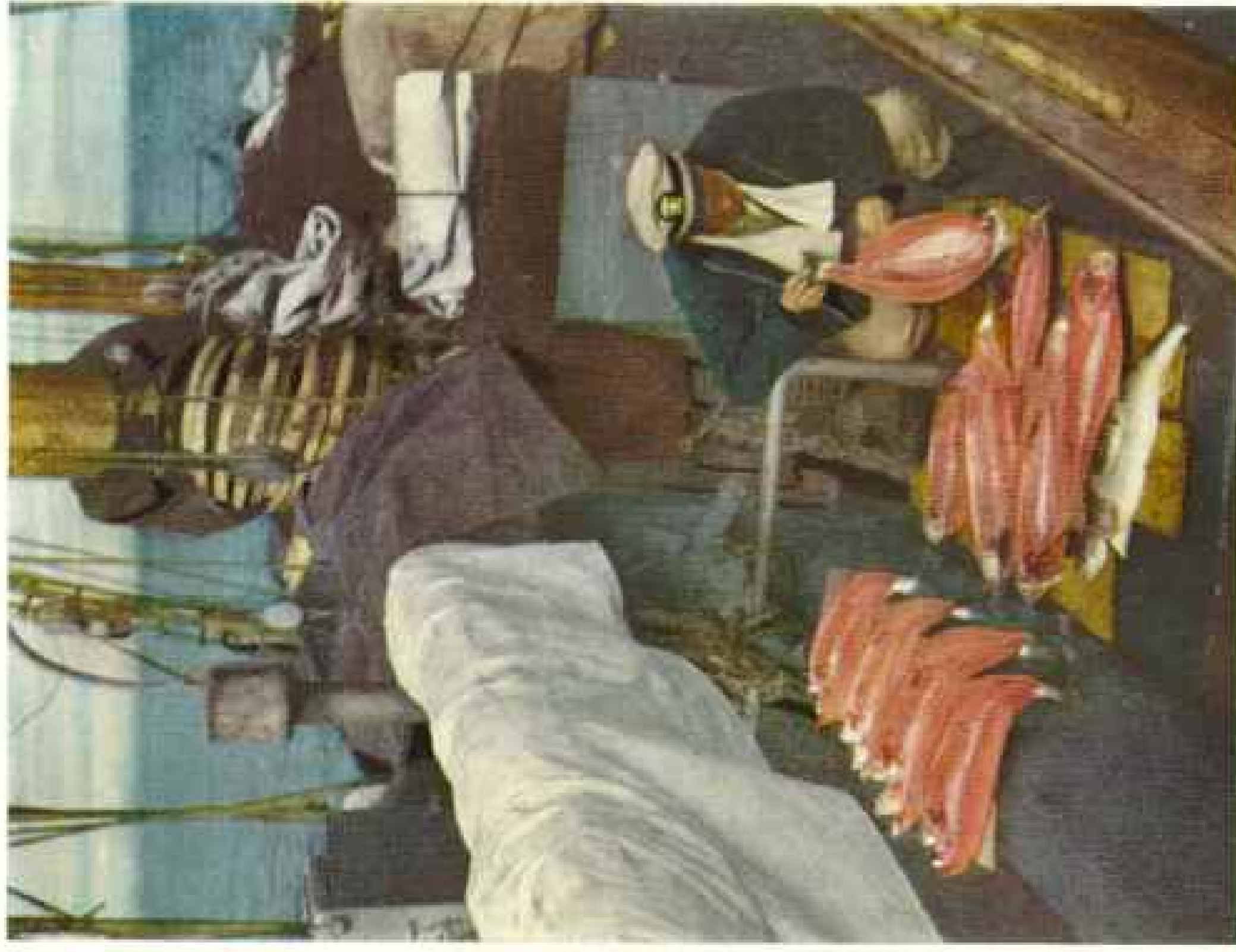


Illustration by Daniel S. Turner

### **Salmon-pink Trout Dry on the Morrissey's Bowsprit**

These fish are char, relatives of the brook trout. They were caught in Frobisher Bay while migrating to fresh water for spawning. Fishermen at the Army base caught char by the hundreds. They are very palatable.

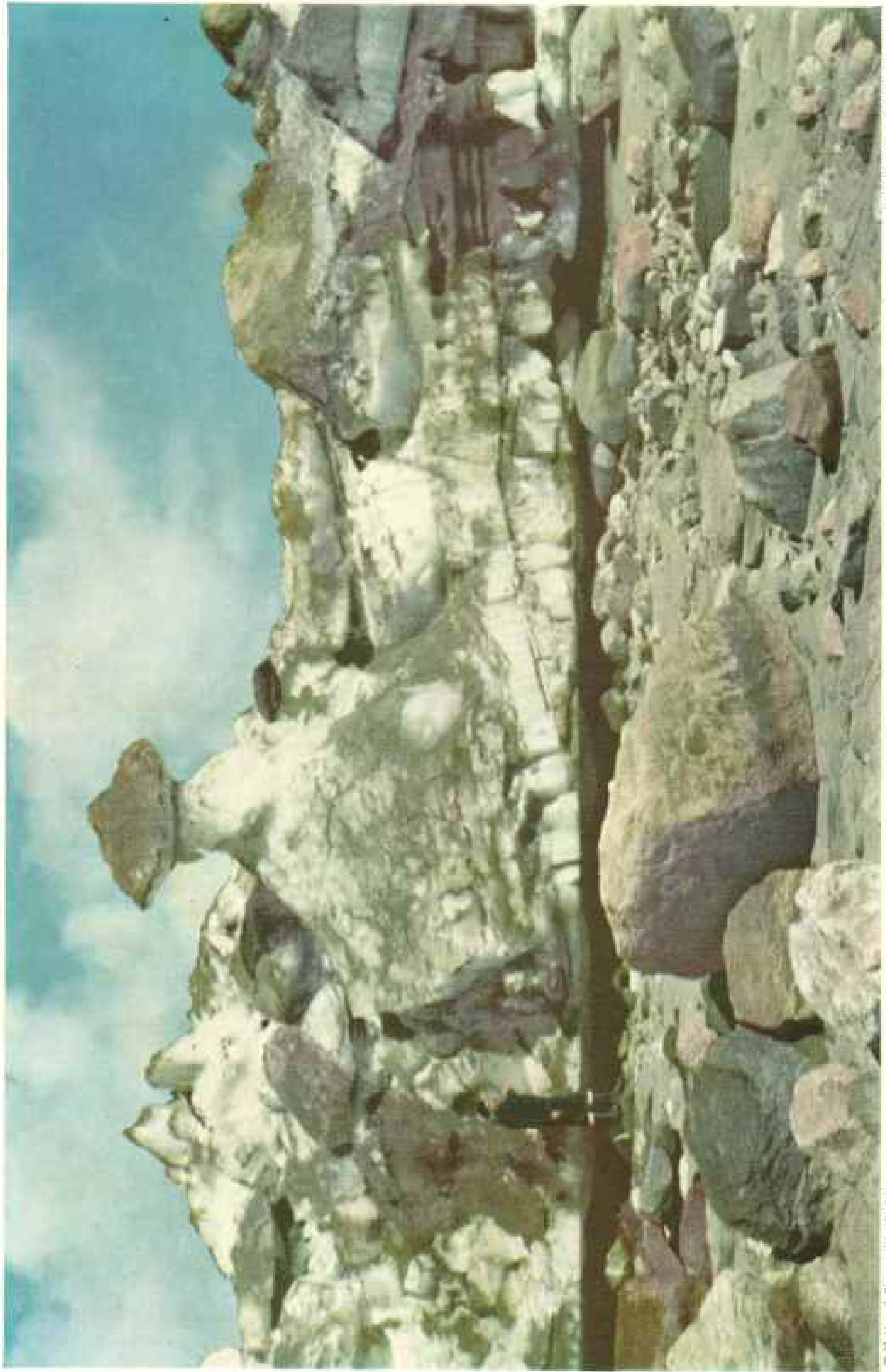


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Illustration by Gustaf H. Tunstall

**Morrissey Makes the First Hydrographic Survey of Frobisher Bay Since It Was Discovered in Elizabethan Times**

The fathometer, an echo-sending, depth-measuring device, leads from rail to water. One man uses lead and line as a check against double echo from a pinnacle-stuck bottom. Here Sir Martin Frobisher, questing for a Northwest Passage, sought a "black eye" to the Pacific. He found instead a "black earth" which created a gold craze.

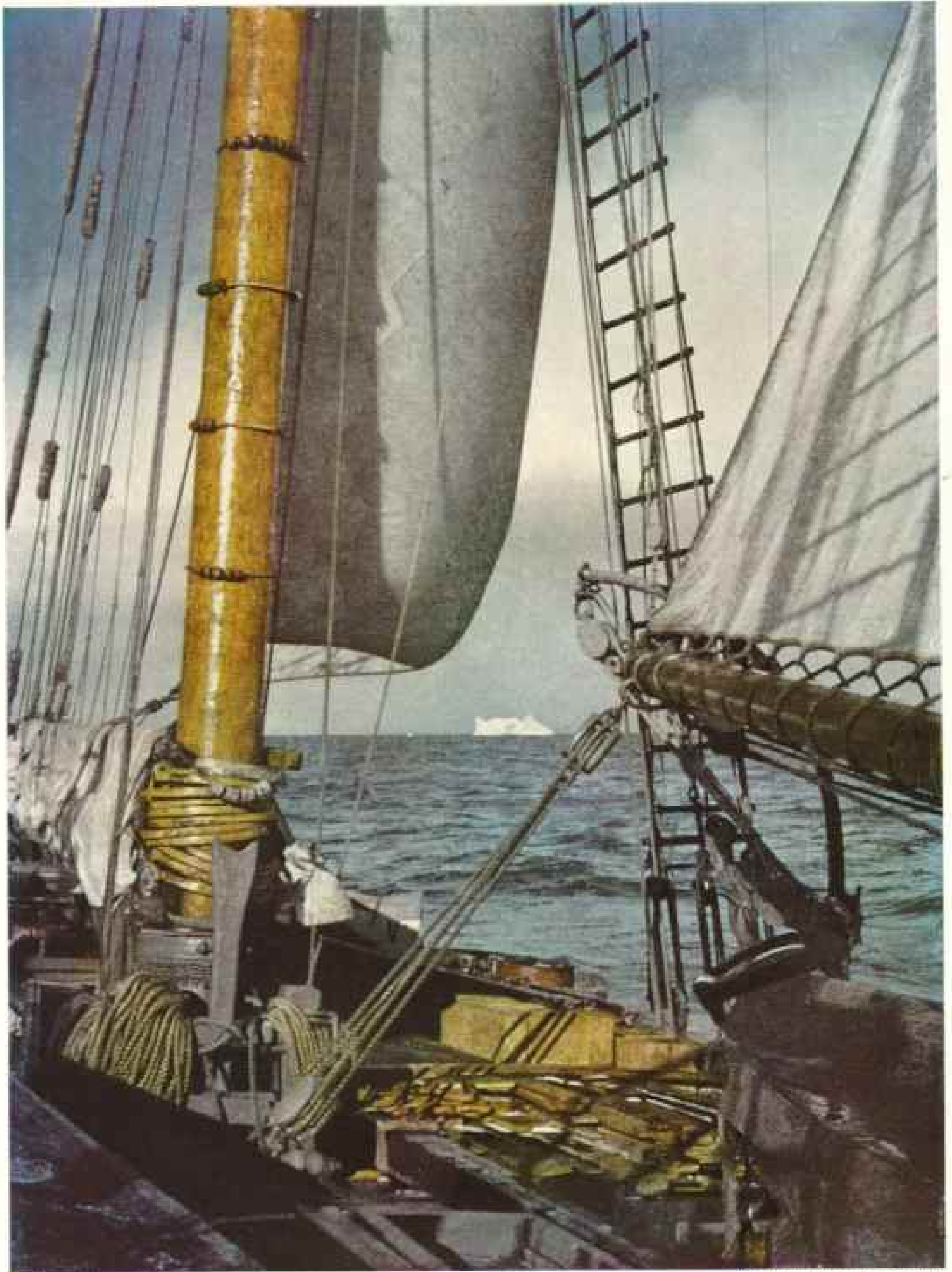


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Koolachene by David B. Tuttle

**Koksoak Shore Ice, Thawing Unevenly Beneath Layers of Silt, Forms Fantastic Sun-sculptured Patterns**

It is spring; the frozen river has broken up and the receding tide has deposited a false glacier upon the shore. Low water exposes the stream's rocky bed.



© National Geographic Society

Ketchikan by Daniel S. Turner

**Under Storm Trysail and Foresail, *Morrissey* Jogs Past a Ghostly Derelict—an Iceberg**

In 22 years the schooner has carried Captain Bartlett 300,000 miles. An Arctic veteran, she has cruised north of Alaska, Siberia, and Franz Josef Land. Exploring the Canadian Archipelago, she ventured into Fury and Hecla, the ice-packed strait between Baffin Island and Melville Peninsula. She carries auxiliary Diesel engines.



# American Pathfinders in the Pacific

BY WILLIAM H. NICHOLAS

**I**N THE DARK of night, hundreds of landing craft pushed off from Angaur, southernmost of the Palau Islands, and quietly headed northward. By early dawn they had come within sight of their objective—a low-lying, reef-fringed coral island which loomed in the semidarkness before the straining eyes of troops crouched in their boats.

Amasa Delano, of Duxbury, Massachusetts, stood in the bow of his launch, in the center of three advancing waves, and looked to his rockets. About him were British naval officers, East Indian seamen, Micronesian warriors—an amphibious invasion force of several thousand men.

Like clockwork, the mosquito fleet slipped within the reef and converged on the beaches. D Day had dawned in the western Carolines.

But it was not the D Day of September 15, 1944. This was not the First U. S. Marine Division forcing a landing on Peleliu.\* This task force, headed by Abba Thulle, King of the Palaus, was bent on subduing a rebellious tribe. The date was June 22, 1791.

An American, 8,500 miles from home, was in the thick of it. His rockets were ancient Chinese inventions which "were not very destructive in fact . . . (but) made a great parade of death to those who saw them approaching with smoke, and fire, and threatening leaps upon the water."

Psychological rocket warfare, 18th-century style!

Amasa Delano lived adventurously in the Pacific of a century and a half ago, but his experiences were not unique.

## Pacific Was Vast Whale Fishery

Americans were at home in every part of that vast ocean between the close of our Revolution and our Civil War. GPs and sailors in the Pacific during World War II were following in the footsteps of their great—and great-great—grandfathers.

Whale oil, sealskins, *bêche-de-mer* (dried sea slugs), edible birds' nests, turtle shell, sandalwood, and guano were the prizes sought in the days of sail by these daring American seamen. They risked their lives in far-off places to fill their ships with novel cargoes and then sold them, often at fabulous profit, in Canton, San Francisco, New York, or the ports of Europe.

By 1840, smoke from the tryworks of some 675 American whaling ships billowed over the waters of the Pacific. Fifteen thousand seamen manned our whaling fleet.

Following the War of 1812, daring traders from Salem, Massachusetts, Stonington, Connecticut, and other New England ports put in at New Guinea, the Solomons, and the Admiralties.

American missionaries made their homes thousands of miles from our shores, among hostile savages on remote islands where months passed between ship calls.

Nearly a century ago, Americans laid claim to about 50 islets near the Equator, although it is not certain that all of them existed. The tiny dots contained guano deposits, the accumulation of the excrement of sea birds, a valuable fertilizer high in phosphates.

## "American Polynesia"

Our enterprising guano diggers husbanded their claims so zealously that this stretch of the Pacific was referred to in 1859 by E. Behm, a German geographer, as "American Polynesia" (map, pages 624-5).

The area also was labeled "United States" on the map of Oceania in the 1873 and 1882 editions of the *Royal Atlas of Modern Geography*, by Alexander Keith Johnston, Scottish geographer.

With the Civil War, decline of our merchant marine, and development of our own far West, the American public largely lost interest in the Pacific. Whale oil gave way to petroleum; many guano deposits were exhausted. Our acquisition of Hawaii and the Philippines reminded us of the vast ocean, but only for a while.†

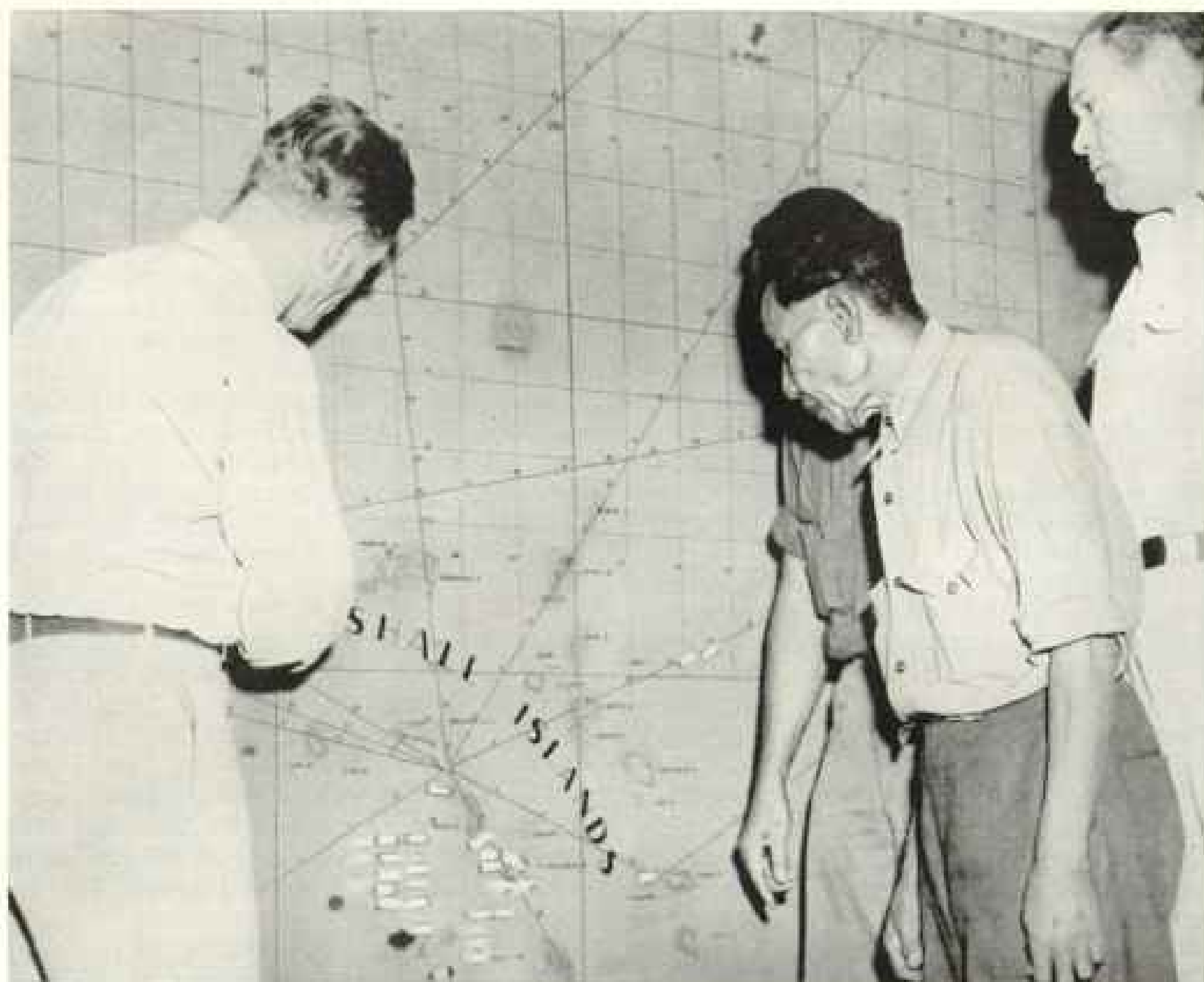
For half a century the pages of the NATIONAL GEOGRAPHIC MAGAZINE have kept fresh in the minds of members of the National Geographic Society the knowledge of remote areas of the Pacific, but few readers dreamed that suddenly the day would arrive when these exotic islands, vividly described in picture and story, would be inextricably linked with our Nation's destiny.

Now a House Naval Affairs subcommittee has recommended establishment of permanent military bases over a wide area of the Pacific. U. S. Navy recommendations along parallel lines have been submitted to the Senate Naval Affairs Committee. The war made the names of these bases household words.

With the single exception of Midway, a

\* See "South from Saipan," by W. Robert Moore, NATIONAL GEOGRAPHIC MAGAZINE, April, 1945.

† See "Revealing Earth's Mightiest Ocean," by Albert W. Atwood, NATIONAL GEOGRAPHIC MAGAZINE, September, 1943.



Joint Army-Navy Task Force, Official

### A Bikini Chief Tries to Pick a New Home for His People

Jomata Kupua, one of the leaders of the 161 islanders on the atoll which is to be the scene of U. S. atomic-bomb tests, is aided by U. S. Navy officers. The islanders now have been evacuated to previously uninhabited Rongerik Atoll, 125 miles away. The Navy built new homes for them there (pages 620, 626).

later discovery (page 620), all were known to American explorers, seamen, missionaries, or scientists of more than a century ago.

One group of proposed installations stretches in a broad central belt between Hawaii and Asia. This includes fleet bases at Pearl Harbor; Midway; Guam and Saipan in the Marianas; Palau in the Carolines; Iloilo and Subic Bay in the Philippines, and Okinawa in the Ryukyus.

Fleet anchorages are suggested for Majuro, Kwajalein, and Eniwetok in the Marshalls and Truk in the Carolines. Airbases are proposed for Pearl Harbor; the islands of Midway, Canton, Johnston, and Wake; Saipan and Tinian in the Marianas, and Puerto Princesa, Tawitawi, Guimaras, and Mactan Island in the Philippines.

Existence of the Hawaiian (Sandwich) Islands was made known to the world by Capt. James Cook, famed British explorer of the Pacific, who touched there in 1778.\* Return-

ing to Hawaii about a year later, after a journey to Bering Strait, he was killed during a scuffle with islanders over a stolen boat.

First American trading vessels to reach Hawaii were the *Columbia*, Capt. Robert Gray; the *Lady Washington*, Capt. John Kendrick; and the *Eleanora* and *Fair American*, commanded by Capt. Simon Metcalfe and his son. They arrived in the winter of 1789-90.

### Whalers Helped Honolulu Grow

The first American whaler to reach the Pacific was the *Beaver*, Capt. Paul Worth, which sailed from Nantucket, Massachusetts, in August, 1791. Off the Chilean coast Captain Worth caught whales that yielded 1,100 barrels of sperm oil and 200 barrels of whale oil, and he got home safely in March, 1793.

\* See "Hawaiian Islands: America's Strongest Outpost of Defense," by Gilbert Grosvenor, NATIONAL GEOGRAPHIC MAGAZINE, February, 1934, and "Columbus of the Pacific," by J. R. Hildebrand, January, 1927.



Staff Photographer Robert F. Wilson

### A Plastic Model of Bikini Atoll Shows One Pattern for the Atomic-bomb Test

Vice Adm. W. H. P. Blandy, center, commander of "Operation Crossroads," studies the plan, along with Dr. A. W. Sawyer, technical director, and Maj. Gen. W. E. Kepner, commander of air operations for the project. Ships cluster at one end of the lagoon, which is fringed by islands and reefs. Coral heads rising elsewhere menace navigation. In center foreground is the main entrance to the 25-mile-long lagoon.

First whalers to arrive in Hawaii were the *Equator*, Capt. Elisha Folger, of Nantucket, on her maiden voyage, and the *Balaena*, Capt. Edmund Gardner, of New Bedford, on September 17, 1819. The whalers' commerce helped Honolulu grow.

Hawaii became a rendezvous for British, French, and American ships. Imports in 1840, much of which was whale oil and was transhipped, were worth half a million dollars.

Sooner or later, most whalers in the Pacific visited the grogshops and dancehalls of the Honolulu water front. Many deserted ship and some became residents of the islands.

Whalers contributed to discovery in the Hawaiian group. Capt. Joseph Allen, in the *Maro*, of Nantucket, charted barren Gardner Pinnacles and Maro Reef in 1820.

Almost as early as the whalers came American missionaries, who contributed much to the early development of the Hawaiian group.

Twenty years after their arrival in 1820 they had established 375 schools, with 18,000 pupils. Dr. Hiram Bingham, aided by his associate, the Reverend Asa Thurston, reduced the Hawaiian language to writing. With other members of their group they translated the Bible into Hawaiian.

Few whalers or missionaries foresaw the future of Hawaii. Even so sagacious an observer as Lt. Charles Wilkes, commander of the famous United States Exploring Expedition of 1838-42, underestimated the group's potentialities. After thorough exploration and study, he wrote in 1844:

"Fortunately for the Sandwich Islands, they have no port that is defensible against a strong naval force, and therefore their consequence will be comparatively small in a political point of view. . . . Honolulu is the port where vessels can best receive repairs, but it can only be used for the smaller class. . . . I am rather



JOINT ARMY-NAVY TASK FORCE, OFFICIAL

### Bikini's Tribesmen Hear "Moving Day" Plans from U. S. Navy Officers

The 25-mile-long atoll, 190 miles east of Eniwetok, will be the scene of the United States' momentous atomic-bomb tests. The battleships *Arkansas*, *Pennsylvania*, *New York*, and *Nevada* as well as cruisers, aircraft carriers, submarines, and destroyers will be in the armada to be anchored in and near Bikini's lagoon.

disposed to think that, in the progress of civilization in the South Seas, this group will be considered of less importance than it now appears, and instead of its being looked to as it now is, it will be only visited by whalers for recruiting. . . . Growth has already arrived at the greatest extent to which it can ever reach."

#### Hawaiian Bark Discovered Midway

Midway Islands, whose Marines helped win the Battle of Midway (June 3-6, 1942), lie almost at the northwestern tip of the Hawaiian archipelago, 1,300 miles from Honolulu. A nearly circular atoll, about six miles in diameter, its reef encloses two small coral islands, Sand and Eastern.

In July, 1859, Capt. N. C. Brooks in the Hawaiian bark *Gambia* was cruising in the vicinity of Midway on a sealing and exploring trip. He sighted the low-lying atoll, named it Middlebrook Islands, found guano deposits, and claimed possession for the United States.

The atoll was renamed because it lies about midway between San Francisco, to the east, and Japan to the west.

A commercial coaling station was set up, but by 1869 it had been abandoned to the

sea birds, for which the atoll has always been a paradise (page 622).

In 1887 the 467-ton schooner *Wandering Minstrel* was wrecked on Midway. Five of the crew took off in one boat and disappeared. Two others and a marooned seaman from a previous wreck made their way in a second boat by way of Mili Atoll to Jaluit in the Marshalls—a 1,900-mile trip.

Capt. F. D. Walker, his wife, three sons, and remaining members of the crew led a hard life on the tiny atoll for 14 months, subsisting on a diet of fish and birds' eggs. They finally were rescued and brought back to Honolulu by the fishing schooner *Norma*.

Capt. Edwin C. Musick made aviation history on Midway. At 2 p.m. on November 24, 1935, he landed the first Pan American *China Clipper* there on its westward flight. Pan American had rediscovered long-forgotten Midway for the American public.\*

Kure, or Ocean, Island at the northwestern tip of the Hawaiian archipelago, 65 miles beyond Midway, was set aside as a U. S. Navy reservation by President Franklin D. Roosevelt on February 20, 1936.

\* See "Flying the Pacific," by William Burke Miller, NATIONAL GEOGRAPHIC MAGAZINE, December, 1936.



Seventy-six years ago a small Mare Island, California, naval boat, the U. S. S. *Saginaw*, was sent to Midway to dredge a passage through the reef to the lagoon. About to return to San Francisco, her captain, Lt. Comdr. Montgomery Sicard, decided to visit Kure first to see whether any castaways from unreported wrecks might be there. In sight of the island, engine trouble suddenly rendered the vessel helpless; she drifted on the reef and was pounded to pieces.

In a specially outfitted captain's gig a crew of five set out for help and succeeded in reaching Hanalei, Kauai, in 30 days after passing through three heavy gales. Oars and provisions had been swept overboard.

When the men tried to land the boat at Hanalei, they were so weak that it capsized in the surf and all but one, William Halford, were drowned. Halford was able to report the wreck, and a steamer was sent to Kure to rescue the others.

#### Wilkes Located Elusive Wake

About 1,200 miles southwest of Midway lies the V-shaped atoll of Wake, scene of the stand (December 8-22, 1941) of a handful of United States Marines against overwhelming Jap invasion forces. Like Midway, it was a prewar stopping place for the *China Clipper*.

Mere speck in a wide ocean, Wake was elusive for many years. It may have been discovered by Alvaro de Mendaña de Neyra, Spanish explorer, who sighted land in this area of the Pacific in 1568. Credit for discovery goes to Capt. William Wake, of the British schooner *Prince William Henry*, in 1796.

Captain Gardner, in the *Balaena* (page 619), saw Wake in 1823 and described it in some detail. Its position was definitely fixed by Lieutenant Wilkes in 1841.

In addition to Wake Islet, there are two smaller islands. A scientific expedition to the outlying islets of Hawaii in 1923, led by Dr. Alexander Wetmore, now Secretary of the Smithsonian Institution and a trustee of the National Geographic Society, made a side trip to Wake.\*

The party named one of the islets Wilkes, after Wilkes, and the other Peale, after a naturalist-artist with the Wilkes expedition. They found evidence of Jap poachers who collected feathers of sea birds for millinery uses.

In 1819 Capt. Joseph Allen, discoverer of Gardner Pinnacles (page 619), met an old friend, Capt. Jonathan Winship, of Salem. Winship had been a passenger on a China ship bound for home. He told Allen of huge schools of sperm whales which he had seen in his passage from Canton to Honolulu,

and said they were particularly dense in the region northeast of the Ladrões (Marianas).

Acting on this tip, Captain Allen, in the *Mara*, and in company with another Nantucketer, Capt. Frederick Coffin, in the ship *Syren*, sailed on a northwest course from Honolulu and discovered the famous "Japan Ground" of the whalers. Soon scores of whale-ships were plying these waters and many visited the Marianas to replenish their food supplies. Guam, Saipan, and Tinian became familiar stopping places.†

#### Magellan Discovered Marianas

Magellan, in 1521, discovered the Marianas, which lie some 1,300 miles west of Wake, when he made his famous voyage.‡ Curiously enough, after passing through the Strait of Magellan and pushing westward, Magellan and his starving, scurvy-ridden crew sighted no land, with the exception of two small and uninhabited islands, until they reached Guam.

Had Magellan sailed a more northerly course he would have seen the Hawaiian group. Had he sailed in a little more southerly direction he would have encountered the Tuamotu Archipelago, the Marquesas, the Line Islands, or the Marshalls.

More than a score of years before the whalers reached the Marianas, a celebrated Yankee sailor, trader, and explorer rescued two Englishwomen, a baby, and a shipwrecked crew from the island of Tinian.

In 1798 Capt. Edmund Fanning, of Stonington, Connecticut, in the *Betsey*, put in at Tinian to replenish his supplies. He was surprised to see signals as he approached. Upon landing he was greeted by a motley group, who had lived a Robinson Crusoe life on the island for 13 months. Their wrecked ship lay near by on a reef.

She was the annual supply ship sent by the British East India company from Canton to the British settlement at Sydney, in New South Wales. She carried a cargo of tea, silk, chinaware, rice, sugar, ginger, *samsu* (a Chinese liquor), candy, and spices.

Buffeted by severe storms off the coast of Japan and driven off her course, she had sprung a leak and her condition became precarious. Her captain headed for Tinian, planning to beach the ship gently within a reef and make repairs.

\* See "Bird Life Among Lava Rock and Coral Sand," by Alexander Wetmore, NATIONAL GEOGRAPHIC MAGAZINE, July, 1925.

† See "Springboards to Tokyo," by Willard Price, NATIONAL GEOGRAPHIC MAGAZINE, October, 1944.

‡ See "Greatest Voyage in the Annals of the Sea," by J. R. Hildebrand, NATIONAL GEOGRAPHIC MAGAZINE, December, 1932.



Three Lines

**Sooty Terns Wheel over Midway, off Whose Shores War Was Fought, in June, 1942, the Battle That Turned the Tide of War in the Pacific**

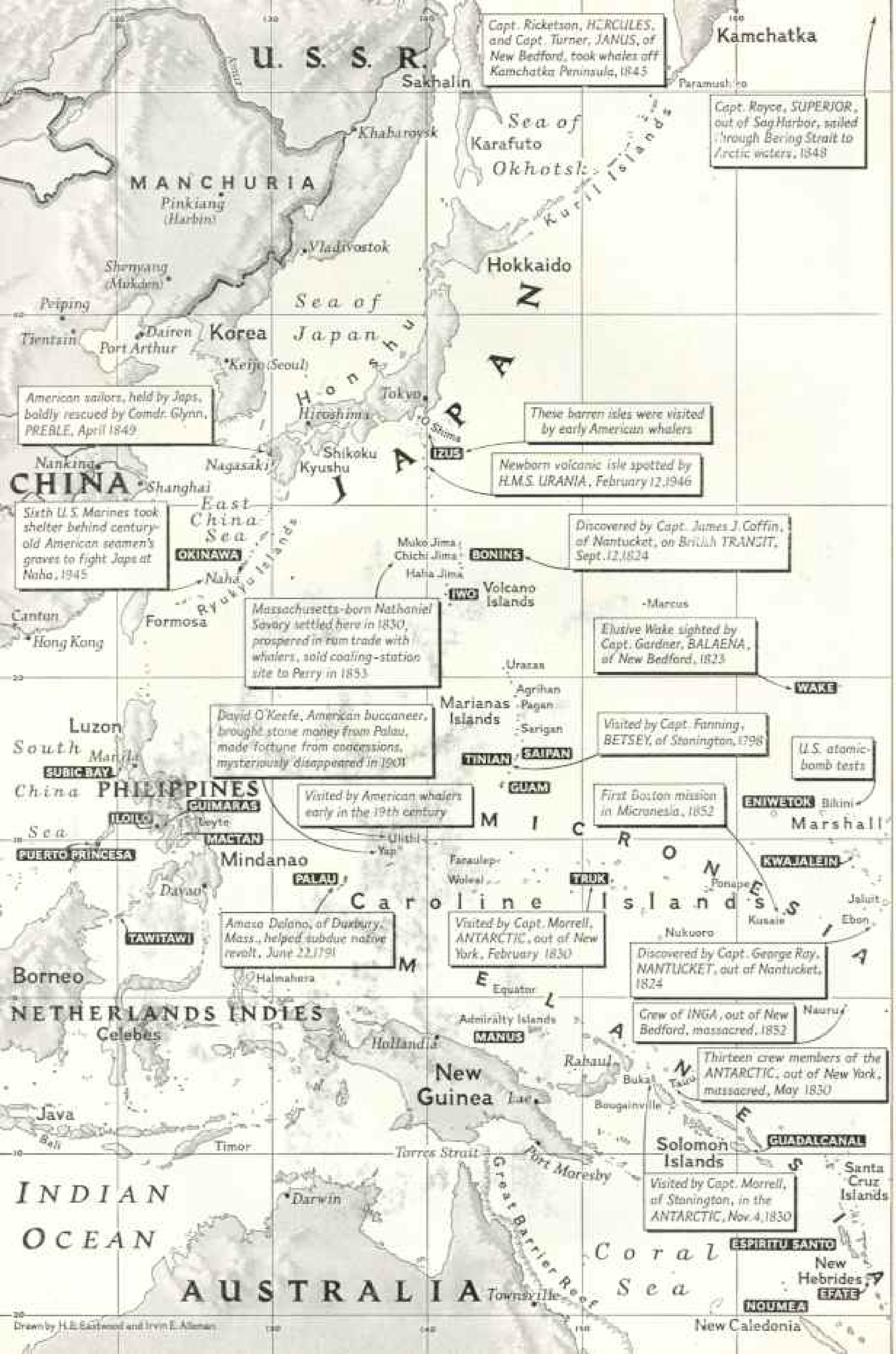
The birds are the most abundant of five species of terns which occur regularly on the atoll. Military planes and Pan American Clippers share the flat stretches with gooseys (black-footed albatross), shearwaters, rails, canaries, boobies, frigate birds (man-o'-war-bird), bosun birds (tropic-bird), and mourning birds. Midway, Clipper and cable station near the northwestern tip of the Hawaiian archipelago, was discovered in 1859 by Capt. N. C. Brooker in the Hawaiian bark *Gambier* (p. 620).



U. S. Navy, official

**Smoke from Palau's Ships and Docks Tells U. S. Dive Bombers They Have Hit Their Targets.**

The photograph was made during a devastating task-force raid on Malakal Harbor, March 29 and 30, 1944 (see Plate IV, "Painting History in the Pacific," NATTONAL GEOGRAPHIC MAGAZINE, October, 1944). One hundred and fifty-three years earlier, an American, Amasa Delano, participated in an amphibious invasion in the Palaus to help a native king subdue a rival tribe (page 617).



Capt. Ricketson, *HERCULES*, and Capt. Turner, *JANUS*, of New Bedford, took whales off Kamchatka Peninsula, 1845

Capt. Royce, *SUPERIOR*, out of Sag Harbor, sailed through Bering Strait to Arctic waters, 1848

American sailors, held by Japs, boldly rescued by Comdr. Glynn, *PREBLE*, April 1849

These barren isles were visited by early American whalers

Newborn volcanic isle spotted by *H.M.S. URANIA*, February 12, 1946

Discovered by Capt. James J. Coffin, of Nantucket, on British *TRANSIT*, Sept. 12, 1824

Sixth U.S. Marines took shelter behind century-old American seamen's graves to fight Japs at Naha, 1945

Massachusetts-born Nathaniel Savary settled here in 1830, prospered in rum trade with whalers, sold coaling-station site to Perry in 1853

*Evasive Wake* sighted by Capt. Gardner, *BALAENA*, of New Bedford, 1823

David O'Keefe, American buccaneer, brought stone money from Palau, made fortune from concessions, mysteriously disappeared in 1801

Visited by Capt. Fanning, *BETSEY*, of Stonington, 1798

U.S. atomic-bomb tests

Visited by American whalers early in the 19th century

First Boston mission in Micronesia, 1852

Amasa Delano, of Duxbury, Mass., helped subdue native revolt, June 22, 1791

Visited by Capt. Morrell, *ANTARCTIC*, out of New York, February 1830

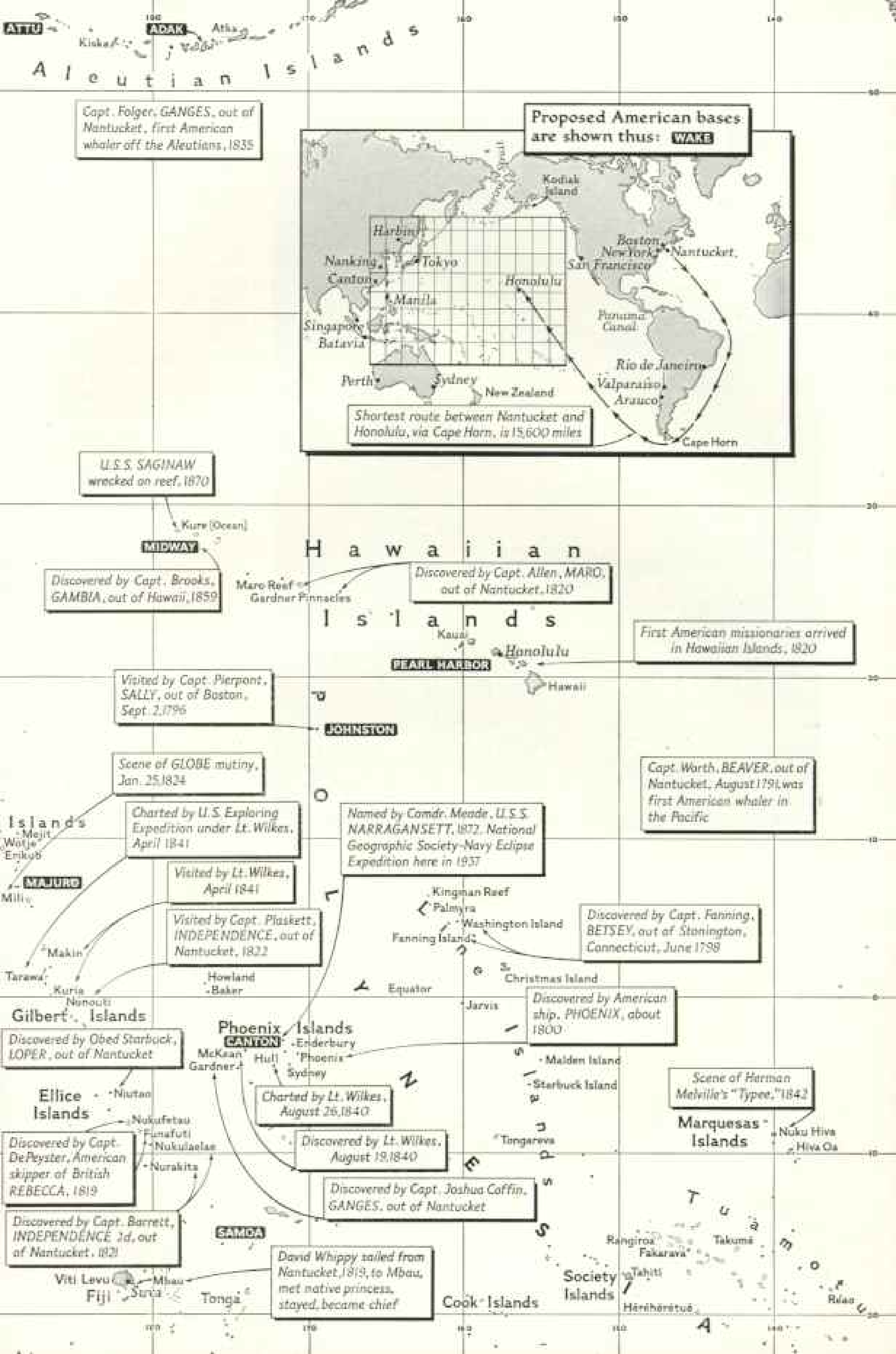
Discovered by Capt. George Ray, *NANTUCKET*, out of Nantucket, 1824

Crew of *INGA*, out of New Bedford, massacred, 1852

Thirteen crew members of the *ANTARCTIC*, out of New York, massacred, May 1830

Visited by Capt. Morrell, of Stonington, in the *ANTARCTIC*, Nov. 4, 1830

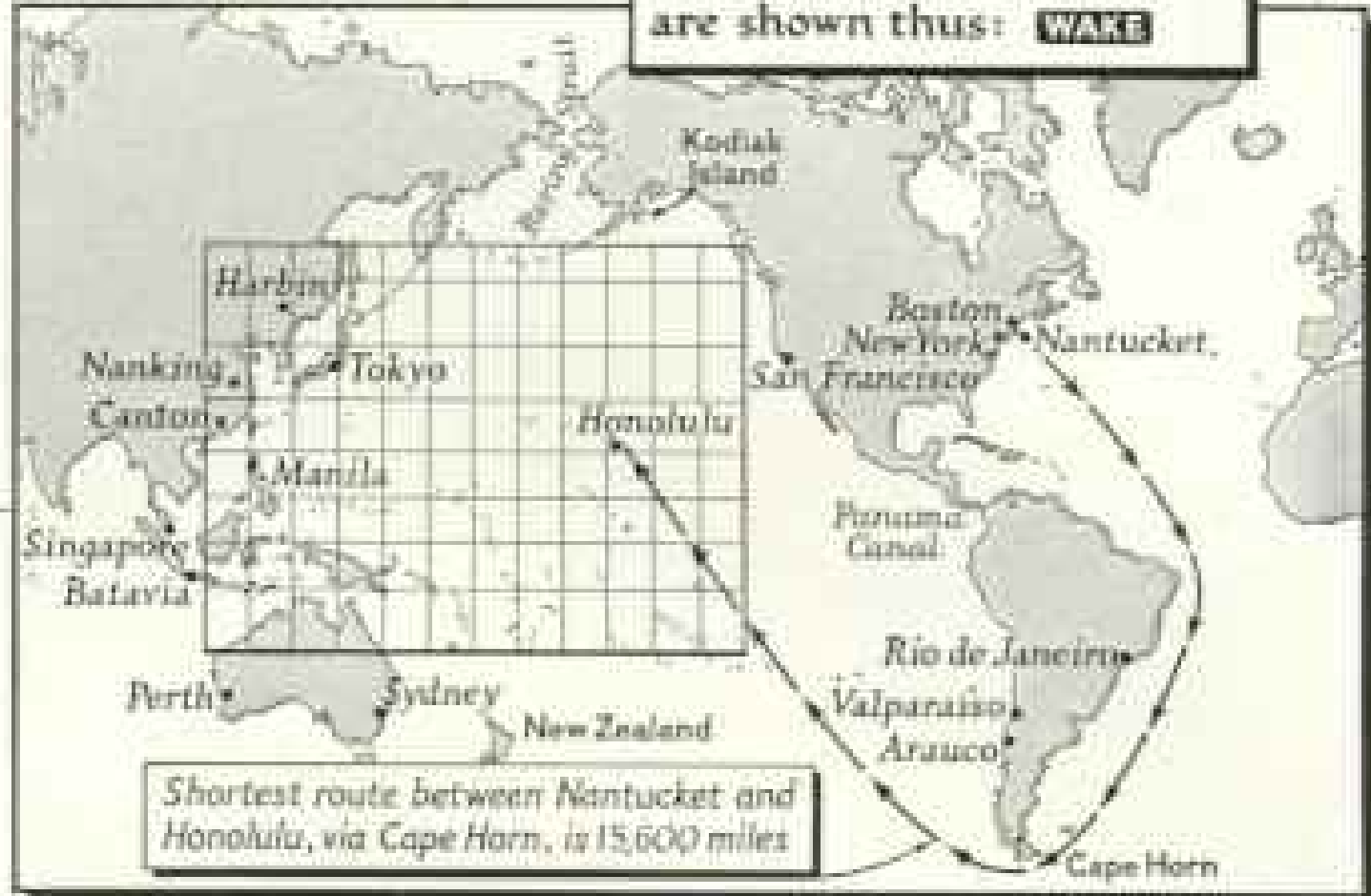




# Aleutian Islands

Capt. Folger, *GANGES*, out of Nantucket, first American whaler off the Aleutians, 1835

Proposed American bases are shown thus: **WASE**



Shortest route between Nantucket and Honolulu, via Cape Horn, is 15,600 miles

U.S.S. *SAGINAW* wrecked on reef, 1870

## MIDWAY

Discovered by Capt. Brooks, *GAMBIA*, out of Hawaii, 1859

## Hawaiian Islands

Discovered by Capt. Allen, *MARO*, out of Nantucket, 1820

First American missionaries arrived in Hawaiian Islands, 1820

Visited by Capt. Pierpont, *SALLY*, out of Boston, Sept. 2, 1796

## JOHNSTON

Scene of *GLOBE* mutiny, Jan. 25, 1834

Charted by U.S. Exploring Expedition under Lt. Wilkes, April 1841

Named by Comdr. Meade, U.S.S. *NARRAGANSETT*, 1872. National Geographic Society-Navy Eclipse Expedition here in 1937

Capt. Worth, *BEAVER*, out of Nantucket, August 1791, was first American whaler in the Pacific

Visited by Lt. Wilkes, April 1841

Visited by Capt. Plaskett, *INDEPENDENCE*, out of Nantucket, 1822

Discovered by Capt. Fanning, *BETSEY*, out of Stonington, Connecticut, June 1798

## MALDEN

Discovered by Obed Starbuck, *LOPER*, out of Nantucket

## Gilbert Islands

Discovered by Obed Starbuck, *LOPER*, out of Nantucket

## Ellice Islands

Discovered by Capt. DePeyster, American skipper of British *REBECCA*, 1819

Discovered by Capt. Barrett, *INDEPENDENCE* 3d, out of Nantucket, 1821

## Phoenix Islands

Charted by Lt. Wilkes, August 26, 1840

Discovered by Lt. Wilkes, August 19, 1840

Discovered by Capt. Joshua Coffin, *GANGES*, out of Nantucket

Discovered by American ship, *PHOENIX*, about 1800

Scene of Herman Melville's "Typee," 1842

## Marquesas Islands

Nuku Hiva, Hiva Oa

## SAMOA

David Whippy sailed from Nantucket, 1813, to M'bau, met native princess, stayed, became chief

## Fiji

Viti Levu, M'bau, Surua

## Tonga

## Cook Islands

## Society Islands

Rangiroa, Fakarava, Tahiti, Hērihēri-tūā

## Takumi

## Rilai



Staff Photographer W. Robert Meyer

### Japs Gone, Marshall Islanders Resume Peacetime Work

The man is hewing a boat-shaped wooden bowl, in which his wife may prepare rice, grated coconut, or other food. Marshall Islanders welcomed the coming of the Americans. One tribe asked to be wards of the United States. Some Gilbert and Marshall Islands were discovered by American whalers (page 627).

But a gale arose and cast the vessel on the reef.

Within a few days the captain contracted a fever and died. The first mate, in command, turned out to be a member of the famous seafaring Swain family of Nantucket. The women were the captain's widow, her maid, and a baby girl. The rest of the group was made up of three English officers, six British seamen, nine lascars, or East Indian seamen, and 11 Malays.

The castaways had tamed a milch cow, some wild swine and chickens, and gathered ample supplies of breadfruit and coconuts.

The Malays were in ill favor. They had broken into the samshu stock, had become

intoxicated, and had beaten the lascars. Captain Fanning did not have room for the whole company in the small *Betsy*, so Swain decided to leave the Malays behind to guard the wreck, promising to return for them.

He kept his word. Five months later a rescue ship reached Tinian, took off the Malays, and retrieved nearly all of the cargo except the samshu.

In 1798 the adventurous Captain Fanning discovered Fanning and Washington Islands, 1,200 miles south of Honolulu.

Southwest of Hawaii, southeast of the Marianas, and south of tiny Wake lie the Marshall, Gilbert, and Ellice Islands, stretching in a southeasterly direction from about 15° north to below the Equator.

### Marshalls Atomic-bomb Test Scene

The Jap-mandated Marshalls were strongly garrisoned early in the war.\* In expelling the Japanese in 1944, the United States Army and Marines made such names as Kwajalein

and Eniwetok familiar all over America. Now one of the smaller atolls of the group may be destined to become most famous of all. The atoll of Bikini has been selected as the site for America's momentous tests of atomic bombs against warships, scheduled to begin this summer.

Bikini, 25 miles long, contains about 20 small islands. The 161 inhabitants have been evacuated to previously uninhabited Rongerik Atoll, 125 miles away (pages 618, 620). There the Navy built new homes for them. Residents of Eniwetok, 190 miles to the west, and of other atolls will be removed temporarily.

\* See "Hidden Key to the Pacific," by Willard Price, NATIONAL GEOGRAPHIC MAGAZINE, JUNE, 1942.

It is not known just how far off the devastating effects of the bombs will be felt.

About 100 craft will be anchored in the vicinity of Bikini, including the battleships *Arkansas*, *Pennsylvania*, *New York*, and *Nevada*. Submarines, aircraft carriers, cruisers, and destroyers will be in the armada. Twenty thousand men of the fleet and scores of observers will crowd the Marshalls for the test operations, which have been given the code name of "Crossroads."

Some early explorers probably sighted the Marshalls and stopped there, but these islands and their neighbors to the southeast, the British-held Gilberts, are named for two British sea captains. After traveling in company from England to Australia, they went on to Canton in 1788 to load up with tea. On the way they made a wide sweep eastward which brought them to the Marshalls and Gilberts. They discovered several islands in each group.

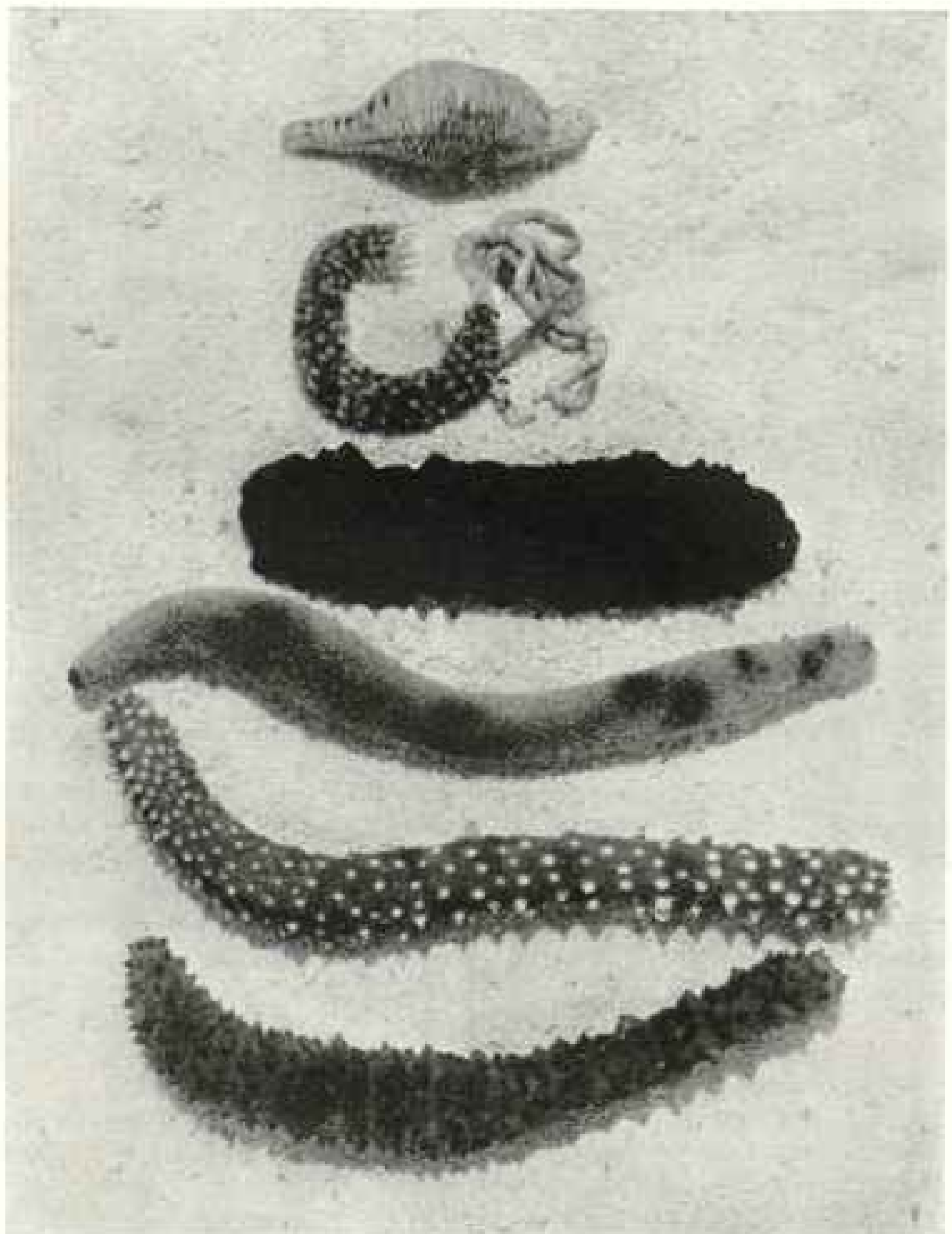
American whalers cruised in this area of the Pacific early in the 19th century.

Capt. George Ray, in the *Nantucket*, discovered Ebon Atoll, southernmost of the Marshalls, in 1824 and named it Boston Island. It was long a rendezvous for whaling ships.

Capt. William Plaskett, of the *Independence*, Nantucket, may have been the discoverer of Nonouti Island, in the Gilberts, in 1822.\* It has been known variously as Sydenham, Parker, Blaney, and Dog Island and was familiar to more than one whaler.

Captain Plaskett sailed out of Nantucket to the Pacific for 16 years, in the *Independence*, *Pacific*, *Japan*, and *Napoleon*.

In the British-controlled Ellice group



T. C. Dougherty

#### Bêche-de-mer—Prized by the Chinese for Soup

American sailors of a century ago risked their lives on cannibal isles in the Pacific to procure these "caterpillars of the sea" and then sell them in Canton (page 635). Trepangs occur in enormous quantities in the waters of northern Australia and many Pacific islands. The specimen second from top has just ejected its internal organs, a common practice with some species when frightened or disturbed. The sticky mass affords protection from enemies. The "caterpillar" suffers no harm and quickly develops a new set.

claims to discovery of four islands have been advanced on behalf of Nantucket whalers, based on reports of captains upon their return from voyages and preserved in old files of the *Nantucket Inquirer and Mirror*.

The daring Obed Starbuck of Nantucket has been credited with the discovery of Niutao, which he called Loper Island after his ship.

Starbuck had an adventurous career. He

\* See "Gilbert Islands in the Wake of Battle," by W. Robert Moore, NATIONAL GEOGRAPHIC MAGAZINE, February, 1945, and "War Finds Its Way to Gilbert Islands," by Sir Arthur Grimble, January, 1943.

shipped first in a merchant vessel at the age of 16. A year later, in 1816, he sailed on a new whaler, the *Hero*, and on her second voyage was first mate.

Off Santa Maria Island, Chile, the *Hero* was seized by pirates. Capt. James Russell and a crewman were slain. The *Hero* was taken to Arauco, Chile, but upon arrival there young Obed rallied the crew, retook the ship, and brought her home. When the *Hero* next sailed, he was master.

Capt. Arant Schuyler De Peyster, American skipper of the British brigantine *Rebecca*, discovered Funafuti and Nukufetau in 1819, on a voyage to the East Indies. De Peyster named the group the Ellice Islands after a member of the British Parliament. Funafuti was an important American base at the time of the invasion of the Marshalls (February, 1944).

Capt. George Barrett, in the *Independence 2d*, of Nantucket, discovered in 1821 the two southernmost Ellice Islands—Nurakita and Nukulaelae. He named the first Independence Island and the second Mitchell Island, after Aaron Mitchell, of Nantucket, owner of the vessel. Captain Barrett died at sea on this voyage, which lasted almost three years and carried the *Independence* as far as New Zealand.

#### Wilkes Charted Tarawa

The United States Exploring Expedition made a thorough survey of the three groups, and its work was the basis for future charts. Wilkes's chart of Tarawa was the only chart of that island available when the United States planned the bloody U. S. Marine invasion of that strongly held Jap outpost in the Gilberts in November, 1943. Tarawa and Makin were the first in the group to be retaken from the Japs.

West of the Gilberts is isolated Nauru (Pleasant) Island. When Capt. James Taber, in the whaleship *William Tell*, of Sag Harbor, Long Island, put in here on January 4, 1853, he made a shocking discovery.

A month before, the brig *Jago*, out of New Bedford, had been cut off by the islanders, and Captain Barnes, with all the crew but one, had been massacred on this, the most valuable of all the phosphate islands.

Did bombs dropped by U. S. Seventh Air Force raiders in their forays against Nauru in 1944 disturb their moldering bones?

The notorious *Globe* mutiny took place in the Marshalls. On January 25, 1824, four members of the crew, headed by Samuel B. Comstock, murdered Thomas Worth, the captain of this Nantucket whaler, and his first

mate while they were asleep. Then the mutineers killed the second and third mates after a struggle and took the ship into Mili (Mulgrave) Atoll.

Here the mutineers quarreled and Comstock was killed. Six crewmen who had not participated in the mutiny had been stationed aboard ship as a guard. When they saw an opportunity to escape, they cut the cable, sailed away, and reached Valparaiso after a long voyage. Ten men were stranded on Mili.

The desperate Silas Payne, one of Comstock's confederates, assumed leadership. His inhuman treatment of the islanders so angered them that they began to kill the seamen one by one. By the time a United States vessel reached Mili to capture the mutineers, all had perished except two innocent seamen, William Lay of New London and Cyrus M. Hussey of Nantucket.

Two secondary airbases in our proposed broad central defense belt in the Pacific are Johnston and Canton Islands.

Isolated Johnston lies 825 miles southwest of Honolulu, while Canton is in the Phoenix group 1,300 miles farther south.

Johnston, a strip of sand and coral less than 50 feet above sea level at its highest point, is some 2,000 yards long and 200 wide. Its discovery is credited to H. M. S. *Cornwallis*, on December 14, 1807, and it is named after her captain, Charles J. Johnston.

Americans knew about the island eleven years earlier. The brig *Sally*, of Boston, Capt. Joseph Pierpont, went aground on a near-by shoal on September 2, 1796. The crew, glad to get away, did not bother to name the inhospitable stretch of land.

#### Phoenix Group Discoveries

American whalers probably discovered Canton Island, largest of the Phoenix group, before 1828.\* The waters surrounding the Phoenix Islands were frequented by American whalers early in the 19th century. On old charts the island is known as Mary, Swallow, Mary Balcout, and by other names. Comdr. R. W. Meade, of the U. S. S. *Naragansett*, fixed its exact position in 1872 and named it for a notable wreck.

The whaleship *Canton*, whose captain, Andrew J. Wing, came from a famous New Bedford whaling family, piled up on the island's reef on March 5, 1854 (pages 634, 635). Captain and crew safely made a 49-day voyage to Guam in open boats.

\* See "Crusoes of Canton Island," by Irvine C. Gardner, NATIONAL GEOGRAPHIC MAGAZINE, June, 1938.



Readers of the NATIONAL GEOGRAPHIC are familiar with Canton (and also with nearby Enderbury) because of the 1937 National Geographic Society-U. S. Navy Eclipse Expedition to that spot, 195 miles below the Equator. A New Zealand expedition also chose Canton as a place to view the eclipse, and both groups flew their national flags over the tiny island.

Guano companies had visited Canton, but until 1937 no power had accorded it much attention. Development of aviation made its value as a seaplane base evident. As a result of conflicting claims arising from the rival eclipse expeditions, the United States and Great Britain agreed, in April, 1939, to place both Canton and Enderbury under joint control for 50 years.

Capt. Joshua Coffin, of the *Ganges*, Nantucket, discovered Gardner Island in the Phoenix group on a voyage between 1821 and 1827. He named it for Gideon Gardner, owner of his ship.

Captain Coffin sailed out of Nantucket for 16 years as a whaling master, and died of a fever in Rio de Janeiro at the age of 44.

Lieutenant Wilkes discovered McKean Island in the Phoenix group and named it after the man in his expedition who first sighted it. He also named Hull Island after an American naval officer and put it on the charts. When Wilkes sighted Hull, he was searching for Sydney Island and thought he had found it.

Chart positions for the whole Phoenix group were untrustworthy in that day. Landing at Hull, he was surprised to find there a Frenchman and eleven Kanakas from Tahiti, who had been left on the island five months



U. S. Navy, official

#### She Fled to Safety Through Jap Lines

When American troops landed on Guam, this Chamorro girl escaped from enemy-held territory during a night action. Although Guam became an American possession as a result of the Spanish-American War, the Chamorros became acquainted with American whalers and traders more than 100 years ago. At the close of World War II a youthful U. S. sailor wrote to his parents on Nantucket that he was stationed in Guam. They told him in answer that his great-grandfather had been there a century before as a whaler.

before by a trading vessel to catch turtles. They had corralled 78. From them Wilkes learned that Sydney Island lay 60 miles to the east.

#### Early U. S. Arrivals in Carolines

West of the Marshalls, the Caroline Islands stretch across the Pacific for about 2,000 miles. These 549 dots in the ocean, with a total area of only 510 square miles, lie from 2° to 10° north of the Equator.

Americans became acquainted with Truk, Ponape, and Yap as Jap plane and fleet bases during the war. They learned to know

Peleliu and Angaur in the western Carolines—the Palau group—even better, when the U. S. First Marine Division and the U. S. 81st Infantry Division invaded them in September, 1944. After the war they found out about the huge secret United States fleet rendezvous at Ulithi, only 100 miles from Yap.

All of these islands have American historical associations.

First American mission station in Micronesia was established in Kusaie, easternmost of the Carolines, in 1852. The Reverend and Mrs. Benjamin Galen Snow, sent out from Boston by the American Board of Commissioners for Foreign Missions, landed there from the schooner *Caroline*. Kusaie was once known as Strong Island, in honor of Governor Caleb Strong of Massachusetts.

#### Blackbirders Kidnaped Islanders

The island also became a favorite resort of William Henry ("Bully") Hayes, of Cleveland, notorious in the Pacific as ringleader of the blackbirders. These desperadoes kidnaped thousands of Polynesians, Micronesians, and Melanesians and sold them to labor on Queensland sugar plantations, in Mexican mines, or on guano islands off Peru.

The Boston missionaries were handicapped by such examples of "civilized" men as Hayes and his gang on the island, but eventually the renegades were driven out by the British. In *Pacific Adventure* Willard Price points out that Americans have had much to do with Kusaie; they damned it and they also redeemed it.

By 1857 American and native Hawaiian missionaries were established in the Gilberts, Marshalls, and Carolines, and in the Marquesas of Polynesia.

In 1856 the American Board built its own missionary schooner, the *Morning Star*, with the pennies of Sunday School children in the United States. She sailed from Boston for Honolulu. Next year she made her first voyage to Micronesia, stopping at Kusaie and Ponape with supplies and taking missionaries on to the Marshalls and Gilberts to establish the work there.

As early as 1830 Ponape was a stopping place for Nantucket and New Bedford whalers. During the Civil War the Confederate cruiser *Shenandoah*, at large in the Pacific, caught several whalers in Ponape's harbor and burned them to the water's edge.

Ulithi, northernmost of the Carolines, lying 400 miles southwest of Guam, is 22 miles long and 10 miles wide. Within the reef are four sizable islands—Asor, Mogmog, Soren-

leng, and Fassarai—and several smaller ones.

The lagoon, with 85 square miles of fine anchorage, can hold a thousand ships. Just prior to the American attacks on Iwo Jima and Okinawa it often did accommodate that many U. S. warships, supply vessels, and landing craft at one time (page 633).

Before our Navy discovered Ulithi's possibilities as a sea rendezvous, its history had been uneventful. Sometimes it is found on early charts with the name Mackenzie, after an early British explorer.

Early in the 19th century the whalers found Ulithi, with unhappy results for the islanders. The seamen imported diseases here and elsewhere throughout the Carolines—smallpox, mumps, measles, whooping cough, venereal disease—which the inhabitants could not withstand. More than half the population of the Carolines died within a hundred years from imported ailments introduced by whalers, merchant seamen, and adventurers.

In 1944 the Japs abandoned Ulithi as useless, withdrawing all able-bodied islanders to Yap; so, when the 81st ("Wildcat") Division went ashore there September 20 and 21, it was unopposed.

Falalop became the base of a protecting Marine air group. Mogmog was equipped as a recreation island where weary crews, after months at sea, could have brief shore leave on a tropical beach. The few islanders still living there when United States forces arrived were removed to Fassarai, where they lived undisturbed by the fleet.

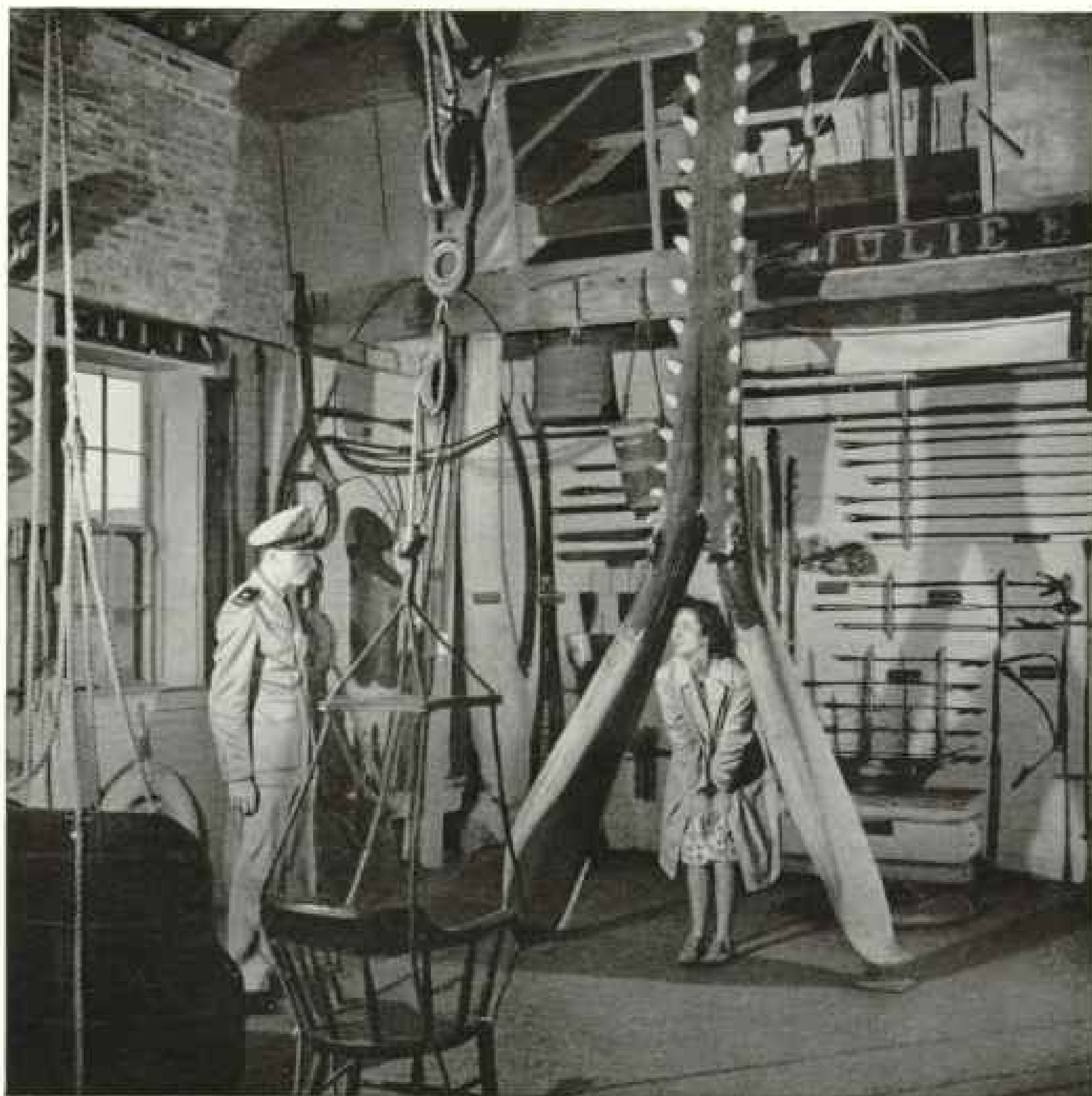
Now Ulithi is theirs once more. The ships have left the broad lagoon. When will history's pages note this remote atoll again?

#### O'Keefe Brought Stone Money to Yap

Americans had little to do with the early history of Yap, but in the latter half of the 19th century an Irish-American buccaneer and freebooter, David D. O'Keefe, left an indelible imprint there and in the Palaus, where he owned concessions.\* O'Keefe brought much of Yap's huge stone "cart-wheel" money to the island from the Palaus, using it to buy coconuts.

When O'Keefe mysteriously disappeared in 1901, he was reputed to be a millionaire and had vast real estate holdings in Hong Kong and on many Pacific islands. His wife was a native of Nauru and spoke excellent English.

\* See "Yap Meets the Yanks," by David D. Duncan, NATIONAL GEOGRAPHIC MAGAZINE, March, 1946, and "Mysterious Micronesia," by Willard Price, April, 1936.



Staff Photographer B. Anthony Stewart

### This Sperm Whale Could Have Swallowed Jonah; Its Lower Jaw Is 18 Feet Long

The relic stands in Nantucket's Whaling Museum. The whale from which it was taken in 1865 yielded 110 barrels of oil. Chairs in foreground were carried on a whaler when the captain's wife accompanied him on a voyage. At sea, when his ship spoke another whaler whose captain's wife also was aboard, lines were passed between, and one of the women was swung across to visit her sister sailor. Exchange of gossip on such an occasion was called a "gam." Harpoons and other whaling implements line the wall.

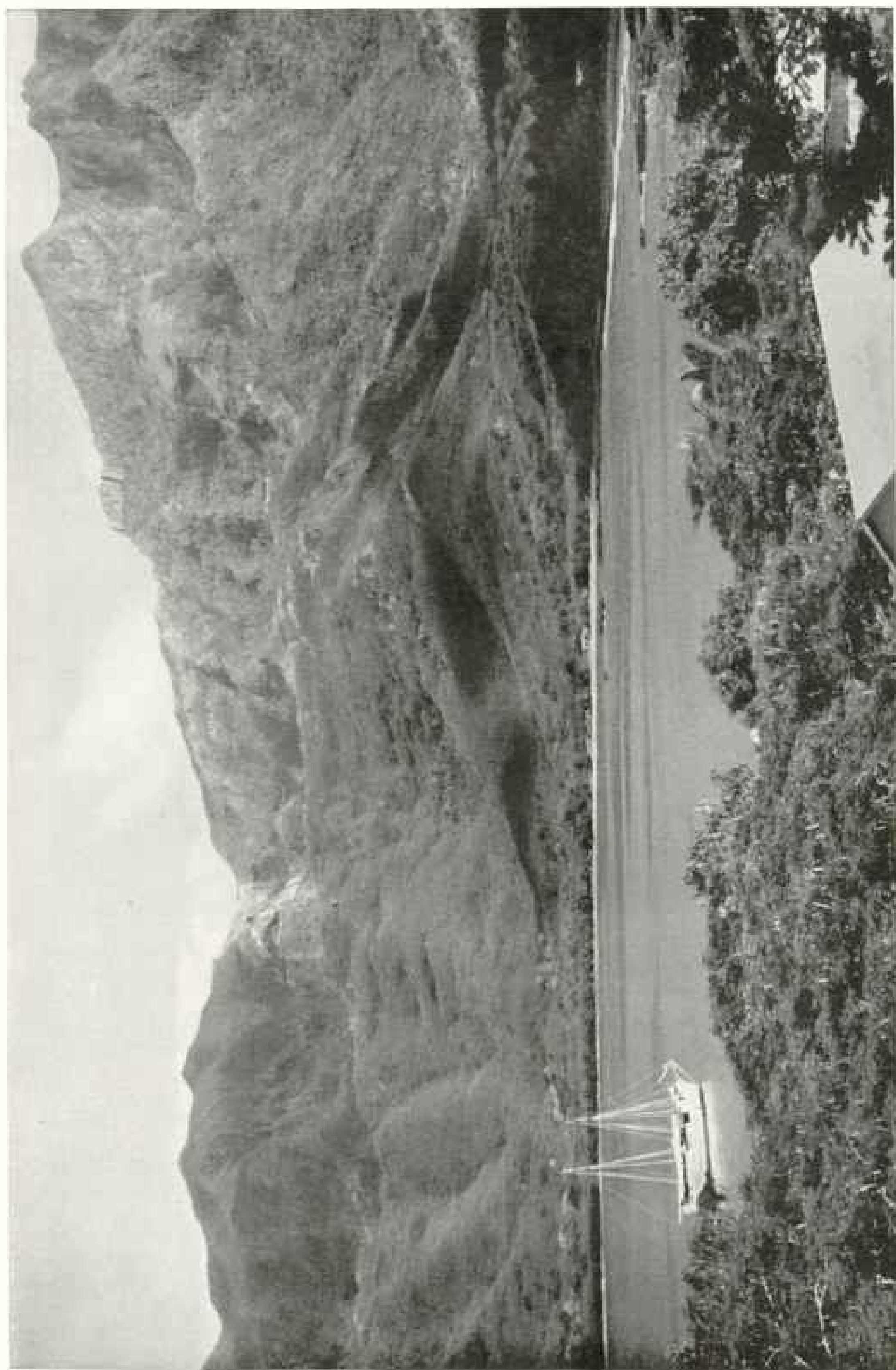
One of the earliest Americans to visit Truk was the colorful Capt. Benjamin Morrell, son of a Stonington, Connecticut, shipbuilder. Morrell ran away from home at 16 to follow the sea. In 1830 he was sailing the Pacific for the fourth time in his own ship. His wife accompanied him.

He was on the lookout for seals, pearls, *bêche-de-mer*, for anything with which to turn an honest penny. He was an excellent navigator and sealer, possessed a fighting heart, and was a shrewd businessman. But he seemed to regard himself as a pioneer of the

Pacific, reporting "discoveries" left and right and naming them after his friends. One of these "discoveries" was Truk.

On a February night in 1830, while he was en route from New Zealand to the Philippines, Morrell was aroused by the lookout's cry of "Breakers ahead!" With great effort he extricated the *Antarctic*, his 172-ton, topsail sealing schooner, from her peril. When daylight came he saw Truk before him (p. 637).

"It was a group of beautiful islands," he wrote, "surrounded, enclosed, fenced in, completely locked up, and defended by a wall

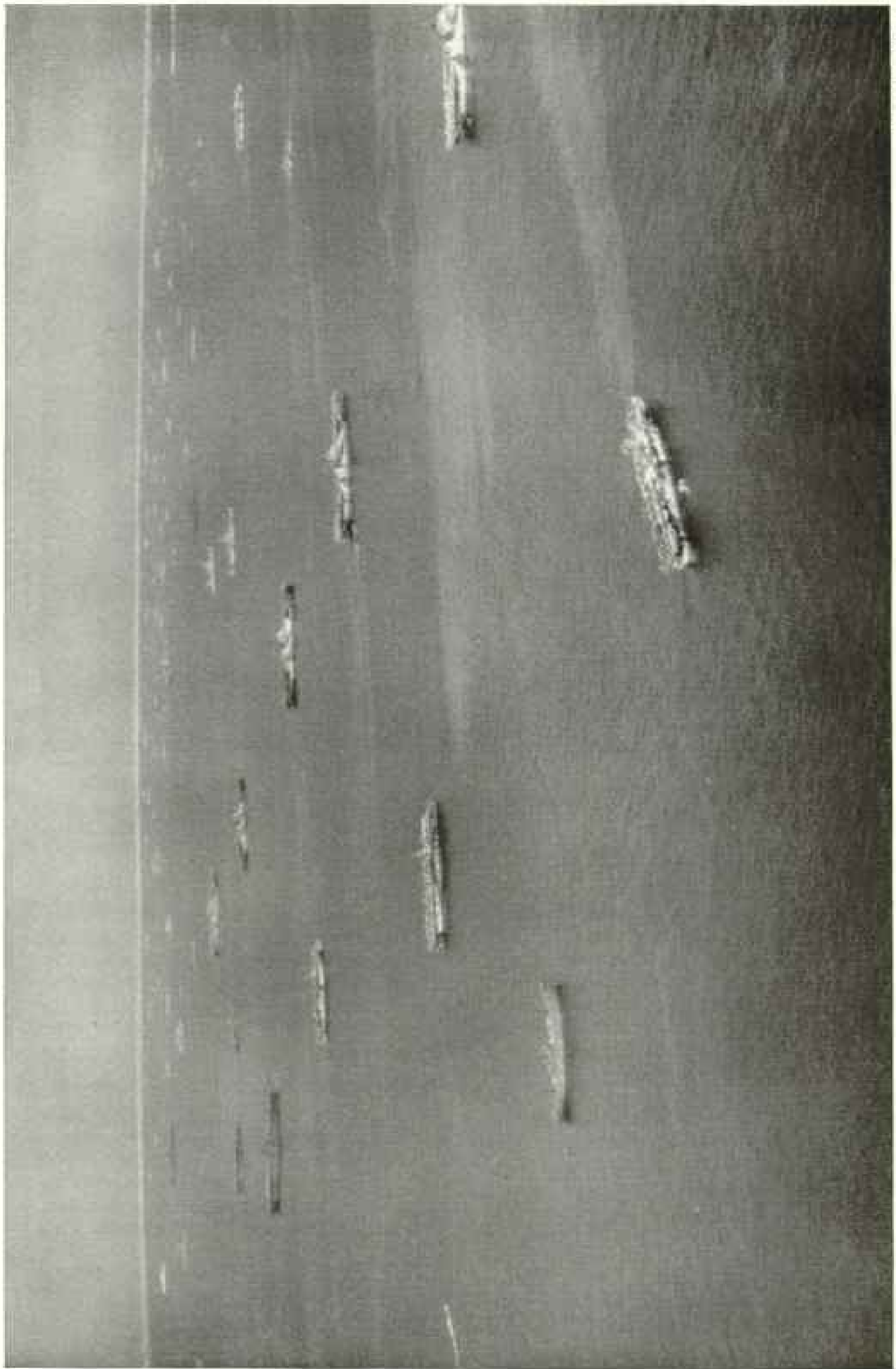


Dean DeLuca from *Ecija Gajpar*

**Nuku Hiva's Placid Harbor Lured Herman Melville from His Whaleship, the *Acushnet*, into a Tropical Paradise**

Here, with his companion Toby, he set off for the interior of this island in the *Marquees*, back in 1842. His four-month sojourn among the cannibal Typeset and his romance with the lovely Fayaway were described in his classic, *Typee*. Melville also was the author of the whaling masterpiece, *Moby Dick* (page 639).

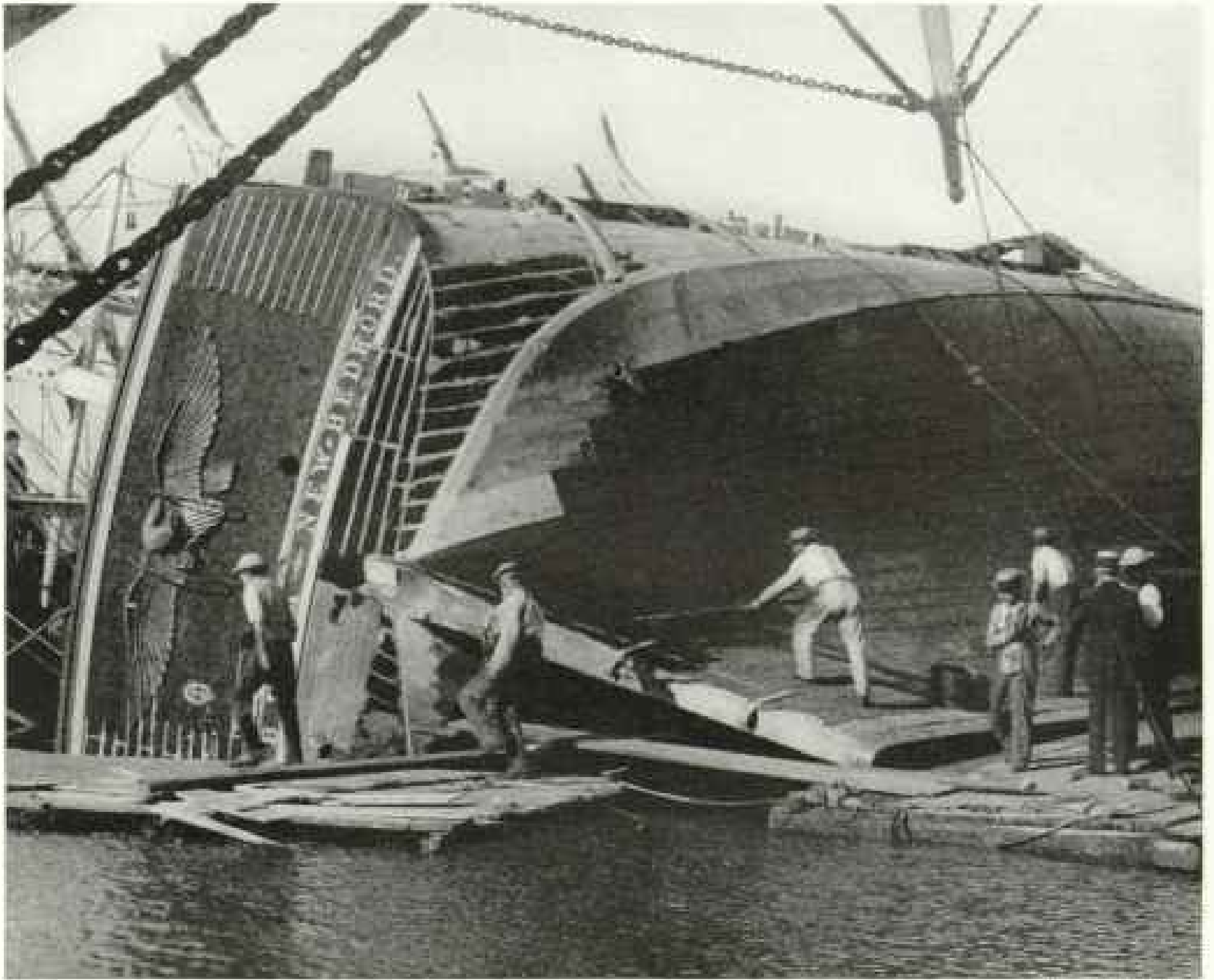




**Flattop Row—America's Mighty Carrier Fleet Lies at Anchor at Ulithi, Haven for Whalers a Century Ago**

A thousand U. S. warships assembled in this broad lagoon before our landings on Iwo Jima and Okinawa (page 610). Only a part of the vast, secret rendezvous in the Carolines shows here. The Japs abandoned Ulithi in 1944, transporting all able-bodied islanders to Yap, 100 miles to the southwest.

U. S. Navy, official



George V. Plummer

### *Sunbeam*, One of New Bedford's Last Whalers, "Hove Down" for Recoppering

The 360-ton bark made many successful voyages for J. and W. R. Wing, famous whaling firm (page 628), between 1856 and 1909. In 1911 the proud old ship, relegated to carrying lumber, ran aground at Wolf Island, Darien, Georgia, and was a total loss. Clifford W. Ashley, eminent whaling artist, sailed on the *Sunbeam* in 1904 and saw her take three sperm whales.

of coral, from one-third of a mile to three miles in width, and one hundred and fifty miles in circumference; the depth of water on it varying from two to eight feet.

"In circumnavigating this single submarine parapet, we counted more than 70 islands, of different sizes, situated within its circle, the appearance of which was truly paradisiacal and delightful."

Morrell immediately leaped to the conclusion that he was the discoverer of Truk, since it did not appear on his charts, and named it Bergh's Group in honor of a friend, Edwin Bergh of New York. But Truk was seen by Louis I. Duperrey, the French navigator, on June 24, 1824.

Morrell also was acquainted with the Solomons, and his greatest adventure befell him not far from them.\* After leaving Truk on his 1830 voyage, he came upon a group of 20 low coral islands on an 8-mile reef

about 150 miles northeast of Bougainville. Today they are known as the Tauu Islands.

They were called the Marqueen Islands in Morrell's day, but he was unaware of this, regarded them as a discovery, and in the light of subsequent events named them Massacre Islands.

### Mass Production of Cured "Sea Cucumbers"

He found the reef literally covered with *bêche-de-mer* and decided to procure a cargo for the China trade. He held a parley with the native chief, a fantastic creature ornamented with rows of sea shells, wreaths of flowers, and tortoise-shell bracelets. Morrell dubbed him Nero.

The chief had never seen a white man and believed that Morrell and his crew wore tight-

\* See "A Woman's Experiences Among Stone Age Solomon Islanders," by Eleanor Schirmer Oliver, NATIONAL GEOGRAPHIC MAGAZINE, December, 1942.



From William H. Tripp

#### Whalers of the Bark *Platina* Caught a Pure-white Whale in Mid-Atlantic

The old square-rigger came upon this extremely rare real-life version of *Moby Dick* about 550 miles northwest of Bermuda on an August day in 1907. The flag with a "W" on the fore-topgallant mast is the house flag of J. and W. R. Wing, owners of the ship. That on the main-topgallant mast with the letter "P" stands for the name of the ship. The banner on the mizzen-topmast is the Union Jack, taking the place of the traditional "blue peter" which signifies the vessel is bound out. The *Platina* was built in 1847 at Rochester, Massachusetts, and ended her whaling days in 1910.

fitting white clothing. Only after minute examination was he convinced that their skin really was not ebony.

Apparently Nero was friendly, so Morrell landed men on an island to build drying sheds for the *bêche-de-mer* (page 627). Best quality *bêche-de-mer* was sun-cured, but the Yankee skipper had found that he could cure the "sea cucumbers" thirty times as fast by exposing them to artificial heat in drying sheds.

*Bêche-de-mer* sold in China by the picul, a Chinese weight equivalent to 133½ pounds. First-quality *bêche-de-mer* was worth \$90 a picul in Canton; second quality, \$75; third quality, \$50. So, even if he did lose something in quality by using drying sheds for curing, he more than made up for it in quantity. Mass-production methods in 1830!

For a time all went well.

Then one day Morrell heard a loud war

whoop ashore. He fired a cannon to frighten the natives, but succeeded chiefly in alarming his party of 21 men at work on shore. They ran for the beach, where they had left their arms under the care of two of their number. But on arrival they found the two sentinels slain, and they were confronted by 300 natives. At the first volley of arrows, three of the seamen fell.

Morrell immediately sent a whaleboat to shore with 11 members of his crew, who drove the islanders back with musket fire in time to rescue seven of the twenty-one.

When the survivors were aboard, Morrell slipped the cable and headed seaward. Through his telescope he watched the cannibals on the beach butchering their victims and roasting them.

A month later Morrell was safely back in the Philippines, but no sooner had he

landed than he planned to return to Massacre Islands. He could not be sure that all fourteen of his missing crewmen had been killed; one or more might have escaped inland.

So he recruited 50 Manilans to complete his crew and, again accompanied by his wife, started back. On September 14 the *Antarctic* dropped anchor a quarter of a mile from the beach on which the massacre had taken place.

A flotilla of canoes put out from shore to surround the vessel. As they drew within close range, their occupants discharged a shower of arrows, which did no damage. Then Morrell gave the order to fire.

"For ten minutes nothing more was heard but one continued roar of cannons, swivels, and musketry," he wrote. "The astounded assailants . . . were scattered like chaff before the hurricane."

Officers and crew wanted to pursue in boats, but Morrell would not permit them. Instead, he opened the *Antarctic's* battery upon the native bamboo village, with surprising results.

#### A Survivor Returns

In a few moments a small canoe bearing one man, painted and naked, put out for the ship. Believing him to be an emissary of the chief's, the captain ordered firing to cease as the canoe sped through the water as fast as the paddler could propel it.

"As soon as he came within hailing distance," wrote Morrell, "I demanded the nature of his business; but what was our astonishment and delight to hear him reply, in our own language, 'It is I—old Shaw, come back again!'"

He had escaped the massacre on the beach, had eventually been captured and put into slavery, and had been tortured and half-starved. The islanders had sent him out to the boat as a peace offering.

Our proposed bases at the western extremities of the broad Central Pacific defense belt, with the exception of those in the Philippines, all lie in territory that has been an integral part of Japan for many years. This embraces stations at Okinawa, in the Ryukyus; Iwo Jima in the Volcanos; and islands in the Bonin and Izu groups. All have some century-old American historic associations.

At Okinawa, row upon row of new white crosses testifies to the loss of American lives in the capture of that vital island from the Japanese (April-June, 1945). Some of the American fighting men who died in the battles at Naha, Okinawa's capital, used as shelters the tombstones of U. S. sailors and Marines who had been buried on Okinawa 92 years

before! The graves were those of six men who were members of Commodore Matthew Calbraith Perry's famous 1852-54 expedition, which finally opened Japan to Western commerce and influences (page 639). They had died of natural causes.\*

Members of the Sixth United States Marines fought through the little graveyard in which they lay. Bullets, bombs, and shells partially ruined the tombstones. Bulldozers, following in the wake of advancing Marines, completed the destruction. Today not a vestige of this little American burial plot on Okinawa remains.

Perry reached Naha on May 26, 1853. The Ryukyus then were known as the Lew Chews and Okinawa as Great Lew Chew.

Hydrographic charts of Naha harbor and land surveys were made during the visit and these helped form the basis for charts and maps used in the war with Japan. Perry suggested to the U. S. Government back in 1852 that we establish a base at Okinawa.

Three years earlier, Comdr. James Glynn, of the U. S. S. *Preble*, had touched at Naha on his way into Japanese waters (page 638).

Three groups of small islands, the Volcanos, the Bonins, and the Izus, stretch northward between the Marianas and the Japanese coast, and points on all three are suggested as military bases.

Of the Volcano Islands, the name of Iwo Jima, or Sulphur Island, has become a familiar word in the United States ever since the memorable invasion by the Third, Fourth, and Fifth Marine Divisions in February and March, 1945. These inhospitable specks in the ocean were known to the whalers, but were of little use to them.

#### An American Discovered Bonins

The Bonins, or Ogasawara Shoto, are somewhat more friendly to man. They probably were known to the Spaniards as early 1543, and also to the Japanese, but their first recognized discovery was made on September 12, 1824, by Capt. James J. Coffin, of Nantucket, in command of the British whaleship *Transit*. He found the southernmost cluster of islands, to which he gave the name Coffin Group (Haha Jima), and he called four of them Fisher, Kidd, South, and Pigeon Islands.

"For ships employed in the whaling," he wrote, "or bound to Port Jackson [at Sydney, Australia] from Canton, or the northwest coast of America, they furnish a desirable

\* See "Peacetime Rambles in the Ryukyus," by William Leonard Schwartz, NATIONAL GEOGRAPHIC MAGAZINE, May, 1945; and "Okinawa, Threshold to Japan," by David D. Duncan, October, 1945.





U. S. Navy, Official

#### Truk Harbor Just Before U. S. Navy Airmen Struck in April, 1944

Off Dublin Island, docks and small boats stand out sharply in this aerial view of part of Eten Anchorage. Until the Japs began fortifying Truk after World War I, its Kanaka population of some 10,000 had lived uneventfully in pleasant coconut groves. Capt. Benjamin Morrell, of Stonington, Connecticut, when he visited Truk in his 172-ton *Antarctic* in February, 1830, was impressed with the defending wall of coral which enclosed the vast lagoon (page 631). Truk comprises the largest group of islands in the Carolines.

place for refreshment. These islands are covered with large and beautiful forest trees; on any of them there was no mark made by a knife or otherwise traceable by which it could be made to appear that man had ever been on any of these islands."

Three years later Capt. Frederick William Beechey, in H. M. S. *Blossom*, arrived, re-named the southern group Baily after Francis Baily, president of the Royal Astronomical Society, and called the northern group Parry (Muko Jima). The middle cluster (Chichi Jima) he named after himself and designated the three larger islands as Stapleton, Buckland, and Peel.

In 1830 a group of Americans and Europeans, residents of the Hawaiian Islands, ar-

rived to establish a colony on Peel Island. A number of Hawaiian men and women accompanied them. The five leaders were two Americans, an Englishman, a Dane, and a Genoese.

When Commodore Perry visited the Bonins in 1853, only one of the five, Nathaniel Savory, originally from Essex County, Massachusetts, was living there. The Englishman had moved to Guam and the others presumably had died. Savory had married the widow of the Genoese.

Savory had established a farm where he raised sweet potatoes, and sugar cane from which he distilled rum. He carried on a thriving trade with visiting whaleships.

Perry purchased from Savory a strip of



Dr. Edward Burton MacDonell

#### His Fiji Island Forebears Were Cannibals

This old photograph shows the type of tribesman encountered by the early missionaries. When Lt. Charles Wilkes, leader of the United States Exploring Expedition, visited the Fijis in 1840, he found chieftains hostile to the missionaries and loath to give up cannibalism. Today the islanders still are a rugged lot. During the war an American ship put in at Suva with rolls of barbed wire. Islanders unloaded the cargo. The captain was amazed to see them run over the wire in their bare feet and propel the rolls along the dock by kicking. Constant walking barefoot had so toughened their soles that the sharp barbs did them no harm.

beach 1,000 feet long for a U. S. coaling station. But Japanese colonists arrived later, and in 1876 Japan took over all American and British claims in the Bonins.

Some of the foreigners departed. Others remained and intermarried with the Japanese.

The Izus, north of the Bonins, extend about 100 miles almost to the Japanese coast. They are volcanic and their soil is poor. O Shima, largest of the group, is about ten miles long and six miles wide. Its summit, Mihara, is an active volcano 2,477 feet above sea level.

American whalers were acquainted with

the Izus but found them, like the Volcanos, useless for refueling or resupplying their ships.

#### Japs Tortured Stranded Whalers

To the whalers the shores of Japan were even more forbidding than bleak islands like Iwo and the Izus. For example:

In January, 1849, Comdr. James Glynn, of the U. S. S. *Preble*, then part of the American squadron in China seas, was ordered to Nagasaki to demand the release of 15 American seamen, some of whom were Hawaiians. They were members of the crew of the whaler *Lagoda*, Capt. John Brown, out of New Bedford, who had deserted ship the previous June and had been imprisoned by the Japs. Word of their plight had filtered to the naval squadron by way of Batavia, since the Dutch at that time had very limited trade relations with Japan.

In April, Glynn boldly sailed his sloop into Nagasaki harbor, where he was met by a swarm of large Jap boats called together by signal guns fired from headland lookout posts. The *Preble* was

ordered away, but Glynn anchored instead. Hundreds of Jap soldiers were hastily stationed at elevated points overlooking the harbor, and 60 pieces of heavy artillery were trained on the *Preble's* decks.

Glynn ignored the hostile manifestations and demanded that the seamen be produced. After some equivocation the Japs surrendered the survivors, who told a tale of inhuman and cruel imprisonment which sounds today much like the experiences of luckless American GIs who languished in Jap prison camps during the war.

No prophet was on hand to foretell that 96 years later Nagasaki was to be devastated from the air by an atomic bomb (August 9, 1945).

In addition to bases in the broad Central Pacific defense belt, our Congressional subcommittee has recommended the establishment of outposts on northern and southern flanks. Stations in the north are contemplated in the Aleutians.

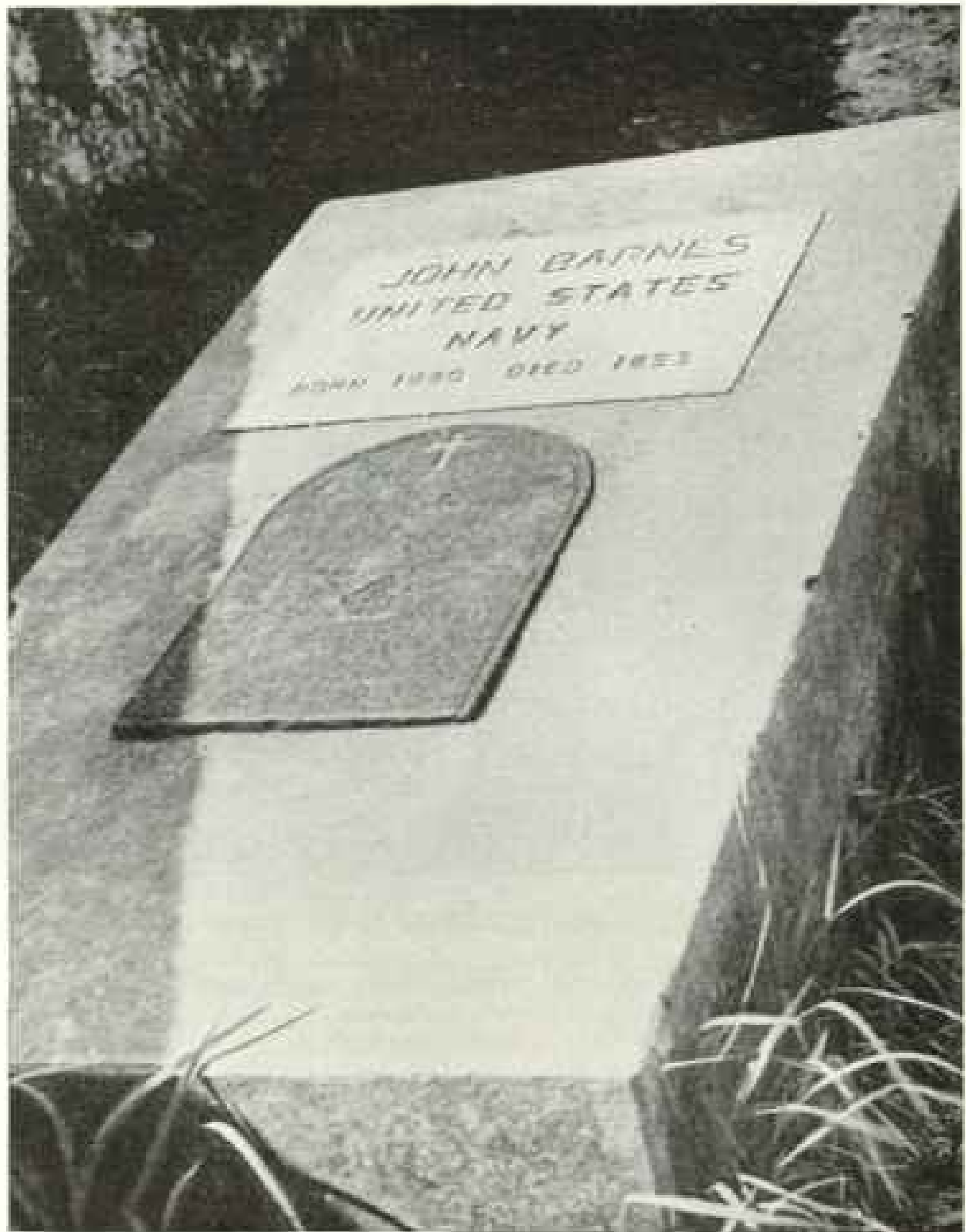
Whalers followed their prey into the northern Pacific as early as 1835. Capt. Barzillai T. Folger sailed the *Ganges* to the Kodiak grounds in that year and was the first whaler to operate off the Aleutians.

Eight years later Captain Ricketson, in the *Hercules*, and Captain Turner, in the *Janus*, both out of New Bedford, took whales off the coast of the Kamchatka Peninsula. And in 1848 Captain Royce, in the bark *Superior*, out of Sag Harbor, passed through Bering Strait.

Within three years 250 captains had filled their ships with whale oil in the Bering Sea, although whaling that far north was extremely hazardous in the days of sail.

Sites for American military bases on the southern flank have been recommended for Manus in the Admiralties; Espiritu Santo in the New Hebrides; Guadalcanal in the Solomons; Nouméa in New Caledonia; and Samoa.

Prior to World War II, the Admiralty Islands were an Australian mandate, by the terms of the Treaty of Versailles, 1919. Great Britain and Australia (the latter by a mandate) shared the Solomons. The New Hebrides were in a British-French Condominium. New Caledonia was a French colony.\*



AP from Press Ass'n

#### A U. S. Tomb of 1853 Sheltered Marines on Okinawa

The stone is one of six marking graves of seamen who died while on Commodore Perry's historic voyage to Japan (page 636). Members of the Sixth U. S. Marines crouched behind them in the fierce fighting around Naha in 1945. Later, shells, bombs, and bulldozers completely destroyed every vestige of this little American cemetery on Japanese soil.

Like all the important groups of islands in the South Pacific, these have American historic associations.

As a youth, one of America's distinguished men of letters, Herman Melville, was familiar with these waters. Thousands of schoolboys have read his *Moby Dick* and *Typee*. *Typee* told of Melville's adventures in the Marquesas,† where he left the New Bedford whaler *Acushnet* in 1842 and fell in love with the beautiful maiden, Fayaway (page 632).

\* See "War Awakened New Caledonia," by Enzo de Chetelat, NATIONAL GEOGRAPHIC MAGAZINE, July, 1947.

† See "Turning Back Time in the South Seas," by Thor Heyerdahl, NATIONAL GEOGRAPHIC MAGAZINE, January, 1941.



Staff Photographer William R. Oliver, visiting Stonington Marine Museum

### Salt Spray Lashed This Eagle at the Stemhead of the "King of Clippers"

Now in the Marine Museum, Stonington, Connecticut, the figurehead keeps alive memories of the beautiful ship it graced—the *Great Republic*. The 4,555-ton clipper, built by Donald McKay in 1853, was rebuilt along smaller lines by Capt. Nathaniel Brown Palmer, of Antarctic fame, after a disastrous fire on the eve of her maiden voyage. She made the run from New York to San Francisco around Cape Horn in 92 days.

Many an inquiring American sailor, on shore leave in the South Pacific, had an opportunity to bring his history up to date during the war with Japan. That is what Lt. George Backus, of Nantucket, did.

One morning, back in 1943, Backus's ship docked at Suva, in the Fijis, and he went ashore. He looked up one of the British administrative officials.

"Do any of the descendants of David Whippy live here?" he asked.

The Britisher looked at him in surprise. "What do you know about David Whippy?"

"Why, he came from my home town, Nantucket."

"Indeed, we know the story of David Whippy very well," the Britisher replied.

Back in 1819, David Whippy as a boy sailed for the Pacific on the whaler *Francis*, out of Nantucket. His brother was the captain. At Valparaiso, Whippy deserted ship, unhappy over life on a whaler. But he wanted to see the Pacific, so he signed as a seaman with an English trading brig.

When the ship docked at Mbau, in the Fijis, Whippy went ashore. He met a native princess and decided to stay. When her father died, Whippy became a chief.

There Lieutenant Wilkes found him, happy and prosperous, when the ships of the United States Exploring Expedition put in at Mbau in 1840. He acted as Wilkes's interpreter and escort. He urged Wilkes to suggest to the United States that the Fijis be taken over as a permanent possession, but back in Washington the plea fell on deaf ears.

Whippy was appointed United States vice consul in the Fijis. He loved the South Seas and died there, never returning to Nantucket.

"He has a number of descendants here on the island today," the British official told Backus, "and they own much property. As a matter of fact, if they had had David Whippy's acumen they probably would own all of Suva today."\*

\* Consult National Geographic Society 10-color maps.

Pacific Ocean and Bay of Bengal: 36½ x 26½ inches; includes Burma, part of India; has 56 insets of islands such as Kwajalein, Tarawa, Chichi Jimu, Paramushiro, New Britain; table of 1,035 air distances; 4,472 place names.

Pacific Ocean—with 73 Island Insets: 38 x 31 inches. Extends from Calcutta to Panama, from Antipodes to Bering Strait; features naval bases, time zones, table of 861 air distances, 73 large-scale insets of islands and harbors—Palau, Saipan, Solomons, Yap, Truk, Wake, Guam, etc.



# Camels of the Clouds

By W. H. HODGE

**H**IGH-DWELLING companions of the puffy white clouds that float about the heads of the Andes are the lamoids, that group of South American camels which includes the llamas, alpacas, guanacos, and vicuñas.

The thinner the air the better they like it, and the favorite home of these so-called "sheep" of the old Inca civilization is the highest land in our hemisphere, the bleak, barren wastes of the lofty Andes.\*

True, guanacos can be found at home close to sea level, but the remaining lamoids apparently cannot adapt themselves for any great length of time below their normal range, except occasionally in zoos.

Thus, llamas generally range from upwards of 7,500 feet; alpacas are seldom seen at elevations below 12,000; while the dainty vicuña is encountered in the less accessible areas above 10,000. In Bolivia and Peru their home is known as the *puna* or *altiplano* (high plateau).

More than any other Andean country, Peru is the home of this quartet and especially of the llama (*Lama glama*), the only native beast of burden domesticated by the peoples of the New World.

## All-purpose Animal of the Andes

Today, as in the pre-Inca civilization, the llama remains the most important all-purpose animal to the sierra Indian and also the animal closest to his heart.

Besides owning a flock, the *terrano* (mountaineer) includes these daily companions as subjects in his textiles, on his hand-decorated gourds, his pottery, his silver and gold ornaments (pages 648, 654).

Indeed, the presence of the llama in Andean Peru is as universal as its figure, which has even crept into a symbolic place on the national coat of arms of that Republic and is also found on its coins and postage stamps.

Peruvians revere the llama as we do our eagle, and the culmination of their respect is the fine bronze statue to this animal in a prominent site on Lima's beautiful Paseo de la República.

But to see the llama or his mountain confederates and to understand their importance among the peoples of the highlands, you must journey to their Andean home, which centers in southern Peru on the high plateaus surrounding the blue waters of Lake Titicaca. You may catch your first glimpse of pack

llamas on the clean sloping streets of Arequipa, beneath snow-capped Misti, guardian peak of Peru's most important southern city.

However, llamas in Arequipa are only visitors and they will not come into their own until you wind by railroad or auto road up over the bleak passes lying between Arequipa and Puno.†

The Department (State) of Puno is the world's center of lamoids. In this area, roughly the size of West Virginia, there are at least 200,000 llamas, close to 700,000 alpacas, and the largest flocks of wild vicuñas.

Actually, llamas and alpacas far outnumber their owner-associates, the Quichua (Quechua) and Aymará Indians, who, as living descendants of the Inca people, constitute some 90 percent of the highland population in this and most other sierra regions of southern Peru and neighboring Bolivia.

## It Is Cold in Llama Land

My first night on Titicaca's shores found me so cold that I resolved to purchase at least a part of the Indian's warm costume, much of it made from llama and alpaca wool.

So the second day found me, bright and early, in the colorful, if unsanitary, market square, searching out the woolen goods "counter." There you can find any variety of hand-knitted woolen wear—socks to fit any size foot (thanks to the cylindrical heel-less construction), mittens with or without full fingers, thick mufflers, and the colorful stocking caps (known as *gorro*), with their handy ear flaps and gay designs of dancing figures.

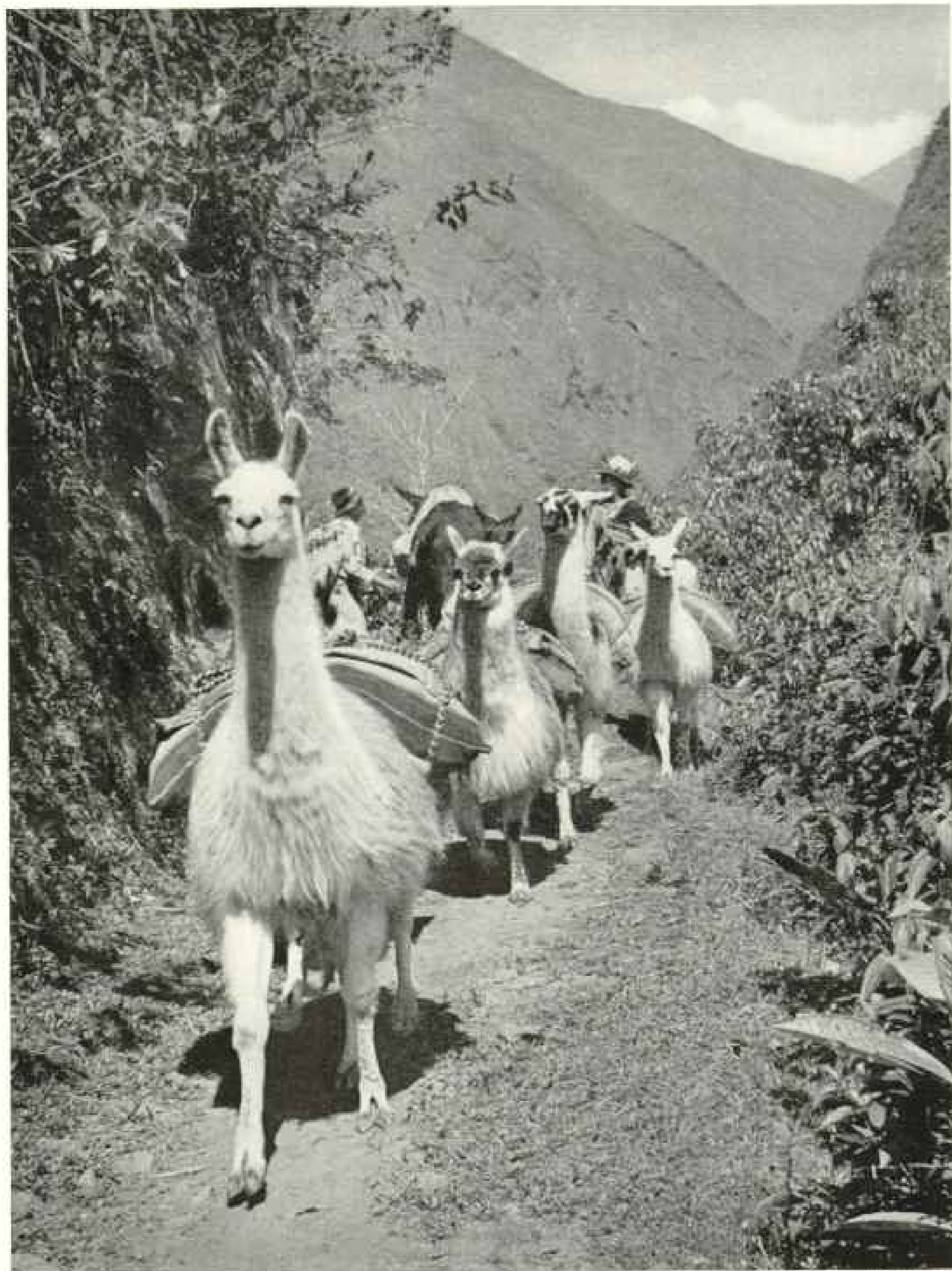
My second night in Puno found me in bed dressed in my recent purchases, complete with cap, scarf, sweater, long woolen underwear, and several pairs of socks.

If your night progresses as mine did, you will be cool in such garb, even with addition of the hotel's heavy wool blankets, until the wee hours past midnight when of a sudden you are warm. To be comfortable you must then begin shedding your extras until you have the normal complement of bedclothes.

Yet the outside temperature is seldom really cold, averaging at night about freezing. The

\* See "Incas: Empire Builders of the Andes," by Philip Ainsworth Means, NATIONAL GEOGRAPHIC MAGAZINE, February, 1938, and accounts of the Peruvian Expeditions of the National Geographic Society and Yale University, February, 1915, and May, 1916.

† See "The Pith of Peru," by Henry Albert Phillips, NATIONAL GEOGRAPHIC MAGAZINE, August, 1942.



W. H. Hodder

### Cargo Carrier of the Andes, the Llama Labors Tirelessly—Within Limits!

When more than about 100 pounds is loaded on its back, it lies down and refuses to move. When displeased, it spits and kicks. Treated on its own terms, however, the sure-footed animal is a docile and faithful servant. Here a llama pack train carries flour and sugar to a Peruvian gold mine near Limhani.



Carl A. Bell

### "What's So Funny?" A Llama Plays Stooge to His Comedian Owner

Aymaras of Bolivia show great affection for their all-purpose pack animals. The Indians alone seem to understand how to manage llamas. They fondle their useful friends before loading and during journeys. When one falls sick, the owner ties a scrap of red fleece to its ear and turns it loose. His warm clothing is woven from llama and sheep's wool.

trouble is the lack of oxygen, which affects one in the same way as excess cold.

Cold or not, this is llama heaven. Were it not for the warm fleece of these Andean camels, it is doubtful whether a civilization like that of the Incas could have existed at such altitudes.

Some zoologists consider the guanaco to be the primitive ancestral type from which the present domesticated lamoids, the llama and alpaca, were developed (page 653).

At any rate, there are no such things as wild llamas or wild alpacas, but there are still wild guanacos. These range over a wider area than any other lamoids, being found from the middle of Peru to the southernmost tip of South America, even to inhospitable Tierra del Fuego. There Charles Darwin, when making his epic voyage on H. M. S. *Beagle*, encountered guanacos in flocks occasionally numbering hundreds of individuals.

### "Like Small Camels," Wrote Early Visitor

Guanacos are still numerous in the southern part of their range, especially on the plains of Patagonia. In Peru and Bolivia they appear to be rarer nowadays than the vicuña, but

formerly they were important and most numerous in the highlands, with flocks there numbering in the thousands.

Huánuco, an important sierra town of central Peru, was apparently named after this animal. In 1628 a Spanish chronicler wrote of this general region: "Roundabout here there are many stray or wild llamas, the guanacos, similar to the llamas but with a muzzle which is darker colored and more nearly black; these whinny almost like horses."

Even in those days their camel relationship was noted, for the same chronicler, writing about "Peruvian sheep"—the guanacos, vicuñas, and llamas—described them as "the size of a large deer, with long necks like camels . . . They look like small camels," he reported.

Pizarro, conqueror of Peru, was the first European to gaze upon one of these "little camels," for when his expedition first touched Peruvian soil in the vicinity of Tumbes llamas were among the curiosities that interested him most. So great was Pizarro's admiration for the little beasts that he took one to his emperor, Charles V, when he returned to Spain to report on his discoveries.



W. H. Hodge

#### From the Elusive, Cloud-dwelling Vicuña Comes the World's Costliest Wool

Rarest of the lamoid family, the vicuña is found only in the less accessible Andean areas above 10,000 feet (page 651). In the United States, a man's soft vicuña coat will sell for \$400 or more. Captured as a fawn, this pet was raised on milk from a bottle by two Indian boys of Cuyo Cuyo, Peru.

The fact that in Pizarro's time llamas were common on the Peruvian coast as far north as the present Ecuadoran frontier would indicate that their distribution was far greater during the Inca Empire than today. Llamas are now found only very rarely north of the highlands of central Peru (except around Riobamba, Ecuador) and seldom on the coast.

The relatively low elevations of the Andean ranges in northern Peru act as a natural barrier to a creature which thrives only at high altitudes.

Llamas may lack the antiquity of their forebears, the guanacos. Their coarse fleece cannot compare with the thick, fine wool of their cousin, the alpaca, or with the exquisite silkiness of the vicuñas; and llama flocks have long since been outnumbered by imported sheep.

But in spite of all this competition, llamas still are the No. 1 animal in the silent Quichua heart. It is easy to see why, for the llama, from its smallest hair to its most insignificant dropping, is utilized almost 100 percent by the Indian.

Jerked llama meat, or *charqui*, though coarse, nourishes him; its woven fleece keeps him warm; its hide is made into the crude sat-

dals with which he is shod; its tallow aids him in making candles; the long hairs, braided, serve him as rope; and its excrement, dried, constitutes the *carbón peruano* (Peruvian charcoal), or *taquia*, which helps as a fuel to ward off the penetrating chill that surrounds his treeless, high-altitude home.

#### Bred as Beasts of Burden

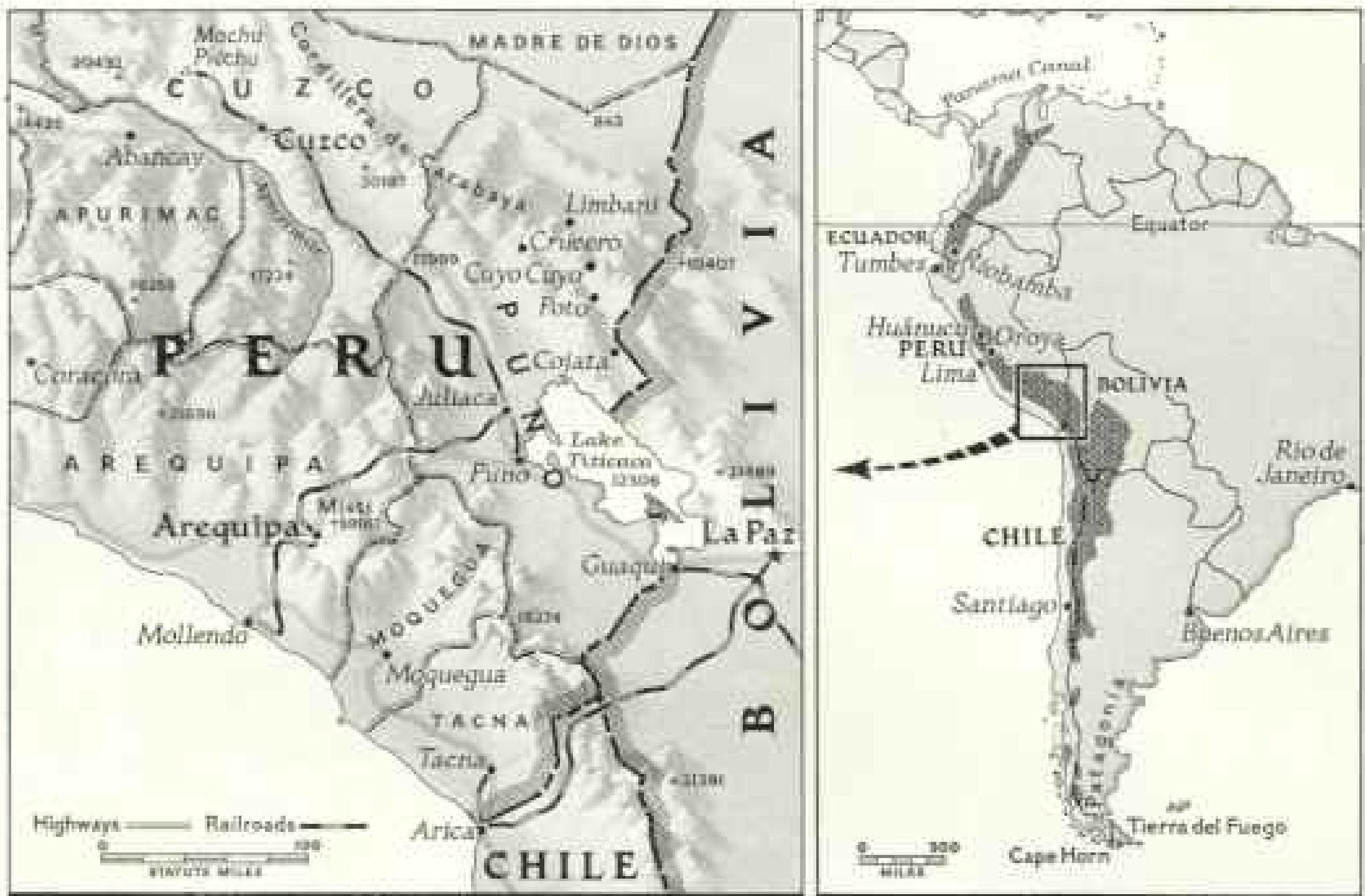
But, above all, the llama is the sierra Indian's beast of burden, and for this use it is bred (pages 642, 646, 650).

Only males over three and a half years of age serve as pack animals. To tell a llama's age the Indian looks, not at its teeth, but rather at the droop of the lower lip—the older the individual the more pronounced the droop.

A good big llama can carry as much as 130 pounds, but the average animal can seldom manage much over 100 pounds, which is half what an Andean mule can handle.

Apparently this load limitation is the reason why llamas, unlike the Old World camels, are not used in their homeland as saddle animals, though I have always half expected to see a Quichua youngster astride his woolly companion. But perhaps the possibility of a spray of llama saliva is suffi-





Drawn by Theodore Peier

### High Plateaus and Passes of the Andes Are the Lamoids' Home

The shaded area of the map at right shows the habitat of back-packing llamas, woolly alpacas, rare vicuñas, and wild guanacos. This area ranges upward from 7,500 feet. At Machu Picchu, Inca citadel near Cuzco, excavations were made in 1911, 1912, and 1915 under auspices of Yale University and the National Geographic Society.

cient deterrent to all would-be llama riders!

There is plenty in the pack llama's favor, for his partially cleft hoofs, which are sharp and faintly hooklike, make him more sure-footed than the mule. Moreover, the llama's all-round operating cost, compared with that of a mule or horse, is practically nil.

The llama needs no expensive pack saddle because he has a "built-in" one in the thick matted wool which efficiently protects his back from the cargo. The potatoes, grain, or what have you, are merely cinched on with a piece of soft llama-hair rope.

Furthermore, a llama can get enough nourishment on his journey by merely grazing on the natural grasses which are found on the puna, and, like the camel that he is, the llama is able to carry over a few spare cud of food in his complex stomach just in case a snowstorm covers the food supply.

#### A Llama's Lie-down Strike

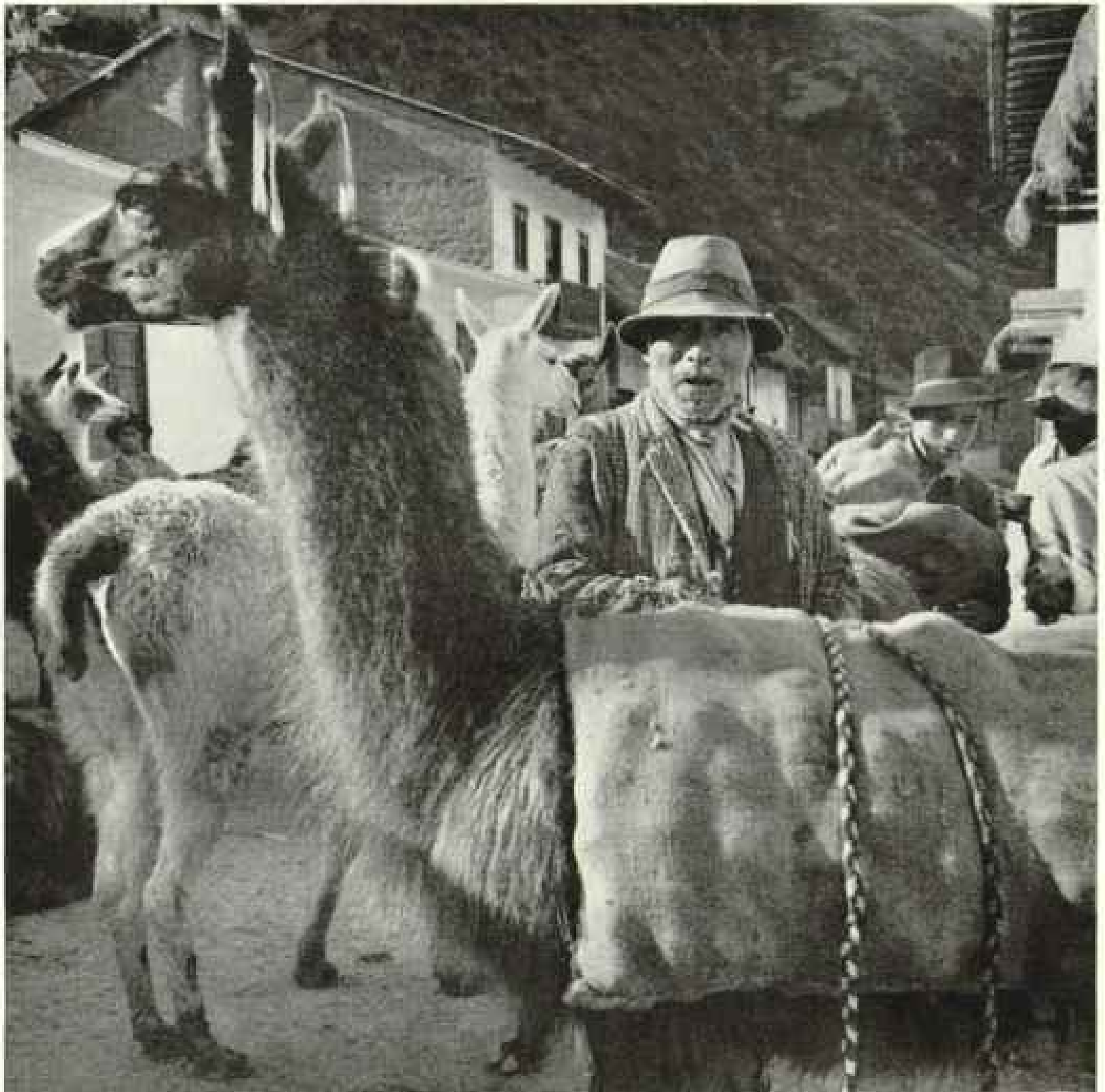
With normal loads a flock of pack llamas, sometimes consisting of several hundred animals, can travel for twenty days, averaging 15 to 20 miles per day, eating and resting regularly on their way.

Nor are llamas like mules, which can be overloaded and will often struggle on when dead-tired, frequently falling to their deaths from a precipitous trail. A llama seems to know his load capacity and his state of exhaustion. If the pack seems too heavy or if he is unduly tired, the beast lies down, neatly tucking his front feet under his body, catlike, and refusing to budge until properly rested.

One day in southern Peru near the village of Cuyo Cuyo I heard a weird wail on the trail on which I was hiking. A few minutes later, rounding a bend, I encountered a laden pack llama, apparently dead-tired, lying down squarely in the middle of the path.

The owner was patiently trying to urge the animal to its feet and on its way by lifting him bodily. This effort was the cause of the unearthly racket being made by the llama, the first and only sound I have ever heard from an animal usually noted for its silence.

The Indian should have known better. Eventually he had to give in to the tired beast by removing the pack and leaving the llama to its well-deserved rest while he moved on to the village with the remaining members of the flock.



W. H. Hodges

#### Sturdy Ships of the Andes Can Travel 15 to 20 Miles a Day at High Altitude

Here highland-grown potatoes are unloaded from pack llamas in a Peruvian mountain village. Each animal carries about 100 pounds. Since llamas seldom eat at night, journeys are broken to permit grazing. Colored tassels dangling from the ears indicate ownership. Sometimes llamas are marked by a dye spot, often bright pink, on their backs.

On journeys to towns at lower elevations the pack llamas are generally laden with animal products of the high grazing lands, such as llama skins or crude wool, products of the hand loom, charqui, or *chalonga*, a form of dried salted mutton.

In the market place, roped together while their owner barter, sells, and buys, his flock patiently rests, waiting to be reloaded with provisions for home, such as dried corn, barley, potatoes, oca (an edible tuber), and coca leaves.

Sometimes on such excursions one will meet groups of pack llamas far below their normal

elevation, for these animals are often used for transportation on those exceptionally rugged trails which pass to the eastern forested country.

I never tire of watching these pack animals padding rhythmically and silently by, heads held high, ears erect, interest showing from a variety of blotched faces as they follow every motion of the casual passer-by. Always alert, they exhibit a reserved and lofty mien that makes them appear superior to their brother beasts of burden.

When a car passes, the Indian herdsman usually drives his wards to the side of the



Kirkland from Pix

### Llamas March to Music of Their Leader's Bells

Wearing a bright skirt covering several petticoats, this woman holds fast to the pride of her flock, numbering perhaps 10 to 15 animals. Llamas provide her with meat, and fleece for weaving. They carry ore, pottery, food, and many other products across difficult trails to market.



W. H. Doherty

#### Peruvian Jewelers Favor the Llama Motif

Here the author's wife wears gold earrings, bracelet, and locket, featuring the animal which is also honored on Peruvian postage stamps, coins, and national emblem. Llamas were offered as sacrifices to the Sun God. A mummified llama from Inca days reposes in Lima's National Museum of Archeology.

road and with the aid of a companion holds a restraining rope around the flock. The llamas patiently wait until a soft whistle from their shepherd announces that they can again proceed.

The low whistle which the Peruvian Indian uses in herding his llamas epitomizes his relation with his animals, an understanding which exhibits the essence of gentleness.

You will never see an Indian mistreat a llama. Instead, he handles it gently, talks to it softly, and urges it along with his low whistle. Nor does he carry a stick or a whip, but prefers at the most to raise in the air his soft rope or sling braided of thick llama wool. He adorns the animal's ears with brightly

colored, pendent wool ribbons, and in time of fiesta adds to its chest hand-woven festive trappings adorned with bells (page 647).

To the Indian, his llama is more than an animal; it is a friend who shares the long journeys across the bleak puna. It would scarcely be an overstatement to say that all serranos love their llamas.

This affection stems from the close mutual companionship that starts in the Indian's earliest youth. It is the duty of the children to watch the flocks in the open pastures, to guide them back in midafternoon to the stone-walled corral where they pass the night in one spot, thus aiding the owner in more easily securing the droppings for fuel.

During the lambing period of November to May a Quichua youngster may even have as a pet a llama or alpaca lamb, and in the whole appealing realm of animal infants there is nothing cuter, more capricious, or more lovable than these, unless

it is a vicuña lamb (opposite page).

#### Inca Royalty Owned Immense Flocks

In the time of the Incas the lamoids constituted the principal source of national wealth. The immense flocks of domesticated llamas and alpacas were the exclusive property of the Inca royalty and their deity, the Sun.

The overseers of the royal flocks were men of importance, often of royal blood, while the shepherds under their direction were unsurpassed as animal husbandmen.

The rules and regulations for the management of the herds were as much a marvel to the Spanish conquerors as they would be to us today. The animals were so thoroughly



classified that in the different flocks all were of uniform age, sex, and color. At regular intervals the flocks were shorn, and the wool was placed in public warehouses from which it was doled out to Indian families to make the common man's cloth as needed.

The wild lamoids—guanacos and vicuñas—were rigidly protected by law and were allowed to roam widely with only periodic molestation. At such times thousands of these animals would be driven together in a general roundup to be shorn or slaughtered.

The wool, like that of the domesticated llamas and alpacas, eventually found its way to the public storehouses. The coarse wool of the guanacos was destined for normal consumption, but that of the vicuña was the exclusive property of the Inca nobility.

Male guanacos and vicuñas were killed for meat, but the young breeding females were rigidly protected so that reproduction might replace the number destroyed. Conservation was thus a fact in those ancient days.

According to one historian of Peru, pure-black and pure-white llamas were regularly sacrificed in some of the chief Inca festivals. A black llama from the herds of the Sun was offered up in the richly ornamented Temple of the Sun in Cuzco, and omens were read from its carcass. A white llama was sacrificed in the sowing festival.

The great respect shown to llamas is indicated by the fact that at least one beast has been found mummified and wrapped in hand-woven textiles in one of the ancient tombs. This animal now reposes in the National Museum of Archeology in Lima.



Aaron Fisher

#### A Baby Llama Makes a Fine Pet for Indian Children

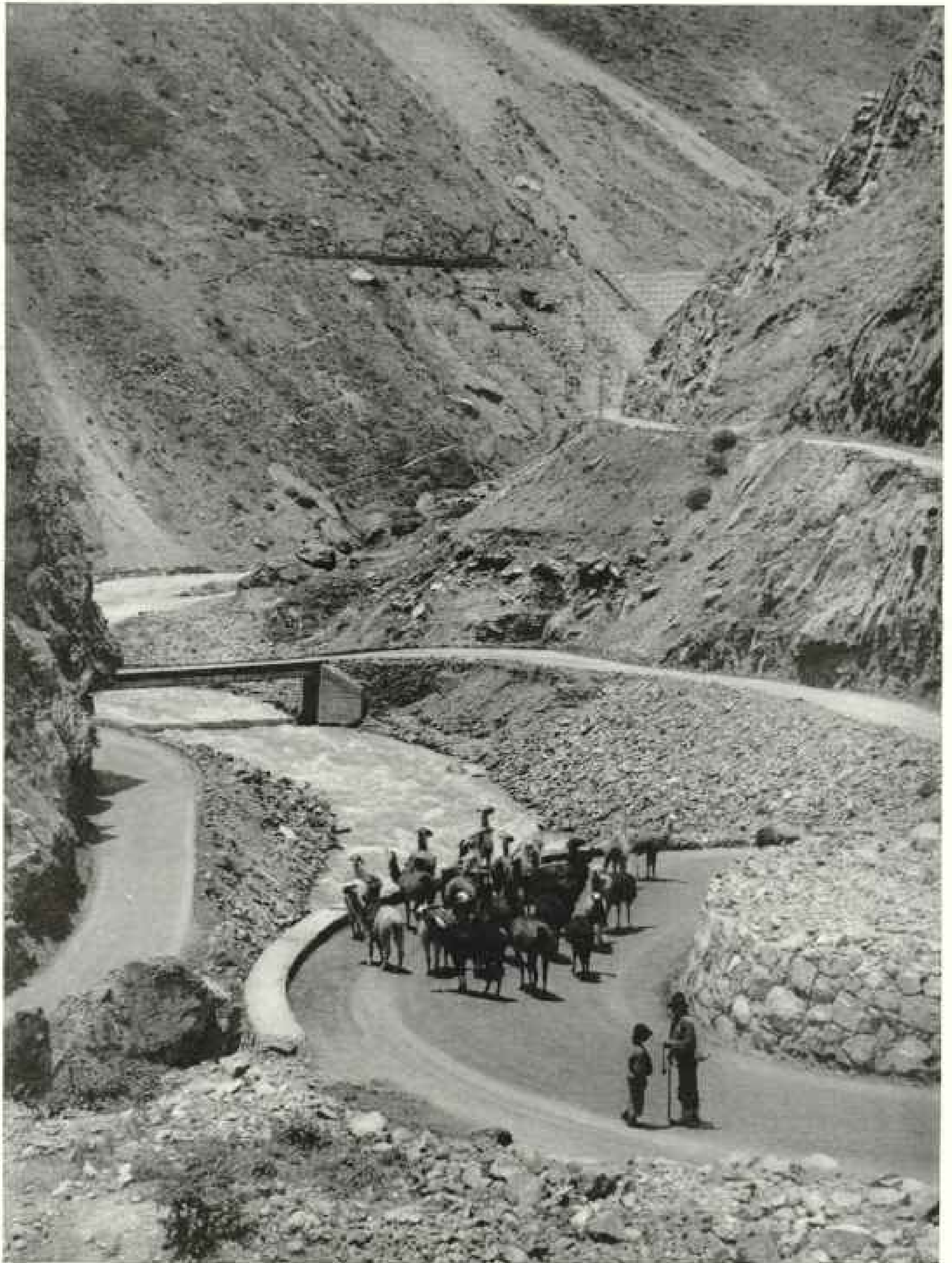
Here two youngsters of the Ecuadorian Andes play with their favorite in front of their hut. Usually a young llama is left with its mother for about 8 months, then placed with a flock. At the age of about 3, the males go to work as burden carriers. Females are used for breeding and for their hair.

Llamas were the beasts of burden of the Incaic peoples, but the job of supplying the bulk of wool used by that civilization fell principally upon the alpaca (*Lama pacos*).

Historians think the approximate time of domestication of the alpaca was several centuries B. C., but that the height of its exploitation was from the 11th to the 13th centuries.

#### Woolly Alpaca, Gift of the Gods

The Incas considered these animals to be a divine gift. However that may be, alpacas today are still the most important lamoids for wool production, and Peru, with an estimated 2,000,000 alpacas, is and will continue



© Charles D. Emery

### Hardy Llamas Thrive in the Thin Air of the Andean Highlands

Here a pack train, bearing ore to a copper smelter at Tamboraque, moves along the curving Oroya highway. This mountain road crosses the crest of the Peruvian Andes at Tielio, 15,600 feet above the sea. Through the gorge flows the Rimac, which empties into the Pacific at Lima. The Oroya railroad parallels the highway.

to be the chief producer. For alpacas, unlike llamas, have never been acclimated in other countries. In Bolivia they are native also.

Recognizing the possibilities of this monopoly, Peru has taken steps, by the formation of a Government breeding station, to increase her alpaca wool production and to improve the quality of this commodity. One day she may have again the immense flocks which diminished after the Spanish conquest.

Alpacas are smaller and weigh less than llamas. They have a whimsical aspect which is not to be compared with the dignity of the llama. Perhaps this is because the body of the alpaca is heavily covered with wool, which often hangs close to the ground, so that the first appearance reminds one of an overgrown poodle or, in a rear view, of a woolly bear (pages 655, 656).

An alpaca is easily distinguished from a llama, which, besides having a squarish-looking figure, holds its curlicue of a tail out from its body, as a rule. The body of an alpaca, on the other hand, is much more rounded, especially the back, and the tail hangs so close that it is seldom clearly visible.

The range of color seems to be as great as that of the llama, and in a flock of alpacas one can see all colors from white to browns and blacks, with many a much-blotched hybrid.

The modern sierra Indian prefers black fleeces, which do not require dyeing; yet he seems to have forgotten the Inca methods of selection whereby black races were carefully segregated from other color types. White is the most expensive and the most popular fleece for export, and a pure-white alpaca-skin rug shows off best the brilliant luster of the long, soft hair. Nearly all so-called llama-skin rugs offered for sale are alpaca skins.

#### Uses of Alpaca Wool

Alpaca wool is remarkably light and warm, and easily sheds rain and snow. Therefore, it was in great demand for the manufacture of linings for sleeping bags, parkas, flying suits, and rugged outdoor clothing needed in the war by our armed forces. Peace again finds it in demand among domestic and foreign weavers for the manufacture of fine coat linings, superior cloths, and the like.

The alpaca flocks of today are owned almost entirely by Indians. Inasmuch as the oldest hairs begin to be shed after the animal reaches its third year, it is necessary to shear the flock every two years. With an average useful age of about seven years, alpacas thus live to be shorn only three or four times.

Each shearing yields about six pounds of

wool, which is used by the family or sold in the wool markets in the little towns lying between Cuzco and Puno on the Southern Railway of Peru.

Eventually most alpaca wool reaches Arequipa, the principal market for this commodity. In the wool sheds there it is sorted and graded by Indian women who can tell at a moment, merely by the feel of a sample, into which one of the seven different classes it must be placed. Alpaca fleeces are cleaner than those of sheep, and for this reason only a small percentage of the wool is rejected. Peru is producing annually over 3,000 tons of alpaca wool, valued at more than \$1,500,000.

The warmth of their fleece makes it possible for alpacas to live under about the worst conditions of weather that the lofty Andes can offer. Like the llamas, they may wander, in the company of Andean geese and killdeer, on the highest and wettest puna where the ever-green grasses are often low and matted.

Here the temperature averages slightly above freezing all year round, and there is often frost on the ground and ice on the pools. Yet on a bright day during the November-to-May summer season, the thermometer may rise to 60° F., only to drop suddenly as clouds appear, bringing swift and violent storms of rain, hail, and snow.

#### Dainty Vicuña Once Near Extinction

In just such spots you may likewise expect to find the deerlike vicuña (*Lama vicugna*), the daintiest, most agile, and also the rarest of all the lamoids (page 644).

Common enough in pre-Columbian days when its ancestors were rigorously protected by excellent Inca conservation laws, the vicuña on various occasions since that time has almost been forced to join that legion of extinct animals. This has been due to the depredations of man upon it for its incomparable fleece.

There is no other wool in the world quite so fine, soft, or silky as the wool of the vicuña. In fact, vicuña fleece has the same position among wools as does chinchilla among furs.

An average hair of a vicuña, when scoured and carded, has a diameter of about five ten-thousandths of an inch. This is considerably finer than the best merino hair and twice as fine as the hair of the alpaca. Compared with it, a human hair appears like coarse wire.

Hair so fine is not for the common man—at least so thought the Incas, who reserved all vicuña fleeces and sheared wool for the royalty of their empire.

The availability of such wool perhaps accounts for the excellence and beauty of ancient



W. H. Hooper

### A Hair Sling Is the Peruvian Herdsman's Favorite Weapon

Hurling stones with this *wonda*, made of llama hair, Indians bring down game. Incas fought the Spaniards with similar slings. An Argentine variation is the *bolas*, a thong or cord weighted with balls of stone or iron, which gauchos throw to entangle the legs of running animals.

Peruvian textiles, which represent one of the greatest textile arts the world has ever known. Woolen threads are naturally not so fine as those of cotton or linen; yet in some pre-Incaic woolen goods probably from the Titicaca area there is a weft count of 190 to 240 threads to the inch.

The Quichua word *cumpi* embraces all articles woven from the wool of the vicuña, and in the days of the Incas fabrics destined for royalty—shawls, robes, carpets, and tapestries—were made from *cumpi*.

#### "Virgins of the Sun"

Women weavers, called Virgins of the Sun, were relied upon for the finest *cumpi*, which

was always woven from the wool of vicuña lambs. Such wool was sometimes mixed with the soft hair of the bat and the viscacha, a large chinchillalike rodent of the high puna. Articles woven of *cumpi* were finished on both sides, and so fine is their texture that they have the luster and feel of silk.

Vicuña wool was obtained at the same time as guanaco wool. In great drives held every few years, an expansive ring composed of as many as 50,000 Indian beaters surrounded the native haunts of the wild lamoids, which were then driven in numbers often as great as their pursuers to a spot where the animals could be shorn and a selected group slaughtered.

Today no such numbers of vicuñas exist in Peru, although it has been estimated that there now may be close to 50,000 in that country. The vicuña is again increasing because of protective legislation passed in 1940 by the Peruvian Government, prohibiting killing vicuñas or

trafficking in articles made from vicuña skin or wool.

The center of the vicuña population is in southern Peru in the Departments of Arequipa, Cuzco, and Puno, though in Bolivia and Chile small numbers also may be found.

Small bands of vicuñas are sometimes seen mingling with the llama and alpaca flocks that are frequent along the railroad or auto road running from Arequipa to Juliaca. Once in a blinding snowstorm on the height of land along this route I almost ran down six of these animals resting in the middle of the road. Their backs were covered with snow and they were peacefully waiting out the blizzard by chewing their cuds.



Vicuñas are common near the Andean Cordillera de Carabaya, especially near the hamlets of Crucero, Poto, and Cojata, which lie north of Lake Titicaca. Here on the lofty 15,000- to 16,000-foot pampas, vicuñas can really be studied; that is, if one can get enough oxygen in one's lungs to stagger about.

#### Usually Shy Vicuña Licks Author's Face

One day while driving across the pampas of Crucero I spotted a vicuña and alpaca grazing together. Vicuñas are usually shy, of men more than cars, and their slender limbs can get them quickly out of harm's way with deer-like agility. Hoping to get a picture, I drove as close as possible.

Even after I had stepped from the car with camera in hand, the vicuña surprisingly made no attempt to flee, even though I was barely fifty feet distant. I was amazed when both animals took a few steps toward me, and even more startled when they began walking in my direction.

The pair were apparently special pets of some alpaca herdsman, for they showed no fear. I soon had a problem of photography on my hands—one of keeping the curious pair at a proper focusing distance. Not content with nuzzling my clothes or licking my face, they also were insistent on exploring the shiny lens of the camera.

This was the first opportunity I had had to examine this prince of wool bearers at close range.

The head of the vicuña is large in proportion to the slender neck and delicate-looking body, and the ears are seldom held as erect as those of the other lamoids. The trim



Staff Photographer B. Anthony Stewart

#### Nomadic and Untamed Is the Guanaco

It has "the head of a camel, body of a deer, wool of a sheep, and neigh of a horse," says one naturalist. Like the vicuña, the guanaco is not domesticated. Indians eat its flesh; its short, coarse hair has no commercial value. It ranges from the highlands of Peru and Bolivia to sea level in Patagonia (page 643). Above, Director William M. Mann feeds a guanaco recently received at the National Zoological Park, Washington, D. C.

body is thoroughly covered with short tan wool, which is especially fine on the neck where it has the feel of bird's down (page 656).

On the flanks, toward the chest and belly, the wool is longer and lighter brown, almost cinnamon in color.

Hanging down nearly to the knees between the chest and forelegs are adorning locks of white hair, a color also found on the belly and inside regions of the thighs.

The quality of the white hair is inferior, and in the utilization of vicuña fleeces the skins are cut so as to separate the various parts on the basis of color and fineness. For



*Courtesy American Museum of Natural History*

#### Inca Trinkets Show Difference Between Llama (Top) and Alpaca

Explorations near Lake Titicaca, Peru, yielded these hollow silver figures, now in the American Museum of Natural History in New York. Incas were skilled in the metal arts, using gold, silver, copper, and lead. In prehistoric times the Peruvians discovered how to make bronze from copper and tin.

this reason, finely matched vicuña-skin articles vary in price.

One would think that the Inca civilization, which used llamas and alpacas so extensively, would have desired, more than anything else, to domesticate the vicuña. The Incas probably tried, and attempts have been made in the years since the Conquest.

Simón Bolívar, the Liberator, had the Peruvian Government provide a reward of one peso for each vicuña tamed, but to little avail, chiefly because these animals cannot live in small enclosures.

Most of the pet vicuñas seen in domestication have been caught as fawns or born in the fold. However, one Peruvian rancher has a flock of three hundred of these animals, many of which were caught by running them down in the open on horseback.

His vicuñas are sheared annually. With each animal yielding six to eight ounces of wool, the herd has a yearly production of something over 100 pounds—not great in volume but commanding the luxury price the rancher demands.

About 900 pounds of vicuña wool were exported by the Peruvian Government in 1941, and most of this was sold in New York City. In that metropolis a vicuña coat ranges in price from \$400 to \$1,100.

#### Loyal Even in Death

Each small flock of wild vicuñas that one sees on the puna consists of a group of females led by a single male, to whom the flock shows much loyalty and affection. According to hunters, if the male is killed it is easy to kill the whole group, for the females always linger near the body of their fallen leader, often sniffing at him as if attempting to urge him to join them.

On the other hand, if only a female is killed the rest of the flock, answering a peculiar warning cry of the male, always seek to escape at high speed.

Fawns are born into their cool highland home in the first months of the year, and after the second day they are able to run beside the mother. A single fawn is the normal rule, but twins sometimes appear.

Illegal hunting still goes on in many isolated sections of Peru, and for this reason fawns often are captured at the time the parent is killed.

Such vicuñas are kept as pets by the Indians, and like lambs they often become much attached to the family. Any lamoid fawn is a lovable creature, but there is nothing softer than a vicuña baby.

The lamoids, when angered, lower their ears to a horizontal position and spit at the object of their anger. Llamas, with a long period of domestication, are less likely to show this form of displeasure, but their wilder cousins, especially newly captured vicuñas, apparently have no qualms.

#### Paco-Vicuña Hybrid Produced

The Peruvian Government, much interested in increasing the quality of its alpaca flocks, has crossed alpacas with vicuñas. The cross, known as a paco-vicuña and shyer than the



Carl H. Hoff

#### While Oldsters Stand Guard, a Newborn Llama Tries Its Legs

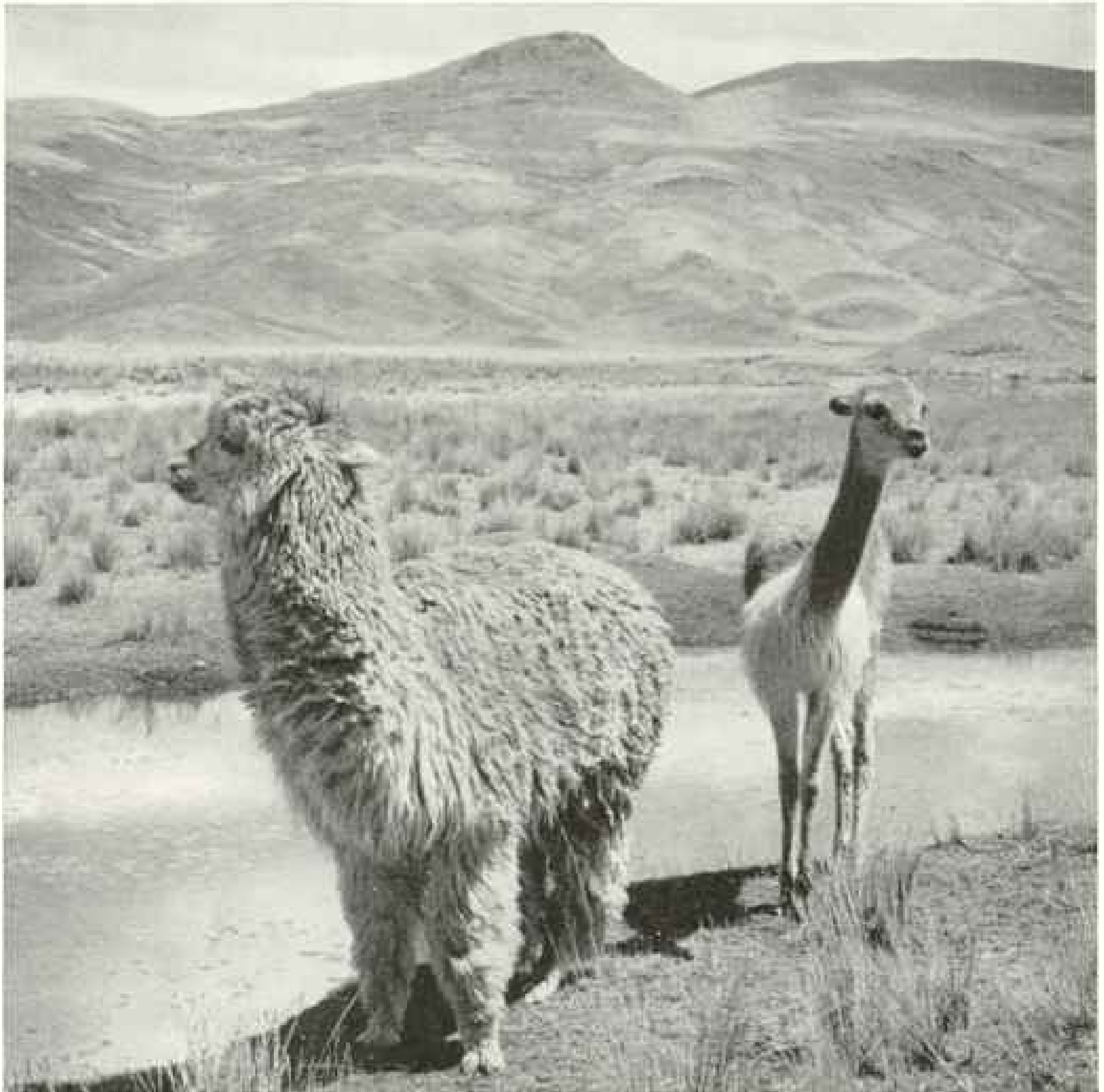
Wobbly now, it will soon travel surely on partially cleft hoofs over steep Andean trails. Adult llamas weigh about 200 pounds, roughly one-tenth the weight of their relatives, the Old World camels. Since they feed on herbage, the cost of maintaining a llama herd is practically nil.



George M. Drott

#### Too Large for Sheep, Too Small for Bears—What Are They?

Alpacas covered with wool six to eight inches long often prompt that question. Like llamas, guanacos, and vicuñas, they are members of the lamoid group, related to the camel. In wartime their wool made warm linings for flyers' jackets; in peacetime it is mixed with other fibers to make clothing (page 651).



W. H. Hodges

### Woolly Alpaca and Streamlined Vicuña Graze Beside a Peruvian Stream

Fibers from the alpaca are mixed with sheep's wool to make worsted and with mohair from Angora goats to produce fancy yarns. Rayon has largely replaced alpaca cloth as lining for men's suits, but during the war millions of pounds went into flying clothes. Incas reserved soft, warm vicuña wool for royalty. In contrast, llama fibers are coarse and are used mainly for native clothing.

alpaca, has a long, fine, silky wool which approaches that of the vicuña in quality but has in addition the quantity characteristics of the other parent.

Paco-vicuñas are very resistant to cold. They are taller than their vicuña parent, but so shy and wild that they often escape and join flocks of wild vicuñas.

#### Strategy of Adoption

The difficulty in effecting such crosses is that of getting the two types of animals to breed, but certain enthusiastic breeders have devised a method to accomplish this.

A newborn alpaca is killed and skinned. The skin is then placed for a few days upon a captured male vicuña fawn of the same age. Only in this way can the young vicuña be made acceptable to the alpaca foster mother, which presently accepts it as her own.

Such a vicuña, raised by an alpaca, will later mate with alpacas to sire paco-vicuñas.

Perhaps with the use of these or similar tactics, modern animal husbandmen will not only bring back to Peru the numbers of lamoids that once roamed the altiplano but will also develop a type superior to any known in the days of the Incas.



# São Tomé, the Chocolate Island

BY WILLIAM LEON SMYSER

THROUGH years of war, all Europe hungered for chocolate. As our armies marched into many countries the children and their elders, too, asked wistfully for a bar or even a bite.

All used unwittingly a variation of the old Aztec word *chocolatl*.

"Chocolat?" asked the French, hopefully.

"Cioccolata?" inquired the Italians in their staccato fashion.

The Danes and Norwegians asked for *sjokolade*, the Dutch for *chocolade*, and the Germans for *schokolade*. Even the Russians had almost the same word, *shokolad*, for the name of chocolate is as universal as the favor in which it is held.

During wartime, only a dribble of chocolate—most of which went to the military—trickled into a Europe largely cut off from tropical sources of raw materials.

Part of this trickle came through neutral Portugal from São Tomé, a Portuguese-owned island about as big as New York City off the West Coast of equatorial Africa. All shipments were made with British approval.

Except to increase its isolation, the war did not greatly change the pattern of life in "the chocolate island." Fewer boats stopped there, but the value of exports went up. In heavy demand were São Tomé's chocolate, normally marketed through London, its coffee, copra, and palm oil, its cinchona for quinine.

Mother Portugal was still at peace, and the island was much closer to European markets than were the Tropics of America or the Orient.

## "Jewel of the Portuguese Empire"

When I first saw São Tomé it was peacetime.

"Is there anyone here from Agua Izé?" we asked as our longboat bumped the pier.

No one answered. The letters announcing our visit to the plantation were still in the hold of the *Guiné*.

Seeing us at loose ends, the only white man in sight introduced himself.

"I am Senhor Humberto Gomes de Amorim, at your service." Then he turned to a little Negro who had sprung up behind him. "Suku, go get some boys to carry the gentlemen's luggage."

Suku's hard feet pounded on the planks.

"São Tomé is the jewel of the Portuguese Empire," Christian de Caters and I had heard before taking ship from Lisbon (map, page

659). Before World War I it held controlling interests in the cocoa market of the world. Then hard times came, because of the lack of hands.

Lack of hands! Suku's boys came running up. Some were in skirts, others wore castoff white trousers from which the glistening black torsos emerged like ebony. Amorim pointed to the luggage; there was a pushing and a scrambling and a cuffing, as each strove to secure the lightest piece.

When the scrimmage was over, the victor marched off proudly with my 20-ounce camera on his head; the runner-up carried Caters' binoculars. Each had taken just one piece to make his load.

## A Long Division of Labor

Caters and I stood in the shelter of the customs office and watched 15 burly Negroes carry off what five could have handled. Amorim warned us that so long as we stayed on the island we must never, at the risk of losing caste, perform any labor more strenuous than pulling up a chair for a lady.

With us behind them, our 15 porters padded down a smooth, paved street, past low, cool façades, French windows, and narrow balconies painted pink and green and lavender (page 663). Other Negroes passed us bearing on their heads big jars and bunches of bananas.

Since it was the hour of the siesta, we were alone with this soft shuffle of bare feet. Every tree stood in a pool of deep shadow. The hot land breeze smelled of spices. Heat quivered along our way, yet a cool breath welcomed us in the house.

Leading us through a warehouse and a counting room, Amorim showed us his quarters. Boxes of quinine were piled from floor to ceiling. His bed, standing proudly in one corner of a large parlor, occupied its own little house of wire netting, a small, free-standing mesh bungalow, complete with slamming screen door.

Life on the Equator, he said, could be made agreeable if one were ingenious. He clapped his hands for beer. No one drinks cocoa in this land where it grows.

We asked about transportation. There was a narrow-gauge railway running on this side of the island, up as far as the mountain wall which cut us off from the west. Usually, however, it carried freight only.

There were light schooners, too, which



William Lott Stewart

#### Babies on Their Backs, Cacao Workers Come to the Kitchen for Their Rations

After toil with the purplish cacao beans from which cocoa and chocolate are made, they are given a scientific diet to prevent beriberi, the dread disease that once caused a high death rate (page 680).



Atnes

#### Gaudy Clothes Get a Mauling in Open-air Laundries of São Tomé

While the washerwomen rub and pound the clothing on a cement wall, the baby sleeps contentedly in a shawl slung around the mother's waist.

circumnavigated São Tomé, the whole distance of fourscore miles, between sunrise and sunset. There were mules to ride. But we would probably prefer the taxi where possible.

Every white man on this equatorial island, by his exquisite courtesy, made me feel that time had turned back and that I was visiting, in all its charm and romance, the Old South of the United States. Even the investigators who came to see São Tomé years ago to search into the alleged practice of slavery were obliged to accept the hospitality of the planters whose business they were examining.

The real life of São Tomé centers about the planters on their large tropical plantations. São Tomé, the capital, harbor, and unique municipality, is simply a grid where four roads cross (pages 661, 663). From the street it looks like an overdecorated stage set, its artifice revealed by too much light. This house had red walls and an ocher roof. That house, gun metal, had a green gate. Most striking of all, another combined under a black roof gray-green shutters and ultramarine walls.

At a fountain, girls were filling their jugs, while a native policeman, one of his feet in a huge white bandage, pinched them playfully.

We passed washerwomen pounding gaudy dresses. Street merchants were daydreaming over their round piles of bread.

Just beyond town the road was being repaired. In lieu of a steam roller, the contractor had hitched a big concrete lawn leveler to a mule team. Following in its wake, a gang of singing natives tamped down the edges.

It took but a moment to pass the broken country and irregular patches of the small landowners. We plunged into a fragrant forest of coconut, oil palms, vanilla vines, kola, cinnamon, banana, coffee, cocoa, and tall shade trees.

Almost as round and spicy as a pie, São Tomé is cut into triangular pieces by vast plantations which start at the beach and mount, ever narrowing, to the volcanic summits of the center.

#### A Rib of the Cameroons

The twenty-odd peaks belong with the mountains of the Cameroons. Instead of stopping at the coast of Africa, the range extends out through the Gulf of Guinea in a series of erupted massifs, thrown up out of 1,500 fathoms, of which Fernando Poo comes first, then Príncipe, São Tomé, with its tiny satellite, Ilheu das Rôlas, and Annobón.

Ilheu das Rôlas is cut off from São Tomé by a troubled sea channel a mile across.

About halfway down the eastern coast lies Agua Izé. It takes its name from the little



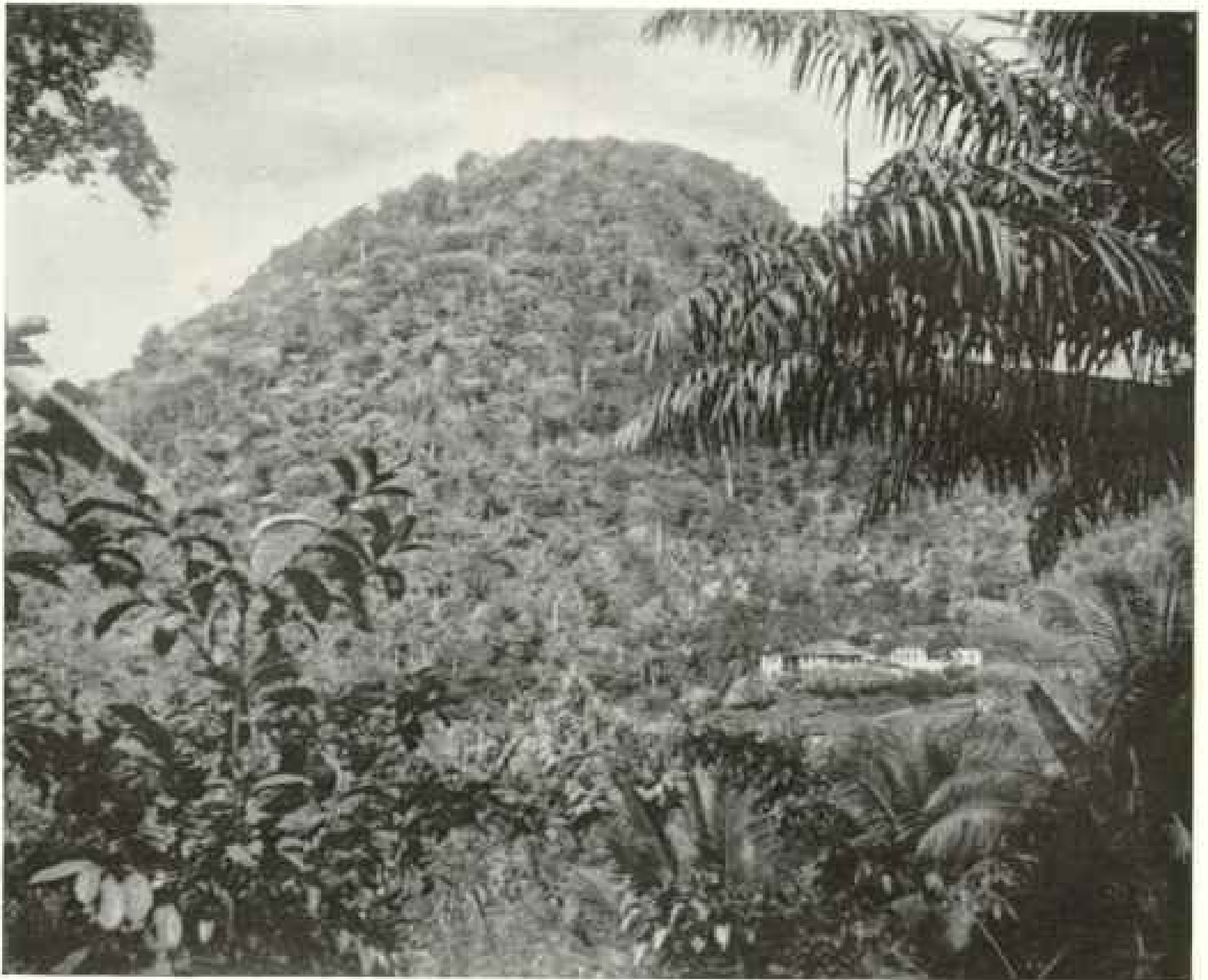
#### Mountains Rising from Sea Form São Tomé

Continuing from the African coast through the Gulf of Guinea, the Cameroons mountains thrust up this island and its sisters from a depth of 9,000 feet.

river which rushes down behind the main plantation buildings into a palm-lined estuary where the cacao fleet lies.

When the secrets of the Aztec *cacahuatl* or *chocolatl* were brought to Europe by Spanish explorers, Elizabethan lips promptly deformed "cacahua" into "cocoa." "Cocoa," in Africa, means only a drink. "Cacao" refers to the tree and to the bean in the sack before it is exported. I follow this practice of the "cacao" country.

We found rooms already prepared. The director of the plantation, who had not been home to Portugal for 15 years, was as brown and dry as his cacao beans. He had many contacts with civilization, his books, his radio, his phonograph, and his car. No man can lose



Agricult. Genl. Ser. Colônia

### Lush Forests Climb the Mountains of São Tomé

In a small clearing on the shoulder of the peak, buildings of a plantation have been erected. The wild kapok trees and other less valuable timber are cut down and cacao and coffee shrubs take their places, but care is taken that enough tall trees remain to shade the young plants (page 669).

interest in life when he bosses 2,100 men at work on 15,000 acres.

A few of the workers lived behind the residence, and their attractive little concrete houses, painted white with green gables and shutters, stood in rank and file ranging back to where the cacao trees and the mountains abruptly began (page 662).

In front of the residence lay a formal garden, stocked with exotic blossoms which we grow in hothouses at home. Tall palms grew along the sea wall. The voice of a fountain playing among them was drowned by that of the surf.

Around to the right the sea came into the land, forming a little basin where one could swim without fear of sharks, and a harbor sheltering four green schooners.

The meals were deliciously and fearfully concocted. Plantation cooks, like the Mexicans, shake burning peppers into everything. Ordinary water is useless against *malagueta*,

the local pepper; it seems actually to spread the fire instead of quenching it.

"What is this stuff?" I gasped, my mouth open in agony and my throat scorching.

The table roared with joy. "It will do you good," laughed the director. "You can't catch fever while it flames inside you."

"Water," I pleaded, "much water!" I drained my own glass, Caters' glass, and the director's glass to no avail. "Take this," said my host, and offered me some wine.

A rich glow spread through me, countering the *malagueta* irritation. I drank no more water at Agua Izé. It was no adequate match for the cuisine.

This tropical meal, inspired certainly by the natives, is based on a stew of chicken and palm oil, with spices, okra, onions, tomatoes, pimento, and pepper to give it flavor. It calls for a throat and a stomach of cast iron.

In São Tomé riches grow from the soil as if Midas had touched it. The benevolent rainfall





William Linn Burges

#### In a Pleasant Park near the Harbor Stands the Governor's Palace

He does not live here the year round, for he has a more comfortable home in the hills at an altitude some 2,000 feet higher. In the mountain mansion he entertained the author and his companion.

amounts yearly to an average of about 96 inches, while in some parts 394 inches have been recorded. The fructifying sun knocks you over like a tenpin if you run about bare-headed. A stroll through the cacao is fatiguing. An hour's walk in the glare of an open road is dangerous. White people move about by muleback, automobile, or narrow gauge.

#### A Trip to the Gold Peaks

One morning we donned cork helmets and warm overcoats and set out by rail for a trip to the peaks, which rise to more than 6,500 feet. Mules pulled us, since locomotives were too heavy to make the grade (page 664).

"Guard your heads!" called out the director. "You advance here at your own peril." Ripe breadfruits were thudding to earth like bombs, squashing to a pulp as they plopped down about us. The fallen leaves, nearly a foot across, formed a carpet.

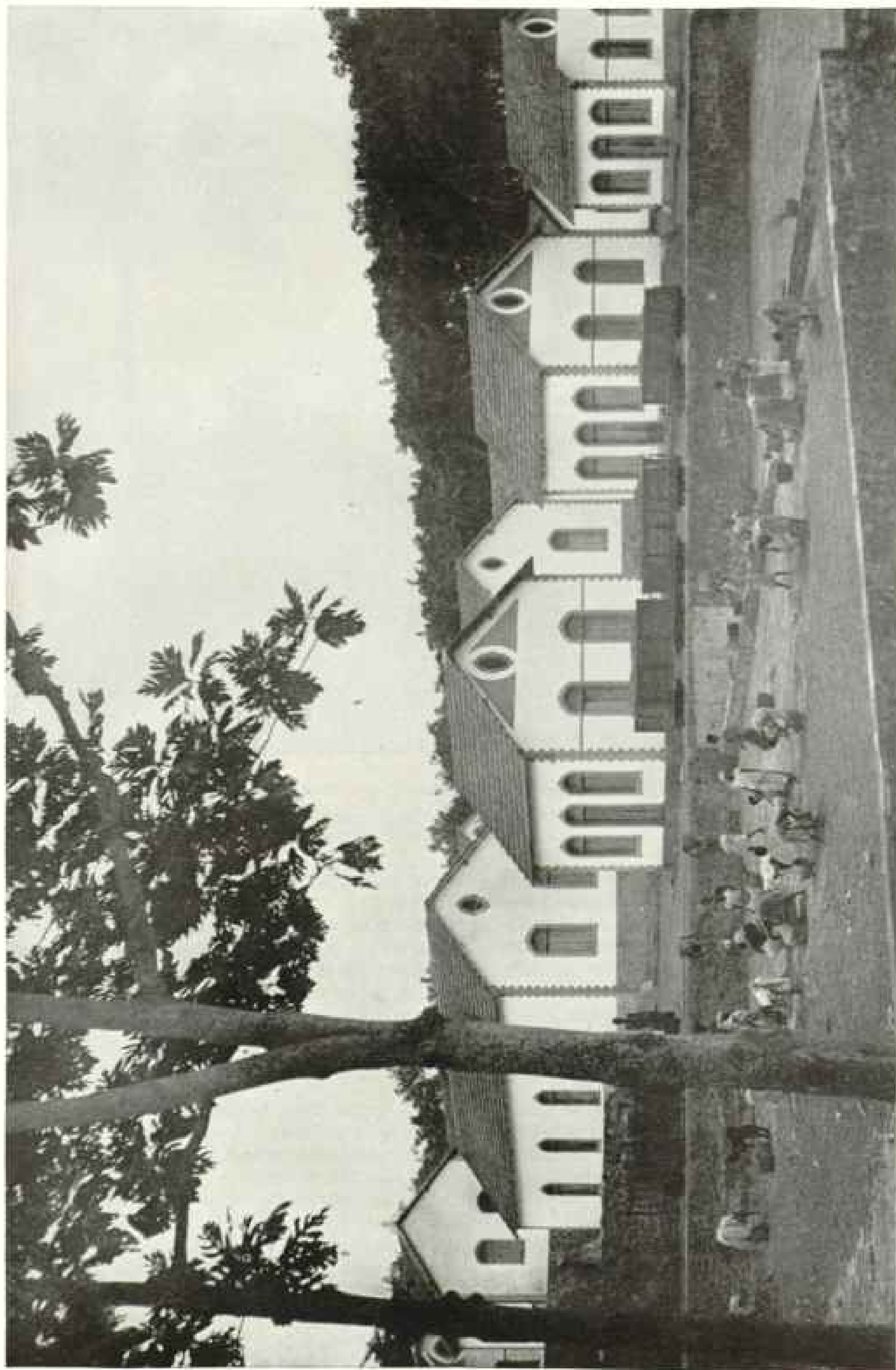
Our way led upward along one side of a valley. Dark rubber trees hung above us; their

roots gripping the slopes, their trunks scarred obliquely from numerous tappings. Below us grew green kapok trees, acacias, and pawpaws. Young cacao, light green, bronze, and scarlet, pushed up its fringed head.

Tilted palms crisscrossed each other crazily, their trunks overgrown with parasitic ferns and marked by knives of workmen who had climbed them for oil nuts and the fermentable juices.

Great kapok trees, struggling to rise higher above their neighbors, stood on a large flowing buttressed base which bulged out of the ground like the muscles in a wrestler's neck. They were thin walls of soft fibrous wood which appeared to be half trunk, half root, rising sometimes ten feet above the earth and whipping away through the forest like snakes to run for 15 or 20 yards before finally diving underground.

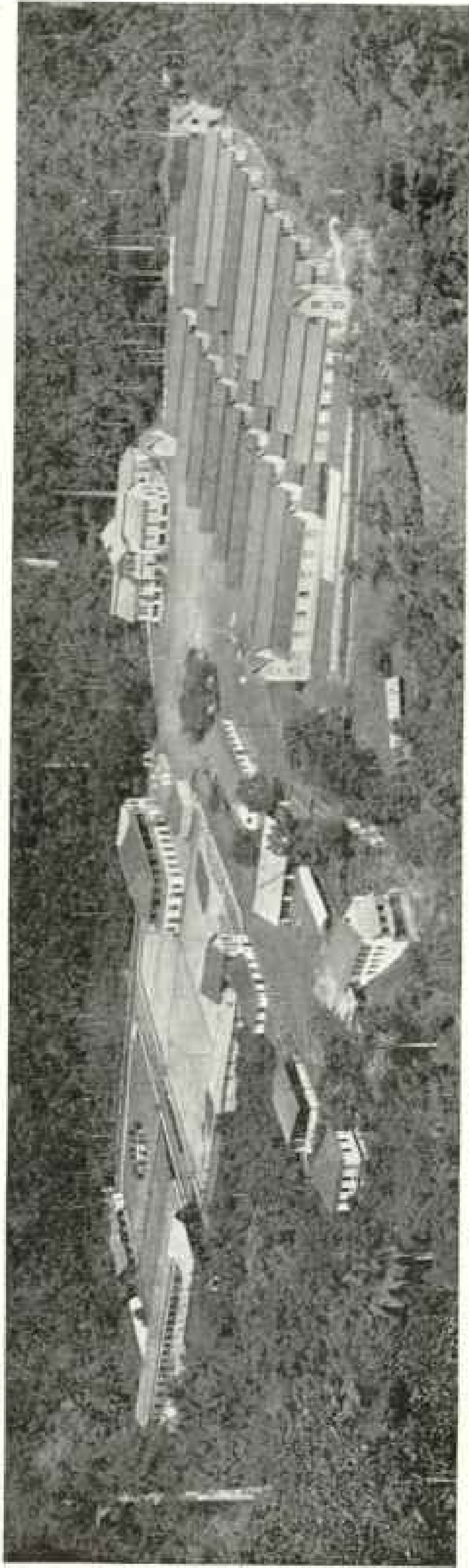
Such trees were growing here when Portuguese navigators first visited the island on the feast day of St. Thomas, 1470.



Cacao Beans Are Spread in Thin Layers and Dried on Outdoor Cement Floors.

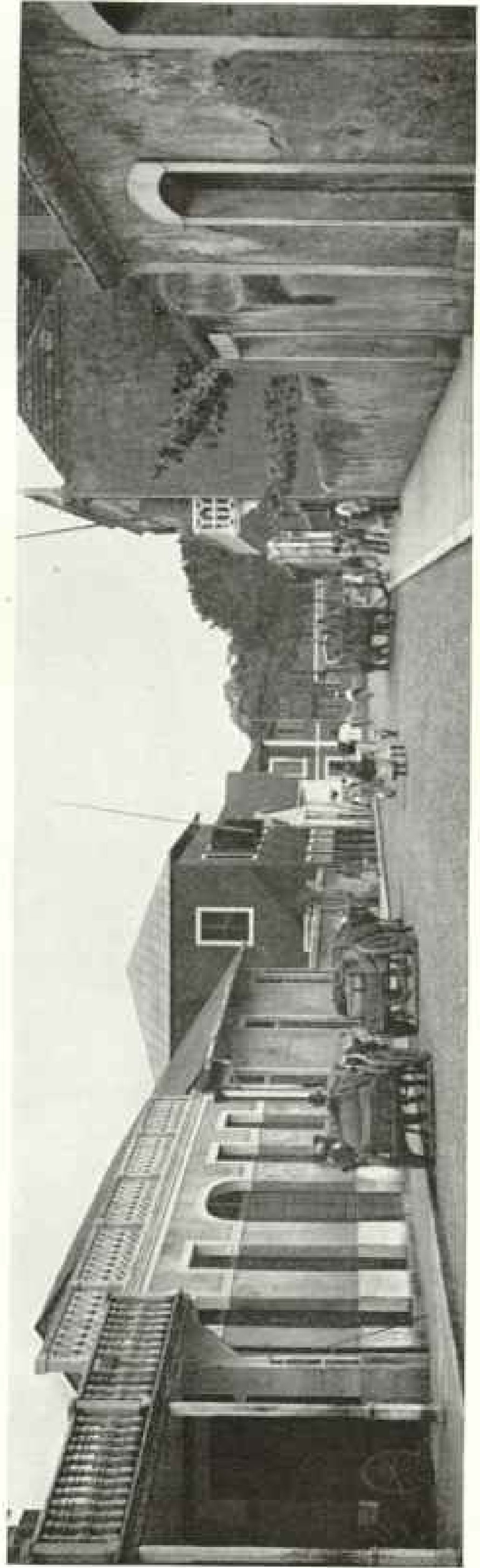
Here on the Agua Izé plantation, workers are hurrying to scoop up a lot that is ready and to load a train, for rain is threatening. The workers' houses in the background are typical. Built with an eye to health and sanitation, they are easy to keep clean (pages 663, 677).

© Christian de Castro

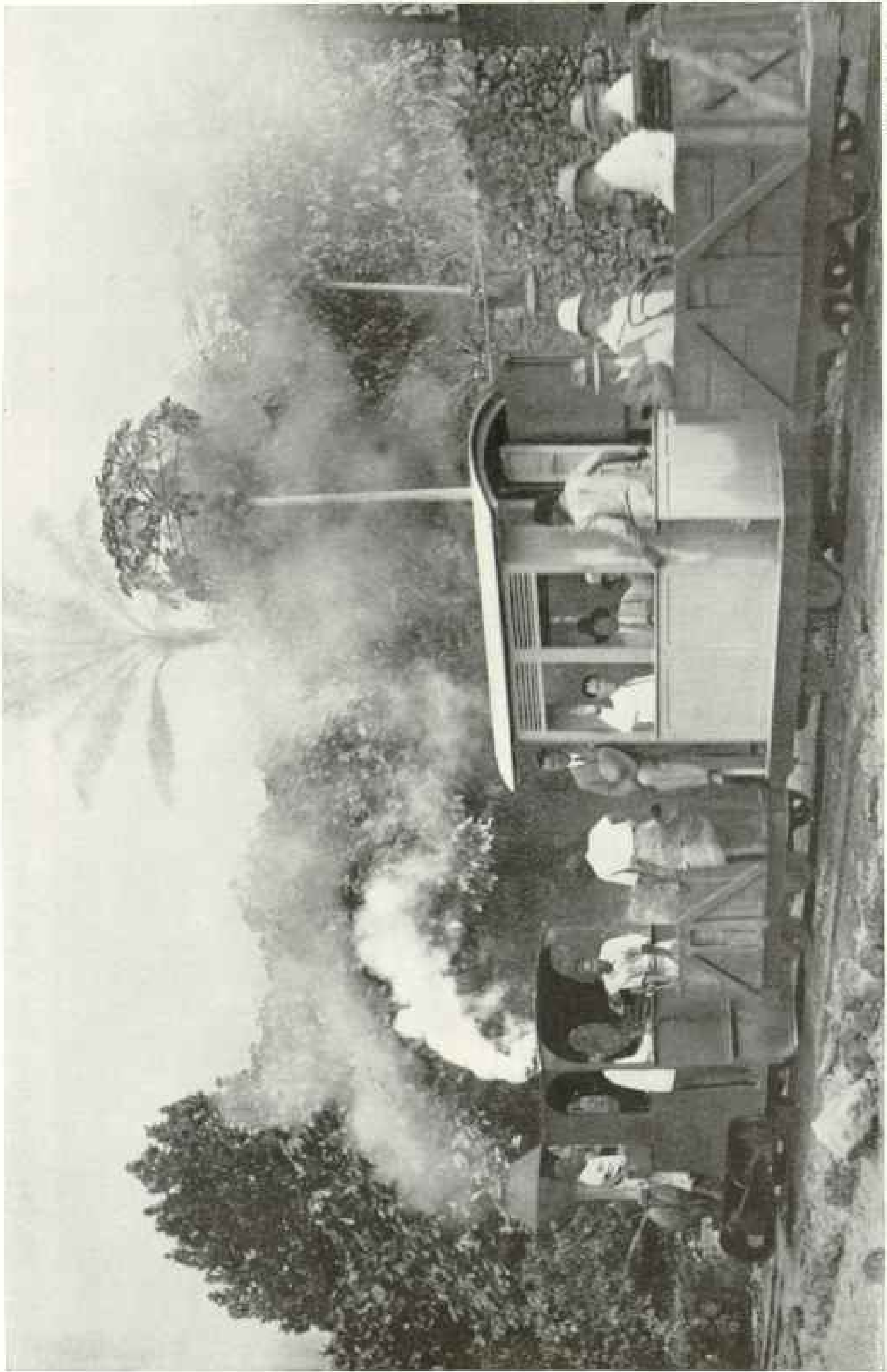


**Like an Island in a Leafy Sea Is Boa Entrada; Workmen's Quarters on the Right**

The house of the administrator is in the center, the hospital farther back. To the left is a space for drying cacao beans, which are spread on concrete platforms or on big wooden trays (pages 662, 665, 676).



**Shadeless Main Street in São Tomé City Presents a Sharp Contrast to the Surrounding Jungle (page 657)**

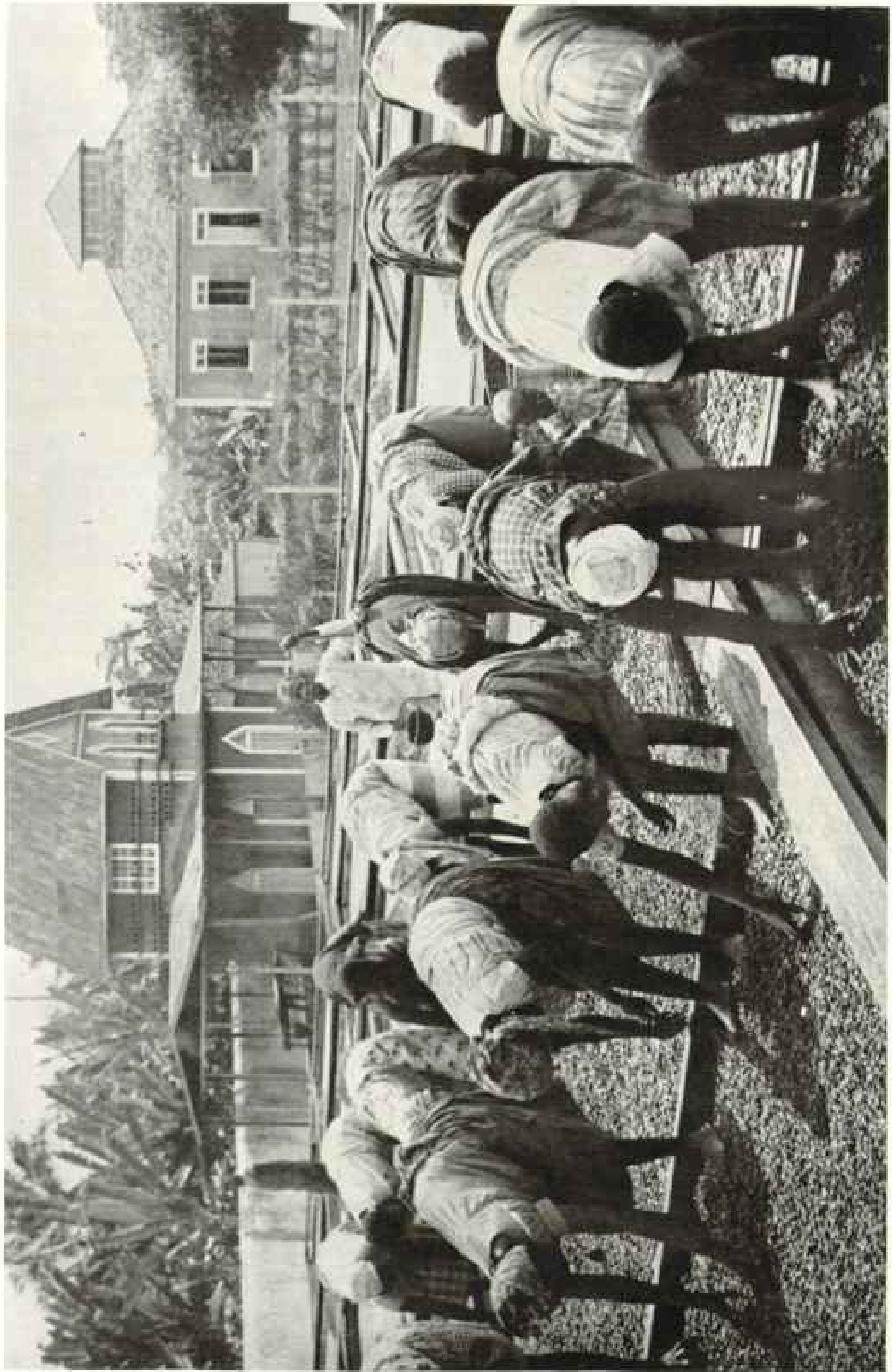


William Easton

**To Explore the Jungle, Visitors Ride a Narrow-gauge Train**

It starts off powered by a puffing engine, but in some far stretches of the trip it is drawn by mules. On long declines it merely coasts (page 666). The covered coach accommodates a few passengers, but if the group is large the extras sit on stools in the cicito cars.





Chocolate from Chocolates de Cacao

**Chocolate Milk Shakes and Fudge Sundae—the Cacao Beans Must Be Turned by Hand**

With back-breaking labor, these women at Boa Entrada plantation turn over the layers of beans to ensure even drying (page 676).

"Collision, collision, head-on collision!" shouted workmen on the track ahead of us.

Rolling free under the impetus of gravity, a laden train was pounding down upon us from the higher station. Its crew was frantically trying to apply the brakes. Not trusting them, we tumbled off our seats into the ferns. A cut of the whip drove our mules to the side and out of danger. Black shoulders derailed our light cab.

The down train that rumbled harmlessly past us was loaded high with bananas. We had already attained 2,000 feet above the zone where cacao flourishes.

São Tomé is a volcanic island. As we climbed, the structural scheme of the volcano could be studied, rising in round curves to the cone, where a lake, we were told, now occupies the crater. Along the railroad cuts we could see how the porous lava, easily broken and decayed, was split by roots and infested with life. If the small island had not been volcanic, it might have remained barren, fit only for a guano deposit or a coaling station.

Lively streams now tumbled past us. Sources of future electricity, they have inspired the islanders to study projects for developing energy.

Banana plants gave place reluctantly to altitude. They grew from every cleft and cranny, sticking to the rocks like goats. As darkness fell, their long pallid leaves, vaguely waving like giant wings above the abyss, gave a disquieting impression of lost souls hovering on the brink.

A quarrel broke out between the old mule driver and his boys. He threatened to punish them by sending them back with the team alone in the dark. That settled it. The dense jungle below us seemed full of jinn and goblins.

#### Robin Hoods of the Jungle

"They're not afraid of ghosts or such things," the manager said. "They've been hearing bloodcurdling tales of the *fugitarios*."

"Fugitarios? Who are they?"

"Runaways from justice. Plantation workers who have jumped their contracts. They take to the mountains."

The *fugitarios* were at their best in the old days of slavery, when in some years one slave in 24 would take to the hills and any poor devil might flee from the cacao to join them if he dared.

They still have their fastnesses in the mountains and live by their wits; yet they take care not to drive their depredations too far. Nowadays, planters see little difference between them and the robust, independent *Angolares*,

who have lived free and untrammelled on the island for centuries (page 680).

The *Angolares* refuse to accept regular employment and set a bad example of primitive contentment and laziness to those natives who work under contract.

They are descendants from the castaways of a slave ship from Angola which was wrecked off the Canal das Rólas about the middle of the 16th century. The captain and his crew were never heard of again.

Their human cargo, providentially released, established a black colony at the southern end of the island and gave as wide a berth as possible to São Tomé town, which was already flourishing. They formed a dangerous state within the state, freebooting and waging guerilla warfare.

In 1574 they attacked and destroyed São Tomé itself, burned the sugar mills, and captured many women. Expeditions sent against them by way of the mountains fell into ambushes. Many colonists migrated to Brazil, where Portugal was making surer strides in colonization.

São Tomé degenerated. It was captured by French pirates in 1567, and by the Dutch in 1600 and 1641. Each time, as soon as the foreigners had left, the *Angolares* rose.

One leader was the notorious Amador, a black ruler in the style of Haiti's Emperor Dessalines.\* For more than a hundred years São Tomé was terrorized.

#### Sempaio Bought a White Elephant

Punitive expeditions at last drove the blacks to the south where they had originally settled; yet nothing could dislodge them. Finally, one courageous man was able to meet and master them on their own ground.

Mateus Sempaio bought most of the region occupied by the *Angolares*. On the Angra (bay) de São João fellow adventurers built a stout blockhouse and started to open up roads through the rain forest and to make plantations. When Sempaio met individual *Angolares*, he offered them work and gave them presents. He turned most of them into productive citizens and restored to São Tomé one of the richest parts of its inheritance.

Even today, not all *Angolares* have been brought into the white man's economic scheme. When they are paid enough, they engage to grub land by piecework, but they refuse to enter long-period contracts.

\* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Bare Feet and Buttos of Haiti," by Oliver P. Newman, September, 1944; "Haitian Vignettes," by Capt. John Houston Craige, October, 1934; and "Haiti, the Home of Twin Republics," by Sir Harry Johnston, December, 1920.



Christian de Carore

#### After the Fermented Cacao Beans Are Dry, They Are Cleaned on Sieves

Native women do this work and pack the sacks for shipment. For the heavier task of breaking open the pods in the forest, men are employed.

Up on the edge of the primeval jungle a battle is being waged.

The cacao tree is no match for the fiercely growing wild things. It must be protected by higher trees, for it cannot thrive when exposed to too strong a sun; yet it dies like any commoner plant when some robber branch comes down to throw a blanket of suffocating leaves across it.

After our excursion to the peaks, we coasted down the flank of our volcano in the dark. Bats fluttered past our faces. Owls hooted. Brakes squealed. No fugitarios opposed our passage; far more dangerous was the narrow-gauge line down which we catapulted. It had been built without benefit of professional engineering.

"We go slowly at the turnings," expounded our host, "and we don't always jump the track."

We were eager to get into the cacao. We went first to the sheds where old men and invalids, the infirm who could serve no useful purpose in the field, were weaving deep, narrow baskets of tough palm-leaf strips. With sharp knives they split the leaves and hacked them into proper lengths. Then deftly, in a few minutes, they fashioned their baskets, the "papoose" cases which were to carry young

cacao trees out into the world (page 679).

Young cacao plants are also often reared in sections of bamboo. After transplanting, the vegetable flowerpot rots away, and by the time the sapling is ready to drive down its long, strong central taproot, its protective casing has been absorbed back into the ground.

#### A Gift of the Aztecs

The young tree thrusts deep into the soil for nourishment, penetrating friable volcanic soil to a depth of seven or eight feet. The potash and lime of decomposed lava and tufa provide just the food it craves. For this reason, São Tomé has adopted the Aztec plant, offering it a hospitality like that of its New World home. It was introduced, first as an ornamental plant, from Brazil in 1822.

There are over three million cacao trees on Agua Izé alone. Some of the trees on the estate have been bearing for more than 40 years and now spread out from gnarled old bases to cover more ground than an apple tree. Most of them, however, are kept in shape; suckers are cut away, and here and there experimental prunings are attempted.

Although it bears all the time, one tree yields only about two pounds of dry cured cacao bean a year. This amounts in the end



William Leon Sawyer

#### When the Forest Is Cleaned Up, Cacao Saplings Can Be Transplanted

This hillside has been prepared for the setting out of young trees which have been growing in handwoven basket pots (page 679). They do much better under scientific treatment than in the wild state.

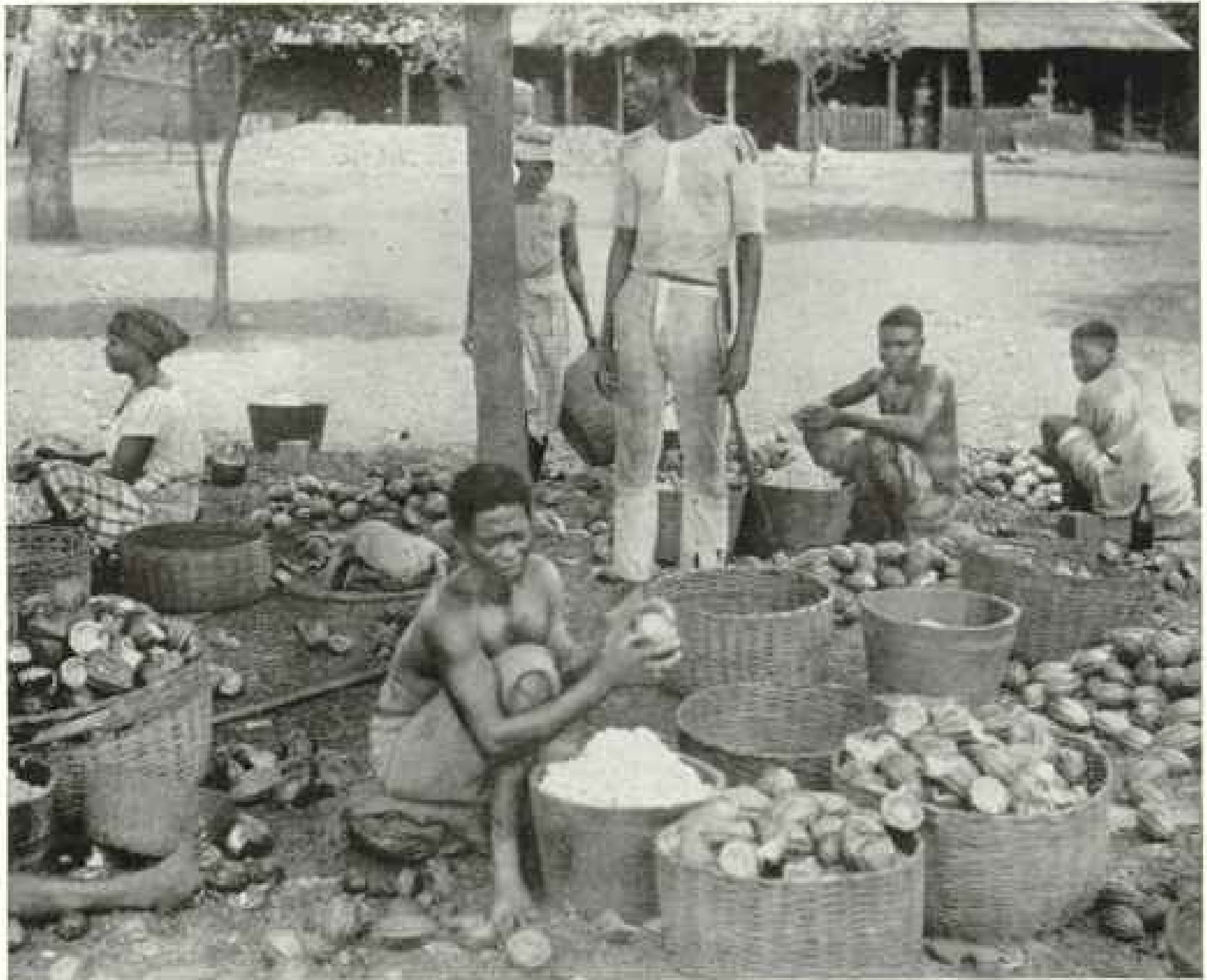


Christian de Casters

#### Far Inland the Visitor Finds a "Shipyard"

This dugout, intended for use on small streams and along the coast, has been hacked out of a big kapok log with homemade tools. The wood is soft and rather light. In their crude boats the natives venture out into the bay, carrying fruit and hand-made articles such as tortoise-shell combs for sale to ship passengers.





Christiano de Calery

### Native Workers Take the Pulp from Cacao Pods

Buried in a mauve-white sticky substance, from which can be made a savory applelike jelly, are the beans. The fruit is grooved like a hand grenade, with outer skin so thick that machetes are used to cut it open after it falls from the trees. Pulp and beans are carried in baskets to the fermenting sheds. The fermented beans are then dried in the sun or in a hot-air dryer (pages 662, 665, 676).

to about one and a half pounds of milled and refined manufacturer's nib, or less than one pound of powdered cocoa. It takes more than 700 million trees to supply the world demand.

In Trinidad the British usually set out their trees in parallel rows. But in São Tomé plantations are bits of cleared forest, where the underbrush has been cut out and most of the lesser trees are cacao.

#### The Pirates' Cutlass Aids Agriculture

As we moved about, it dawned on us that every tree was separated about five yards from its nearest neighbor. Every so often, perhaps at intervals of 20 yards, there stood a taller tree. Frequently it was one belonging to the species *Erythrina* or *Albizzia*. These are leguminous trees, which give nitrogen to the soil and also yield shade for the cacao trees.

Workmen were busy "cutlassing" the undergrowth, hewing away with broad swords and

machetes as if the weeds were pirates. Other workmen were setting out alien shrubs and plants beside the young cacao.

When the young trees are taken out in their bamboo pots and placed in the holes dug for them as their permanent homes (page 668), they are often given the protection of manioc shrubs, peppers, or bananas.

Since crude tapioca and the products of these other plants form the chief food for their workers, the estates are able to feed their laborers with home-grown crops while waiting for the younger trees to yield.

Cacao flowers are best found by hunting for stray pods. They are waxlike and inconspicuous, lost in a surge of mosses and in the green and sorrel and reddish lichens which grow all over the cacao's russet-gray bark.

They come out all up and down the trunk and out along every limb, for Nature is perpetually renewing itself on the Equator.



Photograph from Christian de Castro

#### Cacao Workers from Mozambique "Double in Brass" on Boa Entrada

To honor visitors, the plantation musicians play lively airs (page 679). The busy blowers are clad in khaki, with pale-green bands around their caps.



William Lam Boyser

#### For Ill and Weary Workers the Administrator Provides Comfort

On São Tomé every large plantation has a hospital. With many workers laboring in the cacao forests, thousands of dollars are spent to safeguard health (pages 663 and 678-9).

When new pods are forming, flowers are sure to be still blooming.

A short distance from the freshly adventuring color and fruit, half-grown and full-grown pods will be hanging, too, some green, some coppery, some bronzed, some almost canary yellow, some blood red.

The cacao tree is essentially a thing of color. Its young leaves are as gaily red as a gum tree in the autumn, and it is always dressing itself anew, always pushing out a tender flashing scarlet ornament somewhere among its foliage. Yet it never bursts into a bouquet of bloom.

The full cacao pod, with its burden of 50 or 60 swollen seeds embedded in luscious pulp, weighs several pounds and would break any ordinary twig off short before ripening. Like the coconut, cacao has been able to survive in the struggle of evolution only by bringing its fruits in close to the parent stalk.

To speed the work of Nature, men cut down the pods as they appear to ripen. We followed such harvesters, armed with cutlasses or with "fool-proof" Agostini pickers, which, even in such inexpert hands as ours, cut the pod stem without injury to the tree. The Agostini blade is sheathed like a safety razor and cannot leave on the bark a scar or a wound which might later encourage an attack of canker.

We passed hours in the sickly-sweet atmosphere of the dumps, watching girls split the pods open with a sharp, deft blow of the ubiquitous machete (page 669).

Every day is harvest day in cacao country. Pods are ripening and being plucked and broken all the time. That is why there are no vintage festivals, no seasonal barn dances.



William Leon Smever

#### Supervising a Huge Plantation Calls for Long Days in the Saddle

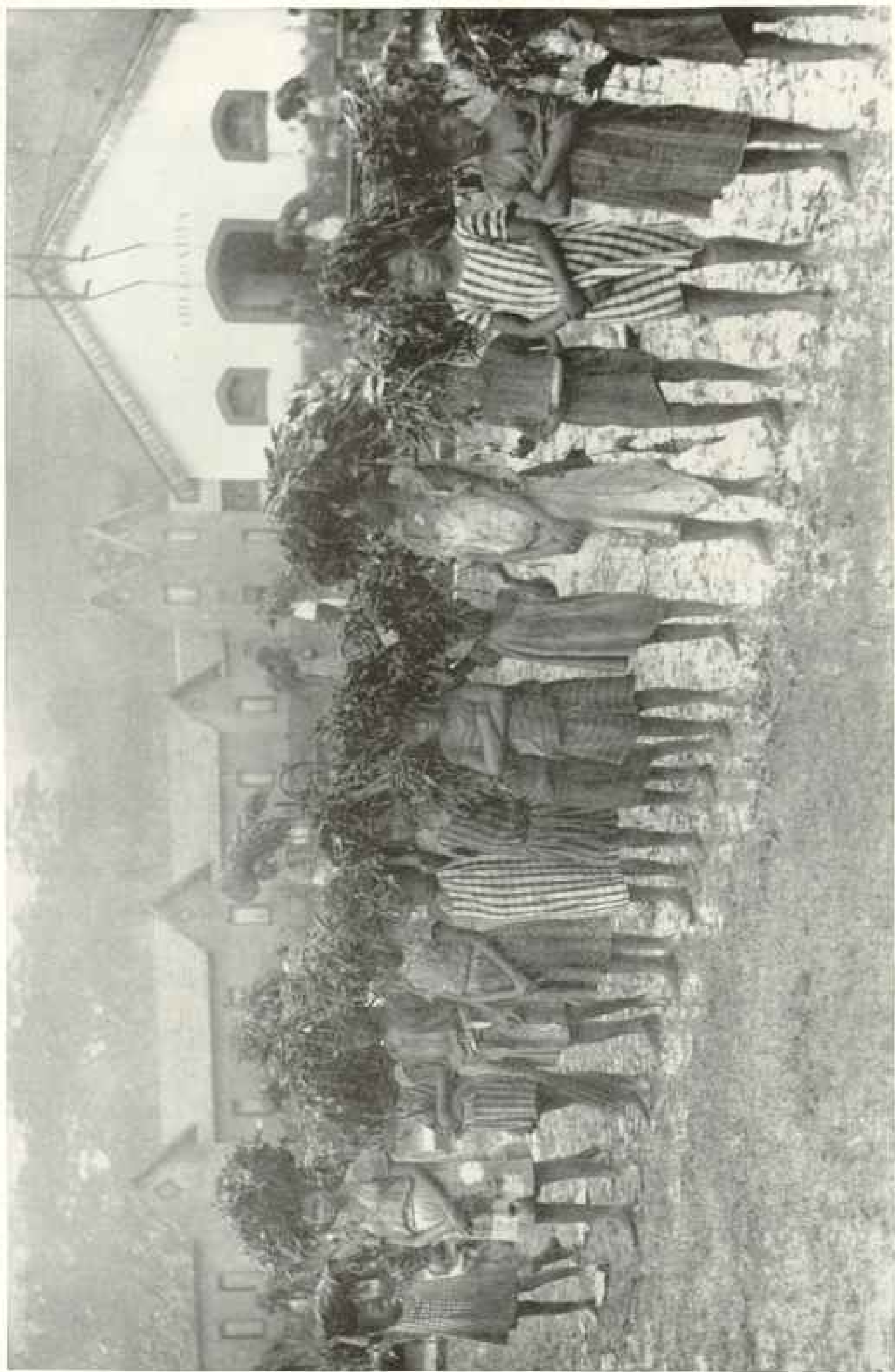
Master of the vast Boa Entrada estate, the administrator lived in almost feudal grandeur, but took a keen personal interest in his employees. On trips around the plantation he rode a mule, for horses cannot endure the humid heat.

But the workers on the great plantations get together once a week and dance the *batuque*.

#### Dancing the Batuque

On evenings when the natives danced, Caters and I went back to the flat concrete drying field where the workers congregated. The open space embraced nearly three acres. The moon, directly overhead, poured down its light upon a mob of milling, howling, chanting Negroes, who pounded drums and beat their feet upon the ground until no buffalo stampede could have been more deafening.

Enthusiastic musicians made orchestral noises, some on flat boards and pieces of tin, some on tom-toms, some on bamboo hollowed out and slit across so that when one piece was



© Charles de Camille

**Even the Native Children Have Their Evening Chores after a Day in the Forest**

Like their elders, they are required to carry a contribution into the settlement at the close of each day. These youngsters balance bundles of fodder for cattle and goats.

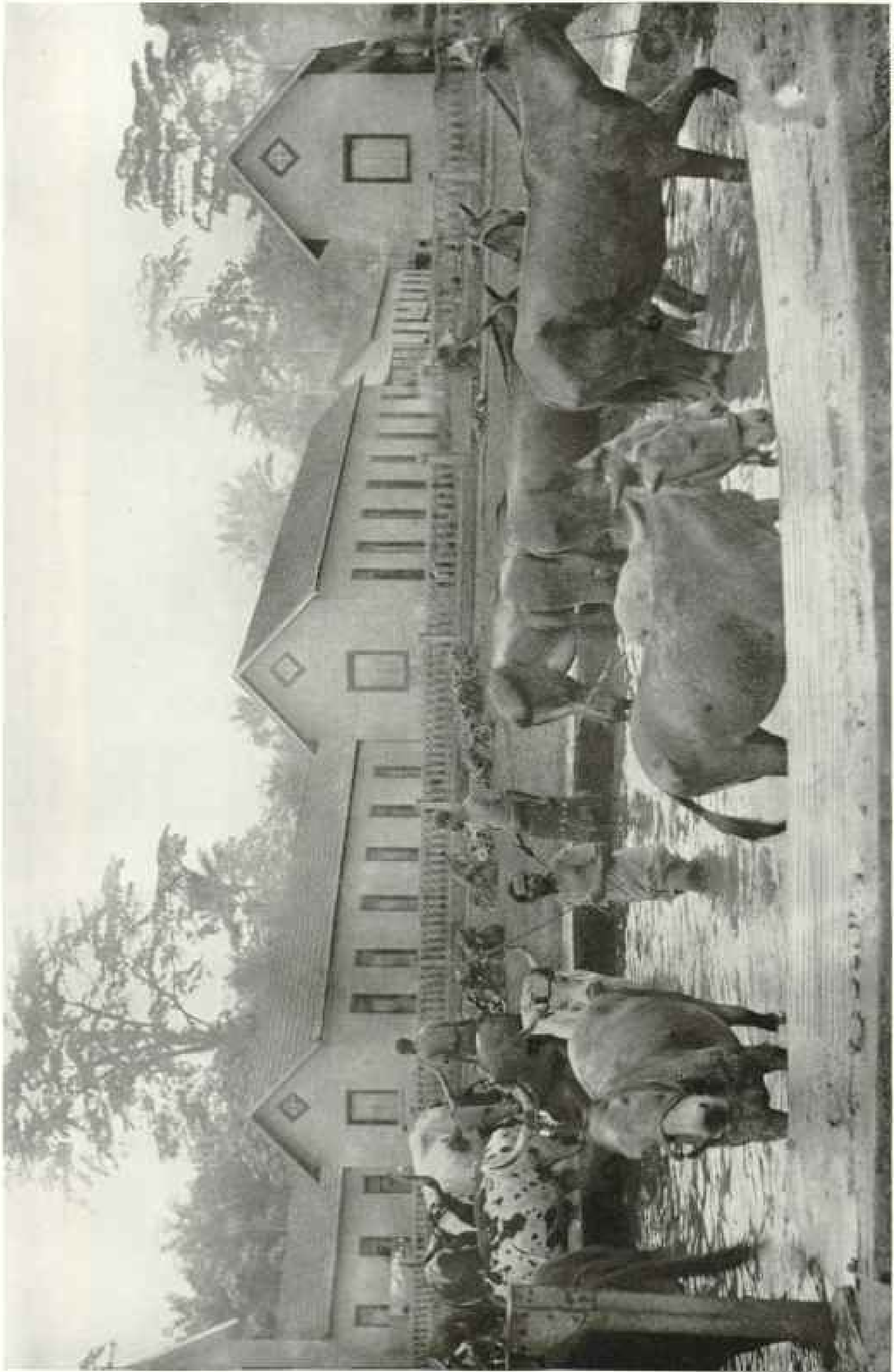




Curitiba de Cuba

**Correct Style for Marketing in São Tomé Calls for Bright Colors**

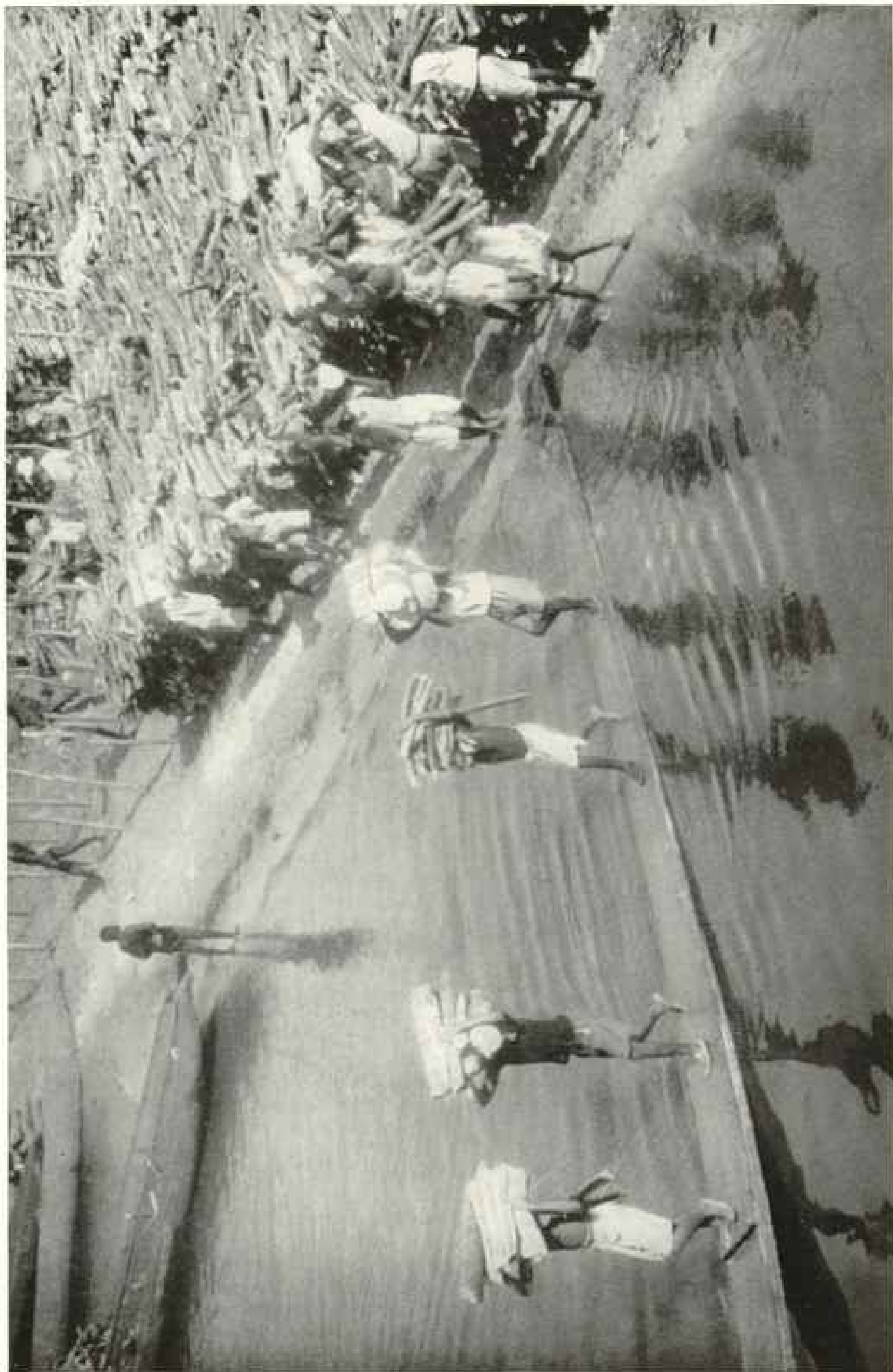
Striped shawls and conical hats are favorites with the native women. They all wear mitered hats and no shoes. The "Chocolate Island" in the Gulf of Guinea, off the coast of West Africa, has a hot, steamy climate.



© Eberstadt de Calvert

**For the Comfort of Livestock on Boa Entrada a Wading Pool Has Been Constructed**

The water comes from a fall which operates machinery in the tool house. In the steamy-hot animals are eager for a cooling bath. The climate here is too hot for horses, and mules are the only workable draft beasts. Cattle, of which there are a few, are of Zebu bred crossed with European or Indian stock.



Coal from Three Lungs

### Fuel for Wood-burning Steamers Is Back-packed to the Shore and Carried Aboard by Natives

Here coal is virtually unobtainable, and the coastal freighters which bring the cargo from plantations to ocean-going steamers have to rely on logs cut from the *toropota*. Loads are never heavy, for the climate is debilitating.

rubbed up and down rapidly along the other a sort of raucous rattling sound resulted. One great drum had been hollowed out of a single block of wood.

During a lull in the tom-tom beating, I examined the drumsticks. The heavy-beating knobs were made of crude forest rubber, black and resilient. Grasped by the short, stout handle, they swung easily and came down with a satisfying thud against the hollowed drum.

When the drums were beaten in the right rhythm, the dancers did a sort of symbolic shimmy. Three men jerked out and wriggled across a beaten space toward three women who retreated with side wiggles before them, then gave place to three other women who used other wiggles and pacings and gestures to push the men back to their side.

The children danced stripped, or in dresses like nightgowns, which clung tight to their shoulders and loose to their little flat hips and knees. They followed a sort of Pied Piper who, clad only in a shirt fastened round his middle like a loincloth, his black body dripping, his white teeth gleaming, gave a whole army of infants his example in shaking shoulders and flapping hands and wagging from side to side.

Suddenly there was a little burst of bells, and a medicine man, nude save for a wisp of straw around the hips, began dancing to the tom-tom, tin-strip, and wooden-board orchestra. He was leaping up and down, turning in the air, coming down and stooping, squatting, bowing, then leaping up again.

When he had done this about 20 times, he varied the routine by going all about in a big circle, spinning upon himself at every step, with the orchestra in the middle of his circle like a noisy sun encompassed by a black revolving planet.

After repeating his leaping and stooping number, he reached a climax. He shuffled backward and forward, bent almost double, while he quivered his wisp of straw from right to left and back again so swiftly that one had an impression only of gray grasses. We lost sight of the little bell hung where his tail would have been had he been a monkey.

#### At a Sudden Signal the Dancers Scatter

Suddenly the white man's signal overrode the din. The dancers leaped away home like scattering goats. One instant, and the world rocked with the dancers' din; another, and they had disappeared as abruptly as Cinderella's outriders. This proof of absolute discipline was impressive.

Cocoa, which our children drink, is the product of fermentation. This method was

first used probably as an easier one than washing to rid the beans of their pulp. Today the process is employed as a result of scientific study. It leaves the bean shrunken and freed from the immediate danger of spoiling.

Compared with the unfermented bean, this one, when roasted, will taste better, smell better, and have a deeper, more luscious chocolate color.

On the native farms beans are often fermented in a hole in the earth covered over with banana leaves, or are tossed in the corner of a hut and left alone. On the large plantations, however, industrial installations have been set up.

#### Fermenting Cacao Beans Generate Heat

In fermentation, the cacao beans, generating their own heat as their pulp begins to work, build up a temperature of about 115° F. They are "stewed" in their own fruity juice, which bubbles into alcohol much as a broken grape becomes wine.

Under the fermenting sheds, black men were standing up to their ankles in the pleasant warmth as they shoveled the beans about.

Sometimes they carted the pungent ferments out to be spread on the concrete floors where they had danced; sometimes they poured them into big wooden trays six yards square which they pushed out on tracks into the sun; and sometimes they transferred them to an artificial hot-air dryer, manufactured in Rochester, New York (pp. 662, 665, and 667).

It was beside them, by the drying trays, that I acquired a taste for the fermented cacao bean. There is an almondlike crispness to the dried bean, changing from a tart piquancy on the tongue to a suave sweetness.

To distract us from absorbing their harvest, the planters expatiated upon the various types of cacao bean and their characteristics under fermentation. The pale *Criollo*, nobler of the two main varieties, ferments in a day or two; the purple *Forastero* takes between five days and nine. The pale bean becomes cinnamon brown and the purple bean becomes modified in tone. Most of the cacao produced on São Tomé is of the *Forastero* variety.

Loss of a single batch of cacao may mean ruin to the planter. If it isn't the boll weevil or the peach borer or the potato bug, as with us, it is either the "sudden death" disease or thrips (*Heliothrips rubrocinctus*), chief insect pirate of São Tomé.

São Tomé rose to prosperity through slave labor, and for 382 years the institution flourished. When it was abolished, ruin followed.

Two years before our Civil War, the island census discreetly changed its nomenclature





William Linn Bruce

### Workmen and Their Families Live in Company-built Lodgings

On washday the women hang their laundry to dry in the yard adjoining their quarters. The cacao is hauled from the forest on the little railroad which runs past the enclosure.

from "slaves" to "blacks." This was a sign of the times. First, the traffic in slaves was abolished. Then, on April 29, 1875, those already on the estates were liberated. The freed slaves took to the road and made for São Tomé. They had no way of obtaining food unless it was by stealing, they had no women, and they were of tribes similar to the Angolares (page 666).

There were only 50 white and 200 colored soldiers in São Tomé. Martial law was declared and the island given over to Commander Fonseca. He landed marines from the *Rio Minho*, threw them around the governor's palace and the fortress, and posted them along the streets of São Tomé to keep the rabble moving.

Free food was found. Lodgings were segregated. Order was maintained. No one had to be shot; not a building burned; not a tree was felled.

In those days São Tomé produced coffee instead of cocoa. The workers had quit the

coffee on the eve of the harvest. The crop of 1875 was lost, and that of 1876 was not good, for the trees did not blossom well after the fruit of the preceding year had gone un-gathered.

### Crisis in Coffee Brought Cacao

São Tomé seemed doomed. The foremost man on the island sold his estate for a pittance. Private capital stepped in to assist the islanders, but by far the most important assistance came from the Banco Nacional Ultramarino.

The Portuguese bank recommended cacao as well as coffee to São Tomé, and by its immediate financial aid saved the plantations at Agua Izé, Boa Entrada, Rio do Ouro, Ghêgue Novo, and Saudade.

The bank persuaded the Government to rescind a ban which had hitherto existed in Angola and to permit the indenturing of free labor for São Tomé.

There is always difficulty in defining the status of indentured laborers. The contracts



PAUL JOHN THOMAS LINDSAY

#### Vendors in the São Tomé Market Offer "Souvenirs"

Since there is no game on or near the island except sharks in the water and tortoises on the beaches, most of these hunting trophies are imported. The large skulls are those of the baboon, the smallest that of a monkey. The skin (right foreground) is from a civet cat, the horn from an African antelope.

signed by the workers on São Tomé constitute an agreement on their part to render agricultural services for a stated time, while the employer, on his part, promises to remunerate these services with money, food, clothing, medical attendance, housing, and a return passage to the worker's country of origin.

Modern transportation has made slavery uneconomical, even if it were permitted, since the planters can now ship men in or out as they are required. Having such a system during hard times is an improvement, even from the planter's point of view. Slaves would have had to be cared for. Contract laborers, when their terms expire, can be sent home.

Although slavery was abolished here in

1875, it died hard. Some 40 years ago cacao planters in Trinidad were invited to buy a São Tomé plantation, complete with its bearing trees, its buildings, and its Negroes—the latter at so much a head.

"Are we buying slave cocoa?" the British planters asked William A. Cadbury, a visiting cocoa manufacturer whose company had often favored the São Tomé bean because of its uniform quality. Mr. Cadbury belonged to the Society of Friends. Within a few months he had made the issue of slave cocoa international.

In England, Germany, and the United States, cocoa firms debated whether to investigate or to boycott at once the São Tomé product. Action was delayed while Mr. Cadbury and his friend, Joseph Burtt, went directly to study the recruiting of labor in Angola and the conditions of work on the estates of São Tomé. They found abuses and asked the Portuguese to set them right.

In 1908 Mr. Burtt and Mr. Cadbury saw the shipment of the first four laborers to be returned under a legal contract system from São Tomé to the mainland. This was a proof that the repatriation laws were no longer a dead letter.

In 1917 the British Foreign Office issued a report showing that repatriation to the mainland was taking place on a large scale, and that more than 14,000 workers had actually left São Tomé in two and a half years.

The boycott, however, continued, to the benefit of Trinidad and the Gold Coast, when its supporters shifted their attack to the large number of deaths on the island. As the mortality rate fell, they said, they would buy again. That fact has made São Tomé a most

elaborately doctored community, and its hospitals are the show places of the island.

My first night at the estate had been sleepless. A resounding wooden chamber magnified strange new noises. Monkey screams startled me. The unusual heat oppressed me.

### Early Governors "on the Spot"

I tried to read a history of the island written in sonorous oratorical Portuguese. This should have lulled me to sleep at once, had it not been that by bad luck I opened it to a list of the early governors. Their names and dates filled five pages; not one had enjoyed a long, healthy tenure of office, but all had died quickly, from fever or poison.

With relief, I calculated that our stay on the island was limited to five or six weeks. Few of the governors had died in so short a time as that. The quickest, as I first interpreted the text, had taken two months.

Then I learned from my dictionary that *logo* did not mean "in the place" but "on the spot." There were several governors who had died immediately, *logo!*

I saw now why the planters of the island laid such emphasis upon their hospitals. When a mosquito buzzed outside my net, I switched off my light in alarm and lay perspiring. São Tomé seemed a pesthole!

Such was not the case. Whether I visited distant estates with the doctor, or whether Caters and I went to them as guests, the first building opened to our inspection was always the hospital. Every hospital on the estates which we visited was hygienic and cheerful, well staffed, and fitted with modern surgical and microscopic equipment (pages 663, 670).



William Least Dyer

### Baskets for Transplanting Cacao Seedlings Are Hand-woven

Scientific forestry is practiced on Agua Izé. Little trees are taken up and set in palm-fiber "pots" as soon as they have attained sufficient growth to be moved. The pots rot away from the roots of the saplings after a few months in the ground (page 667).

The doctor always spoke of his charges, no blacker than himself, as "the blacks," and refused to let me shake hands with them.

In São Tomé the older workers cross their forearms on the chest and bow when a white man passes. While maintaining this extraordinary air of subservience, however, the plantation blacks seemed the happiest, busiest, best-kept set I had seen. They were all grinning teeth and laughing dark eyes. They were always gay.

At Boa Entrada, where we passed a busy week, the band played stirring music in our honor (page 670).

The manager was like a good shepherd to his charges. He stood with his brother, the

priest, watching the native children prance about and, at the height of the festival mood, showering them with candy.

Then there was a bullfight, in which all the half-grown urchins tried to toss a half-grown calf and instead were tossed in their turn.

After the roll call we went with the manager to watch the workers form their food line. Some had their plates on their heads, and mothers had babies slung astride their loins (page 658).

Every laborer was given a well-balanced ration. Besides coffee and oil, he received varying menus of rice, fish, and cornmeal, or of beans, fish, bacon, and cornmeal, or of rice, meat, fish, and wheat flour. Fruit he could pick up while he worked on the plantation. Beriberi had not returned since 1912.

#### Developing Palm-oil Products

After the crisis in cacao (page 678), Boa Entrada, supported by the Banco Nacional Ultramarino, opened a new field of activity—the scientific handling of palm-oil products.

"A one-crop island is as vulnerable as a one-crop farmer," the director expounded. "Where would São Tomé be if suddenly all world markets were closed to our cacao?"

Facing this question, São Tomé had developed other favorites alongside cacao and now exported coffee, copra, cinchona, and palm oil.

Above Boa Entrada, at an altitude where the rainfall is more abundant than at sea level, lies Monte Café. It flourishes when the other estates on São Tomé suffer from drought.

There we heard how coffee, after having declined in favor on the island, was now recovering its former prestige, since it had proved itself more hardy and resistant than cacao.

At the time of my visit, the tendency was toward larger and larger plantations. The Monte Café management had three other estates running up from the seacoast into the clouds. We visited the plantations of the interior and looked down hillsides, cleared for the young cacao and coffee trees, upon buildings far below, like atolls of white coral in a rushing sea of green.

In spite of the number of men mustered for us upon our arrival, the great plantations of São Tomé stood in chronic need of laborers until the world depression affected the cacao demand. Yet in every little settlement around them sat the willing unemployed, who could fish or steal when hungry and sleep on the beach when tired. We called them the "legion of loafers." Except when they were earning money to pay their taxes or buy clothes, they lived an easy, carefree life.

The Angolares (page 666) as we met them

proved far sturdier than the loafers. Once in the forest we came upon two of them who had been clearing away excessive growth. They had rigged up a primitive sawmill platform for holding their logs, and now they were tortuously sawing them into planks.

One squatted below the platform and sweated in a shower of warm sawdust. The other stood precariously on two bamboo uprights and guided the saw. They told us it took nearly a full day to cut one plank.

For their meat supply the Angolares (and some of the loafers) depended largely upon fish. While all the rest of the island specializes in planting, they are boatbuilders and fishermen (page 668).

At São Tomé the social hour at the café was an institution. Whenever one was near, one was expected to join. Caters and I, however, occasionally slipped away to pry around the native market at the far end of the shadeless main street. Sometimes we found trinkets of tortoise shell. Occasionally a native would offer a curious bit of carved wood or a battered idol which he had brought from the mainland (pages 675, 678).

Caters rooted out the fact that even the poorest merchant possessed good scales, which he stood on solid tables or on the earth. Although the Government had put good tables at the disposal of the market folk, most of the women preferred to spread their wares out beside them and squat on the ground.

Sometimes they leaned back against a table leg, or, in the heat of the day, lay completely under the tables for shelter. They were exactly like children playing store.

"The pretext that they are selling something serves them as an excuse for not working," said my cynic.

Yet now and then they did sell something—a basket of tiny tomatoes, a handful of medicinal herbs, seed capsules with peppery contents, dried fish, manioc meal, bananas, kale, or potatoes. After a sale they would quarrel over prices or drift into somnolence.

On São Tomé's escutcheon there is a device which looks exactly like a hand throwing dice. The history of the island is a history of ups and downs, of blind twirls of fortune's wheel, momentous casts of the dice which only a proud, hardy, persistent race could survive.

It is a rare accomplishment in colonization that, after four and three-quarter centuries, São Tomé should still belong to its discoverers, who have fought for the island against foes from overseas and outlaws within, who have planted it with coffee, cacao, and palms, and who have developed upon its slopes a colorful 20th-century plantation life.



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Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 14, 1939, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 291 B. C. (Spinden Correlation). It antedates by 200 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

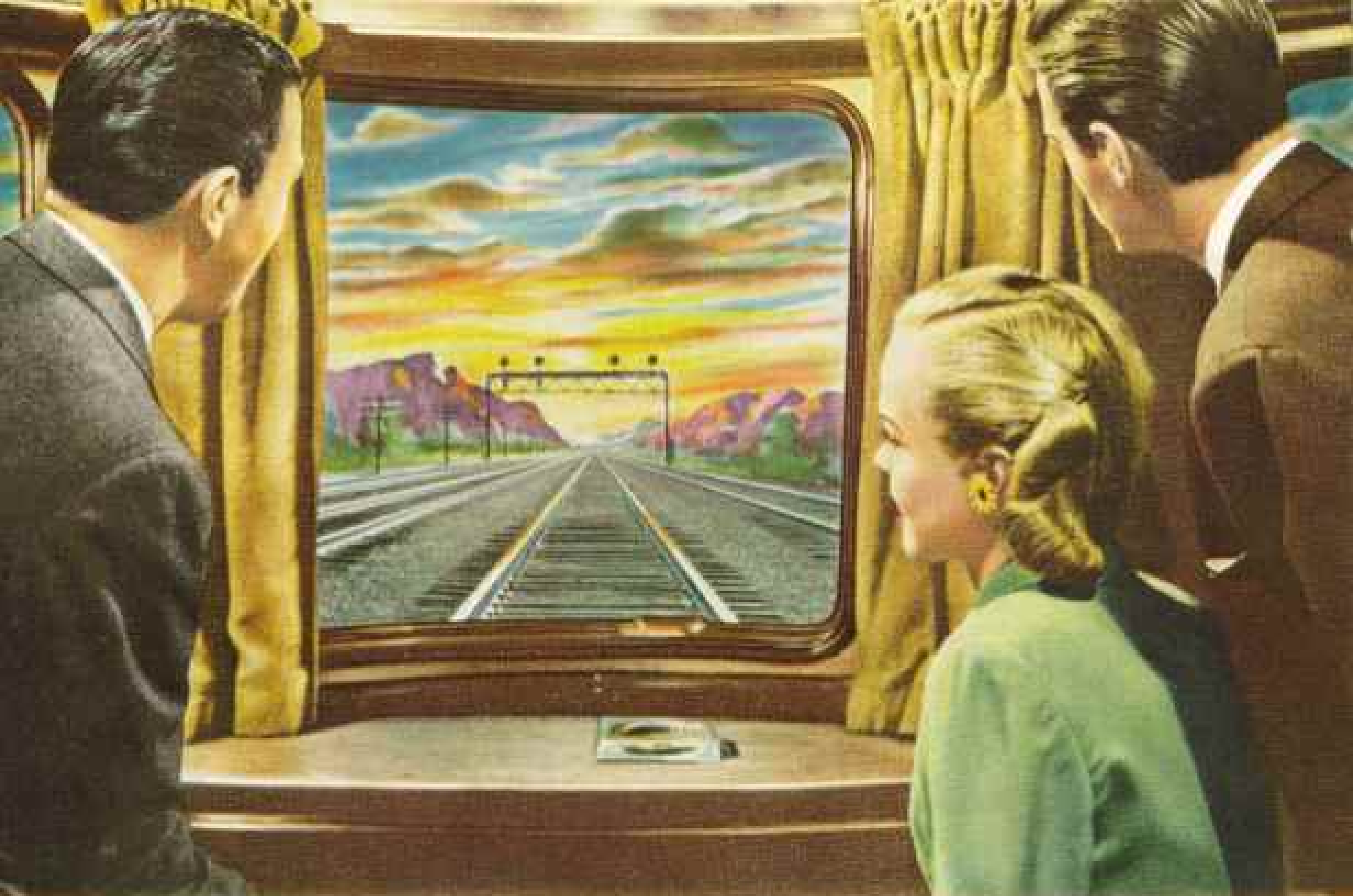
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The National Geographic Society-U. S. Navy Expedition camped on desert Carron Island in mid-Pacific and successfully photographed and observed the solar eclipse of 1937. The Society has taken part in many projects to increase knowledge of the sun.

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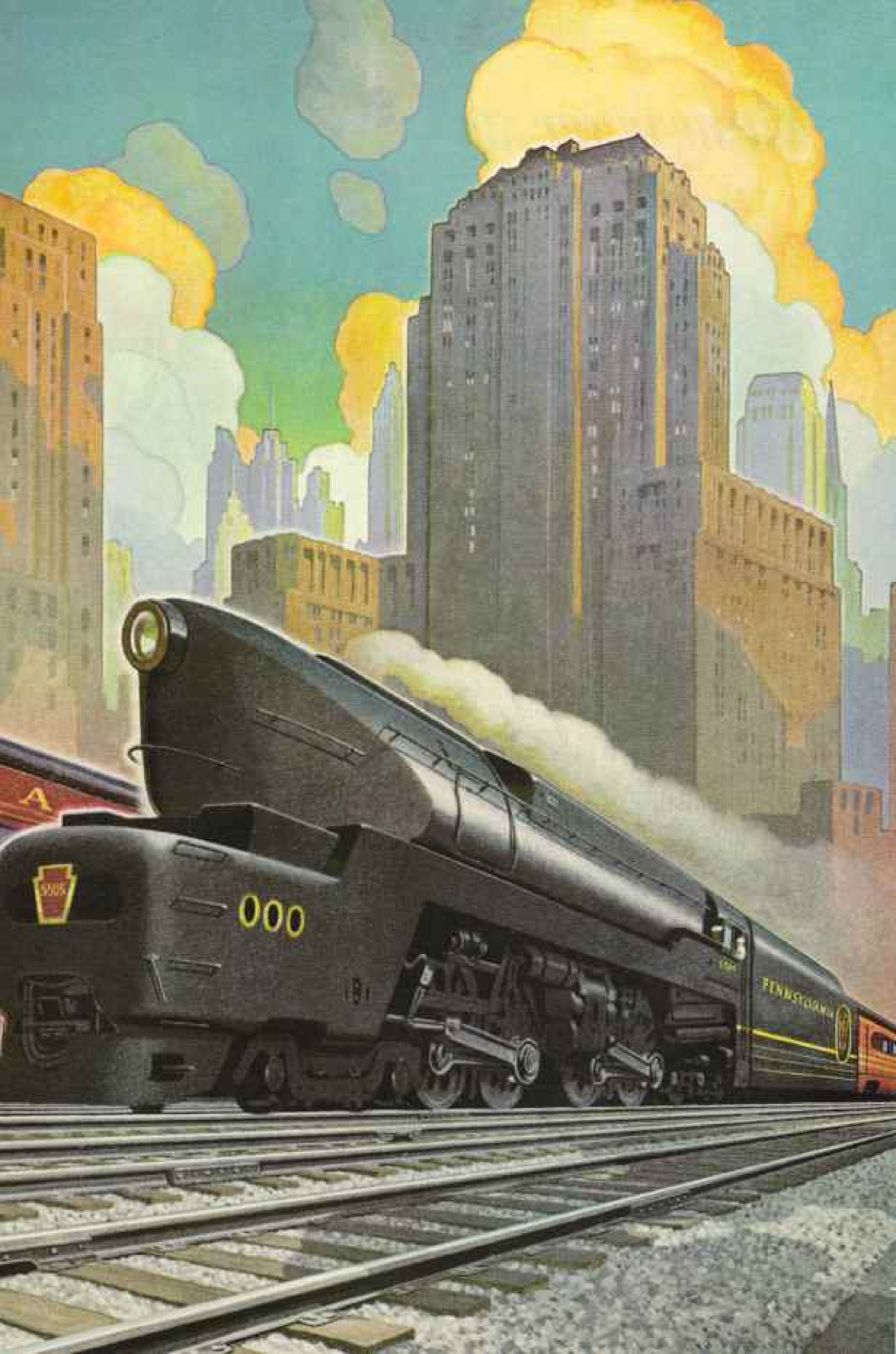
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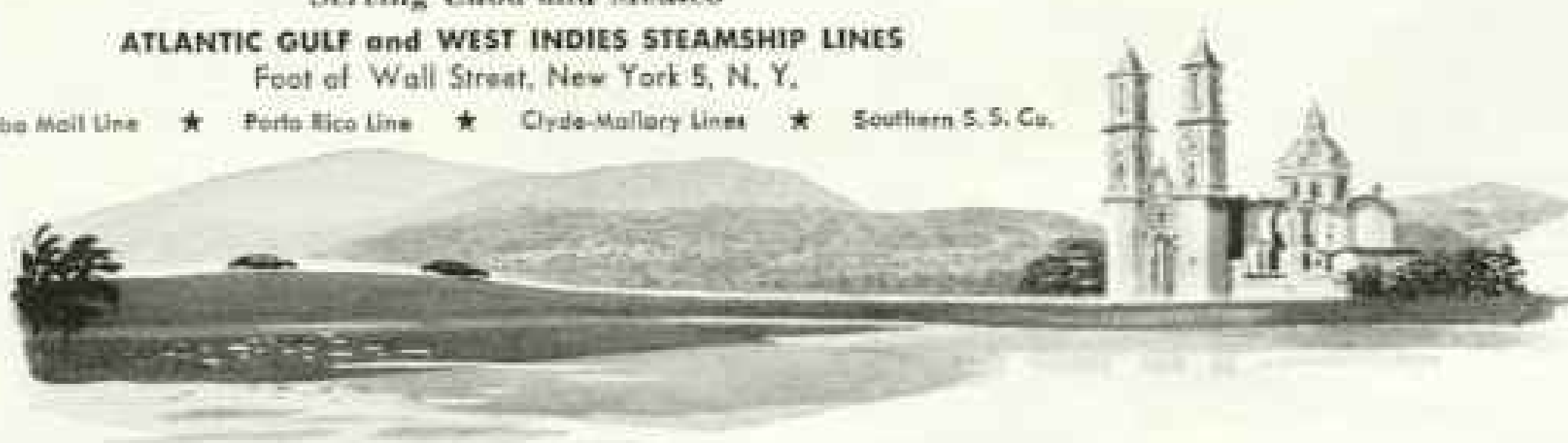
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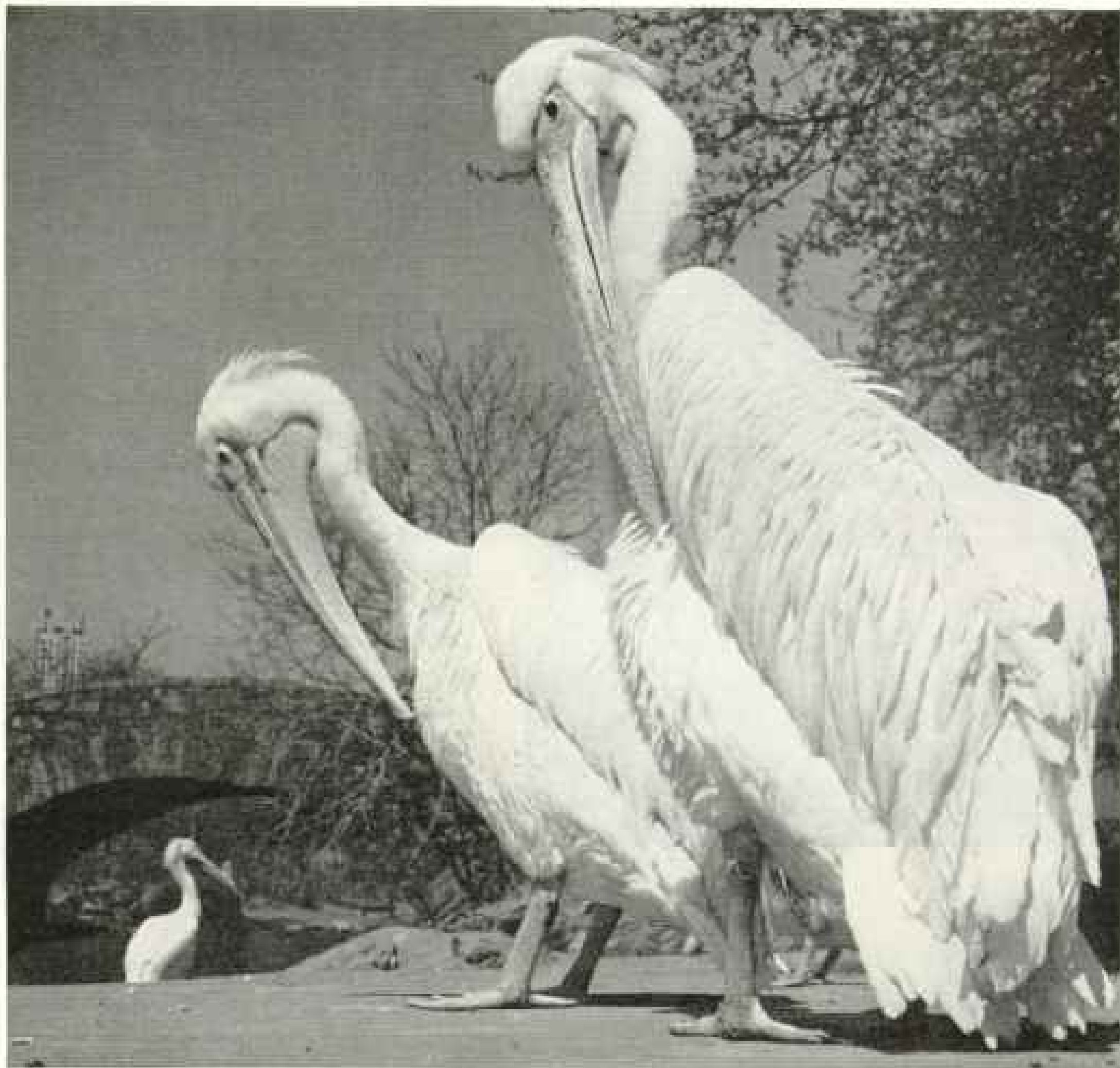
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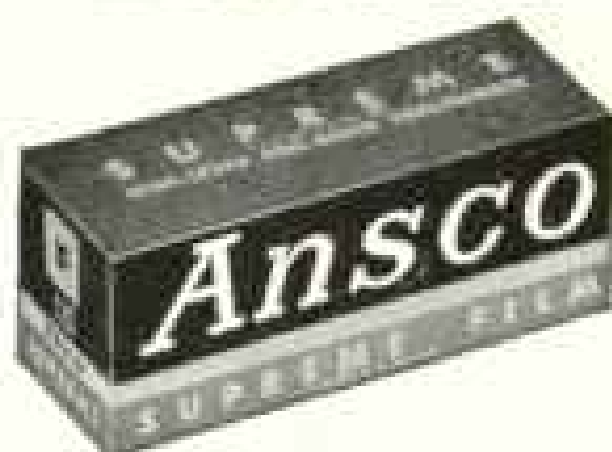
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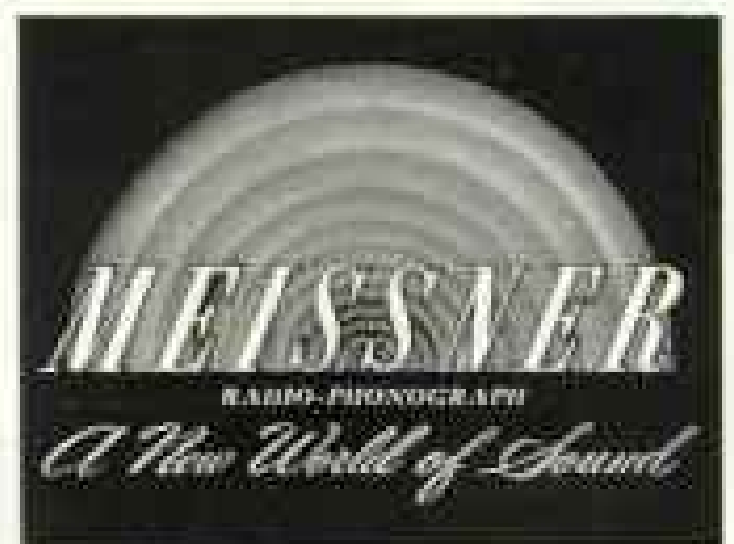
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## Southern California

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That's why, especially in this unsettled year, the experienced traveler avoids the "peak" season and plans a vacation when transportation and accommodations are more readily available. Of course, it is essential to have confirmed accommodations in advance...the later you can come the easier it will be to get reservations.

So try the fall. You'll find Pacific beaches...gay foreign quarters...movie-land night spots as exciting as ever.



Here's a friendly, informal place to relax, to untangle your nerves, to watch or play your favorite sport...to do just what you want to do. Each day will see you browner, healthier; each morning you'll feel more refreshed after a cool night under blankets.



It's amazing how much you can do and see in a short time in Los Angeles County and the rest of Southern California. It's not far to brilliant, mile-high lakes and meadows carpeted with alpine flowers...ridge-top highways, unforgettable panoramas, vineyards, orange groves, a picturesque Mexican quarter.



**Sun-laze** on clean white sand of palm tree-bordered beaches...dive into curling Pacific breakers, ride a surfboard, aquaplane, sailboat or wave-shattering speedboat. Relax under sun or umbrella, watch fishing boats, warships, strange foreign freighters. Pelicans suggest pier fishing, surf-casting, ocean sport fishing.



Night offers excitement - gay restaurants, top swing bands, floor shows, dancing in night clubs with famous stars all about you, movie previews, premieres, symphonies, radio broadcasts, theaters and mountaintop views of the lights of sixty cities twinkling below.

### ALL-YEAR CLUB OF SOUTHERN CALIFORNIA, LTD.

This advertisement sponsored by the Los Angeles County Board of Supervisors for the citizens of Beverly Hills, Glendale, Hollywood, Long Beach, Los Angeles, Pasadena, Pomona, Santa Monica and 102 other communities. Copyright, 1946, by All-Year Club of Southern California, Ltd. - a non-profit community organization serving vacationists.

## Southern California

If you find you must wait for accommodations, just remember: nothing else can ever take the place of this vacation of a lifetime...it is worth waiting for.



# Washington

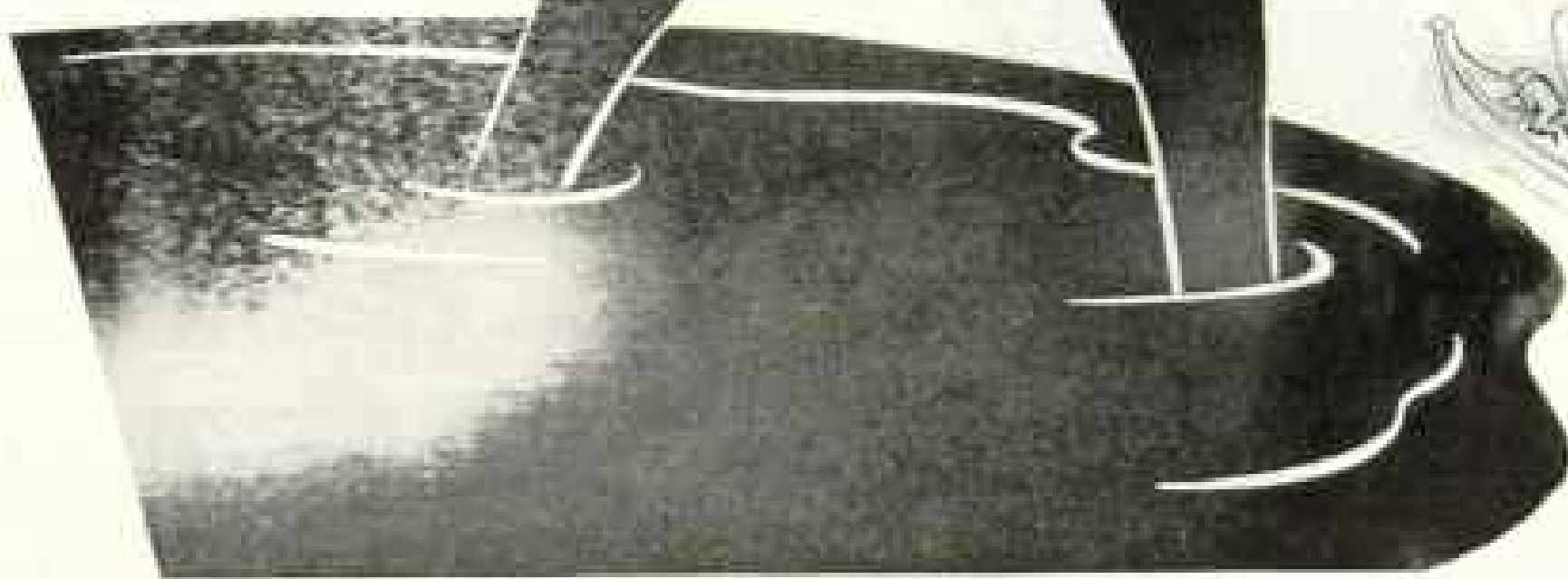
**THE EVERGREEN PLAYGROUND**

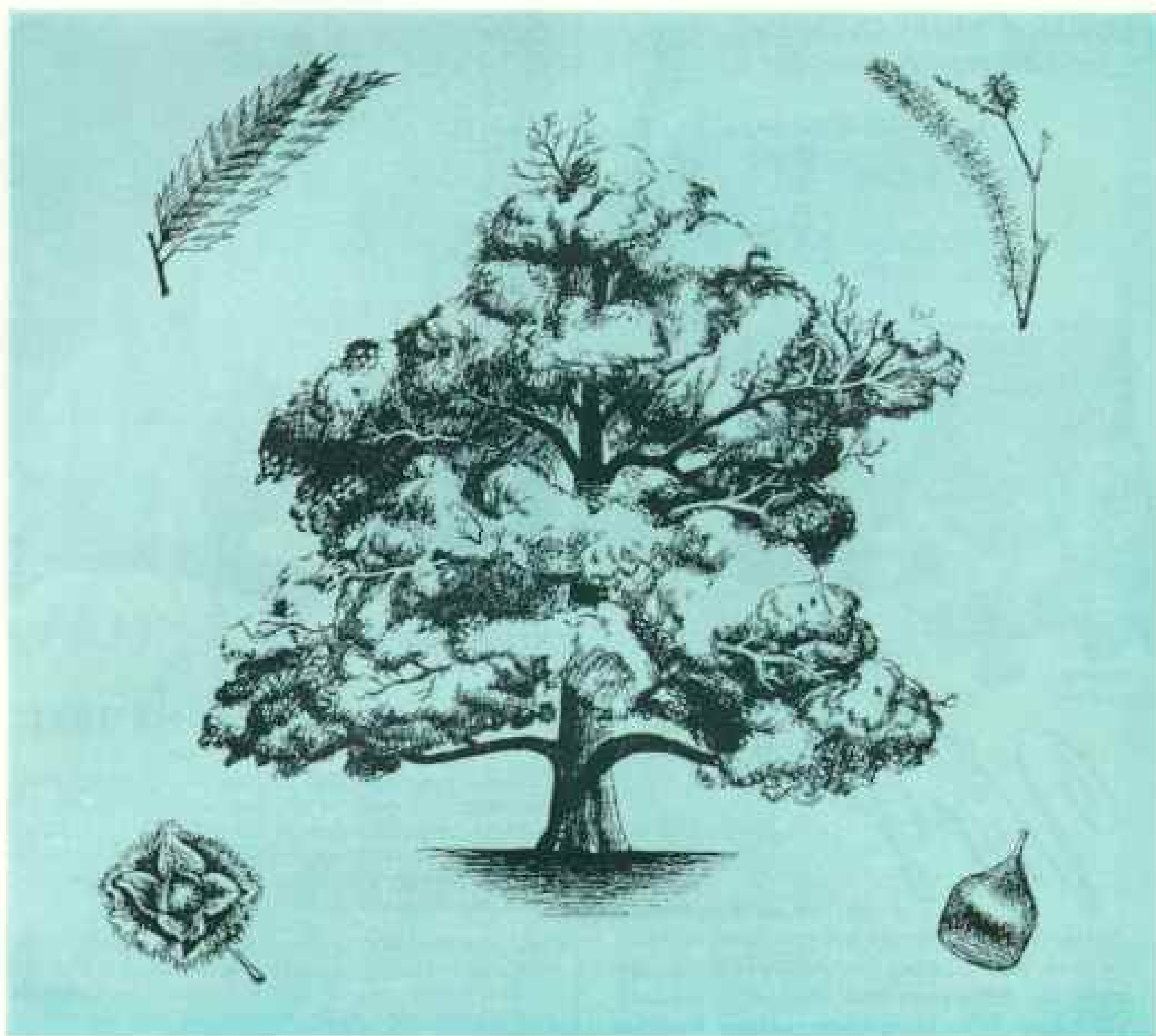
CHOOSE your own tonic in this ever-glorious playground. Visit Grand Coulee Dam and Spokane's Inland Empire of lakes and streams. Explore vital Seattle and Tacoma—gateways to the Orient and Alaska . . . go ferry cruising on island-dotted Puget Sound . . . hike over the glaciers and alpine meadows of Mt. Rainier and Mt. Baker . . . roam the forested Olympic peninsula rising from the Pacific . . . fish, sail, swim, dance, ski. They're all there, the ingredients of a perfect Victory Vacation. While The Milwaukee Road is still engaged in the job of getting our service men home, it's not too early to plan your long-delayed tour of the Northwest via The Olympian.

E. N. Hicks, Passenger Traffic Manager  
Chicago 6, Illinois

**THE**  
*Milwaukee*  
**ROAD**

*Electrified over the Rockies  
to the Sea*





## Gone is the "spreading chestnut tree"

Millions who recall Longfellow's immortal poem may be surprised to learn that the chestnut tree is nearly extinct. Entire forests have been killed by *Endothia parasitica*, a blighting fungus causing serious bark disease. It is a devastation that placed the leather industry in a critical position, because, for centuries, the fabled chestnut tree had been the chief source of leather tanning agents.

As is often the case when nature's replenishing power becomes inadequate, chemistry developed a replacement for the extract of the chestnut tree. It is Exan®—a Monsanto synthetic vegetable tanning chemical. Not

only does Exan assure a constant source of supply, but it has already proved far superior to the natural product formerly used.

The story of Exan is a story of chemical synthesis paralleled by many Monsanto product developments. Monsanto plastics, for instance, are synthetics that offer glamorous and practical possibilities bounded only by the imagination of industry. Vanillin is another synthetic—a flavoring agent developed long ago by Monsanto as a defense against the caprices of nature in supplying vanilla beans. The wide field of rubber products is also among the many that have benefited

\*Reg. U. S. Pat. Off.

richly through Monsanto synthetics.

The history of Monsanto's progress in service is replete with examples such as these. Too numerous to recount here, they emphasize again Monsanto's important role—Serving Industry—Which Serves Mankind.

MONSANTO CHEMICAL COMPANY  
St. Louis 4

**MONSANTO**  
CHEMICALS—PLASTICS

SERVING INDUSTRY...WHICH SERVES MANKIND



YOU'LL FIND EVERYTHING  
for Vacation Enjoyment



State Capital  
Richmond

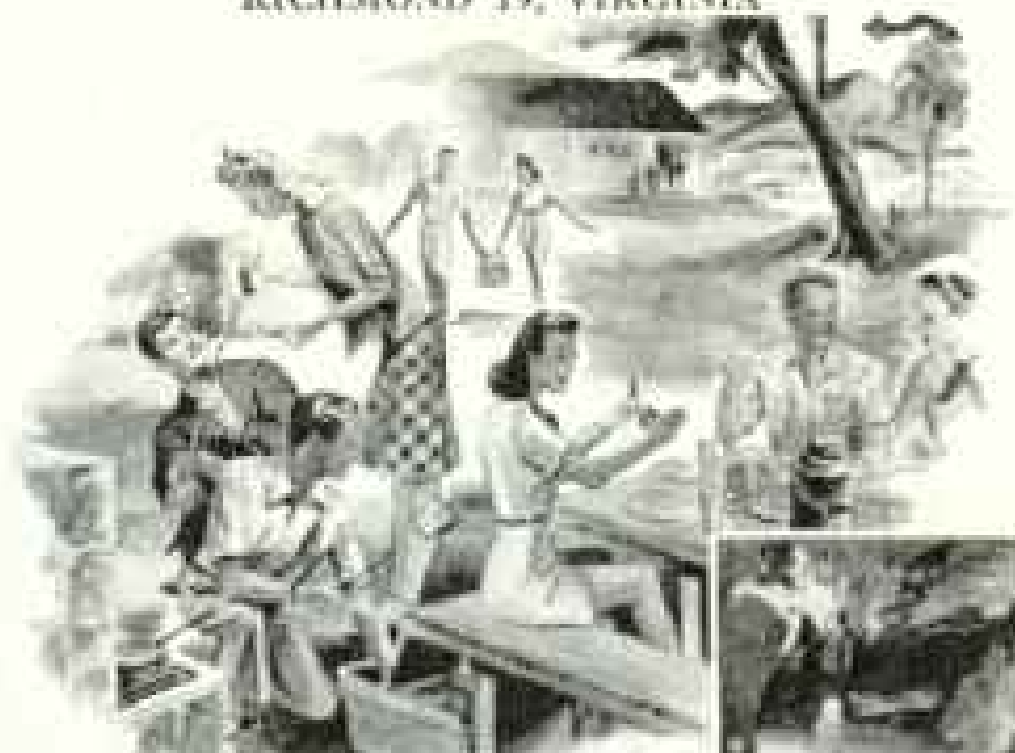
Dogwood  
State Flower

# Virginia

From its sandy, sunny Eastern Shore, across old counties steeped in lore and history, to mountain ranges rich in minerals and majestic scenery . . . the Old Dominion offers endless variety for vacationers. Whatever your inclination, you'll find the place to satisfy it this summer in historic VIRGINIA.

Write for FREE copy of *Pictorial Bulletin*

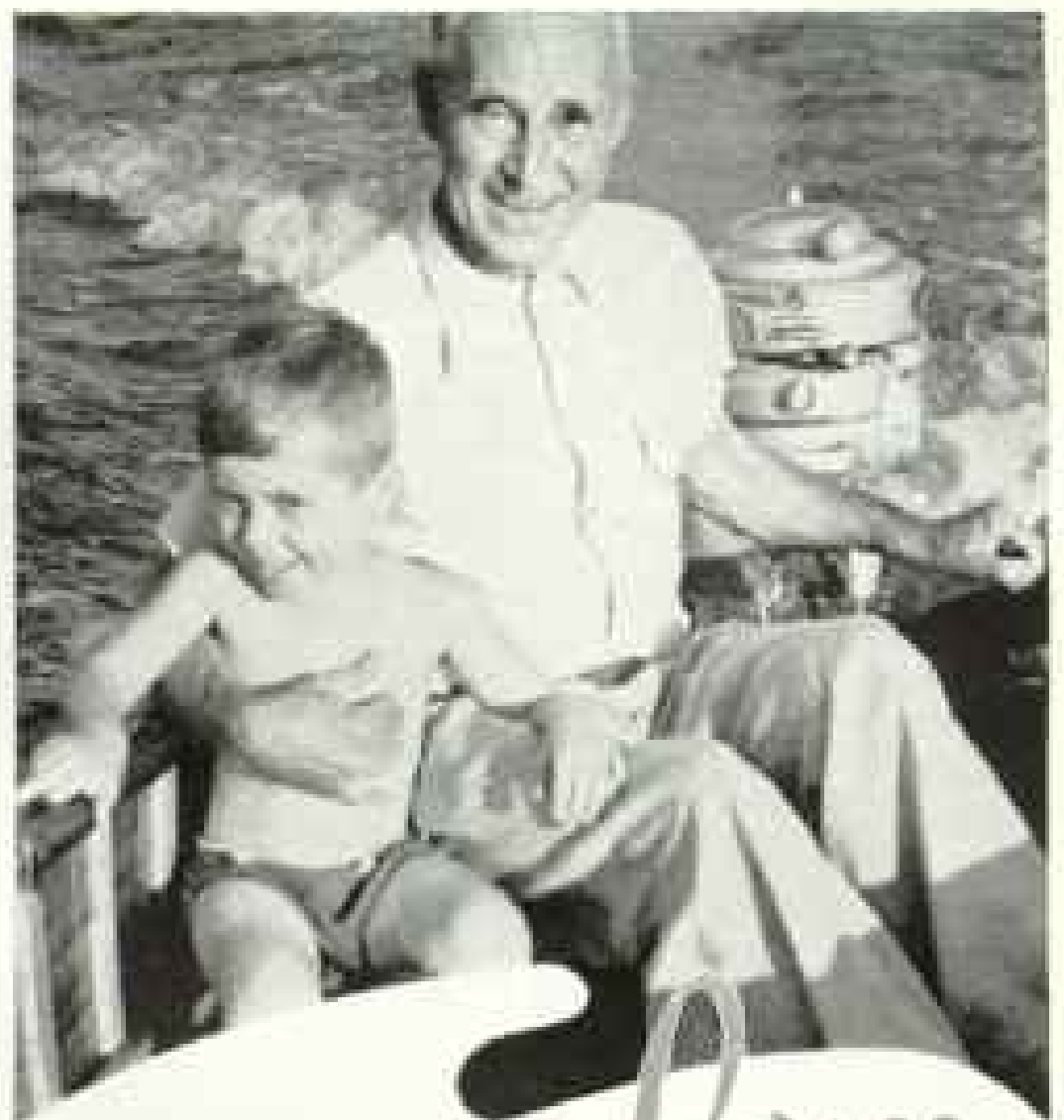
VIRGINIA  
CONSERVATION COMMISSION  
Room 807, 914 Capitol Street  
RICHMOND 19, VIRGINIA



State Parks attract picnickers

Fantastic Caverns  
Shenandoah Valley

MOTION PICTURES ON VIRGINIA AVAILABLE



SUMMER'S MORE

*fun*

WITH AN EVINRUDE!

Glorious holidays ahead . . . the carefree trips you're planning . . . think of the fun an Evinrude can add to every hour! The best of fishing, with an Evinrude speeding you to choicest spots miles away. Or cruising, swimming, picnicking . . . this summer enjoy them the Evinrude way!

See your Evinrude dealer. Look for his name in the classified telephone directory under "Outboard Motors". Most complete range of models, from lightest Evinrudes to thrilling four-cylinder motors. All offer the starting sureness, operating ease and rugged stamina perfected through 36 years of building fine outboards!

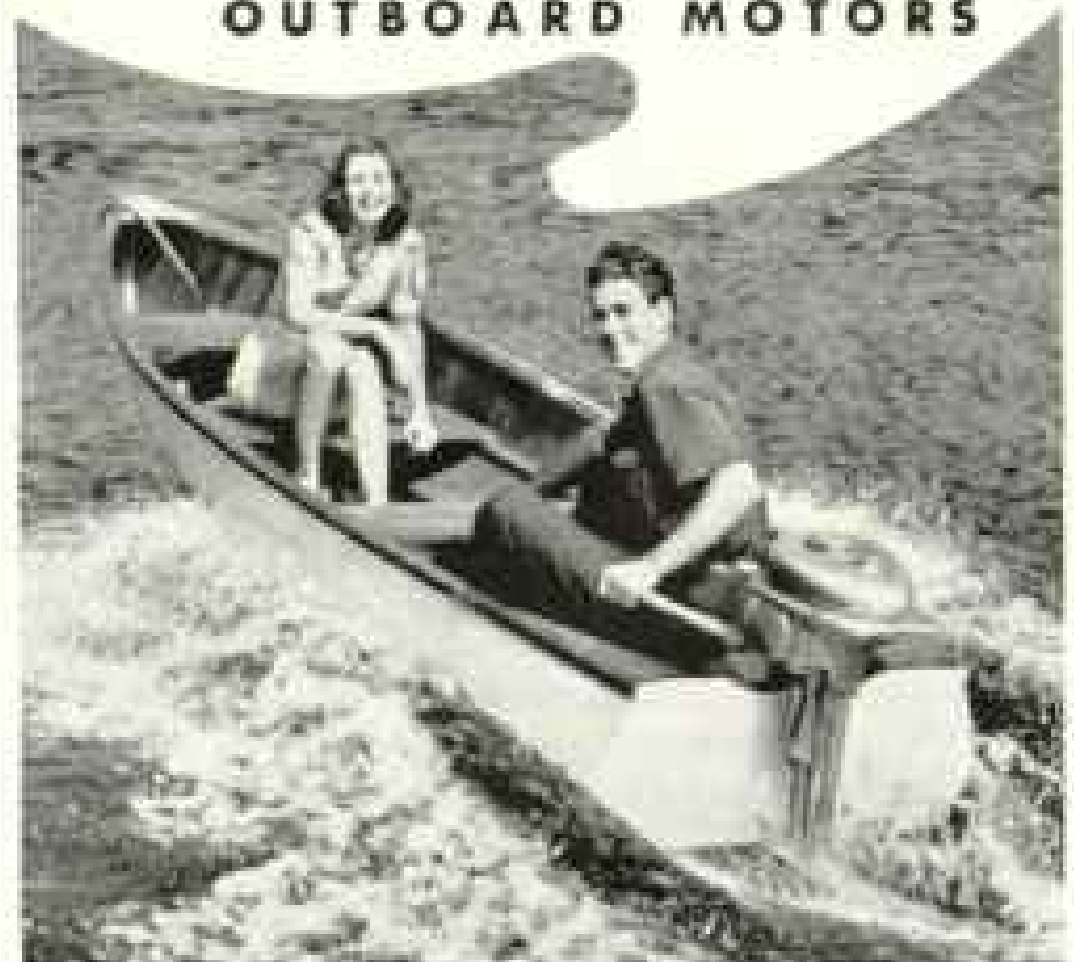
## EVINRUDE CATALOG FREE!

Tells you all the Evinrude features, gives helpful information on suitable boats, speeds, etc. Free. Address EVINRUDE MOTORS, 5223 N. 27th St., Milwaukee 9, Wisconsin.

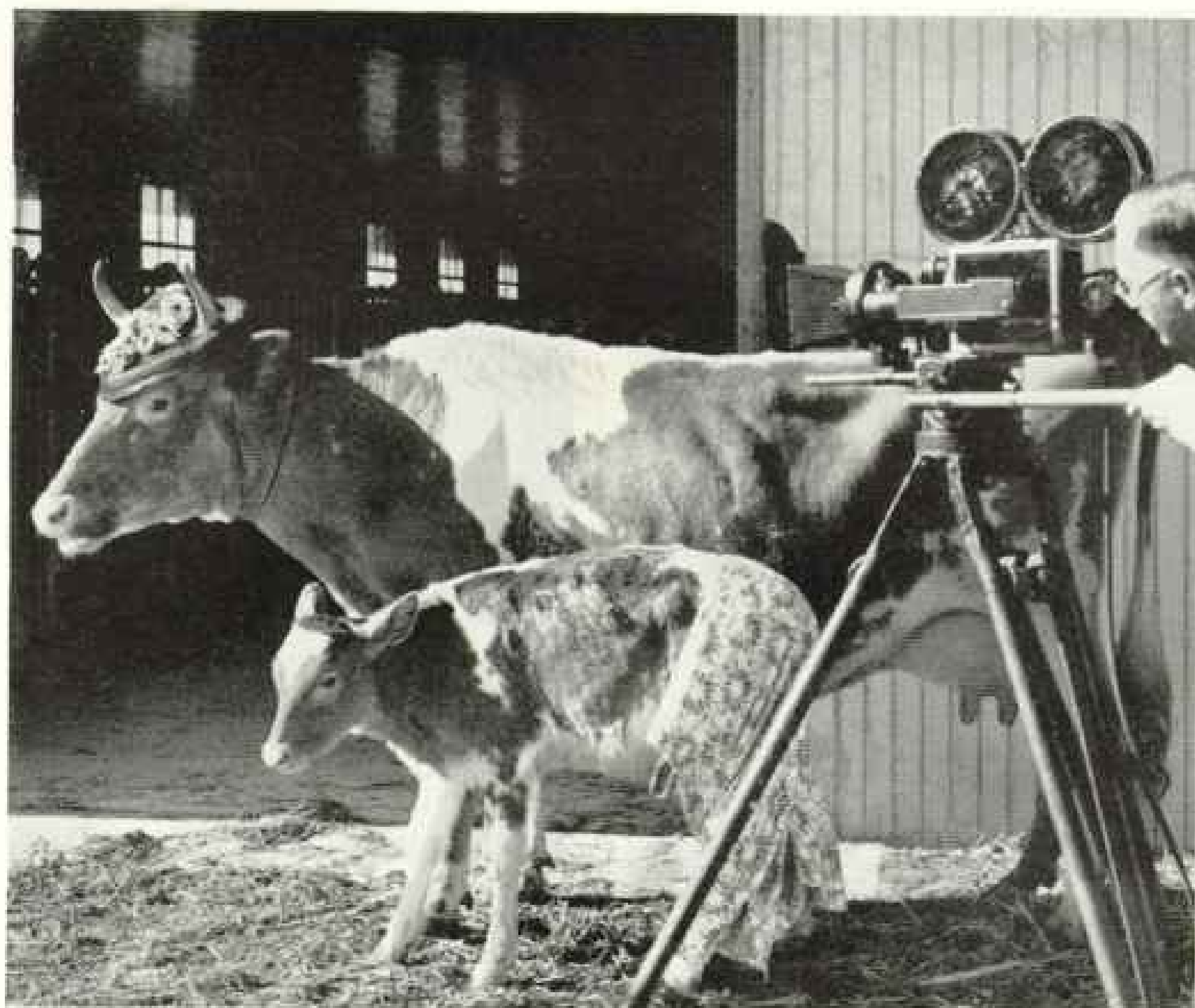


# EVINRUDE

OUTBOARD MOTORS



"Mention the Geographic—It identifies you."



## Mama's in the "moo-vies"!

Though she may never win an "Oscar," nor sign an autograph, she's the star of a picture that's drawing quite a public!

From its title, you can tell the film is something different in movie fare. It's called "Quality Milk Production"—and it deals, not with make-believe, but with scientific methods of getting more and better milk to market.

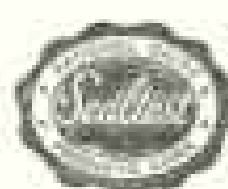
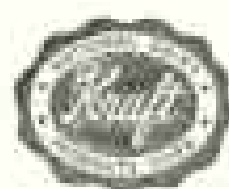
These methods cover everything from the brushing of a cow to the construction of a barn. They show how to keep equipment sterile; milk scrupulously clean. They bring progressive—and practical—guidance to the 350,000 dairy farmers who will see them on the screen.

Filmed by National Dairy, the movie is distributed to U. S. Public Health Services, Vocational Agricultural Departments, Agricultural Extension Services, and state and city Boards of Health. It is shown to farm youth groups, farm associations, grange meetings, and many other such audiences.

In a sense, this picture might be cited as *research in action*. For it's another means by

which the findings of National Dairy Laboratories reach out to improve milk—nature's most nearly perfect food—right at the source, and protect its purity every step of the journey to your dinner table.

*Dedicated to the wider use and better understanding of dairy products as human food . . . as a base for the development of new products and materials . . . as a source of health and enduring progress on the farms and in the towns and cities of America.*



**NATIONAL DAIRY  
PRODUCTS CORPORATION**  
AND AFFILIATED COMPANIES

# UNIVERSAL GENÈVE

ESTABLISHED 1854



14K white gold bracelet watch with palladium case set with diamonds, 17 jewel, \$775. 18K gold cord watch, 17 jewel, from \$115. 14K gold bracelet watch set with diamonds and rubies, or diamonds and sapphires, 17 jewel, \$590. Federal Tax included. At selected jewelers.

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587 FIFTH AVENUE, AT 48TH ST., NEW YORK 17, N. Y.  
1405 Peel Street, Montreal, Canada • Geneva, Switzerland

Supreme in the arts of  
public hospitality



## The WALDORF-ASTORIA

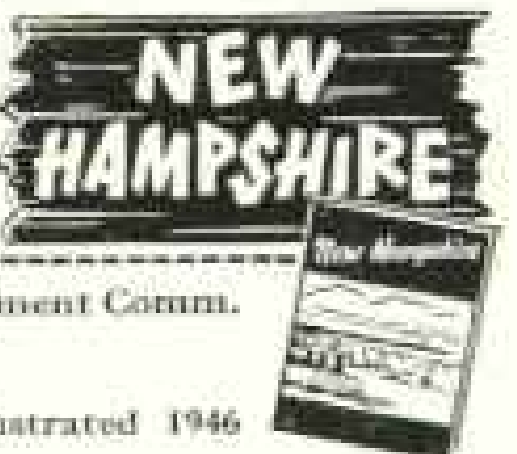
Park Avenue • 49th to 50th • New York



*"I traveled 6800 Miles"*  
FOR MY VACATION IN NEW HAMPSHIRE!

"I've dreamed of this first postwar summer vacation in New Hampshire. Cool nights, pleasant, sunny days, air fresh, clean and clear . . . a lake where fish do bite! And no rushing about—just a nice lazy refresher-course in how to live again . . ."

So, from Japan a soldier comes to New Hampshire and here he finds—as you will find—perfect vacationing. You'll enjoy our 1946 vacation booklet. Write



State Planning & Development Comm.  
553 Capitol Street  
Concord, N. H.

Send me the FREE Illustrated 1946  
Vacation Booklet.



## *Magnavox...an invitation to gracious living*

Listening to Magnavox from the comfort of your favorite chair is a never-ending source of musical enjoyment. In the new Magnavox, all music is reproduced so faithfully that you share the realism of the living performance. Magnavox is one of the truly lasting pleasures you can give your family.



*The Ronald Colman listens to Magnavox in their Beverly Hills home—Photography: Paul Hase*

## *Designed to hold its place over the years*

Combining the wonders of radio science, F.M. and automatic record changing with the best in furniture craftsmanship, Magnavox is built to grace your home over the years. Look for Magnavox in America's fine stores. You'll find a wide choice of models starting at \$214.50. (The Regency Symphony shown is approximately \$385.)



THE MAGNAVOX COMPANY, FORT WAYNE 4, INDIANA

---

**M**agnavox • *Symbol of Quality in Radio—Since 1915*  
RADIO PHONOGRAPH





## SPENDING YOUR SUMMER IN THE GREAT LAKES REGION?

If you are . . . let D&C help you plan your itinerary to include Niagara Falls, Buffalo, Cleveland, Detroit. Or, cruise with D&C on the blue waters of the upper lakes. See historic Mackinac Island, the Indian life at Harbor Springs, sail through beautiful Georgian Bay to Midland, Ont., home of the Martyrs' Shrine and Fort Marie. Regularly scheduled cruises sail mid-week and week-end each week.

D&C ships, the Grand Fleet of the Great Lakes, sail regularly every night, over-night between Detroit and Buffalo and Detroit and Cleveland. Take your car along, if you wish.

*Go by Boat . . .  
It's fun Afloat*



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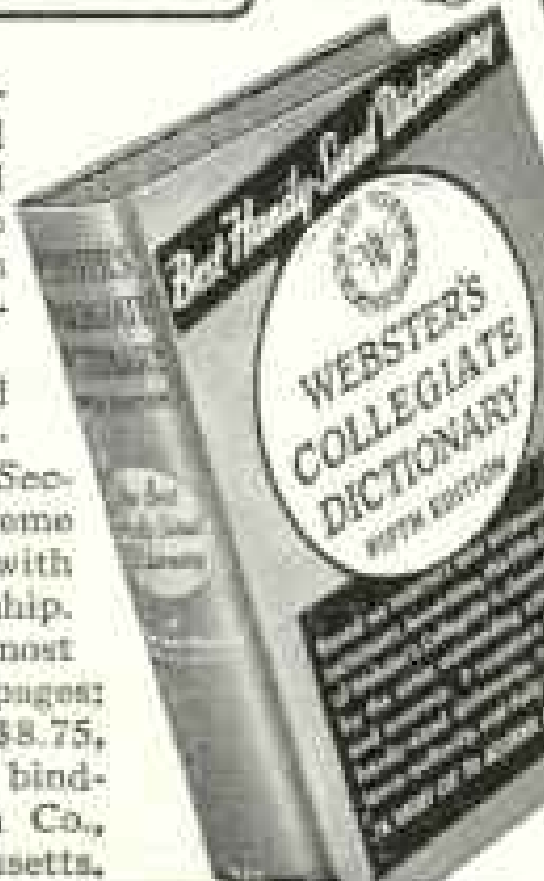
**GRAFLEX, INC.**

"Glad I Waited for the BEST Handy-Sized Dictionary"



**W**EBSTER'S COLLEGIATE has been hard to get, but copies will soon be on the way to your bookseller. See him now and place your order with him.

Based on and abridged from Webster's *New International Dictionary, Second Edition*—"The Supreme Authority"—and edited with the same careful scholarship. Defines all the words most commonly used. 1,300 pages; 110,000 entries. \$4 to \$8.75, depending on choice of binding. G. & C. Merriam Co., Springfield 2, Massachusetts.



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*G. & C. Merriam-Webster*

RD. 5, ST. LOUIS, MO.

"Mention the Geographic—It identifies you."



MOST STYLES \$10.50 AND \$11

# *Florsheim*

**BROWN AND WHITES**

COOL AND CORRECT FOR DRESS OR BUSINESS

THE FLORSHEIM SHOE COMPANY • CHICAGO • MAKERS OF FINE SHOES FOR MEN AND WOMEN

**ATTENTION! EXPLORERS, ADVENTURERS, EDUCATORS**



**VICTOR** gives you  
greatest film protection

Too often, personal, irreplaceable films have been ruined. Your precious films warrant the outstanding protection found only in a VICTOR ANIMATOPHONE.

This greatest safety is possible through three exclusive Victor Features—The Victor Safety Film Trip, Victor Duo-Flexo Pawls, and 180 degree Victor Swing-Out Lens Mount for easiest cleaning.

Simplicity, quick threading, superb sound, easy-plug-in microphone or turntable . . . are all features that will make Victor your first choice.

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**ANIMATOGRAPH CORPORATION**

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New York (18), 330 W. 42nd St. • Chicago (1), 188 W. Randolph

MAKERS OF I & M M EQUIPMENT SINCE 1923



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Available!

THE NEW WESTON  
*Master II*  
EXPOSURE METER

FOR **Better Pictures** EVERY TIME

Quit guessing how to set your camera. Stop wondering how many pictures on each roll or pack will be *correctly exposed*. The *Master II* will make every shot **RIGHT**. Simple to use . . . sure in results. It will save you money for lost film and processing . . . save you heartaches over lost pictures you can't re-take. The new *Master II* is thinner, shorter, more compact and convenient to handle, yet rugged and completely dependable. See it at your dealer's, or write to us for literature. Weston Electrical Instrument Corporation, 584 Frelinghuysen Avenue, Newark 5, New Jersey.



At last, a new kind of screw-stem pipe with a stem that stays on the beam. The patented, "float-mounted" stem will not lock at an off-angle, holds its precision alignment for the life of the pipe. Get Adjustomatic, a pipe of traditional VanRoy quality. VANROY CO., Inc., Empire State Bldg., N. Y. 1

 SIGNET OF QUALITY IN PIPES



*The Plaza, New York*

## HILTON HOTELS

**across the nation** Each hotel in the Hilton group was chosen because it was a hotel of distinction in its own right. It is our determination to maintain the fine tradition of these individual hotels, and to give them the further advantages resulting from group ownership and operation.

*HILTON hotels*

C. N. HILTON, PRESIDENT

In New York: THE PLAZA and THE ROOSEVELT • In Chicago: THE PALMER HOUSE and THE STEVENS  
In Los Angeles: THE TOWN HOUSE • In Dayton, Ohio: THE DAYTON BILTMORE • In El Paso, Lubbock,  
Longview, Texas: THE HILTON HOTEL • In Long Beach, California and Albuquerque, New Mexico: THE  
HILTON HOTEL • In Chihuahua, Old Mexico: THE PALACIO HILTON





You've earned your Victory Vacation—now enjoy it. Make it an all-family, all summer vacation—in Maine. Here there's everything for every one to see and do; majestic mountains, woods and lake country, restful farms and peaceful village life, or the seashore; a comfortable summer climate; farm-fresh foods, seafare that you'll find only in Maine—and a friendly people whose talent for perfect hospitality is traditional. This will be a record season so make your reservations just as early as you possibly can.



**STATE OF MAINE**  
**MAINE DEVELOPMENT COMMISSION**  
**Travel Service,**  
 12 St. John Street, Portland, Maine

Please send me the 36-page illustrated Maine Victory Vacation Guide for 1946.

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**VACATIONS**

VICTORY  
 VACATION  
 YEAR

# The choice of Jose Iturbi

FAMED PIANIST AND CONDUCTOR



"Baldwin! Again I say  
 it is incomparably  
 superior to all  
 others . . ."



Choose your piano as today's masters do: by richness of tone, effortless action, and responsiveness. Baldwin and Baldwin-built Pianos are increasingly available. Meanwhile your Baldwin dealer has set one aside so you can hear and play it any time you like. Let him tell you when and how you can own a Baldwin.

## Baldwin

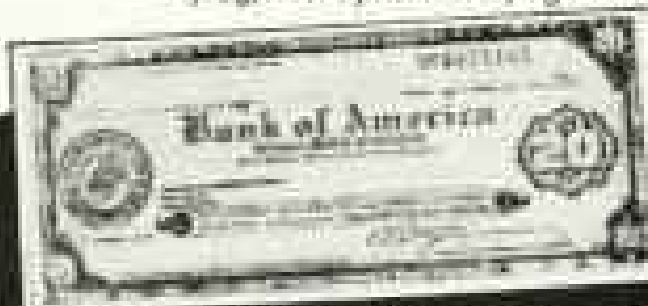
THE BALDWIN PIANO COMPANY - CINCINNATI 2, OHIO  
 Makers of Baldwin, Acrosonic, Hamilton and Howard Pianos



"Old Faithful!"  
 No matter where you go,  
 always carry

## BANK of AMERICA TRAVELERS CHEQUES

They're acceptable everywhere, self-identifying, insure your money against loss or theft.



**Backed by  
 the  
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**of a five billion dollar bank**

Sold by banks and travel agents everywhere

Issued by Bank of America National Trust and Savings Association, CALIFORNIA

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION  
 London, England, Branch: 12 Nicholas Lane, London, E.C.4.

## The day the twins got the moon

1. Dolls and Cops and Robbers... Mumbly-Peg and House... Then the twins discovered music, and nothing else had ever seemed half so exciting. Remember how it was when music first came into your life?



2. They listened by the hour at the home of a friend whose parents owned a new Stromberg-Carlson 18th Century. Standard broadcast, complete FM, records — how wonderfully rich and clear they sounded! "Wish we owned one," whispered Jane. "Might as well wish," said Bobby, "for the moon."



3. Then, one day, it happened. There in the study was "the moon" — with a card that said: "Happy birthday from Mother and Dad." It was a Beaux-Arts, one of the new small radio-phonographs in which Stromberg-Carlson has achieved an

astounding degree of "big set" performance. Have you heard the superb new Stromberg-Carlsons? Your dealer will be glad to have you drop in and listen.

*For the main radio in your home... there's nothing finer than a*

# STROMBERG-CARLSON

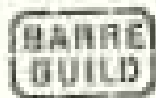
## AN ENDURING MONUMENT INVESTMENT



**B**ARRE Granite Monuments are designed and sculptured by artists in the world's finest granite—to endure. And select Barre Granite Monuments stand in tribute to the things that endure—the faith, love and memories of those who have passed on.

Whatever your monument problem—you will find guidance and inspiration in the book, "Monument Ideas"—published by the Barre Guild as a service to you. And you can rely on sound and sympathetic counsel from the dealer who displays the Barre Guild Seal and Certificate. These are your guarantees of enduring quality—guarantees backed by the Barre Granite Association in Barre, Vermont, "The Granite Center of the World".

Let the Barre Guild help you make an enduring investment in a beautiful monument—through the inspiration and instruction in "Monument Ideas—for every memory" and through the knowledge and experience of the Barre Guild Dealer.



### FREE—TO HELP YOU CHOOSE



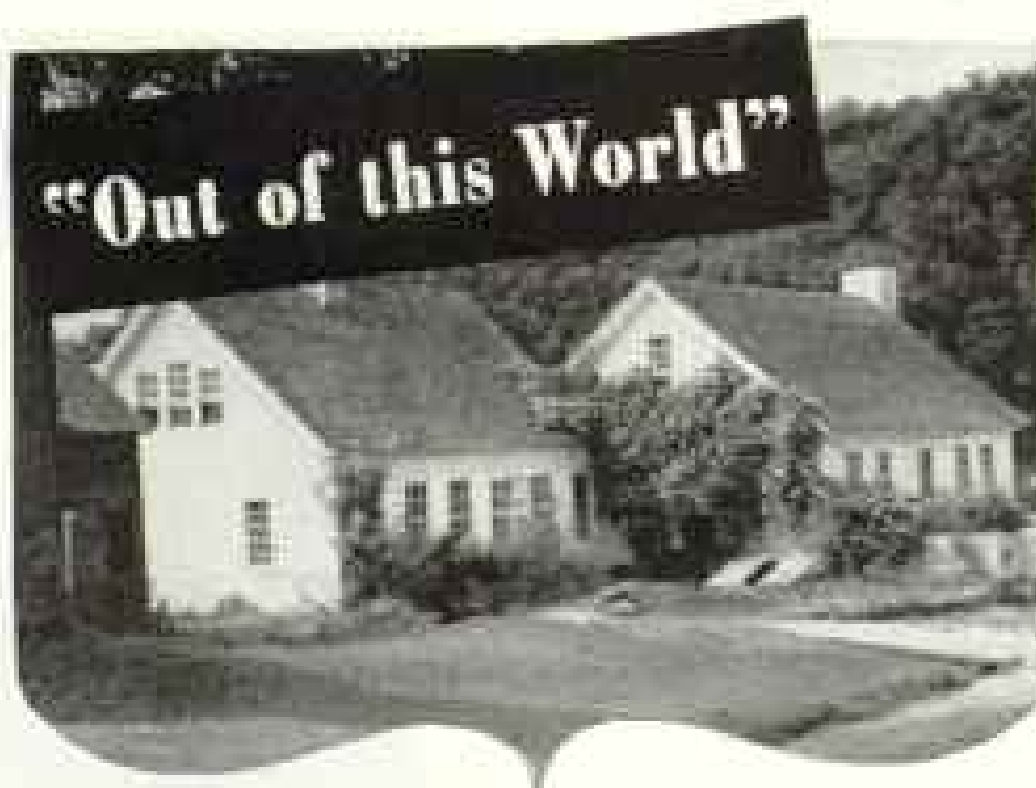
BARRE GUILD,  
BARRE, VERMONT  
(DEPT. NG-3)

Please send my free copy of "Monument Ideas"—a hand-picked selection of inspiring monument designs for every occasion and purse.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_



... life in your Vermont Summer home

Real living, this ... a sunny place of your own ... nestled among the hills or by the lakes of the majestic Green Mountains! If you've sampled the "Vermont way of life" through a vacation season, you are probably already yearning for more of the country fun and graceful living that Vermont provides ... through a blending of the right scenes and the right people.

**FREE BOOKS**—For vacation guidance, ask for free booklet, "Unspoiled Vermont." For home-ownership opportunities, ask for "Farm and Summer Home Book."

VERMONT DEVELOPMENT COMM.  
450 State House, Montpelier, Vt.

# VERMONT



BEAUTY CORNER OF NEW ENGLAND

*Designed for Gracious Living  
and Built for Enduring Service*



**NORTHERN FURNITURE CO.**

MAKERS OF BEDROOM AND DINING ROOM FURNITURE

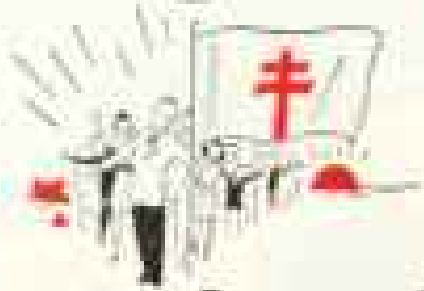
You are welcome to visit our showrooms

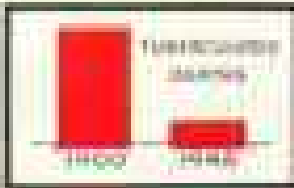
in the following listed cities:



Boston Chicago Cincinnati Cleveland Dallas  
Detroit Kansas City Milwaukee Minneapolis New York  
Philadelphia Pittsburgh St. Louis Sheboygan

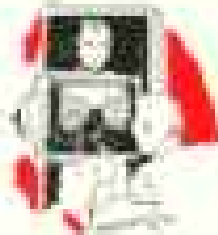
# Man's war against Tuberculosis

can be won!



Already the death rate from this disease has dropped to less than one fourth  of the toll in 1900.

As more and more people have regular physical examinations,  doctors will be able to discover those carriers of tuberculosis who have the disease without knowing it. 

An important part of such examinations is the use of the X-ray or fluoroscope.  Control of all such cases through modern medical methods

*can reduce the death rate still further!*

## Have an annual physical examination!

This is particularly important for those who have persistent coughs.

If you have tuberculosis, self-discipline in following *all of your doctor's* instructions will generally lead to recovery.

Periodic medical checkups will help to guard against recurrences, and permit you to lead a nearly normal life.

For information on public and private examination facilities in your community consult your

doctor, health officer, or local Tuberculosis Association.

To help avoid tuberculosis, send for your free copy of Metropolitan's booklet, 56-N, "Tuberculosis."

## Metropolitan Life Insurance Company

(A MUTUAL COMPANY)

Frederick H. Ecker,  
CHAIRMAN OF THE BOARD

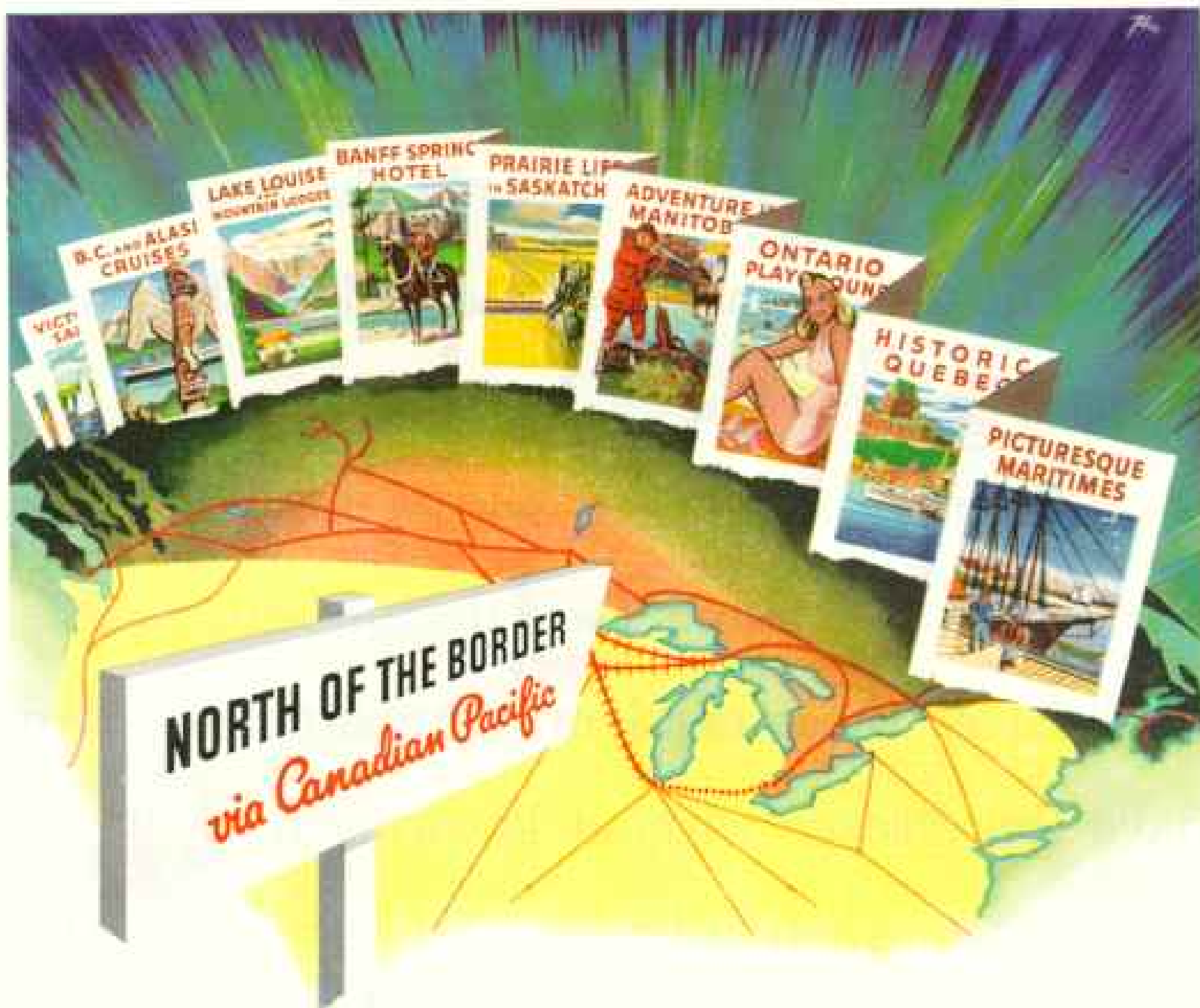
Leroy A. Lincoln,  
PRESIDENT

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There's a glorious vacation waiting for you this year "up Canada way" . . . via Canadian Pacific.

It's a land that beckons the holiday-maker to every one of its three thousand miles . . . from crystal clear Lake Louise in the Canadian Rockies . . . across the golden prairies . . . to the tumbling trout streams of Ontario . . . or from the timbered slopes of British Columbia to the old-world quaintness of Quebec . . . and the seaside charm of the Maritime Provinces.

*For details about Canadian vacations consult any Canadian Pacific Railway office or your own travel agent*

**Canadian Pacific**



**SPANS THE WORLD**

*Examine. Compare. Write!*



Unconditionally Guaranteed  
For First User's Lifetime With-  
out Repair Charges If Sent To  
Sheaffer Factory!



## SHEAFFER'S "TRIUMPH"

To make sure of the best pen, it's worth a little time for critical inspection, comparison, and actual writing with various makes. Sheaffer's "TRIUMPH" looks better and writes better because its quality is better—inside and outside, from point to cap. Comparison will convince you—even before you write. And the instant you touch the smoother, stronger, 14-K *Lifetime*® POINT to paper you'll know you've found Pendom's greatest value.

CREST "TRIUMPH" pen, \$15; pencil, \$4; complete set, \$21. Federal excise tax additional. Other sets, \$3.95 up. Complete range of colors.

LISTEN EVERY SUNDAY to SHEAFFER'S PARADE with Carmen Cavallaro—NBC Complete Network, 3 P.M. E.T.; 2 P.M. C.T., 1 P.M. M.T., 12 Noon P.T.

# SHEAFFER'S

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*"TRIUMPH" Pens and Fineline Pencils*



# Make Movies

of your child...in sparkling color  
...to show on your own  
home screen



**Wonderful Fun**—making your own movies of family, of friends, of holidays and travel... seeing them on your living-room screen with all the thrill of motion and color.

Home movies are so easy, so inexpensive, with Ciné-Kodak—in beautiful full-color Kodachrome or brilliant black-and-white.

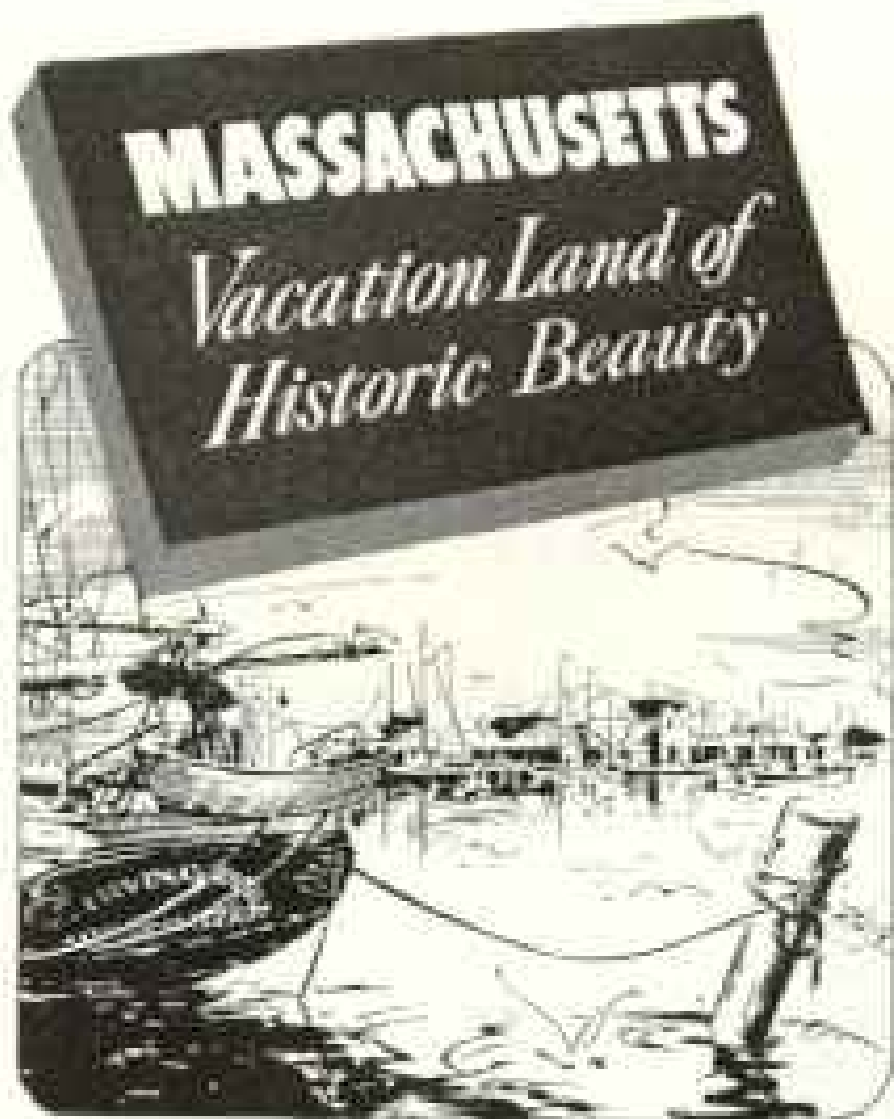
**Complete movie service**—Kodak alone gives you all the equipment and service needed for best results: *Ciné-Kodak*, world's most popular home movie camera; *Ciné-Kodak Film*, finished without extra charge in any Kodak processing laboratory; and *Kodascope*, the projector that shows your movies brilliantly.

Ask your dealer for a copy of Kodak's new free booklet, "Time to Make Movies Again"... Or write to Eastman Kodak Company, Rochester 4, N.Y.

Home movies  
the **Ciné-Kodak** way



**Kodak**



Old North Church of Paul Revere fame

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Whatever you like to do . . . vacation variety is enjoyably yours . . . in historic . . . healthful . . . modern Massachusetts! Plenty of historic spots to see . . . Lexington, Concord, Bunker Hill, Plymouth Rock . . . a host of others. Beautiful Pioneer Valley, the glorious Berkshires, sandy Cape Cod, the North and South Shore beaches . . . linked in a network of scenic highways, beckon to recreation, rest and enjoyment. Come to Massachusetts . . . Vacationland of variety!

FOR SCENERY • SPORTS • HISTORY • FUN

*Vacation in*  
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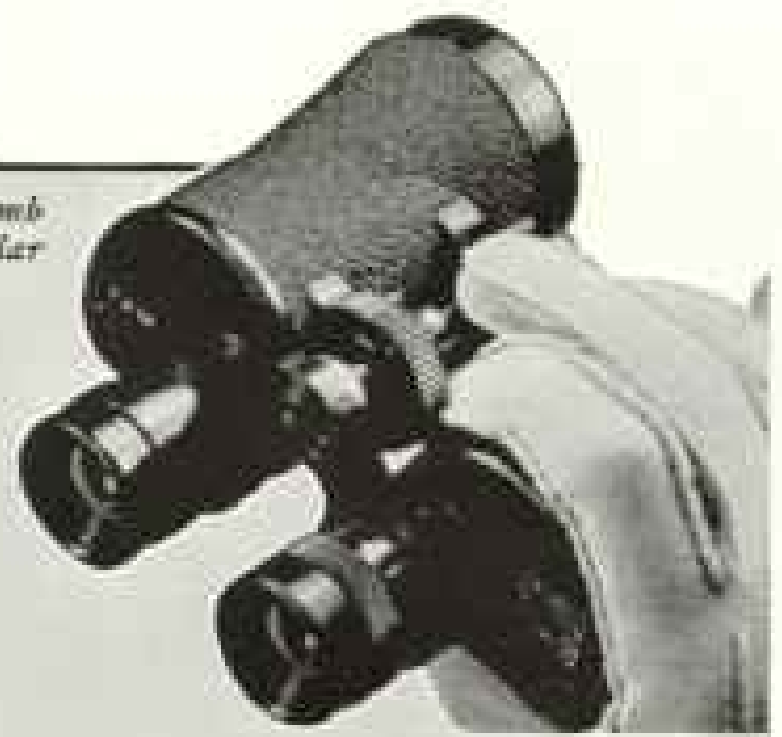
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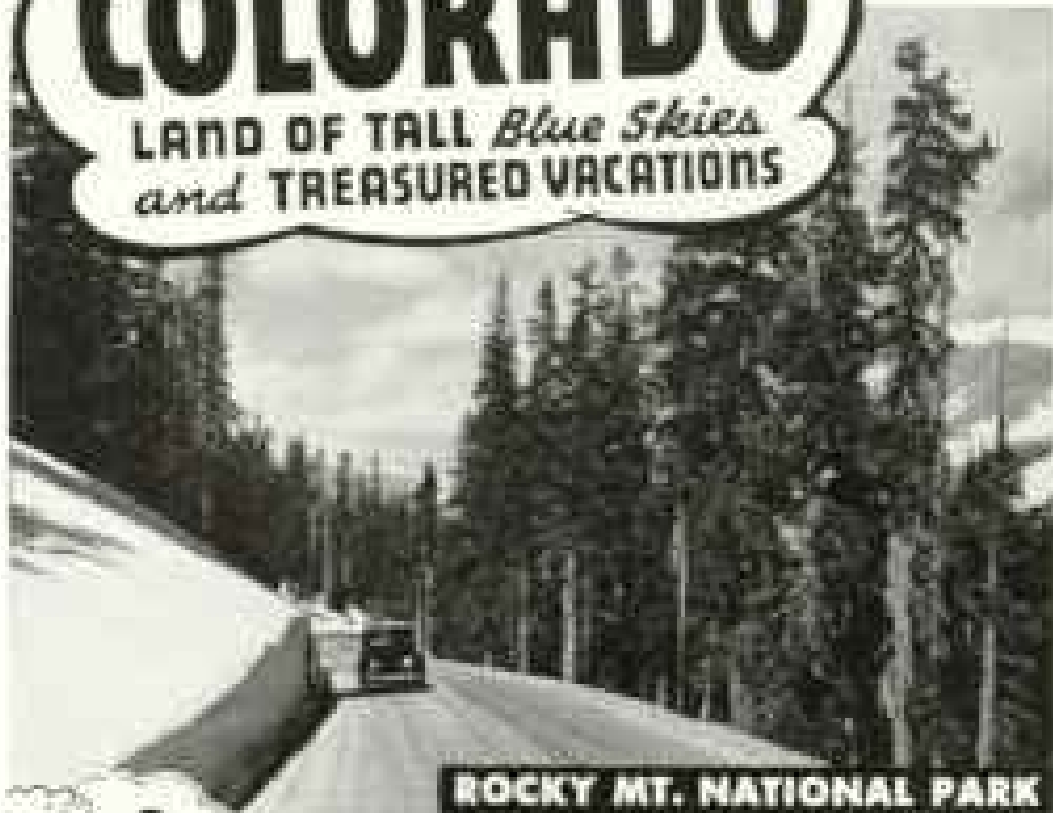
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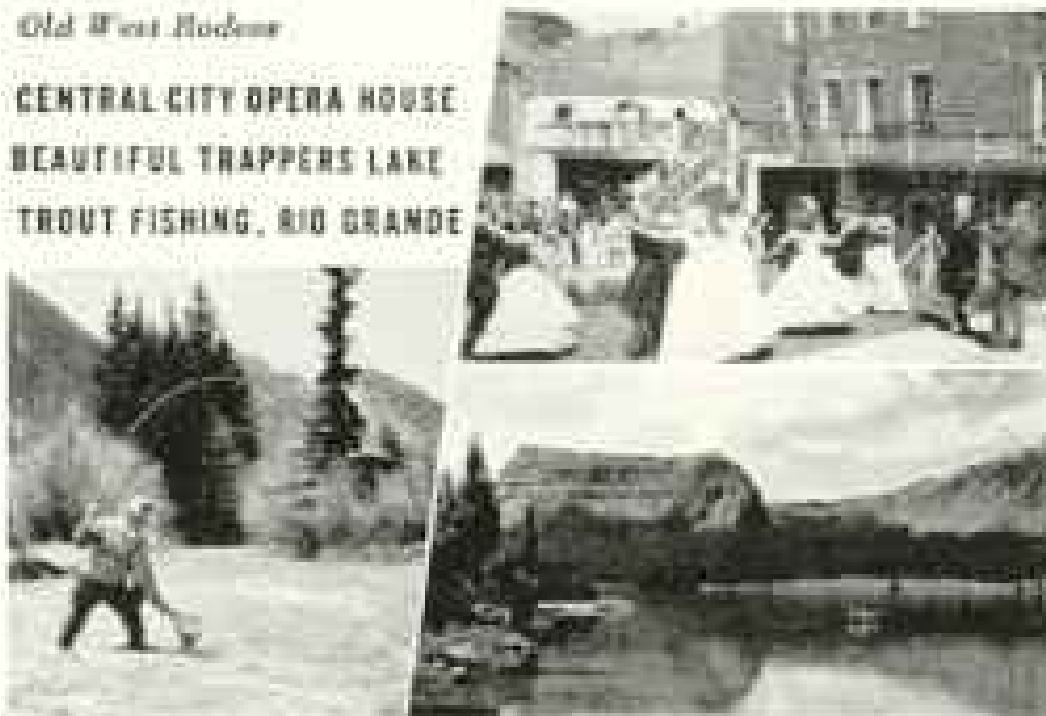
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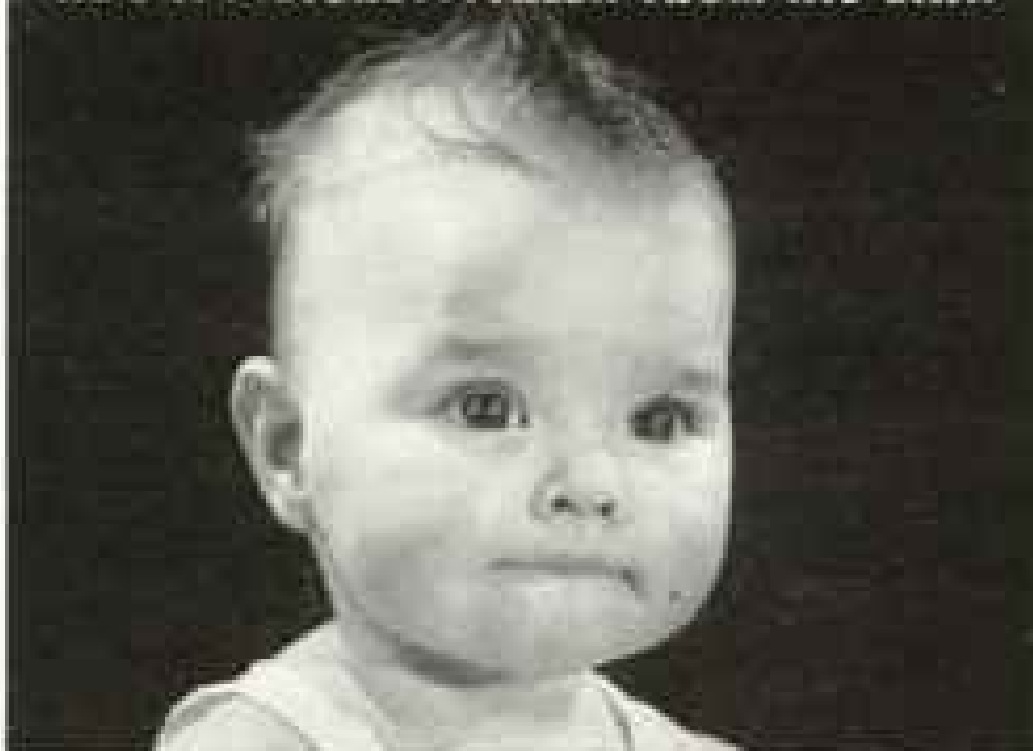
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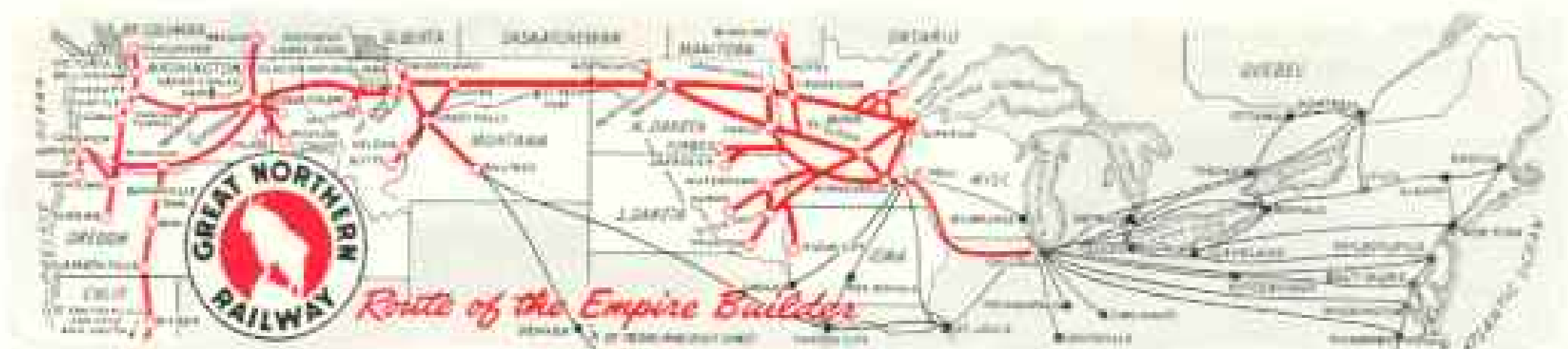
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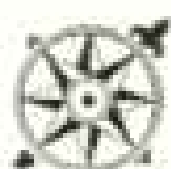
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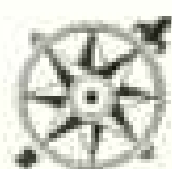
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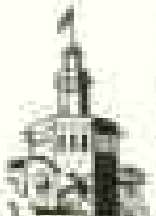
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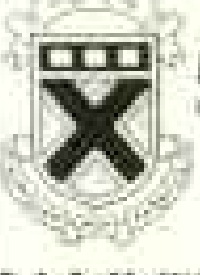
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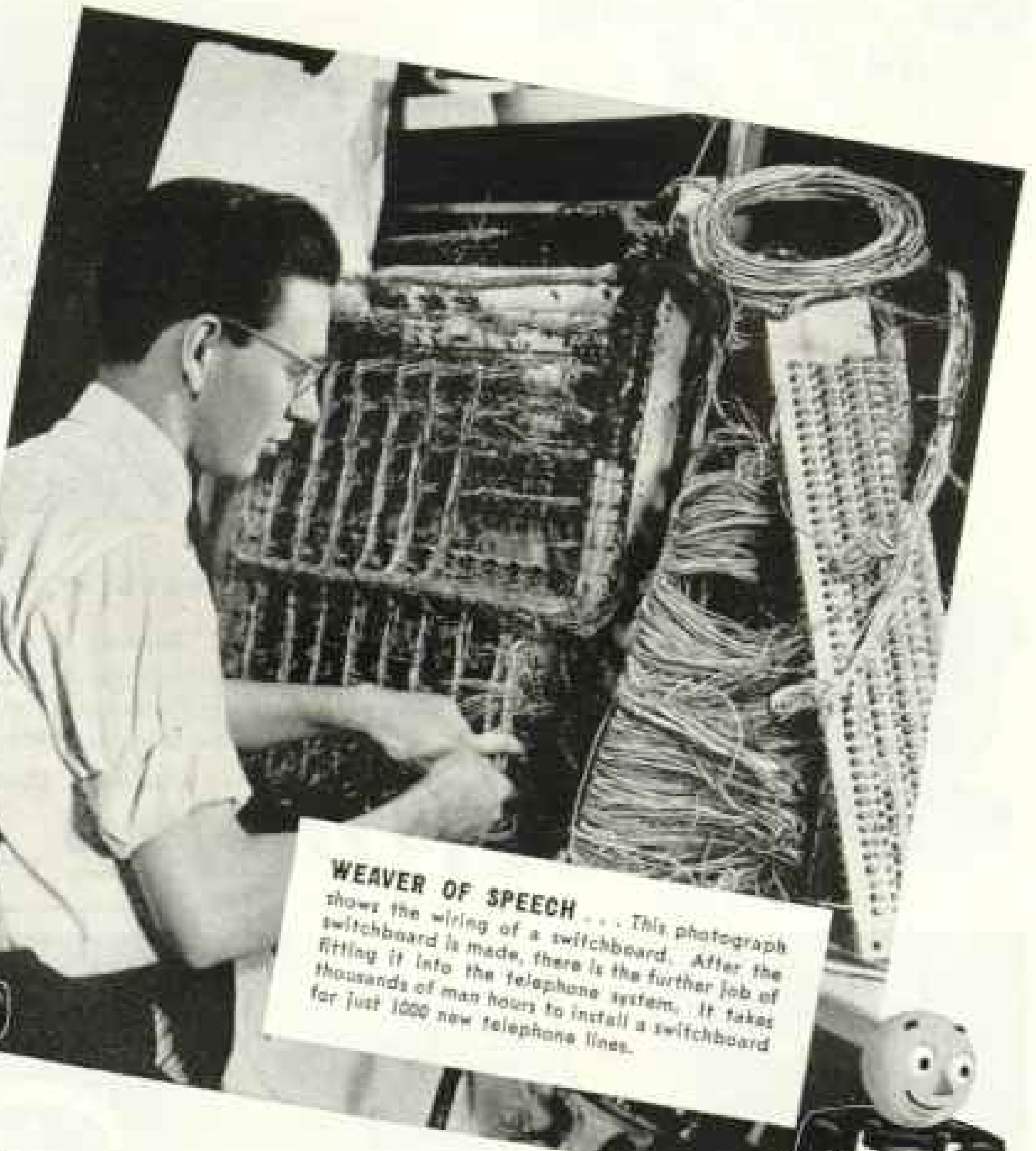
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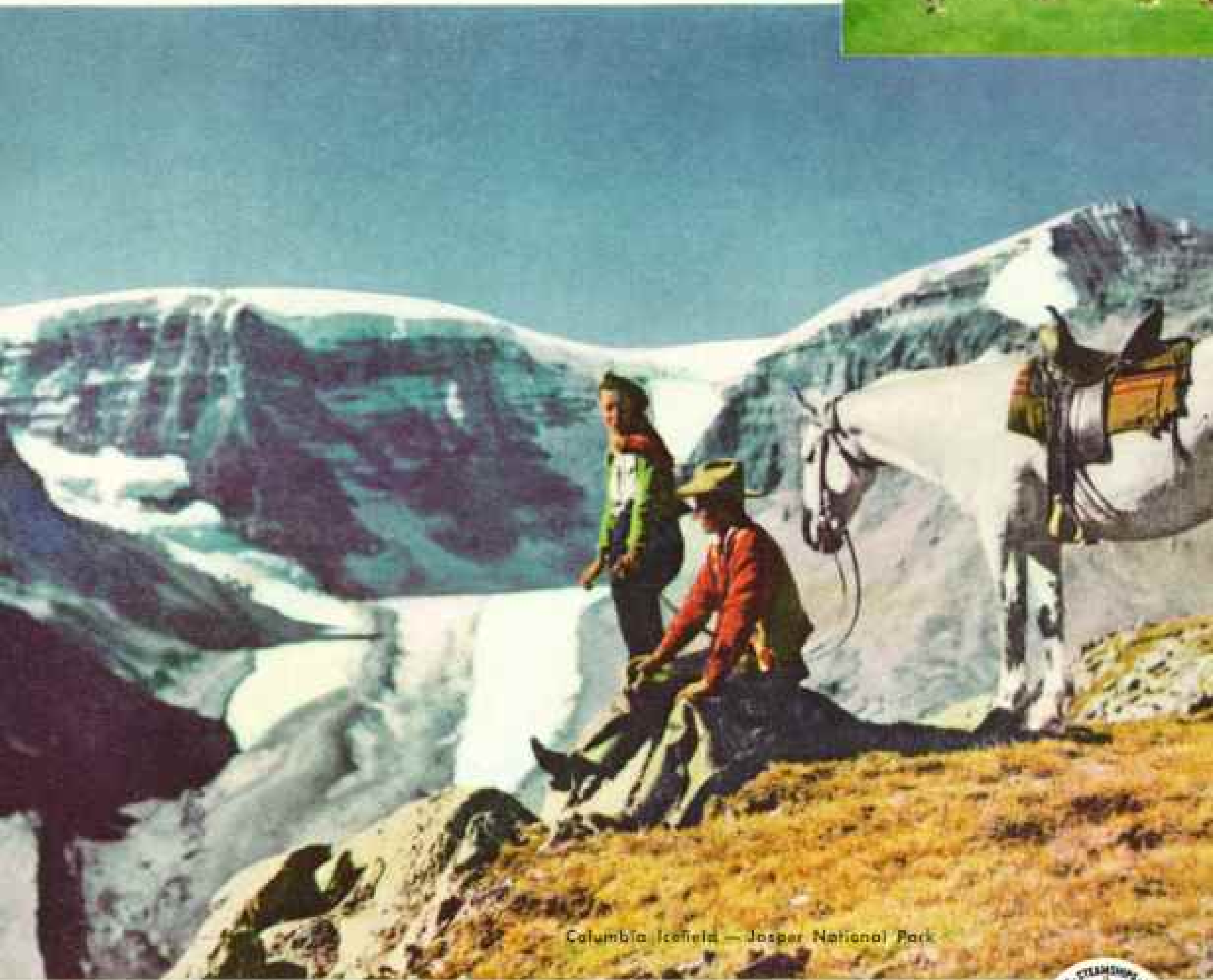
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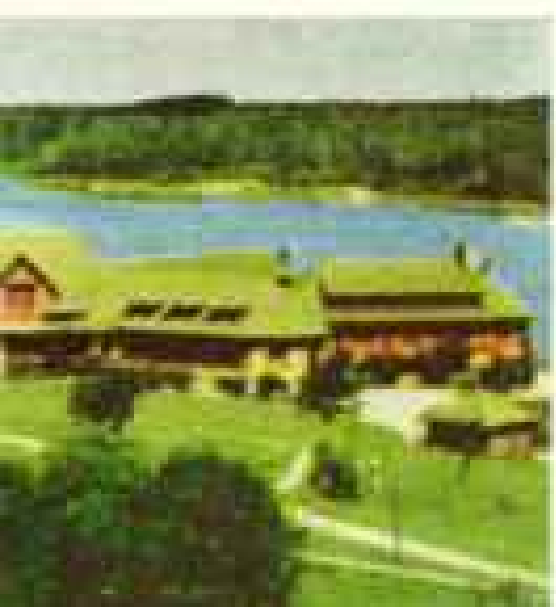
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