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Northeast of Boston

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Map of Northeastern United States

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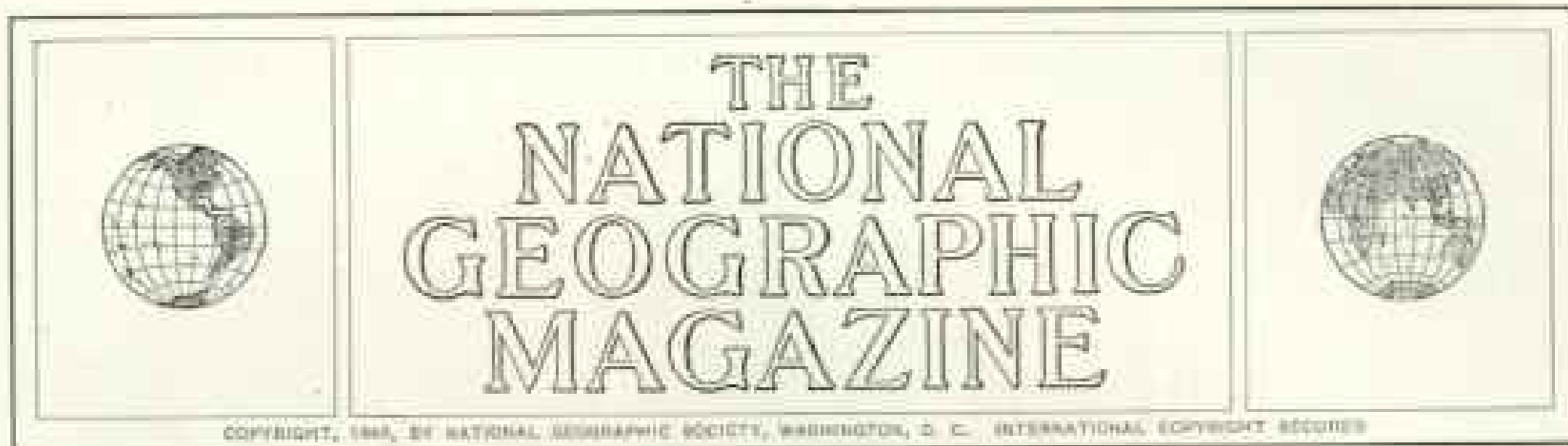
CATHERINE BELL PALMER

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Northeast of Boston

By ALBERT W. ATWOOD

SO COMPLETELY is Boston the capital and metropolis of New England that the coast to each side of it naturally divides into two sharply defined regions, one northeast and the other southeast of Boston.

Each of these far-flung seaboard reaches has a distinctive charm, historic past, and current interest of its own.

But of the shore which stretches far to the northeast, up to the Canadian border, it may be said that nowhere is there a coast whose inhabitants were more clearly destined by Nature to the pursuits of the sea.

It was not that the founders of Massachusetts Bay Colony consciously intended to establish a predominantly maritime economy. True, they hoped to take advantage of the North Atlantic fisheries which earlier explorers had discovered, but their first object was to found a religious refuge, a church and commonwealth for Puritans, which might also prove a profit-making plantation.*

Riches of a "Stern and Rock-bound" Coast

But long, cold winters and thin, rocky, and meager soil made agriculture on the scale of Virginia's tobacco plantations a sheer impossibility. Landed estates were out of the question.

These settlers had cast their lot on a literally "stern and rock-bound" coast. It was a hard land, geologically, climatically, and agriculturally, only a fringe between wilderness and sea.

But the wilderness was filled with timber perfectly adapted to shipbuilding, and the sea itself was filled with fish which, because of the cold winters and cool summers, could be dried, salted, and shipped to distant parts.

In addition, the coast is a highly irregular and indented one, with many large rivers, hun-

dreds of offshore islands, and seemingly innumerable points, necks, capes, peninsulas, coves, bays, and estuaries.†

The islands range from tiny rocks to those like Mount Desert (page 289), capable of supporting several towns and hundreds of summer homes. The indentations range from small inlets to arms of the sea so large that a yachtsman can sail in them for days without exhausting the possibilities.

In consequence, the coast is bountifully supplied with harbors in which shipping may take shelter behind the protecting islands or capes or far up the deep estuaries and rivers.

Thus all the elements for a splendid maritime civilization lay close at hand, and stark necessity forced our Puritan forefathers to seize the only opportunity before them.

If they had not done so, there might well have been no "flowering of New England" and a wholly different kind of development on this continent.

Plymouth, to the south of Boston, was the first permanent white settlement in New England. But it lay apart from the main stream of colonization, and in 1691 its identity was merged into the larger and more powerful Province of Massachusetts Bay.

When Salem Sailed the Seven Seas

It was Salem, 14 miles northeast of Boston, and not the present metropolis itself, which saw the beginnings of the Massachusetts Bay Colony. Prior to the founding of Boston, it was the point of debarkation for the great Puritan migration to the New World.

* See "Massachusetts and Its Position in the Life of the Nation," by Calvin Coolidge, NATIONAL GEOGRAPHIC MAGAZINE, April, 1923.

† See map supplement "Northeastern United States," with this issue of the NATIONAL GEOGRAPHIC MAGAZINE, and page 361.



Staff Photographer John E. Fletcher

To Fill Peabody Museum, Salem Skippers Combed the 19th-century World for Souvenirs

Members have rounded up whaling harpoons, ship carpenters' tools, relics of the frigate *Constitution*, and Dr. David Livingstone's sextant. Other pieces include a Chinese punch bowl, African fetish drum, Egyptian mummies, and carvings from mysterious Easter Island. Fiji spears, Australian boomerangs, Ainu bows, Marshall Islands clubs, and Formosan snakeskin armor illustrate war's fashions. Shown are a ship's model and three figureheads (page 273).

It was Salem that began trading with more different peoples in Asia, Africa, South America, and the islands of the sea than all other American ports combined.

Salem ships were the first to open trade with St. Petersburg (now Leningrad), Zanzibar, Sumatra, Calcutta, Bombay, Batavia, Arabia, Madagascar, and Australia. The city adopted as its motto: "To the farthest port of the rich East" (page 259).

Native chieftains in the Far East, who had never heard of Boston, New York, or Philadelphia, thought that Salem was a country all its own.

Today Salem is a typical factory city of 40,000 population, with its earlier Puritan stock overlaid with successive migrations of Irish, French Canadians, Poles, and Italians.

Like any predominantly industrial town, it has drab aspects.

But this prosaic, utilitarian present is more than matched by an extraordinarily insistent and romantic past. Salem is literally a treasure house of early American landmarks, relics, articles, and documents of historic interest, all easily accessible and within a small area.

The little city is fairly haunted by these still-visible evidences of its illustrious position, first as progenitor of the great Massachusetts Bay Colony, and later as a mistress of the seas.

Unlike some larger cities of venerable age, in which population grew apace, it was unnecessary for Salem to tear down and rebuild; thus a larger proportion of memorable objects remains undisturbed.

A band of fishermen, headed by Roger Conant, had vainly attempted to settle at Cape Ann, but in 1626 they founded the Plantation of Naumkeag, now Salem, only six years after the Plymouth landing.



Staff Photographer John E. Fletcher

Adventurous Captains Carried Salem's Fame into the Orient's Uttermost Gulf

Such fabulous cargoes of luxuries did they bring home that Salem's motto became "To the farthest port of the rich East." Driving hard Yankee bargains, they often made profits of several hundred percent for shipowners. Their portraits hang in Salem's Peabody Museum (pages 258, 264, 273).

Within two years these "Old Planters," as they were known, were joined by a small group of Puritans led by John Endecott (Endicott), agent of a newly formed company in England, sent out to prepare the way for much larger numbers.

Whether or not Endecott should be known as the first governor of Massachusetts, he was evidently in charge until John Winthrop, bringing the charter of the Colony granted under Charles I, landed at Salem in 1630 with some 700 followers and cows, goats, and horses.

Winthrop and his colonists did not remain in Salem long, but dispersed to found Charlestown, Boston, Dorchester, Roxbury, and other towns.

A Park of Living History

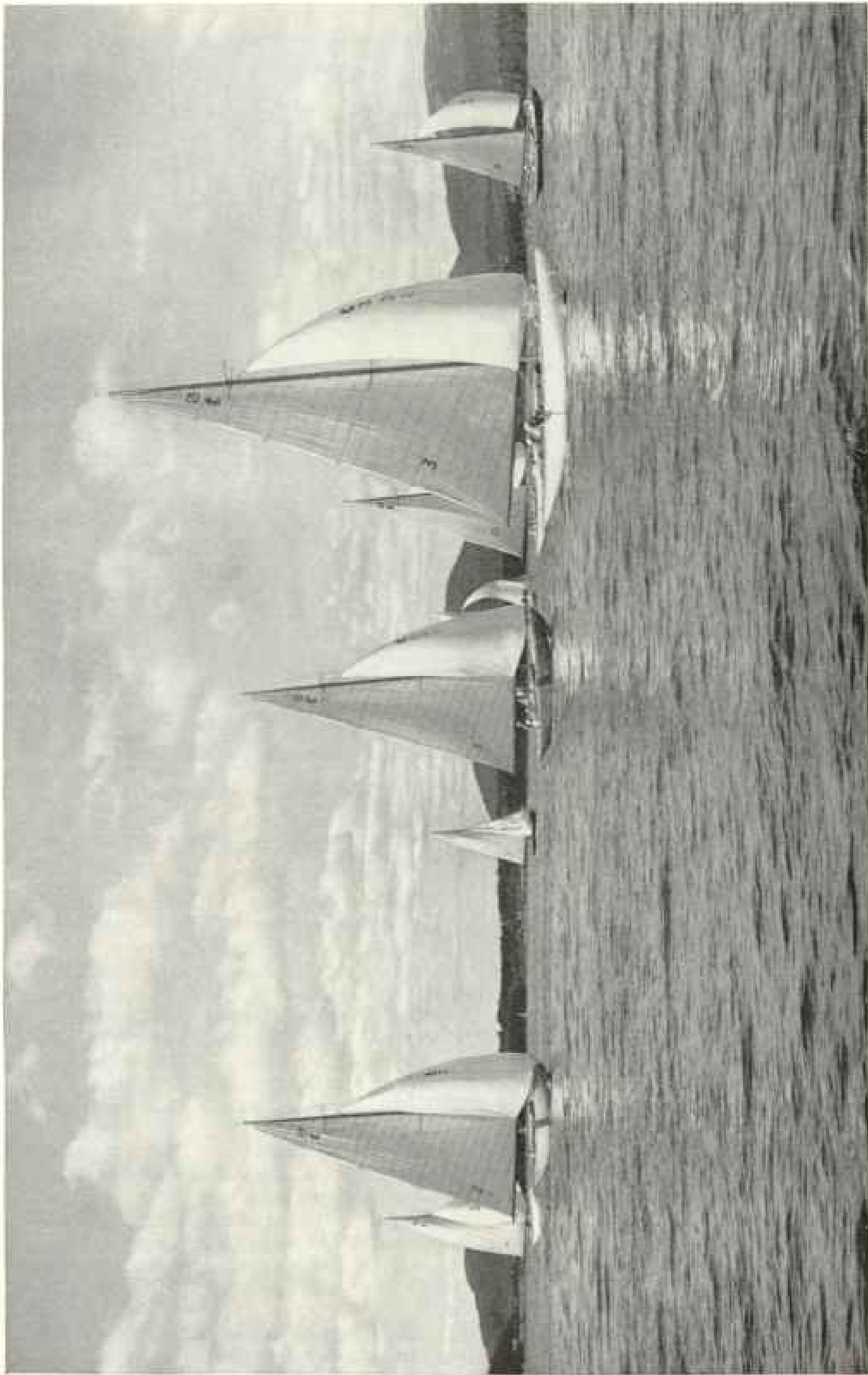
Visitors to Salem do not expect to find the original primitive huts of wattle and thatch in which Conant's and Endecott's followers lived. But on the shore, in a city park, is a

historically correct and faithful reproduction of the settlement which Governor Winthrop found upon arrival (page 275).

Based upon descriptions in letters sent back to England by the earliest settlers and from information furnished by our own and British museums, it is known as the Pioneers' Village, and was Salem's part of the State-wide celebration of Massachusetts' 300th birthday in 1930. It is now maintained as a permanent historical park.

Living conditions of more than 300 years ago are portrayed with detailed fidelity. Besides the primitive huts, there were the somewhat larger "Governor's Fayre House" and the indispensable industries, such as saltmaking, lye, soap, and candlemaking, and the blacksmith's forge, where nails and tools were fashioned.

A man, it seems, could make salt for his own use but not to sell, that being a monopoly of Governor Winthrop's son!



Courtesy, Maine Development Commission

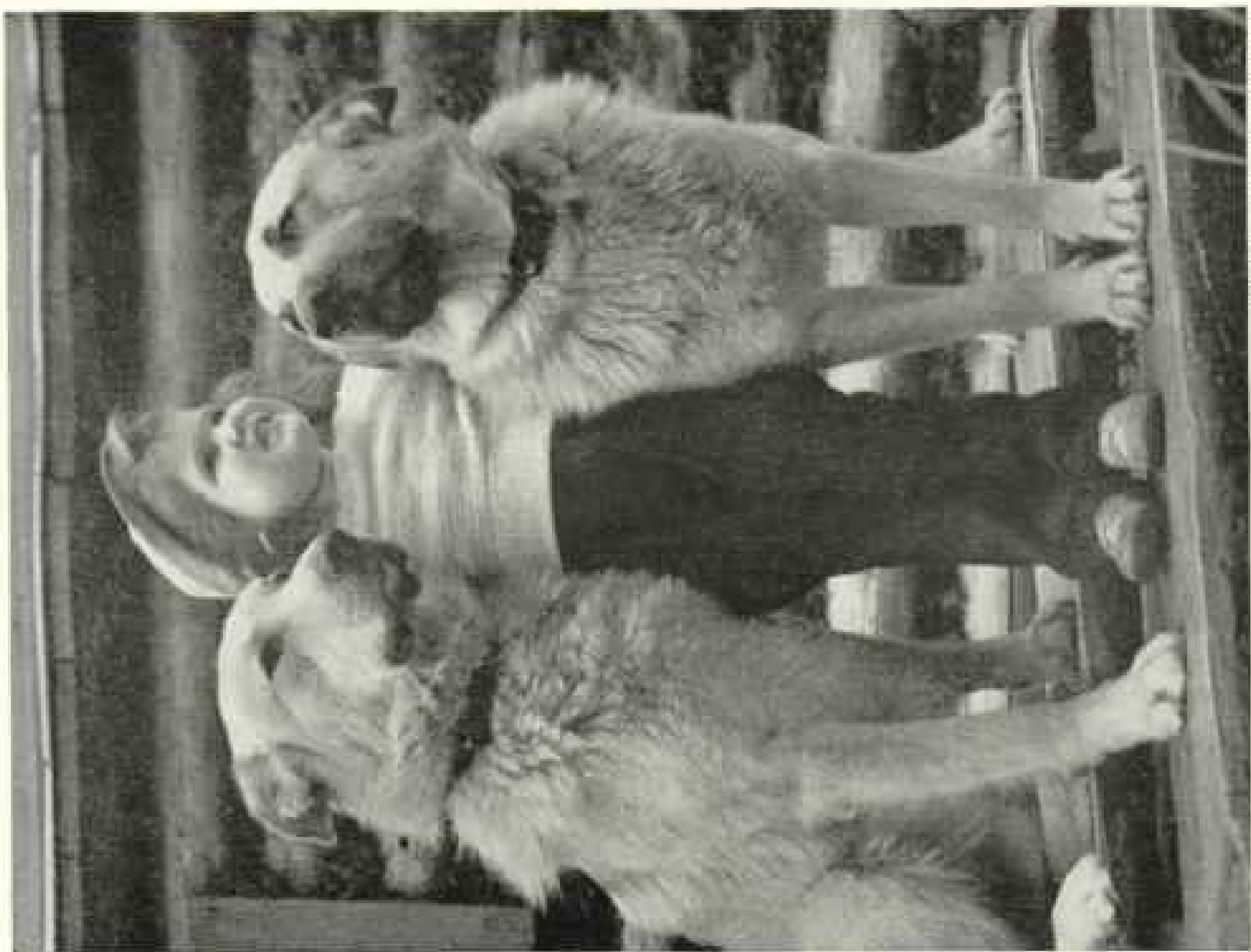
Full or Collapsed, Spinnakers Reveal Skippers' Skill and Luck in Catching a Light Breeze off Mount Desert Island, Maine

One sail (third from left) droops while a rival, 100 feet directly ahead, balloons with a fortunate puff. Hand on sheet, a crew member (second yacht from right) jockeys his sail as he would a horse's reins. Compact and sturdy, these are International Class sloops, all built in Norway before the war. Here the Northeast Harbor fleet nears the finish line after an eight-mile race. Four years of war have not stopped such races.



On This Spot Alexander Graham Bell Burned Midnight Oil

At the Thomas Sanders home in Salem, Professor Bell lived several years. By day he taught in Boston; by night he instructed the Sanders boy, born deaf, and worked on experiments leading to his telephone. The house no longer stands. On its site, the YMCA exhibits replicas of Bell's original instruments.



Powerful Chinooks Make Gentle Guardians for Children

These pets are descendants of a lead dog with a Byrd expedition to Antarctica. They were bred for house and harness at Warren, Maine, by Perry Givens. With seven 100-pound Chinooks hitched to his sled, he traveled 502 miles across the Maine snows in 90 hours.

Staff Photographer John E. Fletcher



Staff Photographer John E. Fletcher

Two Maine Men, Striving to Fill 200 Barrels a Day, Dip Alewives from a Trap

Springtime drives salt-water alewives upstream to spawn. Since 1680, when they were so thick they could be taken from rivers by hand, their numbers have declined. These small and bony fish are disdained by epicures. Many, pickled and smoked, become poor man's fare in the West Indies. A few, canned, enter the domestic market as "river herring." Alewife's linguistic origin is uncertain (page 290).

By 1635 the sawing and cleaving of lumber was a recognized industry, and good frame houses began to take the place of the temporary huts so unsuited to the New England climate.

Of these early frame houses Salem has an unusual number still standing, including the Pickering House, which dates from 1651-1660, and the so-called "Witch House," almost as old (Plate VIII).

Just as the first "common house" in Plymouth and all but the foundations of the early statehouses in Jamestown have long since disappeared, so nothing remains of the early courthouse in Salem where the famous trials and convictions for witchcraft took place in 1692.

When the old courthouse ceased to be used as such in 1718, a new town and courthouse was built near by. Here the General Court (State legislature in modern terminol-

ogy), under the chairmanship of John Hancock, took the first formal action of the Province in putting itself in open antagonism to the British government.

These two sites and a third near by, where stood the first Congregational meetinghouse in America, are all marked by tablets.

The Witch House, at the corner of Essex and North Streets, is one of the oldest dwelling houses in the United States and was owned by Jonathan Corwin, one of the judges of the witchcraft court; in its rooms some of the preliminary examinations may have been held.

Moments of the Witchcraft Hysteria

For a long time the house was defaced by a modern drugstore which grew out of one corner, like an excrescence due to age and disease. But the disfiguring growth has been removed, and the house is being restored and slightly relocated.

As far as is known, only one house still stands in which lived a victim of Salem's witchcraft hysteria. This is the quaint Nurse House, open to visitors, on a hill in a field on the old Nurse farm in Danvers, a few miles from Salem. (In those days Danvers was a part of Salem.)

The aged Rebecca Nurse (or Nourse), executed in 1692, although exonerated by the jury, is buried in a copse of pine trees a few hundred yards from the house. Her body was removed there at night, according to tradition, by her sons. A monument to her memory bears an inscription written by the poet Whittier.

Back in Salem may be seen Gallows Hill, a rocky, barren city park, where those convicted of witchcraft were hung, and also the witchcraft exhibit in the office of the clerk of the modern courthouse.

This includes the death warrant of Bridget Bishop, the first person executed in Salem for witchcraft; the direct examination of Rebecca Nurse, in the handwriting of the Reverend Samuel Parris, who was one of the most active in the delusion and in whose house (at Danvers) the strange doings which led to the trials originated; and the pins, produced in court, which the hysterical girls who caused the trouble declared had been pressed into their flesh by the alleged witches.

Salem will be forever associated with the witchcraft delusion, although this madness lasted only four months out of the city's nearly three and a quarter centuries of existence and reached no such proportions in America as it did in Europe.

No witch was burned in Massachusetts. Of the 20 executed in Salem, 19 were hanged. One, the aged Giles Corey, was pressed to death for refusing to plead, the only recorded instance in the American Colonies of such a punishment.

Many other persons were accused of witchcraft and jailed, but a general jail delivery took place later, when the inevitable revulsion of feeling came.

In 1711 the General Court reversed many of the convictions and paid damages of 578 pounds and 12 shillings to such of the alleged witches as were still living or to their heirs.

It is thought likely that, in the few cases in which convictions were not reversed, the heirs had scattered and disappeared and thus did not press the matter.

One of the 19 hanged was Ann Pudeator. In February, 1945, some of her descendants attempted to have her conviction reversed.

Salem feels that it did a historic service in bringing the witchcraft delusion to a head and

thus to an end. As Whittier said of the blameless Rebecca Nurse:

O Christian Martyr! who for truth could die,
When all about thee owned the hideous Lie!
The world, redeemed from Superstition's sway,
Is breathing freer for thy sake today.

House of the Seven Gables

The first landmark which most people, adults as well as school children, wish to see in Salem is the House of the Seven Gables on the waterfront at the foot of Turner Street. In early days it was the tollhouse for the Marblehead ferry (Plate VI).

Nathaniel Hawthorne, who was born in Salem and whose life and work were so closely identified with the city, never lived in the House of the Seven Gables and may have had other dwellings in mind when he wrote his book of that name. But he spent many hours in the charming old place with his relatives, the Ingersolls.

Since 1910 the house has been used as a residence for the social workers of the House of Seven Gables Settlement Association, which owns it. It serves Polish, French-Canadian, Irish, and Italian neighborhoods.

Two other 17th-century dwellings, the Hathaway House and the Retire Becket House, have been moved to the same grounds, and it is said that these probably form the only group of three 17th-century houses in New England.

Hawthorne's birthplace, at 27 Union Street, and the house in which he wrote *The Scarlet Letter*, 14 Mall Street, are not open to the public.

His birthplace is near the Burying Point, where the earliest settlers in Salem are laid to rest, including Hawthorne's ancestor, John Hathorne, one of the judges at the witchcraft trials.*

Upon him a curse was pronounced by one of the victims, and tradition has it that Hawthorne's descendants long remembered it.

Apparently Nathaniel Hawthorne heartily disliked many Salem people, and they reciprocated; the prophet had no great honor in his own country. Salem people regarded him as gloomy and embittered. In 1850 he wrote his sister Louisa from Boston:

"I should come and see you but cannot endure the idea of coming to Salem just yet. It would be tempting Providence to incur another risk of being tarred and feathered."

At the Custom House, now part of the Salem Maritime National Historic Site, one may stand or sit at the tall desk where Haw-

* The novelist changed the original spelling of his name to Hawthorne during his last year at Bowdoin College.

thorne worked as Surveyor of the Port from 1846 to 1849, and look out, as he did, upon the harbor and upon the great Derby Wharf, nearly 2,000 feet in length, from both of which commerce has long since departed.

For many years before the Revolution, Salem merchants began to engage in that triangular form of commerce between the American Colonies, Africa, and the West Indies that became the backbone of New England's prosperity.

With the sudden cessation of normal trade in the Revolution, the fleet was driven into that highly successful form of war against the British, privateering. Of all ports which provided men and ships for harrying British commerce, Salem furnished the most; fifty were at sea at all times for seven years.

Privateers outsailing almost anything afloat and too large for short trips or coastwise trade had been built.

Adventures of Salem Sailors

Thus, after the Revolution, Salem sought out trade with new and far-distant peoples, its ships penetrating in very truth "the farthest port of the rich East."

A sailor boy might visit Rangoon or St. Petersburg or Sumatra before he walked the streets of Boston.

In the cargoes brought back were tea, coffee, silks, spices, nankeens, lemons, feathers, raisins, wine, figs, rubber, hides, horns, china-ware, rum, gin, molasses, limes, and cocoa.

The West did not yet beckon to daring youth; they practically all went to sea. On unknown oceans and in ports never before visited by Americans there was adventure enough. There were fights with pirates and tribes of savages and imprisonment in French, Spanish, and Algerian dungeons.

Privateering in the Revolution had produced sailors who were well drilled, competent, enterprising, and courageous. Many of the supercargoes were Harvard graduates.

The best of the seamen became captains before they were 25. Each skipper was a trader who could sell his cargo in the most profitable port and engage in personal ventures, retiring at 30 to carry on a mercantile business of his own.

A few merchants were worth more than a million dollars, and in per capita wealth Salem at one time was one of the richest American cities.

For a time Salem monopolized the world's market in pepper; \$18,000 was paid for a single cargo of Sumatra pepper that sold at 700 percent profit.

After the War of 1812 Salem gradually lost

its maritime supremacy. With the Erie Canal, New York became the great port for foreign trade, and the railroads helped not only New York but Boston, Philadelphia, and Baltimore. Nor was Salem's harbor deep enough to accommodate the larger ships which came into use.

But Salem had had her half century of commercial glory, and it concerns us now because of the graceful and stately monuments that remain.

Scattered throughout the city are many mansion houses of the Federal period following the Revolution, which show not only how wealth came out of the sea but which embody the ultimate in good taste and artistic achievement.

These houses are to be seen on Washington Square (Salem's old common) and on such streets as Essex and Federal. They reach their peak in nearly half a mile of elm-shaded perfection on Chestnut Street, one of the most carefully preserved and beautiful examples of a "period" street in America (Plate XII).

Shipbuilding and Wood Carving

The distinction of Salem's architecture, as in a number of other coastal towns, was an outgrowth of its shipbuilding industry, which attracted carpenters who in some cases were skilled wood carvers and designers as well. For example, the rope forms of the shipyard are to be traced in architectural details.

For 30 years Samuel McIntire was the foremost of the wood carver-builders and dominated Salem architecture. The grace, beauty, and precision (without machine production) of much of his work are unsurpassed by that of other American carvers.

McIntire's genius as a carver was lavished upon a large variety of details, especially of interior design and decoration, and upon furniture.

Still privately owned and occupied, the Chestnut Street houses, some of which are by McIntire, are not open to the public. But their exteriors are worth a study.

Besides the mansion houses, there have come down from Salem's seafaring prosperity two unusual museums, the Essex Institute and the Peabody Museum, both crammed with a fascinating and almost infinite variety of objects which, in the language of Hildegard Hawthorne, granddaughter of the great novelist, are "iridescent with romance or eloquent of history, human odds and ends that touch you strongly" (page 280).

The Essex Institute has one of the largest collections of antiquarian and historical

Where New England Meets the Sea

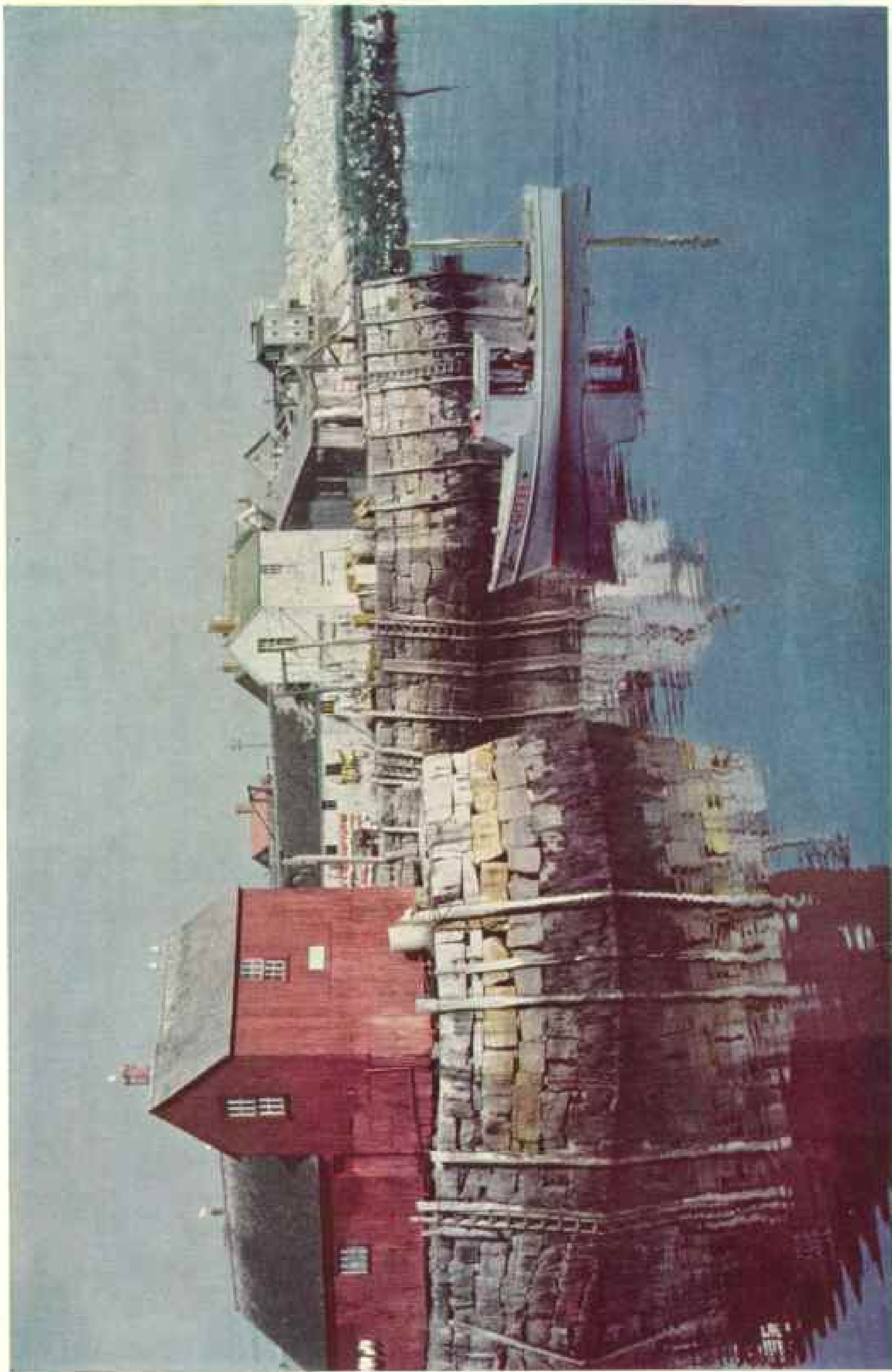


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Reproduction by H. Arthur Stewart

"Spirit of '76," Glorifying the American Revolution, Inspires History Students of Today

Originally entitled "Yankee Doodle," it was painted by Archibald M. Willard, a veteran of the Civil War, for exhibition at the Philadelphia Centennial Exposition in 1876. The painting was presented to Marblehead by Gen. J. W. Devereux, "in memory of brave men of Marblehead who have died in battle for their country."

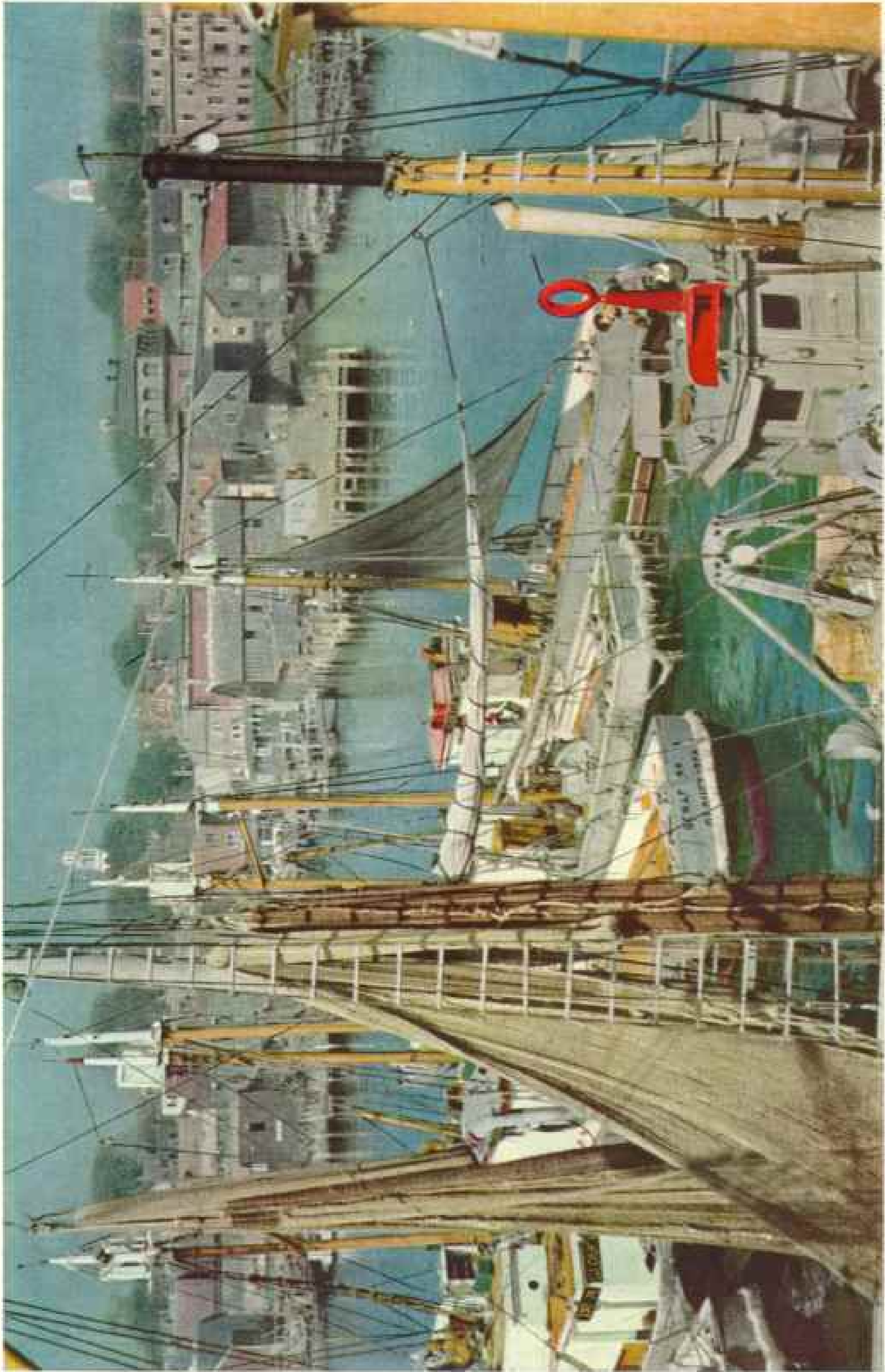


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Kodachrome by B. Anthony Harvart

So Many Artists Paint This Red Sail Loft at Rockport That It Has Been Dubbed America's "Motif Number One"

Attracted by its picturesque wooden houses and waterfront, an art colony flourishes in summer in the fishing village on Cape Ann, Massachusetts. Low tide exposes massive stone blocks of piers. Buildings house fishermen's gear. Sea gulls congregate on the rocks at far right.



© National Geographic Society

Illustration by H. Anthony Barrett

Gloucester Fishermen, Made Famous in Kipling's *Captains Courageous*, Have Sailed for 300 Years from This Harbor

Nets hang to dry from masts of fishing boats, nowadays mostly engine-powered. In right foreground a man paints the red antenna of a radio direction finder which locates the craft in the fog of the Grand Banks and along the coast. Nearly 175 vessels of over 10 ton catch redfish, mackerel, whiting, haddock, and cod (Plate V).



Lush Garden Truck Belies Those Tales of "Stern and Rock-bound" Coast of Maine
Fruits and vegetables at Topsham Fair show what Maine farmers are able to grow in their short summer.

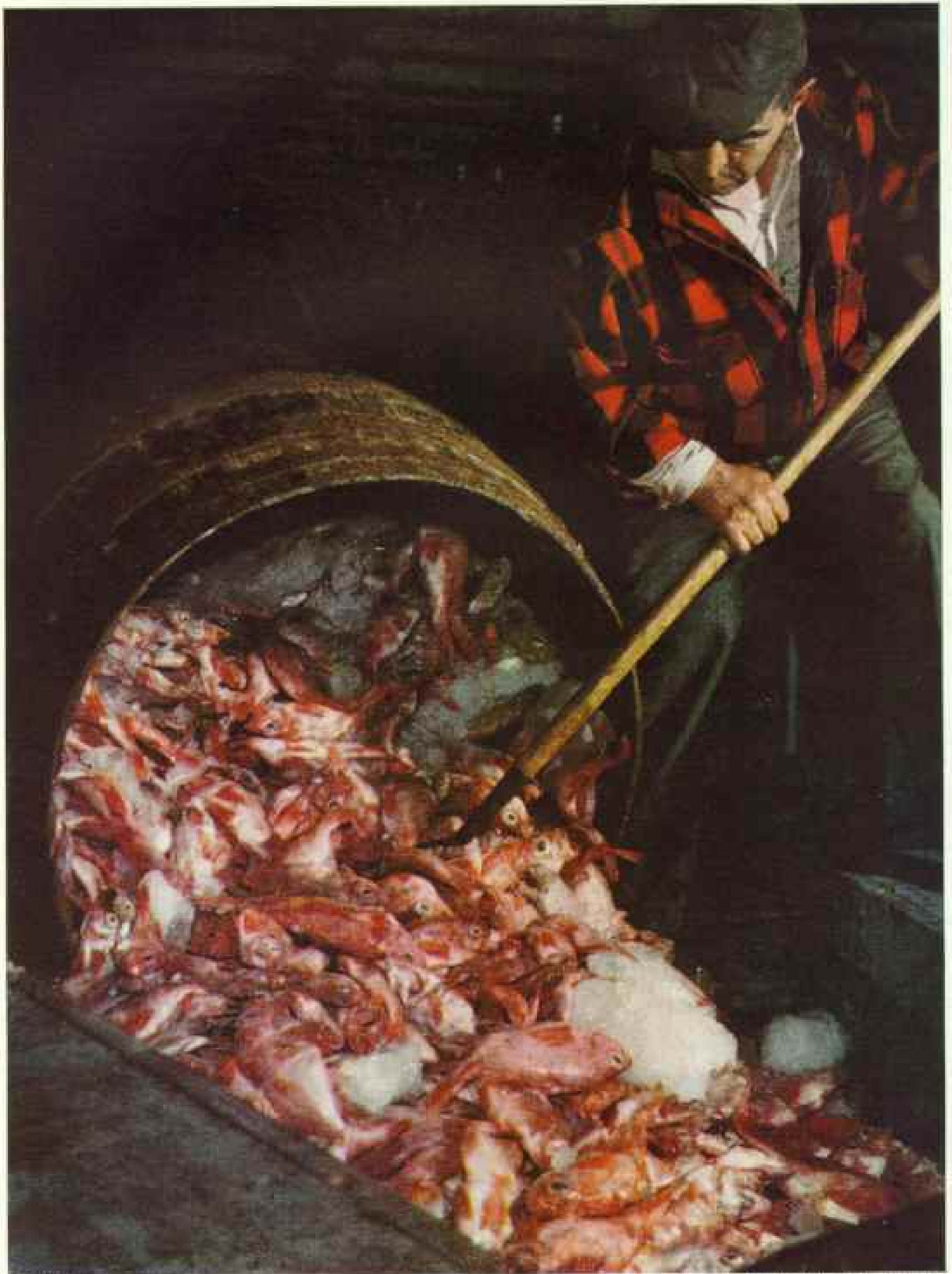


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Photomontage by E. Anthony Stewart

Live Lobsters Are Shipped in Ice All the Way from Gloucester to Hollywood

Consolidated Lobster Co., of Gloucester, Massachusetts, one of the largest shippers of lobsters, stores huge numbers of crustaceans in tanks through which 8,000,000 gallons of sea water circulate daily.

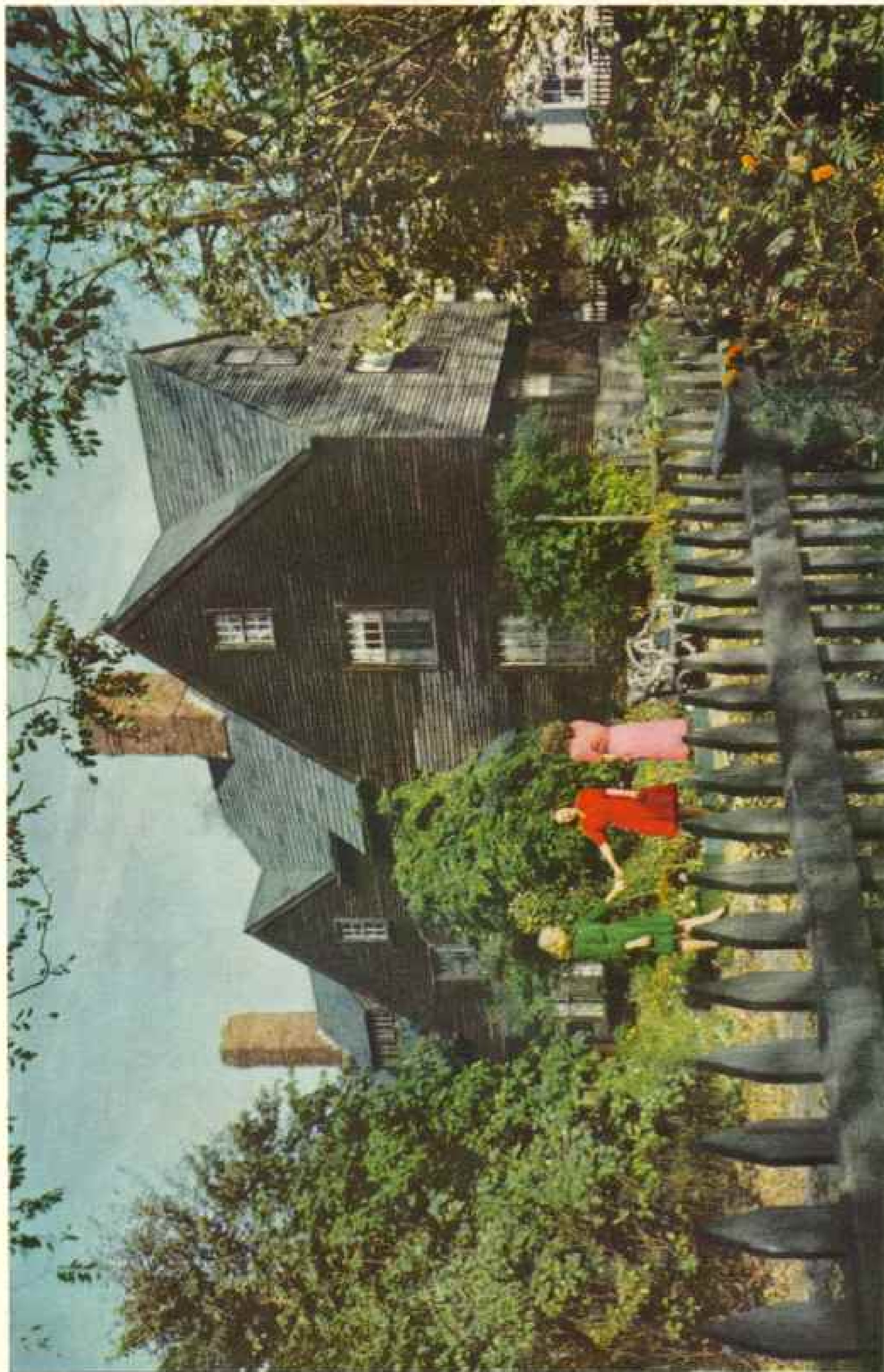


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Kodachrome by B. Anthony Stewart

Huge Catches of Redfish from New England Are Eaten Yearly in Midwest and South

Known also as rosefish, they are seldom used by New Englanders, more accustomed to other kinds. Formerly discarded for lack of demand, redfish now are marketed as frozen fillets; less edible parts are made into fish meal. Increased redfish catch in recent years helped make Gloucester the leading fishing port of New England.

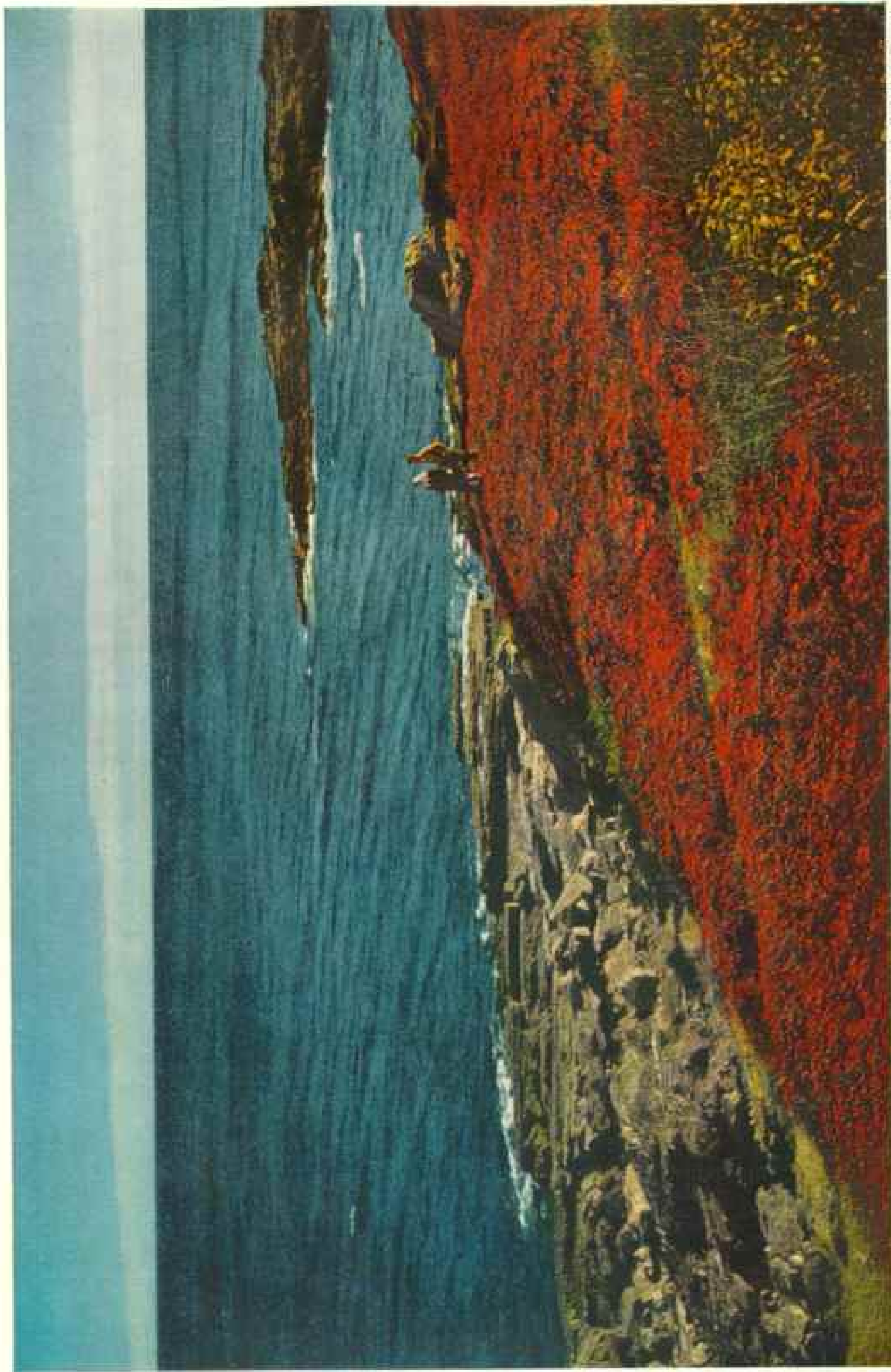


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Restoration by H. Anthony Bennett

House of the Seven Gables, Salem, Built about 1669, Helped Inspire Nathaniel Hawthorne's Novel of That Name

The house described in the story was not this or any existing house, but a composite of several old dwellings in Salem. However, the author often visited this house, occupied by his cousin. It did not have seven gables in Hawthorne's day. Restored in 1909, the house is now a center for neighborhood settlement work.



© National Geographic Society

Blueberry Bushes, Their Leaves Turned to Autumn Scarlet, Carpet the Shore with Color Near Ogunquit, Maine

Rocky coastline is typical of Maine. Low-growing blueberry bushes bear the pale-blue fruit that is the ingredient of luscious New England pies and muffins. Ogunquit is noted for its colony of artists and actors and for its summer theater where nationally known stage and screen stars are guest players.

Photographs by H. Anthony Stewart



© National Geographic Society

Photograph by H. Anthony Stewart

Witch Jail in Salem Recalls Witchcraft Horrors of 1692

Carefree girls of modern Salem are a far cry from the witchcraft delusion of colonial times. Innocent adults were accused of bewitching a group of children who had behaved strangely after listening to superstitious tales of a West Indian slave. Gallows Hill, where most of the victims were hanged, still is preserved.

objects in the country illustrating colonial and Federal life. It also has what it believes to be the largest library east of Boston, including thousands of genealogies, town histories, biographies of New Englanders, broadsides, book-plates, manuscripts, and English parish registers, wills, act books, and chancery proceedings.

One of the Nation's Oldest Museums

But it is in the Peabody Museum, across the street and a short distance from the Essex Institute, that the flavor of Salem's nautical days is most definitely preserved. This is one of the oldest museums in the country and has been in continuous operation since its founding (pages 258, 259).

It began as the East India Marine Society. Later it was endowed by George Peabody, the noted London banker and philanthropist, who was born in South Danvers, near Salem, subsequently named Peabody in his honor.

There are exhibits which date from 1799, including a wine goblet made from the horn of a rhinoceros. Membership was restricted to persons who had navigated the seas near the Cape of Good Hope or Cape Horn as captains or supercargoes in a Salem vessel.

One of the purposes of the organization was to "form a museum of natural and artificial curiosities, particularly such as are to be found beyond the Cape of Good Hope and Cape Horn," and the members responded literally by bringing back from every corner of the globe an amazing collection of objects.

Such, for example, is a porringer made from the copper pump of H.M.S. *Bounty*, given to an American captain who took a group of descendants of the mutineers away from lonely Pitcairn Island.

There are the souvenirs given by the family of Napoleon to George Crowninshield, member of one of Salem's first families. He went to the Mediterranean in *Cleopatra's Barge*, the first seagoing American yacht to sail there. Rumor said his purpose was to rescue the former French emperor from his British captors.

Here are the earliest known American painting of an American-built ship, the *Bethel*;* a flag made by Mr. and Mrs. Robert Louis Stevenson for the king of one of the Gilbert Islands; a sextant used by David Livingstone in darkest Africa; one of the finest collections of ship models; more than 20,000 pictures of ships; original editions; and nautical instruments of Nathaniel Bowditch, famous authority on navigation, who was born in Salem.

Not only in Salem but in Marblehead, Newburyport, and other Essex County towns is it

possible to spend days looking up houses in which celebrated persons were born or lived.

The old joke that all the first families of Boston came from Essex County is almost literally true, if "came from" means "descended from." Only a few of the conspicuous names are those of Saltonstall, Endicott, Peabody, Higginson, Cabot, and Lowell.

Two facts in this connection must be remembered. First, Salem was long the chief port of debarkation for the Puritan migration. Second, when Salem's seafaring prosperity declined, many of the mercantile families moved to Boston in search of greater opportunities.

One of the most influential small groups in the early days of the Nation was known as the Essex Junto, consisting of men of Essex County origin. Timothy Pickering, who held three Cabinet positions under Washington, was born in the house on Broad Street, Salem, which one of his ancestors built in 1660. It is still occupied by Pickeringings.

A sister of Governor Winthrop lived in a house on the present site of the Essex Institute on Essex Street. She had a son, George Downing, after whom Downing Street, London, official home of the Prime Minister, is named.

On the same street in Salem worked as a clerk one Benjamin Thompson, who later became the celebrated British physicist, Count Rumford, as well as commander in chief of the Bavarian army.

Near by, still on Essex Street, is the YMCA, on the site of the Sanders home. Here Alexander Graham Bell, inventor of the telephone, lived for several years. He spent his days teaching in Boston and his evenings in Salem, partly working on his invention and partly teaching 6-year-old George Sanders, who had been born deaf (page 261).

In gratitude, Thomas Sanders, the boy's father and a wealthy leather merchant, provided financial backing for the invention. Incidentally, Walter S. Gifford, who has been president of the American Telephone & Telegraph Company since 1925, was born in Salem.

"From Wharf to Waterfall"

Like its neighboring cities of Lynn and Beverly, Salem is now given over to manufacturing. It has a considerable share in a modern industry, electrical and electronics products.

Here George S. Parker has manufactured games for over half a century. He invented the "Game of Banking" as a high-school student in 1883 and has invented hundreds of others since then.

By 1840 the center of interest in Massachu-

* Lent by the Massachusetts Historical Society.



Staff Photographer John K. Fletcher

Belts Loosened, Sleeves Rolled, New Englanders Pitch into a Clambake

Select a beach where the scent of pines mingles with salt air. Heat stones with a wood fire. For steaming, throw on wet seaweed (left). Add clams and lobsters (center) and fish, potatoes, and corn on the cob, as you like. Cover with a canvas "sail" (beside the pan) to lock in vapors. Steam about 85 minutes. Then go to work with both hands; don't stop for conversation. This small party met in Boothbay Harbor, Maine. A clambake master thinks nothing of cooking for thousands.

setts had shifted from seafaring pursuits to manufacturing, "from wharf to waterfall."

But the textile mills in Lowell and Lawrence, as well as in Biddeford and Lewiston, Maine, were built by merchants and ship-owners, who alone had the capital; and both textile and shoemaking industries were located near the coast, partly because of ocean transportation.

And Then Came Coal

Salem had no water power, but a retired shipmaster raised the huge sum of half a million dollars prior to 1845 to found the Naumkeag Steam Cotton Company. The new fuel, coal, was brought by water to compete with Merrimack River water power. Today the company, manufacturing sheeting and pillow-cases, has the largest weave shed in the world, covering ten acres.

Marblehead, on its rocky peninsula a few miles from Salem, is practically untouched by modern industrialism, and its streets and lanes are still narrow, steep, and crooked.

In early days it was a great fishing port, with approximately 100 ships on the Grand Banks and a population greater than that of either Albany or Baltimore. In 1789 there were 459 widows and 865 orphans in the town.

Proud of its part in our wars, Marblehead's "Amphibious Regiment," under Gen. John Glover, helped Washington to cross the Delaware. In the War of 1812 no fewer than 500 Marbleheaders languished in British prisons.

In the old Jeremiah Lee Mansion is a model of the schooner *Hannah*, to which both Beverly and Marblehead lay claim. Many different men in several different places helped found the American Navy. When General Washington took command of the Army in July, 1775,



Staff Photographer Edwin L. Wheeler

A Helicopter Hovers Near the *Arbella*, Reproduction of Salem's Charter Ship

In 1630 the first *Arbella* carried John Winthrop's Puritans to Salem from England. Three hundred years later this ship moved in for a pageant. Now, rigged to resemble the original, she is moored in Pioneers' Village, a park where Salem re-creates the life of 1630 (page 259).

the *Hannah*, first vessel of "Washington's Fleet," was commissioned to prey upon British sea communications in hope of capturing ammunition.

Marbleheaders take pride in their independence. Tradition has it that an artillery company at drill one day continued to march ahead, although the commander ordered "Retreat." Indignantly asked for an explanation, the sergeant replied that "Marbleheaders never retreat!"

The story is also told of the young couple who moved to Marblehead from Salem, four miles away, with a newborn infant. The latter, upon reaching man's estate, ran for public office, but was opposed by a native who vowed he would "never vote for a d— foreigner!"

Marbleheaders cannot forgive Whittier for his poem condemning Skipper Floyd Ireson, "for his hard heart, tarred and feathered and carried in a cart by the women of Marblehead," because of his alleged failure to help

the crew of "a leaking ship in Chaleur Bay."

According to the most authentic local history, it was Benjamin, and not Floyd, who was tarred and feathered. The women had nothing to do with it. In fact, a lady in Marblehead told me that one of her forebears helped Mrs. Ireson remove the tar and feathers. The real fault for not helping the wrecked vessel lay with the crew who, upon reaching port, tried to shift the blame from themselves to the skipper.

Marblehead Capital of Yachting

Marblehead became an active yachting and yacht-racing center in 1877 when the Eastern Yacht Club began to hold its annual regatta there. It has since become by far the most active yacht and yacht-racing center on the North Atlantic coast.

Sailboats predominate; of more than 200 boats in the harbor in a normal summer, only a handful are powerboats. Races are

divided into seven or eight classes. Normally there are 70 or 80 entries each Saturday from mid-June to mid-September. In race week, the first in August, there have been more than 400 on a single race day.

During the war years racing has continued on restricted courses, with about a third the usual number of starts. In late May, 1945, from the vantage point of Old Burial Hill I counted more than 100 boats at anchor in the harbor.

One of the most interesting features of Marblehead racing is the part taken by children. At the age of seven, they get down to the serious business of learning to sail. They wear kapok jackets for safety, because, as a rule, they have not learned to swim. That knowledge comes soon, however.

At eight or nine, boys and girls are racing in small, wide centerboard boats known as "brutal beasts." At 14 they are too old for these boats and must go with a larger class. A nautical instructor and a police power patrol boat look after the safety of the children.

Gloucester Foremost Fishing Port

Just as yachts fill the harbor of Marblehead, so commercial fishing craft fill the safe inner harbor of Gloucester, 14 miles northeast of Salem.

Boston and Gloucester have long competed for position as premier fishing port of the North Atlantic; today Gloucester proudly holds the title (Plates III and XIII).

James B. Connolly has written many novels and stories about the little city and its fishermen and has helped make it one of the best-known small ports of the world.

Fishermen operated from Gloucester three years after Plymouth was settled, and the inhabitants have almost literally eaten, slept, and thought fish ever since.

The early colonists would have perished without the North Atlantic fisheries. Today the situation is not so serious, but with the present shortage of meat the relative economic importance of fish is difficult to exaggerate.

For the most part, the continents of the world are bordered by strips of gently sloping ocean bottom covered by shallow sea. These strips are known as the continental shelf. Northeast of the New England coast and off the coasts of Canada's Maritime Provinces and Newfoundland are extensive shoals, or "banks," the waters of which are rich in salts, or chemicals, and in the various nutrients that maintain the plankton population on which sea animals feed.

There is no such variety of fish in these cold, northern waters as the Tropics provide,

but the prodigious concentration of a few kinds is essential to the highly mechanized big-business type of fishing characteristic of Boston and Gloucester.

The Gloucester fishing schooner, from the decks of which fish were caught by hand line and baited hook, or from which dories went out to fish, are things of the past.

Gloucester's predominant fishing boat is now the otter trawler, especially of the medium or "dragger" size. It is powered by a Diesel engine. It is a heavy, squat, sturdy boat, built close to the water to stand the shock of towing the dragnet along the ocean's floor to sweep up the fish and to hoist them by winch.

The type of net used is known as an otter trawl, a large, flattened conical bag dragged slowly over the ocean floor. Whether or not it unduly destroys the life of the sea is a much-studied question.

At any rate, it produces vast quantities of fish, permits fishing in winter as well as summer and in all but the very worst weather, obviates the necessity for scarce and costly bait, and has saved the lives of a great number of fishermen. Looking at a dragger, one is impressed by the great amount of machinery, or gear, required to operate it.

Gloucester has become the premier fishing port on the east coast largely because of redfish, officially known as rosefish. Except for the Italian and Portuguese fishermen who made soup of them, these small fish were wholly neglected until a few years ago (Plate V).

Yet, in 1944, 91,579,000 pounds were landed and sold in Gloucester. In numbers caught, redfish now far exceed mackerel in Gloucester. They are shipped to a large extent to the Middle West.

Although Gloucester has been the salt-cod center for several centuries, a recent important commercial development has been the combination of filleting, quick freezing, and truck transportation. This development enables thin-meated fish like redfish to compete successfully with meatier fishes as regards transportation costs.

A by-product of filleting is "waste." In less than twelve hours after the draggers unload their catches at the Gloucester piers, truckloads of skins, heads, tails, and bones are on their way to factories where nationally advertised brands of glue are made, or perhaps to other plants which turn out chicken feed and fertilizer.

Through the course of years there has been a marked decrease in the proportion of fishermen of Yankee derivation and an increase in Italians and Portuguese, with some infiltration of Newfoundlanders and other nationalities.



Staff Photographer John E. Fitcher

Kennebunkport Notables Discuss Down-east Weather

Kenneth Roberts (left), a native, visits Booth Tarkington, an annual summer resident. Millions of Americans know them as novelists, but to their neighbors Tarkington is one of Maine's most important private art collectors and Roberts is a farmer. "Tark" jestingly told the author: "Ken is interested only in haying; he kidnaps everybody's house guests to help get in the harvest." The two friends are aboard the *Regina*, Tarkington's harbor-bound schooner. He has cut holes in the bottom so it won't rise and fall with the tide.

Although the fishermen's incomes are now exceedingly high, relatively, there was a long period when the scale of living seemed low to those of Yankee stock.

The captains and crews fish where they choose; they are not instructed where to go by the companies which buy, process, and ship the fish.

There are miles of wharves in Gloucester where boats unload and where the many packing industries conduct their various departments, such as fresh fish, frozen fish, salt and dried fish, canned fish and smoked fish.

I know of no more fascinating occupation than to sit on a pier in the "Fort," where the Italian fleet is moored, and watch the grizzled, thick-set, gray-haired Italians, with the aid of their 12- and 14-year-old boys, unload their shiny catches.

Share System on Fishing Boats

The Italians start their children as young as 12, the sons of captains learning to handle the valuable Diesel engine at 14 or 15. Some second-generation Italian captains were taken back to Italy at the age of four and put on fishing boats to become accustomed to them.

As in the old days, fishing is done on a share basis. In the typical "lay," or share system, used on the medium-sized otter trawler, part of the proceeds goes to the owner of the vessel and part to the captain and crew. The owner pays part of the trip's expenses, and captain and crew pay part.

Certain joint expenses are deducted, and the remainder divided on a 60-40 basis. Out of the crew's 60 percent share are deducted the cost of the food, fuel oil and lubricants, and ice for the eight months from October 1 to May 31 (cost of ice for the other four months comes from the joint share); also the mate's bonus and the cook's bonus.

The owner, out of his 40 percent share of the net proceeds, pays the captain a commission of 10 percent, furnishes the fishing gear, pays for repairs, overhauling, insurance, taxes, and all other vessel expenses.

Fishing on Georges Bank and the Grand Banks and off the dreaded shoals of Sable Island was formerly a very dangerous occupation. Often men trawling from dories were lost from the mother ship.

In a single night in 1826 fifteen vessels with 120 men were lost, leaving 70 widows and 140



Staff Photographer John E. Fletcher

Here Lived "Lord" Timothy Dexter, Who Filled the Yard with 40 Statues, One to Himself

Shrewd though eccentric, this Newburyport merchant (1747-1806) once cornered the whalebone market. Contemptuous of punctuation and spelling, he wrote *A Pickle for the Knowing Ones*, placing commas and periods at the end of the pamphlet for readers to "peper and solt as they please." Over a coffin in his parlor he held a mock funeral for himself and beat his wife for not weeping. This house was built in 1771. Dexter's statues have been gone for a century, but the watchtower and widow's walk remain (page 280).

children. Since 1830 Gloucester has lost at sea, as I write, 4,836 men and 1,026 ships.

The advent of the powered fleet and dragging has greatly reduced losses, although men are still drowned by falling overboard and are hurt by the heavy gear.

Each August a memorial service is held for those lost during the year. Little children of fishermen's families cast flowers in the harbor at an hour when the tide will carry these tokens out to sea (opposite page).

One of my visits to Gloucester was only a few days after the Archbishop of the Boston archdiocese had blessed the Portuguese-Amer-

ican fleet in a colorful ceremony. Fish nets still covered the front of the Portuguese Church of Our Lady of Good Voyage.

A few miles from Gloucester, just off as magnificent a rocky shore as I have ever seen, is the reef of Norman's Woe, immortalized in Longfellow's "The Wreck of the *Hesperus*."

It will be recalled that, when the skipper saw the storm coming, he bound his little daughter to a mast, with results fatal to all:

Fast through the midnight dark and drear,
Through the whistling sleet and snow,
Like a sheeted ghost, the vessel swept
Towards the reef of Norman's Woe.



Staff Photographer John E. Fletcher

A Bronze Fisherman Looks to Sea, Where 10,000 Gloucester Men Died in 300 Years

Here each August, Gloucester memorializes its fishermen lost during the year. The roll is intoned and flowers are strewn on the ebbing waters (page 278). Leonard Craske created *The Gloucester Fisherman*.

Although the famous sailing fleet has gone, Gloucester and other near-by places on Cape Ann, such as Rockport, still constitute one of the most important summer art colonies in the country (Plate II).

The local chamber of commerce says that 5,000 artists visit Cape Ann every summer and that fully 500 make their summer homes there. Many visitors are students who later become regular summer residents.

Picturesque qualities of the fishing industry first attracted the artists. The gracefully looped nets, acres of drying codfish, mysterious-looking wharves, gleaming piles of fish, and grizzled, swarthy, slicker-covered fishermen are still there.

In addition, all over Cape Ann there are beaches, rocks, surf, quaint village streets, sand dunes, granite quarries, and rocky upland pastures.

The heart of the older art colony is Rocky Neck, which runs out from East Gloucester into Gloucester Harbor. It is connected with the mainland by a narrow causeway that separates the inner and outer harbors. Champlain landed there in 1606 to calk his shallop.

Rocky Neck is a colorful jumble of studios, ship repair yards, gift shops, a theatrical school, and wharves from which fishing trips may be taken. Some of the studios are in old sail lofts, some on wharves in tiers, upper and lower, and some in bungalows.

On the coast a few miles beyond Gloucester are the quaint old towns of Essex and Ipswich. They contain the best-known clam marshes in New England, although there is hardly a bit of intertidal shore without a few clams, which the local people consider their birthright.

In addition, Essex has built fishing vessels for Gloucester for nearly three centuries, for there was a heavy growth of white oak near by when the industry began. One of Gloucester's old sayings is:

"Let Essex build her and Gloucester rig her, and then you have a vessel!"

In Essex I watched a small Gloucester fishing boat being built by elderly workmen in almost the same spot where the town granted an acre for the purpose in 1668.

If to Salem, Marblehead, and Gloucester be added Newburyport, near the mouth of the Merrimack River, all four in Massachusetts, and Portsmouth, near the mouth of the Piscataqua River, in New Hampshire, we have one of the country's most historic short stretches of coast.

From Clipper Ships to Submarines

Along Newburyport's High Street stand the stately mansions of former shipowners and sea captains, testifying to the city's early eminence as a center of fishing, shipbuilding, West Indian and European trade, distilling, and goldsmithery.

Later, between 1841 and 1843, Donald McKay brought fame to Newburyport by building packet ships there.

One of the fine old houses, at 201 High Street, was occupied by self-styled "Lord" Timothy Dexter, an eccentric but cunning speculator, who bought up depreciated Continental currency during and after the Revolution (page 278). In addition, he is said to have sold 42,000 warming pans in the West Indies!

Dexter filled the yard of his house with 40 life-sized wooden statues of himself, Adam and Eve, three of the Apostles, Washington, Jefferson, Benjamin Franklin, and Lord Nelson!

Between Boston and Newburyport runs, for more than 30 miles in an almost straight line, the Newburyport Turnpike, the modern highway following one of the earliest stage routes in America.

The straight-line requirement, a common delusion at that time, proved unfortunate for the turnpike corporation, which was chartered in 1803. Private travelers preferred to go through the centers of population, even though on roads that were winding but fairly level; whereas the turnpike went right over the steep hills.

Wedged in between the long coasts of Massachusetts and Maine, New Hampshire has only 16 miles of coastline.*

This is because John Mason, who had lived in Hampshire, England, was given a grant in 1629 by the Council for New England of "that part of the main land of New England" between the Merrimack and Piscataqua Rivers, and the only change in these coastal boundaries since then has been the removal of the Massachusetts-New Hampshire line three miles north of the Merrimack.

Portsmouth, first known as Piscataqua and then as Strawberry Bank, is one of the country's oldest cities and New Hampshire's only seaport.

It has had a Navy Yard ever since the Revolution. In it in 1905 was signed the Treaty of Portsmouth, which not only ended the Russo-Japanese War but gave formal sanction to the supplanting by Japan of Russian interests and political influence in Korea and southern Manchuria.

It represented Japan's first forward step in territorial expansion on the Asiatic mainland.

Strictly speaking, the Navy Yard is not in Portsmouth or in New Hampshire, but on near-by islands in the Piscataqua River in the town of Kittery, Maine.

Private shipbuilding yards in Portsmouth were used at the Navy's start; later, islands were purchased for a navy yard. But Portsmouth was retained as the Yard's post office; hence the name.

Hildegard Hawthorne once wrote that "Portsmouth is like a fine old man who has done his hard work . . . and is now content to sit quietly in the sun and spin yarns . . ."† But watching thousands of Navy Yard workers pour through the delightful, dignified old streets at the shift hour, I did not feel that the old man was sitting so quietly.

The Navy began to build submarines here during World War I and has built large numbers here in the present conflict. The Yard's personnel multiplied at least fivefold over peacetime, and the little city's population increased nearly 40 percent.

Few American cities have retained so perfectly the appearance of an early American seaport, once so proud and prosperous. There is a mass of old buildings, large and small. In some cases they are of truly magnificent proportions, side by side, to an extent rarely seen.

Open to visitors is the house where John

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "New Hampshire, the Granite State," by George Higgins Moses, September, 1931.

† From *Old Seaport Towns of New England*, published by Dodd, Mead & Company, Inc.

Where New England Meets the Sea

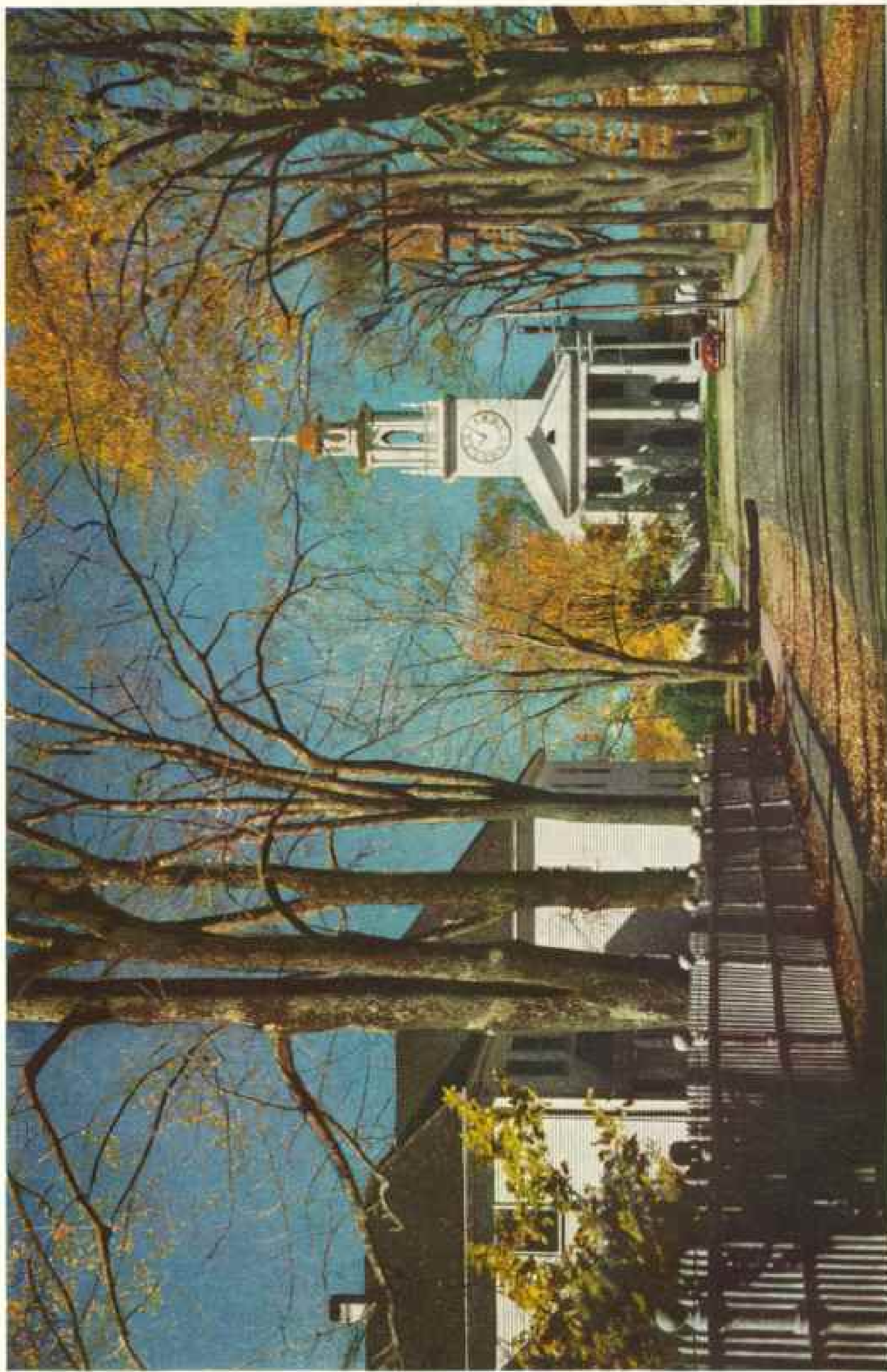


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Illustration by H. Arthur Stewart

"The Minuteman," Lexington Green, Marks a Famous Battle of the American Revolution.

Here militia fought the British, April 19, 1775. Capt. John Parker ordered militiamen: "Stand your ground. Don't fire unless fired upon, but if they mean to have a war, let it begin here." Another statue at Concord bears Emerson's words: "Here once the embattl'd farmers stood, and fired the shot heard round the world."



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Photograph by H. Anthony Stewart

Typical of Old New England Meetinghouse Design Is the First Congregational Church, Kennebunkport, Maine

Built in 1764, it exemplifies the simple, well-proportioned style common in older New England churches. Booth Tarkington, Kenneth Roberts, and other writers and artists have homes in this elm-shaded town. Plays for the New York season are tried out at the Garrick Playhouse, a summer theater.



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Near the Dormitory Where Longfellow Lived, Bowdoin College Students Burn Autumn Leaves

The tablet under the third-floor window at left marks the room in Winthrop Hall occupied by the poet when a student at the college, in Brunswick, Maine. Other Bowdoin alumni include Nathaniel Hawthorne, Rear Adm. Robert E. Peary, discoverer of the North Pole, and Franklin Pierce, 14th President of the United States.

Illustration by B. Arthur Bryant



© National Geographic Society

Restoration by B. Anthony Howard

Chestnut Street, Salem, Is One of the Most Beautiful Streets in New England

Houses are of Federal architecture, a style developed after the American Revolution and in early 1800's. Mansions built by Yankee shipowners and captains who grew wealthy in trade with the Orient are noted for ornamental carving of porches, doorways, columns, and Palladian windows like that over the doorway at right.

Where New England Meets the Sea

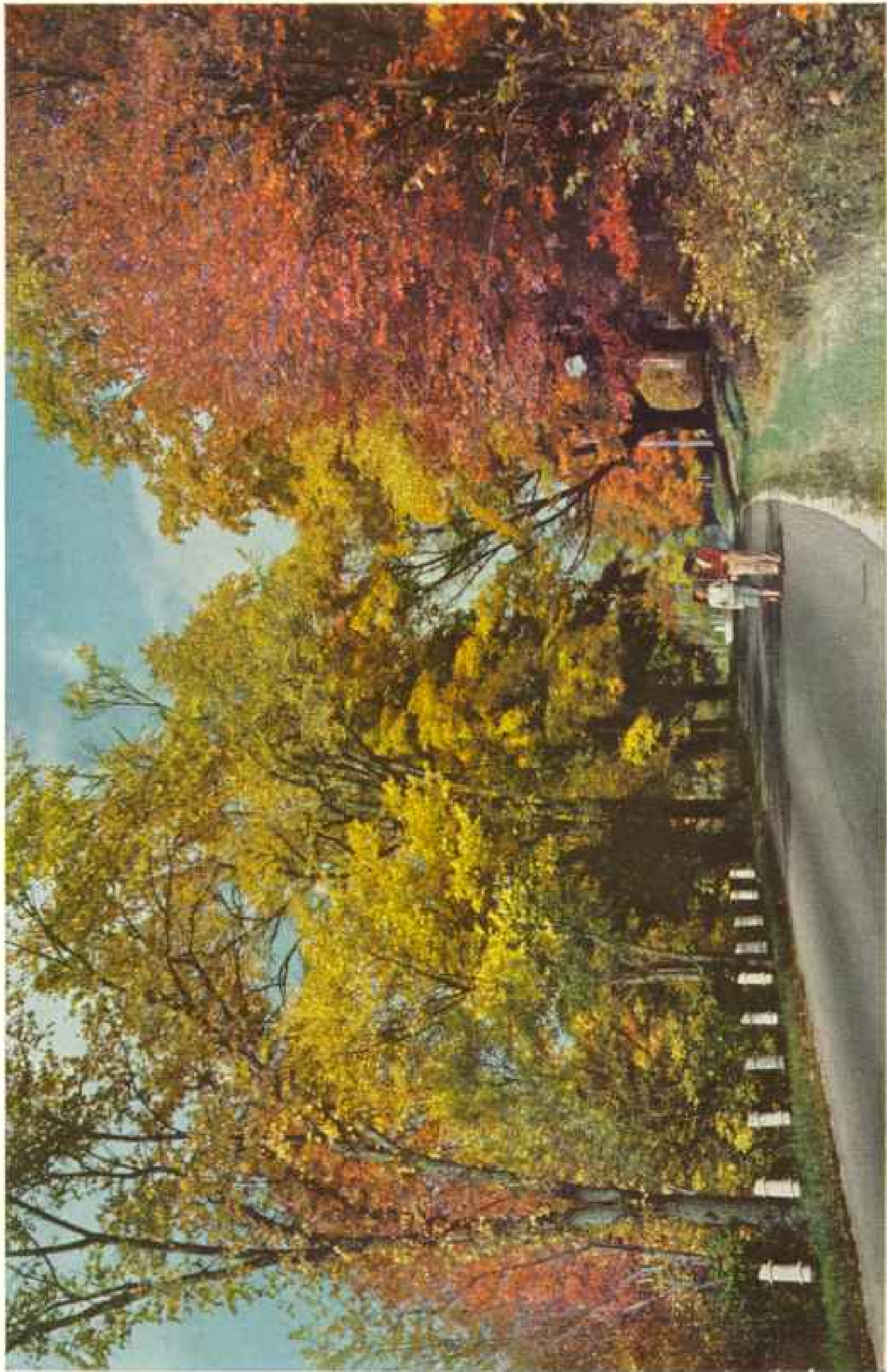


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Kitchen scene by H. Anthony Howard

Old Spiral-carved Banister and Modern Mural Recall Gloucester's Former Glories

Intricate design of newel post and balusters is typical of old New England houses built in Federal style of architecture. This stairway is in the house now occupied by the Sawyer Free Library. The mural by E. L. Stoddard depicts Gloucester fishing schooners of former times, piers, and codfish drying on flakes (lower left).



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Reproduction by H. Arthur Blount

Autumn Covers New England with a Riot of Color, as Early Frosts Turn Leaves to Brilliant Reds and Yellows—near Portland, Maine

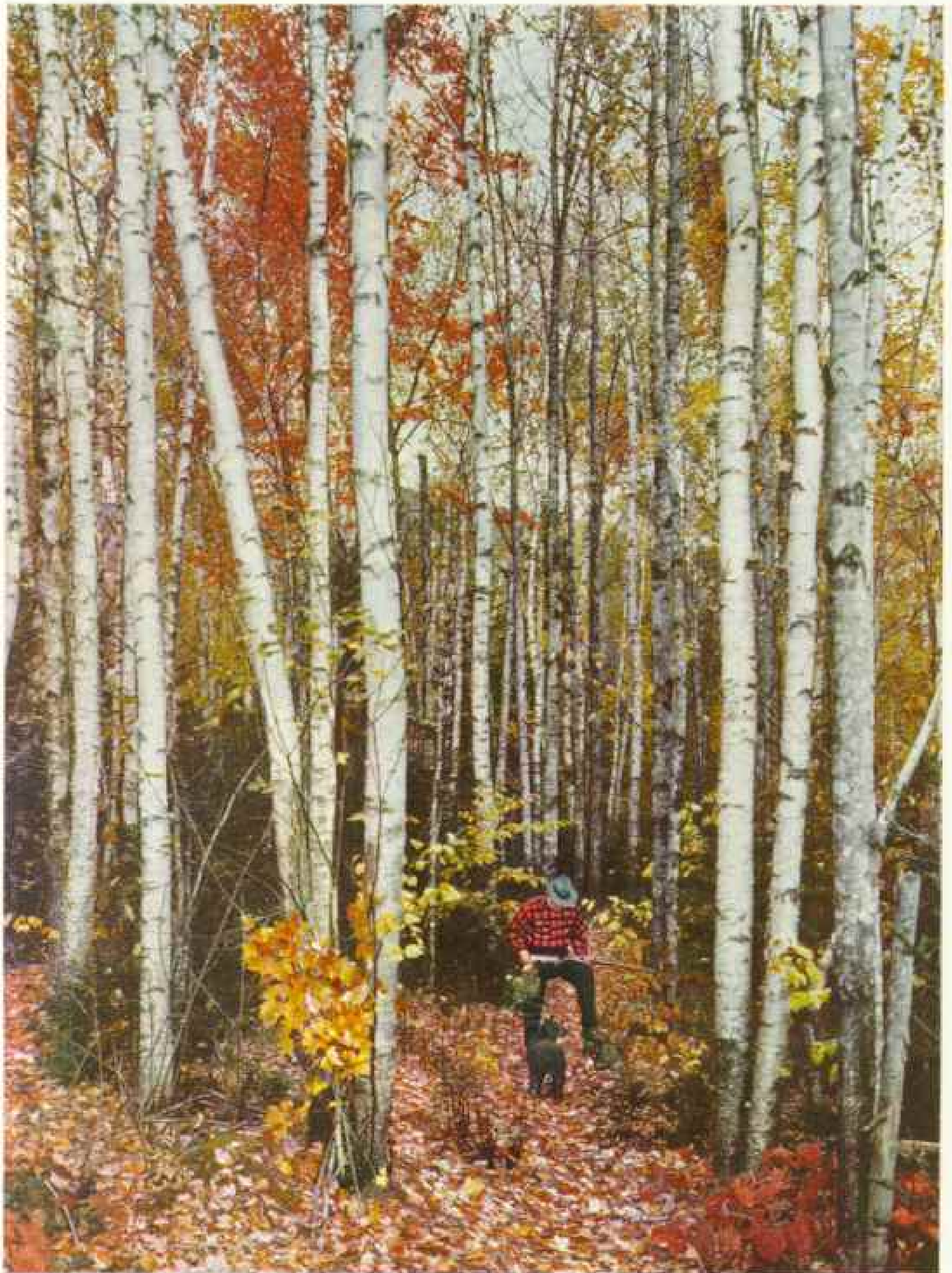


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Kulchrens Jr. H. Arthur Everett

Yachts and Schooners Lie Snug in Harbor at Camden, Maine, Against a Backdrop of Steep Mountains

It lies "under the high mountains of the Penobscot, against whose feet the sea doth beat," as Capt. John Smith described the site in 1614. Schooners at left carry vacationists on cruises on Penobscot Bay, with the "paying guests" acting as crews.



© National Geographic Society

Illustration by B. Anthony Hunt

Among White Birches and Autumn Leaves a Hunter Bags a Quail in the Maine Woods

With his dog and shotgun he has just brought down a bird along a forest path. Yellow leaves of young maple shoots make bright splashes of color amid white bark of the birches. Fallen leaves form a bright carpet underfoot. Maine woods are a mecca for hunters, fishermen, and vacationists.

Paul Jones lived while his famous vessel, the *Ranger*, was being built; the boyhood home of Thomas Bailey Aldrich, furnished as he described it in his semiautobiographical *Story of a Bad Boy*; and the birthplace of Tobias Lear, who became private secretary to George Washington.

From Kittery, Maine, to West Quoddy Head, most easterly point in the United States, is 220 miles in a straight line. But the tidal high-water line of the Maine coast, including islands, is more than fifteen times as long, the U. S. Coast and Geodetic Survey figure being 3,478 miles.

The "Fjords" of Maine

This is because the coast, especially from Portland on, is notched and indented to an extraordinary degree and broken up by an almost continuous array of bays, estuaries, inlets, sounds, coves, and rivers, great and small, including such major streams as the Kennebec and Penobscot.

Speaking of the "undulations and ramifications" of the shoreline, the preliminary report of the Maine Geological Survey, dated 1861, says that "no State of the Union, and perhaps no single nation, can exhibit the same extent of seacoast . . . so magnificent, viewed either in regard to its shore and island scenery, or as to its valuable bays and safe moorings."

In sober fact, there is much to justify the State pride of the geologist.

It has often been stated that Maine has some 4,000 islands. But there is no official confirmation of this claim, either from Federal or State sources.

Where there are vast numbers of rock formations, as along the Maine coast, the difficulty in making an official tabulation of islands lies in deciding just how small a rock can be included.

The Coast and Geodetic Survey was obliged many years ago to supplement the standard method of taking soundings along the Maine shore with the wire-drag method, in which a wire is strung between two launches at fixed depths below the surface.

In some places where the older surveys showed depths as great as 80 feet, the wire drag, by catching pinnacle rocks, disclosed depths as shallow as 17 feet.

However, more than 1,000 Maine coastal islands have been listed by name and location. There are several large archipelagoes, especially in Casco and Penobscot Bays. Eagle Island, on Casco Bay's outer rim, was long the home of Admiral Robert E. Peary, discoverer of the North Pole.

The islands, interdependent and yet each

with distinct features of its own, fringe the entire coast from Portland on. With rocky and abrupt shores, many have a forthright and rugged beauty.

Even though large primeval forests have gone, it is very common for fir and spruce to grow down to the water's edge.

A few remote outposts of the sea, such as Monhegan, objective of the earliest explorers and fishermen, are too rocky to support much vegetation.

In addition to summer residents, many of the islands are inhabited by native fishermen, although island populations are said to be smaller than fifty years ago and to have suffered especially in the last few years from the high wages in mainland war plants. From several of these islands came members of the America's Cup defender crews.

Some of the islands are "plantations." This term goes back to colonial times, but means in Maine today a minor civil division or unit of local government having a status between that of an organized township and an incorporated town.

Mount Desert has great sea cliffs and is almost cut in two by the fjordlike Somes Sound. It is the largest rock-built island on our Atlantic coast and it has one of the highest coastal elevations (Cadillac Mountain, 1,530 feet) north of Rio de Janeiro, Brazil.*

Its bold mountain ranges loom up from the mainland U. S. No. 1 Highway like some strange, crouching monster, or, as the poet Whittier said:

And Desert Rock, abrupt and bare,
Lifts its gray turrets in the air,
Seen from afar, like some stronghold
Built by the ocean kings of old.

Gloucester's most favored redfish grounds lie 20 miles off Mount Desert and from 5 to 20 miles off Matinicus, one of the more remote of Maine's island outposts. It is 14 miles offshore.

Lobstermen of Maine

But commercial fishing in Maine, although of vital importance to almost every town and hamlet along its far-flung coast, is not a highly centralized and mechanized form of big business, as in Gloucester and Boston.

Maine is still the stronghold of thousands of individual, small-scale fishermen, many engaged in hand lining, and of individual lobstermen.

Many do nothing but fish; others cut pulp

* See "Unique Island of Mount Desert," by George B. Dort, Ernest Howe Forbush, and M. L. Fernald, NATIONAL GEOGRAPHIC MAGAZINE, July, 1914; and "First National Park East of the Mississippi River," June, 1916.

or farm a little in summer. Frequently it is difficult to distinguish between the fisherman-farmer and the farmer-fisherman.

Lobsters are found from the Virginia capes to Labrador, but in Maine they provide a paramount shore industry. In addition, lobsters must be imported from Nova Scotia, Prince Edward Island, New Brunswick, and Newfoundland to supply the United States' demand.*

Lobstering does not lend itself to mass-production methods. Each individual trap, or pot, has to be set and baited, for lobsters are caught like mice.

It is inshore work, and therefore conducted wholly from small boats. But powerboats are taking the place of dories, and an individual lobsterman may care for 100 traps or more, instead of 30 or 40 as formerly.

A Risky Business

The business is a risky one, for the operator must constantly repair and replace his traps. A severe storm may destroy all of them.

Little lobster is canned, so great is the demand for the fresh meat. There is no trade in raw dead flesh, as in other kinds of fish and meat; the lobster is kept alive to the last possible moment.

This is probably the reason why lobsters are sold mostly to hotels, clubs, and restaurants much more than to housewives, who dislike boiling a live creature.

Buyers with lobster smacks go from one hamlet to another along the Maine coast, buying up each day's catch. The Consolidated Lobster Company of Gloucester buys from 3,500 individual fishermen, from Gloucester to New Brunswick (Plate IV).

This company keeps as many as half a million lobsters alive in its tanks in Gloucester, with additional capacity in Boston. They are fed every few hours on expensive food and kept alive in running salt water, for lobsters die quickly in fresh water. Packed in ice and rockweed, they can be shipped safely to western States.

Production is very low in winter months, and in summer lobsters are stored to meet the winter demand. The industry has expanded rapidly in Maine in the last few years, although fewer than 5,000 fishermen accounted for the 1944 catch.

Commissioner Arthur R. Greenleaf of Maine's Sea and Shore Fisheries Department says that many new people have entered the industry recently. "In fact, there are a great many persons fishing today who three months ago did not know one end of a boat from another."

One of the oldest fisheries of Maine is probably alewife dipping. These fish run up the coastal streams from April until late in June. The statement is made on responsible authority that it has been possible in one river for one man to dip as many as 100 barrels of fish a day (page 262).

In the early spring of 1782, at the close of the Revolution, what is now the town of Warren was close to starvation. But on the last day of April alewives came into the St. George River, with the resulting jingle:

Thomaston for beauty,
Rockland for pride;
If it had not been for the alewives,
Warren would have died.

The town fathers restricted the fishing and divided the catch evenly among the inhabitants, a custom generally followed elsewhere in the State.

As the original idea of town control was to benefit the poor, the rights to the annual run were and still are auctioned off to the highest bidder by town officials.

If we enter the State of Maine, as the Commonwealth is officially designated, at Kittery and follow U. S. No. 1 to the Canadian border, we pass through many quiet old towns and a few cities. Their graceful and substantial sea captains' houses bear solid witness to a great bygone period of shipbuilding and shipping.†

There is the dignified metropolis itself, Portland, with its superb views of Casco Bay from the Eastern Promenade. This city serves as gateway to and distributing center for an extensive maritime area.

There is Bangor, on the Penobscot River, said to have welcomed more than 3,000 ships in a single year in the days when a vast commerce of lumber, ice, and other commodities moved down the river.

There is Brunswick, seat of historic Bowdoin College (Plate XI), near the campus of which one may see the house where Harriet Beecher Stowe wrote much of *Uncle Tom's Cabin*.

Port of Arctic Expeditions

There are typical seacoast towns, such as Wiscasset, associated with Donald B. MacMillan's Arctic expeditions,‡ and tiny Searsport, which in its time is said to have built 300 ships.

Or we can take what seem like innumerable

* See *The Book of Fishes*, published by the National Geographic Society.

† See "Maine, the Outpost State," by George Otis Smith, NATIONAL GEOGRAPHIC MAGAZINE, May, 1915.

‡ See, in the NATIONAL GEOGRAPHIC MAGAZINE, "The 'Bowdoin' in North Greenland," June, 1925, and "The MacMillan Arctic Expedition Returns," November, 1925, both by Donald B. MacMillan.



Staff Photographer John K. Fletcher

In Place of "Fat Women," an Idealized Mural Hangs in Kennebunkport Post Office

National attention was focused here in April, 1945, when Maine's Senator Wallace H. White, Jr., objected to a Federal art work depicting a beach full of "fat women, scantily clad . . . hulging fore and aft." Gift of citizens, this substitute mural by Gordon Grant shows the Kennebunkport of 1825.

side roads down the many peninsulas, large and small, to almost every nook and cranny of the coast.

From Bath, with its important modern ship-building industries, one may go to the mouth of the Kennebec River, where the English made their first attempt at permanent settlement in New England, preceding even Plymouth and Salem.

Before the Popham colonists had failed in their effort, they had managed to build the *Virginia of Sagadahoc*, first ship to be constructed by Englishmen on the North American Continent.

Some of the roads which lead off U. S.

No. 1 go to celebrated summer colonies, such as the attractive old seaport village of Kennebunkport, with Booth Tarkington and Kenneth Roberts as residents (Plate X and page 277), or to Bar Harbor and other fashionable Mount Desert colonies, with their Ford and Rockefeller estates.

Side Roads to Sequestered Towns

Or the side roads may lead to coastal villages well off the beaten track, seldom visited by and quite unknown to the general public.

After the Penobscot Bay region has been passed, and especially beyond Ellsworth, junction of the highway to Mount Desert, one is,

in the strictest and most technical meaning of the phrase, "down East."

The character of the country seems to change. Tiny settlements at the head of or cut by inlets and watercourses have a windy, hilly, granitelike look.

It is a brilliant but remote, lonely, and seemingly barren land, frequented relatively little by either summer visitors or cruising coastal yachtsmen.

I visited this country in late October. The entire male population, wearing heavy red-and-black flannel shirts, seemed to be engaged either in mending the snow fences along the roads or in adding to the enormous woodpiles attached to every house.

Two "Seasons"—July and Winter

It is not quite true, however, that Maine has only two seasons, July and winter.

In fact, many things are not what they appear to be. From the extensive "barrens" that stretch back from the coast in these down-east Maine counties, mostly from soil denuded of its original timber growth, comes a major portion of the country's blueberries for canning (Plate VII).

These berries, going normally to wholesale pie bakers, constitute one of the chief pie fillers of the Nation.

The land, privately owned by many different persons, must be burned over at intervals to ensure spontaneous growth.

The biggest crop and the highest price on record came in 1943, with some 400,000 bushels selling at more than \$5 a bushel. One grower raised 14,000 bushels. Increasingly, berries are being frozen.

This section of the New England coast is a land of low average summer temperatures, high density of fog, sardines, and tremendous tides.

The "sardine" is not the name of any particular fish, but of any that is soft in terms of

bone texture, small in size, rich in flavor, and capable of being preserved in oil. In Maine it is the herring. At one time Maine had 75 sardine factories, mostly on points that jut out into the sea.

While the men of the family catch the herring, the womenfolk are employed as packers in the canneries.

Formerly the herring were caught in weirs, more than 1,000 of which lined the shores near Eastport and Lubec.

A more modern method is the seine boat, on the stern of which a large revolving spool unwinds a seine which quickly encircles the swimming fish.

Moonless nights in summer and early autumn are considered ideal for seining; a phosphorescent glow helps the scouts to distinguish schools of herring feeding inshore.

Lubec, one of the chief centers of the sardine industry, is the most easterly town and post office in the United States and is only a few miles from West Quoddy Head. It is 3 miles by water from Eastport, but 40 by land.

There is no more picturesque sight in New England than a Lubec sardine factory at low tide, standing on its stilts in the mud and surrounded by countless screaming and swirling gulls.

Tide Range Up to 26 Feet

The tide range in this section is the greatest in continental United States. It averages about 18 feet, with an extreme range of 26 feet.

It was here that the Passamaquoddy Tidal Power Development Project, one of the most controversial of New Deal enterprises, was begun—and abandoned.

Authorities on tides insist that it was entirely feasible as an engineering matter and that such projects may become necessary in the distant future when coal and oil give out. Whether it was economically feasible at the time is another question.

An extensive range in tide does strange things to the appearance of a harbor, but it has practical advantages, not the least of which is to keep open all winter ports which would otherwise be frozen solid.

From the docks in Lubec one looks across a narrow channel, through which the outgoing tidal waters rush as in a millrace, to the Canadian shore, where, on Campobello Island, one plainly sees the summer home of the late President Franklin D. Roosevelt.*

* For additional articles in the NATIONAL GEOGRAPHIC MAGAZINE on Massachusetts, New Hampshire, and Maine, see: "Boston Through Midwest Eyes," by Frederick Simpich, July, 1936; "Skiing Over the New Hampshire Hills," by Fred H. Harris, February, 1920; "In the Allagash Country," by Kenneth Fuller Lee, April, 1929; "From Notch to Notch in the White Mountains," by Leonard Cornell Roy, July, 1937; "Geography of a Hurricane," by F. Barrows Colton, April, 1939; "New England Ski Trails," by Daniel Rochford, November, 1936; "New England's Wonderland of Mountain, Lake, and Seascapes," 14 ill. in color, September, 1931; and "Long River of New England," by Albert W. Atwood, April, 1943.

Keeping House in Borneo.

BY VIRGINIA HAMILTON

MY HUSBAND said I would have to look under every chair I sat in for snakes, scorpions, and centipedes.

My mother-in-law in Holland said to take at least eight dozen sheets and pillow slips because, no matter how tough they were, they wouldn't last long under the beating they received on washday.

My father-in-law said to remember always that in the Indies we whites were not living in our own country, but in a land of other peoples whose strange customs had prevailed for hundreds of years before the commencement of our own era. I should, like all good Dutch colonials, try to adapt myself to the native life on the island.

Awed by all this, I told my family not to worry, for I would be back for a visit in two years and, looking at the map, said that I'd go often for week ends to see friends in Manila.*

Armed with advice, good intentions, and ideas about tropical living gathered from the movies, I set out to begin housekeeping in Borneo.

Coffee percolator and curtain materials were necessities. Chiffon evening gowns exposed a perspiring back at dances and were a problem where there were no cleaners. The handsome sun helmet was never worn, and there were not half enough cotton washables.

My life there lasted not two years but ten, broken only by a vacation after the first five. Manila was too far away for visits.

Island of Heavy Rainfall and High Color

Third largest island in the world, Borneo wears the Equator for a belt and lifts her leafy face through intense humid heat to some of the world's heaviest rains, and to equally glaring sunlight. Borneo may not be so beautiful as some of her smaller sisters of the Malay Archipelago, but in her dense foliage are found, in sudden color, some of the most wonderful jewels of the flower kingdom; and under her dark surface hide brilliant diamonds and many-hued semiprecious stones.

Someday her almost inaccessible jungle may yield its "teak," billian (Borneo ironwood), ebony, sandalwood, and other beautiful timbers, as man finds means to track Borneo's surface with roads to the deep interior, like the rivers and streams that wind their numerous ways to the sea. But it will be a tremendous undertaking, for Borneo's jungle fights back with a patient, imperishable tenacity and strength (page 305).

Borneo's lifeblood is the black oil flowing along her coastline. In some places, it is of such high quality that it can be used almost as it flows from the earth (page 299). It was oil which brought my husband and me to the island. It was oil to feed one of the largest refineries in the Far East at Balikpapan which kept us moving, pushing ever farther inland (map, page 297).

To live in Borneo means living in the land of the head-hunter—not a comforting thought to one who has not been there. At inland Amoentai, we were surrounded by Dyak country, with only a narrow strip of ground along the river populated by Mohammedan Indonesians and a few Europeans.

No sooner were the curtains hung in our little native house than I heard the neighbors talking about a human head found buried near by. "Head-hunting Dyaks, no doubt," was the opinion, and I felt a profound dislike for these Borneo aborigines.

It took me a long time to realize that, although Dyaks had been head-hunters a generation or two earlier, they now rarely break into this type of entertainment and are kindly, peaceful people.† They have little interest in the white man's civilization except for his cotton goods and kerosene cans. Nor have they any love for the Mohammedan religion.

For generations they have gone farther and farther inland in small, isolated groups that do not speak a common language and have little contact with each other.

At about ten o'clock, when the heat of morning became intense, I would welcome the peddlers who wandered from house to house. One was a Chinese whose pack held silks, cottons, and laces. Another was a Malay, and at his call I knew I would find something he had persuaded a Dyak to part with.

Long before I saw a Dyak I had bought many of their articles. Their jackets made of tree bark have now been replaced by ones of Javanese cotton materials. But they still use long blowpipes and bamboo quivers filled with poisonous arrows as their principal hunting weapons. Their round, deep hats served as lampshades in our little house (page 310). Woven baskets made wastepaper containers

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Facts about the Philippines," February, 1942, and "Return to Manila," October, 1940, both by Frederick Simpich.

† See "Notes on the Sea Dyaks of Borneo," by Edwin H. Gomes, in the NATIONAL GEOGRAPHIC MAGAZINE, August, 1911.



© Screen Traveler from Genitoss

Twice Burned and Invaded, Balikpapan Has Paid Dearly for Its Oil Wells and Refineries

In January, 1942, Netherlanders scorched the hilltop cracking plant. Japan undertook repairs. In June, 1945, 300 Allied war vessels stood off the city on the Strait of Makassar (map, page 297). Mine sweepers cleared the channel; American planes dropped 3,500 tons of bombs. On July 1 Australians stormed ashore through triple rows of barbed wire. They found Balikpapan's oil plants in ruins.

for us. Two *parangs*, or short swords, decorated our door.

A Dyak is rarely without his *parang*, and it was these swords, more than anything else, which first assured me of the absence of head-hunting. Years ago the tassels of hair hanging from the hilt came from human heads, but I was never to see one which had anything more gruesome than goat's whiskers for decorations.

A Dyak Cremation

One evening, after a day when the stench of raw rubber slabs being loaded on the river boat outside my door had been enough to give me a splitting head, my husband came home to say that it smelled like heaven compared with what he had been through. If I could stand the odor, he would take me to a Dyak ceremony.

Every ten years the Dyaks around Ampah

have a cremation of all who have died during those years.

Once the dead have been taken from their temporary burial grounds the remains must not touch the earth again until prepared for cremation. For miles around the chosen *kampung* (village), which was a tiny settlement some distance from Ampah, the loosely wrapped bodies tied to the branches of trees at night looked like huge birds' nests.

On arrival at their destination the bones of the dead of each family are assembled in a small boat-shaped coffin (page 309). If any flesh adheres to the bones, this is scraped off.

As the remains were in all stages of decomposition, I could readily understand the impact upon my husband's nose and could imagine his feelings while he was in the *kampung* where the ceremony was to take place. There he had watched the bones being scraped, while pigs and half-wild dogs hovered hungrily.



By Allan Johnston, Fort Jess

A Rickety Fish Trap off Sarawak Supports Airy Living Quarters for Its Malay Crew

Much of Borneo's sea food is strange to the West. Its *bêche-de-mer*, or sea cucumber, makes China's thick soups. Shark fins and turtle eggs, too, are export delicacies. Tortoise shell and mother-of-pearl are well known to world commerce.

Because of the heavy rains, we were unable to attend the first part of the Dyak rite, after which seven days of rest are observed before the cremation begins. This first rite is a sacrifice to the dead. Years ago it was a priestess who was sacrificed. Tormented, bleeding, and half-dead, as a circle of Dyaks slashed her with their parangs, she would fall finally into a deep pit where she was left to die.

From these times until 1937, when the last rites were held here, a *sapi* (native cow) took the place of the old woman, since Dutch law forbade further human sacrifice. It had taken generations of patient compromise to eradicate from the Dyak code their custom of human sacrifice. It was possible that even in its modified form this might be the last ritual of its kind.

The cremation had not yet started when we arrived. The village chief took us to the *balai*, or community house. Here, in the semidarkness, stacked in neat piles, were the coffins.

An old priestess constantly prayed over them. The close air held the scent of herbs, coconut oil, and food. A bowl of liquid and a kerosene lamp were on the only table. The lamp cast weird shadows through the *balai* as the witchlike woman, seemingly in a trance, walked and crouched among piles of caskets.

In her faded sarong and jacket, a pillow-shaped turban on her head, the old hag mumbled a prayer to ghosts through toothless jaws. At the same time she splashed liquid from the bowl or threw bits of rice and dried herbs from her dirty scarf to the coffins. Several bodies occupied each coffin, and a carved bird or snake's head on the prow signified whether a man or woman was the eldest of the family dead contained therein.

300 Sets of Bones

Food, crockery, and clothing were piled near the 3-foot-long receptacles. There were some 300 sets of bones in the hundred boxes.

From the eerie gloom of the balai we went to find sunshine. There, looking up at us, we met the eyes of a very scrubbed and smiling old gentleman. It was unusual to see anyone here dressed so neatly in white European clothing. Even more startling was the Maltese cross of the Willem's Order, highest military decoration of Holland, so seldom bestowed.

The charming old man wore the cross on his breast and explained in perfect Dutch that he had inherited it from his father, a Dyak chief and a Christian. The chief's tomb was built by the Indies government just outside the kampong.

Here roses struggled to grow over the simple concrete building. Pots of freshly cut gardenias were at the door, and a beautiful painted plaque in memory of the great chief hung on the wall inside. The fact that the receptacles holding the gardenias were nothing more than battered *pots de chambre* did not detract from the whole effect, for here was a combination of primitive simplicity and the highest, proudest dignity.

We picked our way over little bridgelike paths of bamboo running in all directions from the balai built for these observances and walked the mile through jungle to the funeral pyre. Those chosen to cook and distribute the food must not touch the earth until the three weeks' ceremonies are concluded.

In the clearing we took our places on a rickety platform built of saplings with a wide bamboo ladder for steps. At the other end of the platform, slightly raised above our level, was the pyre. It was nothing more than very green saplings placed like a picket fence against a railing. Back of this, in the ground, was a deep pit.

Slowly, with chanting, came the families bearing food offerings and coffins from the balai.

As the clearing quickly filled with Dyaks, I noticed how much lighter in color were these natives than the typical Malays I saw in the Indies. Most of the faces had a resemblance to the Chinese. Their religion also showed Chinese influences, tracing back to the centuries when the Chinese and a few Hindus settled and mixed with the peoples of Borneo.

A family took their places on the platform. The women squatted in front of us near the pyre. The men lifted the first coffin, prow end containing the skulls upward, to rest it vertically against the fence of saplings.

Two bodies were in this coffin, a baby and an old man. For each a white chicken was struck against the lid of the box to kill it before it was thrown over the coffin into the pit, to be followed by water and food for the

dead. A dry branch of a tree was brought to stand against the coffin, its twigs filled with little cakes, fruits, and small bundles of food wrapped in banana leaves.

The fire was not large. It burned slowly, creeping gradually up the wooden boxes. The men pressed sticks against the flat lid to keep it from falling as the fire loosened its bindings.

Then, suddenly, it burned furiously. The cover fell away and charred bones began to drop out. As these were shoved back into the flames the women covered their heads, swaying and moaning in conventional grief.

Suddenly the whole coffin flared up. A skull rolled down into the flaming mass. There was quick action, as men and women drew short knives from their belts. These were held for a moment between their owners' teeth; then the flat side was pressed to their foreheads and held out to touch the foreheads of every person within reach.

Burial of the Bones

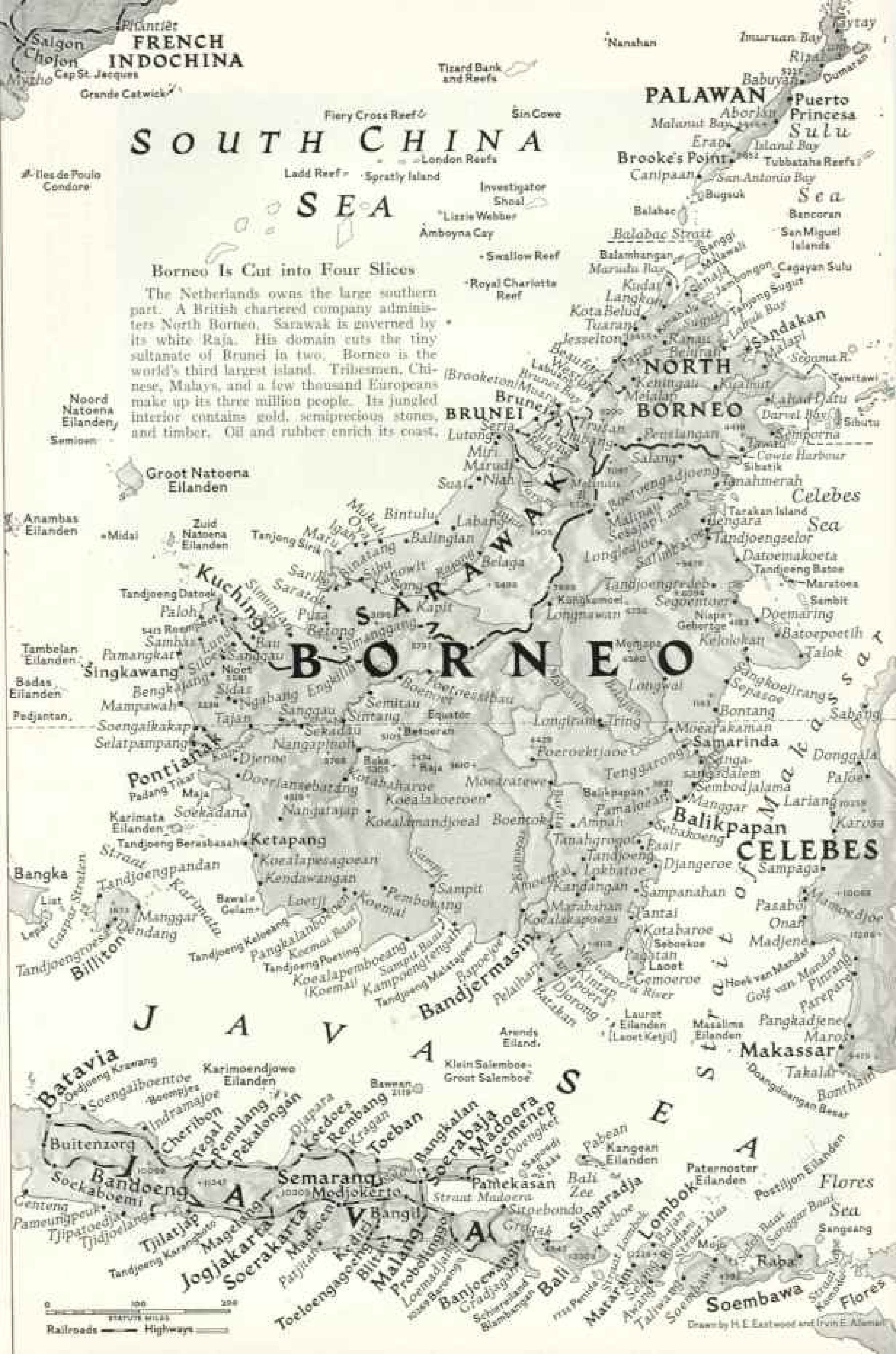
Finally, as the bones became blackened bits, the women prepared an iron pot for the remains, lining it with the clothes of the dead. The fire was extinguished with water mixed with coconut liquid, poured from special gourds prepared and blessed for this purpose. Speedily the remains were collected into the pot; the women carried them away as the men cleared into the pit all that was left, making ready for the next family to cremate its dead.

We watched until the sun had set; darkness spread quickly through the thick trees. Millions of insects began their evening songs, turning the green growth, so quiet during the day, into a noisy accompaniment for moans of the mourning and the crackle of fire, which continued through the night and into the next day.

As we stumbled back to our car through mud and darkness, we realized again, as we did so often while living among these primitive peoples, that although dying holds no very great fears for them, the ghosts of the dead are a constant terror, making the night hideous with the haunting of evil spirits. Everything must be done to placate the ghosts' tenacious evil will, which brings disease and sorrow on the living.

The last of the ceremony, which took place after another seven days of rest, we missed because of floods. This is a fight between the living and the ghosts of the dead.

After feasting and drinking of native wine, the ritual begins as a dance. Half the village takes the part of the living; the other half, the ghosts of the dead. From a dance it gradually grows into a frenzied battle.



François
**FRENCH
 INDOCHINA**

SOUTH CHINA

SEA

Borneo Is Cut into Four Slices

The Netherlands owns the large southern part. A British chartered company administers North Borneo. Sarawak is governed by its white Raja. His domain cuts the tiny sultanate of Brunei in two. Borneo is the world's third largest island. Tribesmen, Chinese, Malays, and a few thousand Europeans make up its three million people. Its jungled interior contains gold, semiprecious stones, and timber. Oil and rubber enrich its coast.

BRUNEI
BRUNEI
BRUNEI

SARAWAK
SARAWAK
SARAWAK

BORNEO
BORNEO
BORNEO

NORTH BORNEO
NORTH BORNEO
NORTH BORNEO

CELEBES
CELEBES
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Bandjermasin

Makassar
Makassar
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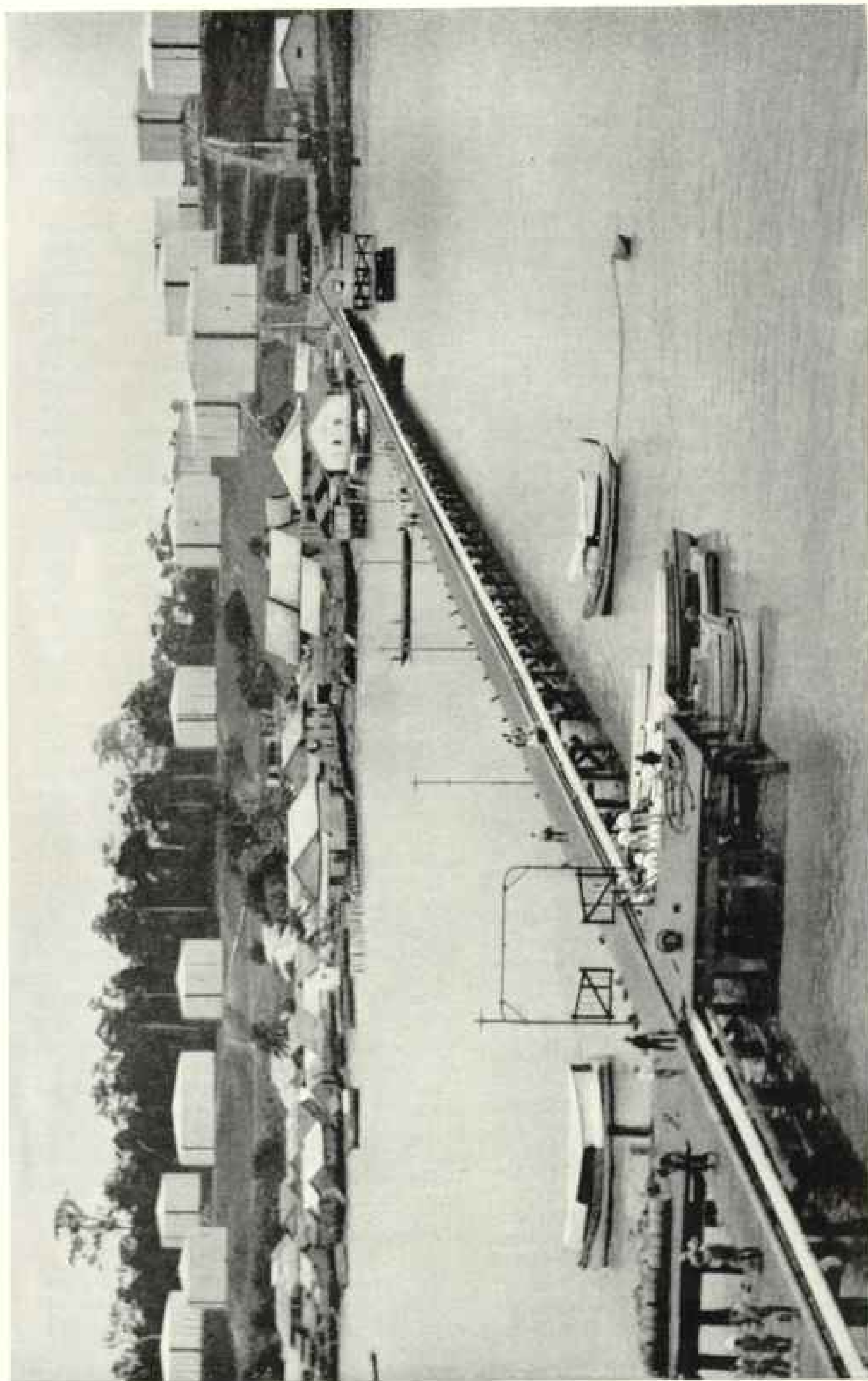
Drawn by H.E. Eastwood and Irvin E. Allen



Wide World from Press Ass'n

Shelled and Burned, Tarakan's Oil Tank Farm Looks Like an Exploded Fortress to the First Australian Assault Wave

Some in helmets, some in campaign hats, the Aussies crouch in a U. S. Navy landing craft. Ahead lie underwater obstacles, marked by rows of stakes; these must be cleared by engineers. Storage tanks have been destroyed by Allied bombers lest the Japanese pour flaming oil onto the beachhead. Shells and bombs have driven the enemy into the hills. The 54-day campaign left the island "a filthy mess" where oil oozed into bomb craters.



Depot Tihassan from Flying Gullway

Tarakan's Tank Farm Before Destruction. Now Its Wells Produce Oil Again, Relieving American Tankers of a Long Haul

Hundreds of wells remained virtually intact despite the wrecking of surface installations. Carrying full equipment, a Netherlands Indies rehabilitation team landed with Allied troops in May. By July it had oil flowing to the United States armed forces. No refinery was available, but Tarakan fuel may be burned in ships' boilers and Diesel engines. In 1940 this Netherlands-owned island exported 4,574,000 barrels.

The ancestors of these Dyaks fought their battle with knives and swords, to the death of most of one side or the other. Now the tribesmen fight with sticks and poles and no serious damage is done.

Balikpapan a Modern City

I was delightfully surprised on first seeing Balikpapan (page 294). We were whisked away from the dock in a Buick touring car over asphalt roads that ran through an unbelievable array of factory shops and all the hustle and noise of a great refinery. Somehow, before seeing Borneo, I had imagined that a bullock cart would be my means of travel, a coolie going on ahead to cut down the lianas choking our path.

We needed no bullock cart, however, for wherever one could go there was an oiled road, and there were cars to carry us, or boats for inland travel. Occasionally, along the road, there was a village with cozy homes or an oil field. Surrounding these spots, with their electric lights and telephones, within a stone's throw of the last village house, the jungle shut out civilization, to grow ominously in somber patience.

It is customary and necessary to know the Malay language if one lives in the Indies. Many of the 70,000,000 islanders speak only their native tongue, but Malay is commonly used and understood.

Since the islands are the country of the Malays, where, legally, a white person may own land only under certain conditions, Hollanders do not demand that Dutch be spoken to them. They use Malay in the Indies as they would use French in France or English in the United States.

My first months in Borneo were spent in pantomime, as I sat at the sewing machine making curtains and frantically learning Malay and Dutch. Moving into 16 houses in ten years, I found both houses and house-keeping were much the same.

Before furniture was brought in, floors and walls were washed with a disinfectant. Under the rugs a layer of old newspapers was spread. They were mostly old American papers. From them I could learn what had been going on in Boston and Galveston and could read the editorials of three years before.

Because the ravenous flying cockroach doesn't appreciate newsprint, he will at least not eat the underside of the rugs. No better does he like borax powder sprinkled freely in all cupboards and wardrobes. I soon learned that these precautions apply only to the underside of things!

When darkness falls, the cockroach comes

out of hiding or flies in the window, bent on a night of destruction. He eats almost anything from soap to silk. I spent ten years with a native slipper not far from me after nightfall. Never did I become accustomed to the pop of these two-inch-long brown insects as I swatted my way from room to room, armed with the supple sole.

Beds and their nettings are of first importance when moving into a new house. Everything is done with a thought to keeping cool; and hard beds are, no doubt, cooler. There are planks where springs should be, under thin kapok mattresses. If the netting is not up at nightfall, mosquitoes sting unmercifully, and one is subject to the invasion of other insects and even snakes. In the newest homes, however, a metal screen enclosure around the beds makes a cool, sure protection.

During the day a burning punk keeps the dangerous malaria carrier at a distance.

The netting and a clean water supply are perhaps of the greatest importance in maintaining a happy, healthy Indies home. Rain water collected from tin or shingle roofs into cement containers or oil drums serves for drinking, cooking, and generally for bathing. This water must be boiled for 20 minutes, filtered through porous stone, and boiled again before it is safe to drink.

The few later types of city homes are built on the ground. The greater number of older houses may lack in beauty, but, built high off the ground on stilts, they are immensely more practical protection against reptiles and bugs, and the breeze sweeping beneath keeps them cooler and far less damp.

In the long building, separated from the main house by a roofed walk, there are kitchen, storerooms, servants' quarters, and, at the farthest end, the bathroom. Because of the few dry spells, river water is piped to kitchen and bath. There is never hot running water. I had no real bath in Borneo, as a bathtub is a luxury rarely found in even the best hotels in Java.

In the cool bathroom, sediment sinks to the bottom of water in a large reservoir. With the aid of a coffee can to pour water over me as I stood on the cement floor, I found the Indies method of bathing refreshing and practical.

"Whiskers" Grow on Shoes, and Mildew Collects on Books

Temperature varied little day and night. Terrific humidity made whiskers grow on shoes and powdery mildew collect on books; mattresses had to be aired every day in the sun. All year long one was in a constant state

of perspiration, for the climate seemed to change only from the rainy to the rainier season. A dry spell brought worries over the drinking-water supply.

Every day, before soiled things had a chance to mildew, the laundry was done. Each morning our willing and hopeful laundress would give my American washboard a test of its worth, soon to become disgusted with the inefficiency of such civilized nonsense. I would later find her squatting among wash-tubs, beating the clothes on the cement walk, a stiff floor brush ready to clean them vigorously in the soapy water on the pavement.

After years of persuasion, the heavy clothes iron filled with glowing charcoal was replaced by an electric iron. The ironing board, however, served only as a stand for cooking utensils, while on the large kitchen table the laundress was able to turn out an expert job of ironing.

Among other things, I learned that if servants are obviously distrusted, or feel condescension shown them, they are likely to quit at a moment's notice. It took two years and much native help before I began to understand these friendly people. Then Tasmi and Atmah came to travel with us as cook and houseboy.

There exists among many white families and their brown servants a close and fond friendship. During the course of eight years that Tasmi and Atmah were with us, they became admired and beloved members of our household.

In return, they gave us unfaltering loyalty and devotion, lavishing almost fanatical love on our little daughter.



U. S. Navy, Official from Armo

Mother Worries about the Aussies; Baby Fears No Man

She is one of the more than 6,000 natives who hid in the hills when Japan began moving threatened Tarakan's population to the Borneo mainland. Soon after D Day they were behind Allied lines, demanding food. Many bore wounds.

They were not unlike so many others of their race. Color and creed make no difference in judging whether a person is noble or ignoble. One should not judge the natives by our standards before learning to understand their own Mohammedan religion and age-old customs. Gentle, law-abiding, and peace-loving as most Indonesians are, they are controlled by Mohammedanism. It sets rigid, high standards, but these standards do not always coincide with our own.

Tasmi and Atmah, like many others, were admirable, judged by even our own code. They were intelligent, proud and high-principled, honest, sincere, and cleanly.

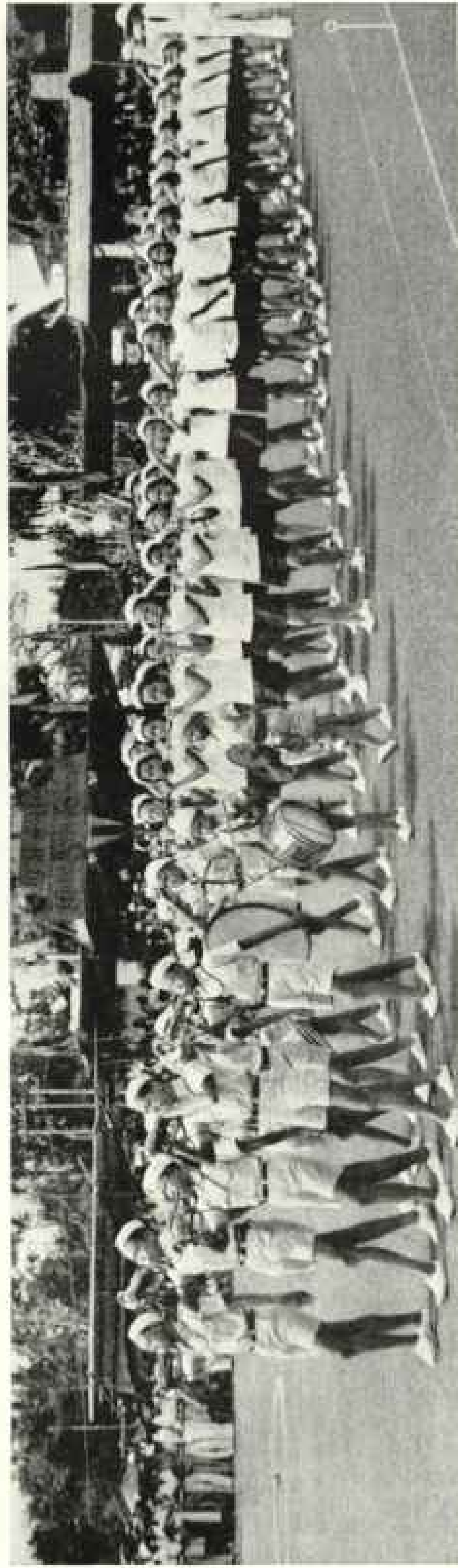
Like many other housewives, I had to read



Harrison W. Smith

Sarawak Fishermen Build Homes on Stilts. Streets Are for Canoeing and Fences (Left) for Trapping Fish

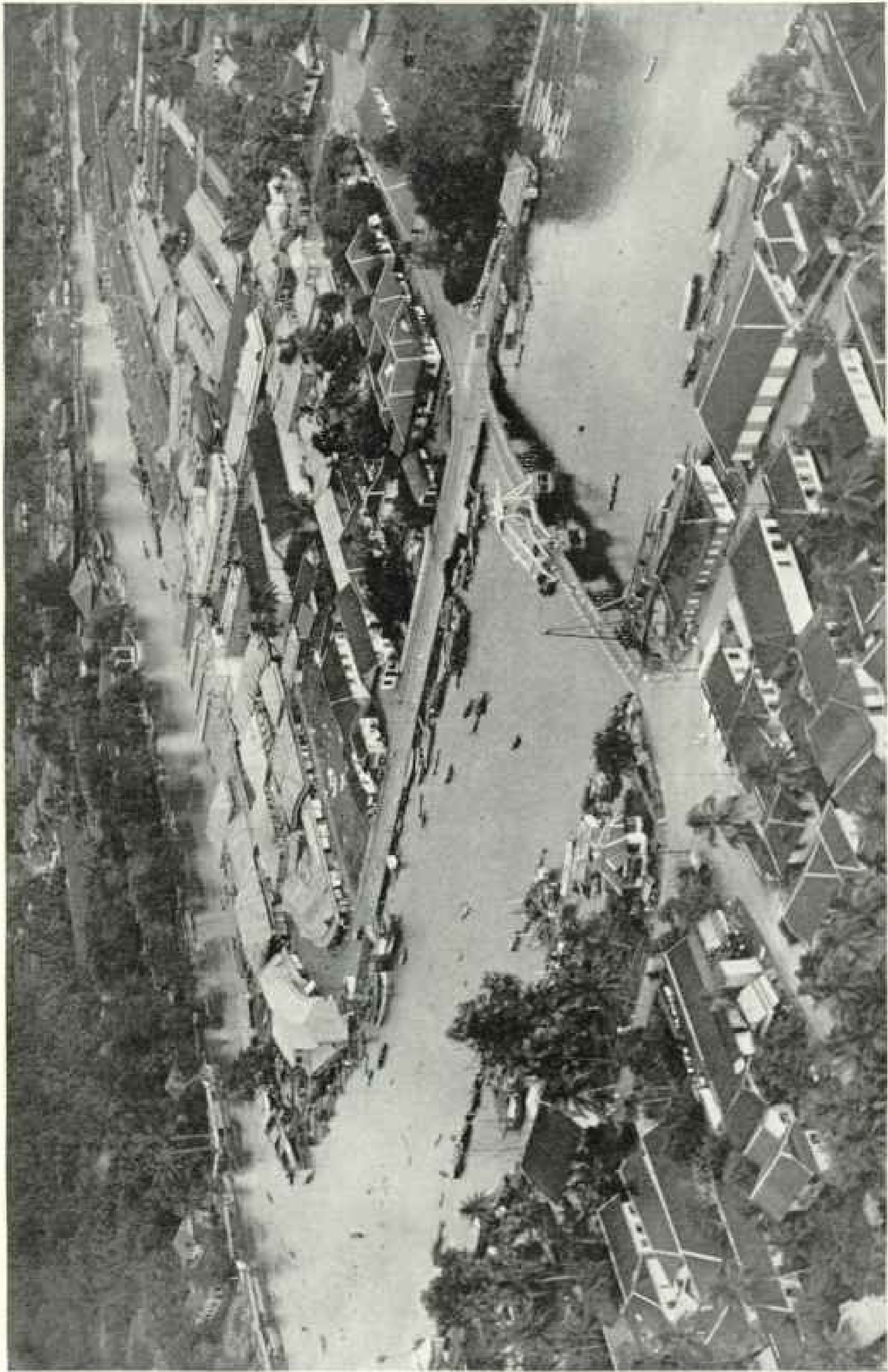
Goats, chickens, and babies fight, play, and romp across rickety floors and catwalks. Even the house cats are swimmers.



Clifford A. Davidson

Sarawak's Chinese School Children Parade on the Birthday of Their White Raja

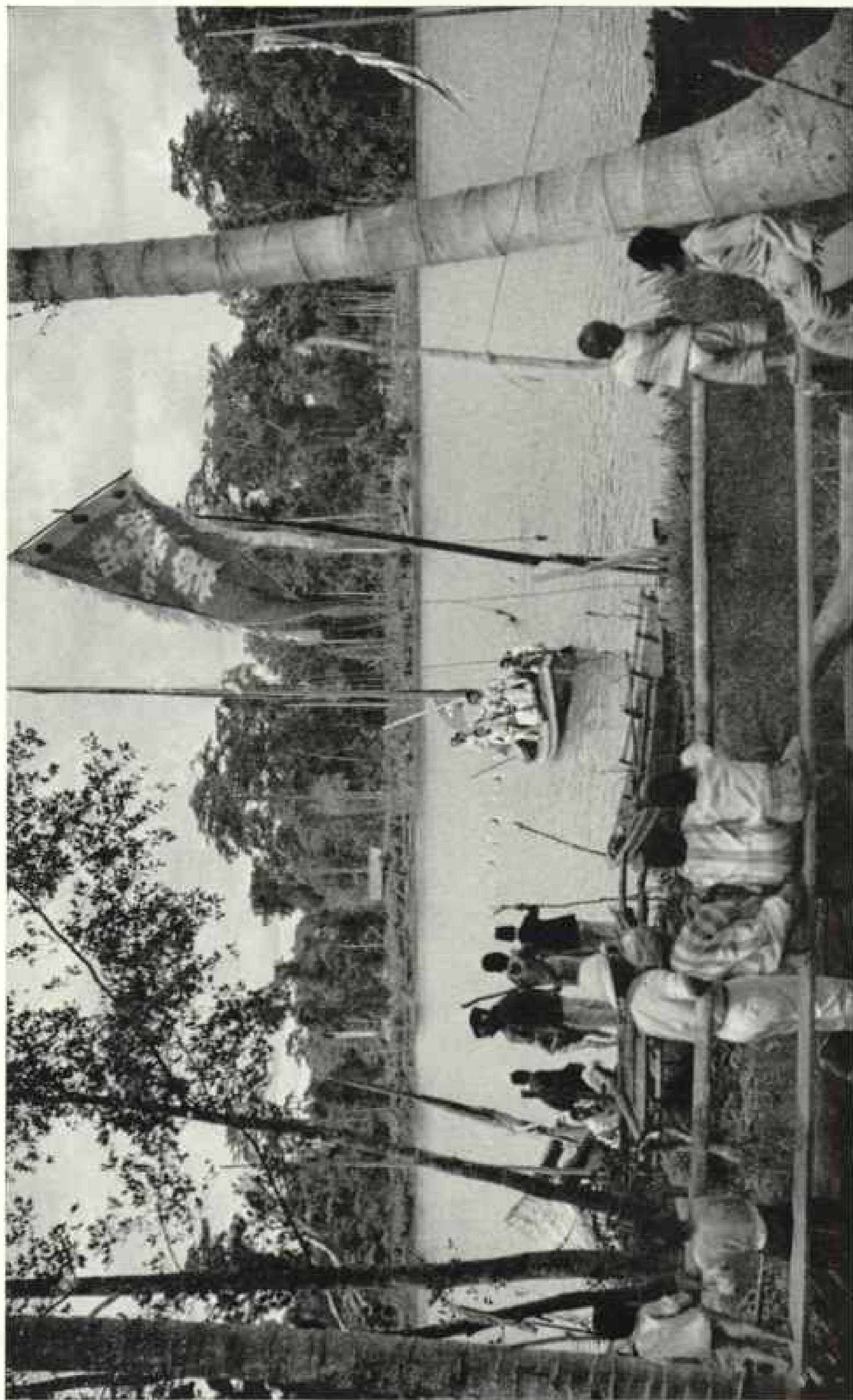
In 1941 the Raja, Sir Charles Vyner Brooke, third of his line, abandoned absolute power and gave his people a constitution. Japanese invasion called him.



© I.C.N.I.I.H.

Bandjermasin's Prosperity and Sorrow, the Martapoera River Brings Shipping and Floods to the Swampy Capital of Netherlands Borneo

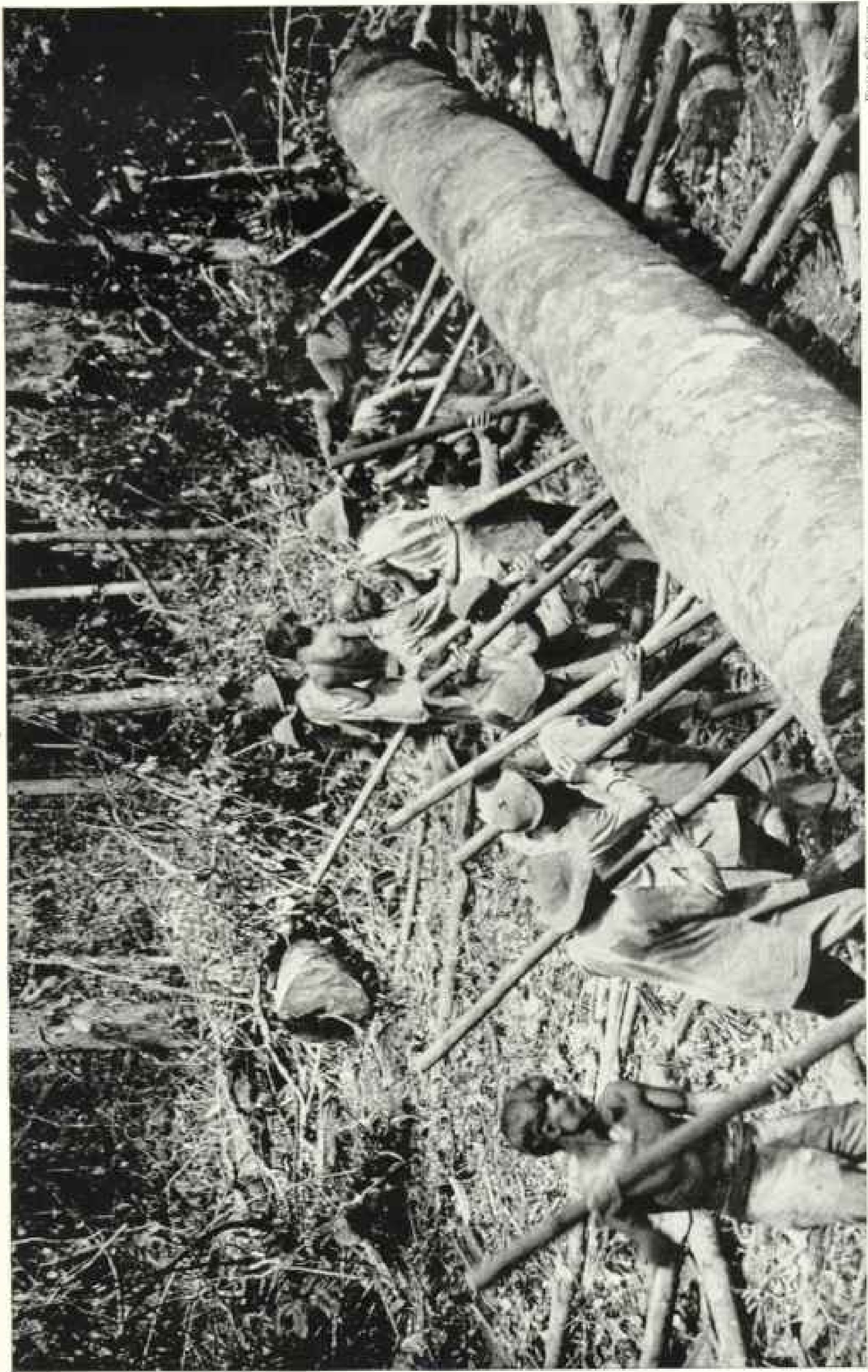
In its stores, the author recalls, she sometimes found old brandy marked down to 30 cents because "it has been on the shelf so long." Hospitable Dutch homes made the city's heat and humidity bearable. Early in 1942 its European women and children fled to Java, only to meet the Japanese there.



Howard L. Wainburn

Though He Lives Next Door, a North Borneo Malay Sails to His Bride's Home for the Wedding

A ceremony like this was observed by the author in front of her home in Netherlands Borneo. "The bridegroom was ushered in by a many-gonged orchestra," she relates. "He, too, lived next door to the bride. Having tried hibiscus juice on her lips, she rushed to my house for a real paint job. She was married in American-made powder, rouge, lipstick, mascara, eye shadow, and nail lacquer."



Boque Gallery

Chanting as They Heave, North Borneo Lumberjacks Roll a Log to River. Their Island is a Huge Timber Reserve, Scarcely Touched

Prime timber covers almost 80 percent of Borneo land. Giant trees, some 220 feet, have never been disturbed. Forests contain valuable Borneo ironwood, "teak," camphor, ebony, and sandalwood. North Borneo has several million acres of trees within 20 miles of its coast. Netherlands Borneo has a large stand of pine suitable for making plywood. Rattan, resin, tannin, nuts, and floral oils are other jungle products.



© R.P.M.

With a Swish of His Sword, a Dancer Shows How He'd Hunt a Head if the Law Allowed

Argus pheasant feathers cap this Dyak's fur beaddress. His bark jacket is stained brick red. From his back hangs a square woven mat, a combination chair, pillow, tray, and umbrella. A faint tattoo appears on his thigh. His fine parang is the product of native blacksmiths. Sometimes hair of slain foemen hangs from the blade's hilt.

their letters to them and sign their papers, for they could not even write their names.

Tasmi Adopted Ten Children

Tasmi had no children of her own. She adopted ten babies, sent them all through school, and, with my husband's help, found the boys good jobs. The girls were trained to be excellent housewives, and Tasmi cried over each one as, at the age of fifteen, she found them good husbands and gave them big weddings.

Love of children is in the hearts of all natives. Adoption is popular even in large families.

Tasmi wept happy tears and danced with joy when my daughter was born. Now she would have a little white girl to love and spoil.

In spite of all her household duties and of having her own children to care for, Tasmi always appeared to help with my baby. As if she were playing with a doll, she would change her clothes many times a day and, if we were away, she would sleep at night outside her door until we returned.

No one of Tasmi's children was spoiled. At the age of ten the girls could darn as well as I, cook as delicious meals as those Tasmi prepared, and do all the housework in their mother's home with real efficiency.

We shared our happinesses and our hardships as Atmah and Tasmi followed us to our successive homes. Now I lie awake at night sometimes, hoping I can find these good friends again.

Even when the bombs fell on Java, they, like so many of their kind, refused to leave their white friends, and the Hollanders did not leave them. Government personnel stayed at their posts to help where they could. It was I, an American, who finally had to leave.

In the ninth month of the Moslem year comes *Poewasa* (Ramadan), time of fasting ended by a feast. *Poewasa*, which is called "New Year's" by foreigners, is a time for much patience and understanding, for in it there is a real sacrifice for all Mohammedans, and a great majority of the people of the Indies are good Mohammedans. No food or drink may pass the mouth between sunrise and sunset.

It is hard for anyone to have much sleep during *Poewasa*. After two o'clock in the morning tin pans, beaten in a constant din, keep everyone awake as the Moslems prepare and eat their heavy meal.

At sunset kneeling Mohammedans offer prayer. Then a glass of tea may be drunk before a large evening meal.

After a full lunar month, *Poewasa* ends at evening in a great popping of firecrackers, lighted torches, and processions. The night is passed in festivities and dancing to the music of gonged *gamelans* (orchestras in which percussion instruments predominate).

Shadow plays recount long stories of gods and goddesses. And of course there is gambling, which is dear to the hearts of all Malays.

In some villages along the rivers the only lights are the many little sheltered candles placed at the gates of each native house, making the black night look as if all the shooting stars had come down for an evening in the jungle.

Vacation Shopping in Java

I didn't realize how many things I could do without until I lived in Borneo. There you don't just go out and buy a dress if you think you need it. Instead, you wait for your yearly vacation in Java to purchase a sorely needed supply.*

We did without fresh milk or butter for all the years on the island and, until yeast was imported, we used dried hops to make all our own bread.

Our stove was always a long block of cement with a trough down the middle under an iron grating. Fire in the trough created only a slight heat in the cavity, the section beneath which served as an oven. A kerosene can with one side cut into a flap made a better oven—when a native used it. Tasmi put such a can over the fire, dough inside, live coals on top, to cook delicious bread and cakes.

Once we bought Tasmi a two-burner kerosene range with detachable oven, thinking it would be a grand present. Within a week she got out her own charcoal burner and hunted up a good kerosene can. None of that fancy stuff for her!

I used to dream of standing rib roasts and beefsteaks with a crisp edge of fat and a bone I could see.

Beef on Borneo bore no similarity to that from a Texas steer. On the hoof it resembled a scrawny, inbred runt. Lean meat was cut away from everything else; so fat and bone had to be bought separately. But once when our weekly order did not arrive for three months we found it was good enough to be really missed.

It was hard to make a native chicken palatable every day. Goat had to be bought alive, prayed over by a Mohammedan *hadji*, after

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Java Assignment," by Dee Bredin, January, 1942; and "Through Java in Pursuit of Color," by W. Robert Moore, September, 1929.



Clifford A. Dart/Don

Malay Gamblers at Miri Choose the Fan-tan Table; a Chinese Woman Banks the Game

Easy money came from Miri's oil-field pay roll. Ordinarily the State, debt-free Sarawak, collected taxes from gambling, but on Chinese New Year's, when this picture was taken, it remitted them. Players place bets on the number of counters left after a deal. Here the croupier, having removed a handful from the bowl, counts them off by fours. The table's "cut," or percentage, is kept in the glass cage (right).

which the slaughter in our own back yard made eating it a real hardship.

Obtainable also were deer and doves and little green parrots, but we couldn't get these or wild pig all the time; so for a change we ate water buffalo (page 318). Take an old shoe, grind it, sprinkle with sugar and salt, add a few drops of cod-liver oil, and cook. There you have a dish of buffalo patties.

Rijsttafel, a Culinary Masterpiece

In the Indies nothing should be eaten raw unless it can be peeled. Hearts of palm and wild avocados helped to solve our salad problem, as did tomatoes and cucumbers.

Only the foolish indulge in lettuce unless it is cooked. European-type vegetables arrived from Java mountains sadly wilted from days in the sun. It was fun improvising American meals from those things which grew on the island.

But best of all is to learn to like native foods and to serve them often.

Visitors in Java always remember the *rijsttafels* (rice tables) served by twenty boys at the Hotel des Indes in Batavia. To us who lived in the Indies this was our Sunday dinner and always a social occasion. Early on Friday, Tasmi assembled everything edible at the market—every kind of vegetable, meat, fowl, fish, shrimps, and crabs. She cooked white, red, and sticky *ketan* rice.

Sauces of coconut meat and its liquid were filled with breadfruit, red peppers, and peanuts. There were tortoise eggs and what we called stink beans, which looked like green almonds but grew in pods. Many sorts of green beans, thin lavender eggplants, marble-sized sour tomatoes, and other fascinating vegetables made *sambalans*, or spiced dishes.

When a *rijsttafel* is ready, some thirty herbs, roots, and spices of all kinds have been



Virginia Hamilton

In a Dyak Morgue, Boats Are Coffins and Dishes and Food Are Gifts to Ghosts

From temporary burials of the previous ten years, bones have been gathered at a remote Netherlands Borneo village. Each coffin contains members of a family. Bird or snake, the figurehead on every prow, represents man or woman, whichever is senior among the deceased. Here the author heard a toothless old witch mumble prayers. Then flames were applied to the pyre (page 294).

used for seasoning, and a modest meal consists of over thirty different combinations.

All was made still hotter with the red jam, consisting of red peppers, lime juice, and salt mashed in a stone mortar like the ones our American Indians used. The duck eggs were made somewhat like the preserved eggs of China. When fresh they were packed in a mixture of coarse salt and wet wood ashes. They were ready to eat any time after they had been saved for six weeks in a stone jar.

We had been offered python meat, considered a great delicacy by the Chinese, but that was the one thing in Borneo I never could bring myself to try. I had enough to do with pythons without eating them.

A group of road coolies called me to the door one morning. They shouted with excitement, flourishing their knives. There was a huge python in the high grass across the road. Yes, I had a chicken and would give

them the long rope they wanted. Soon the fowl was tethered securely about a hundred yards from my front door.

Reptile Visitors

Next day several gunny sacks sewed together were towed onto our lawn, to lay there undulating as a 23-foot python coiled inside. The coolies had caught him while he slept after eating the chicken. Their proud grins faded when I asked who was going to kill the reptile.

The python remained in the sacking alive and uncomfortable for two days on our lawn until a Chinese realized he could make good money selling the meat.

I told him I would pay him gratefully to take the awful thing away if I could have its skin later. I have five other skins now, smaller ones, all caught near our house.

A black snake coiled and uncoiled on the



Sun Hats, Resembling Knights' Shields, Relieve Bare Walls. In the Author's Home They Served as Lampshades

That frames are rattan; the fabric, nipa-palm leaves. Shells, beads, and even tin foil are decorations. As a Dyak man tends the boiling pot, two women, their ear-lobes stretched with heavy rings, sort feathers. Left: the basket with shoulder loops is a native carryall. Beside it are two imported kerosene cans.

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Rings in Her Ears, She Jingles Wherever She Goes

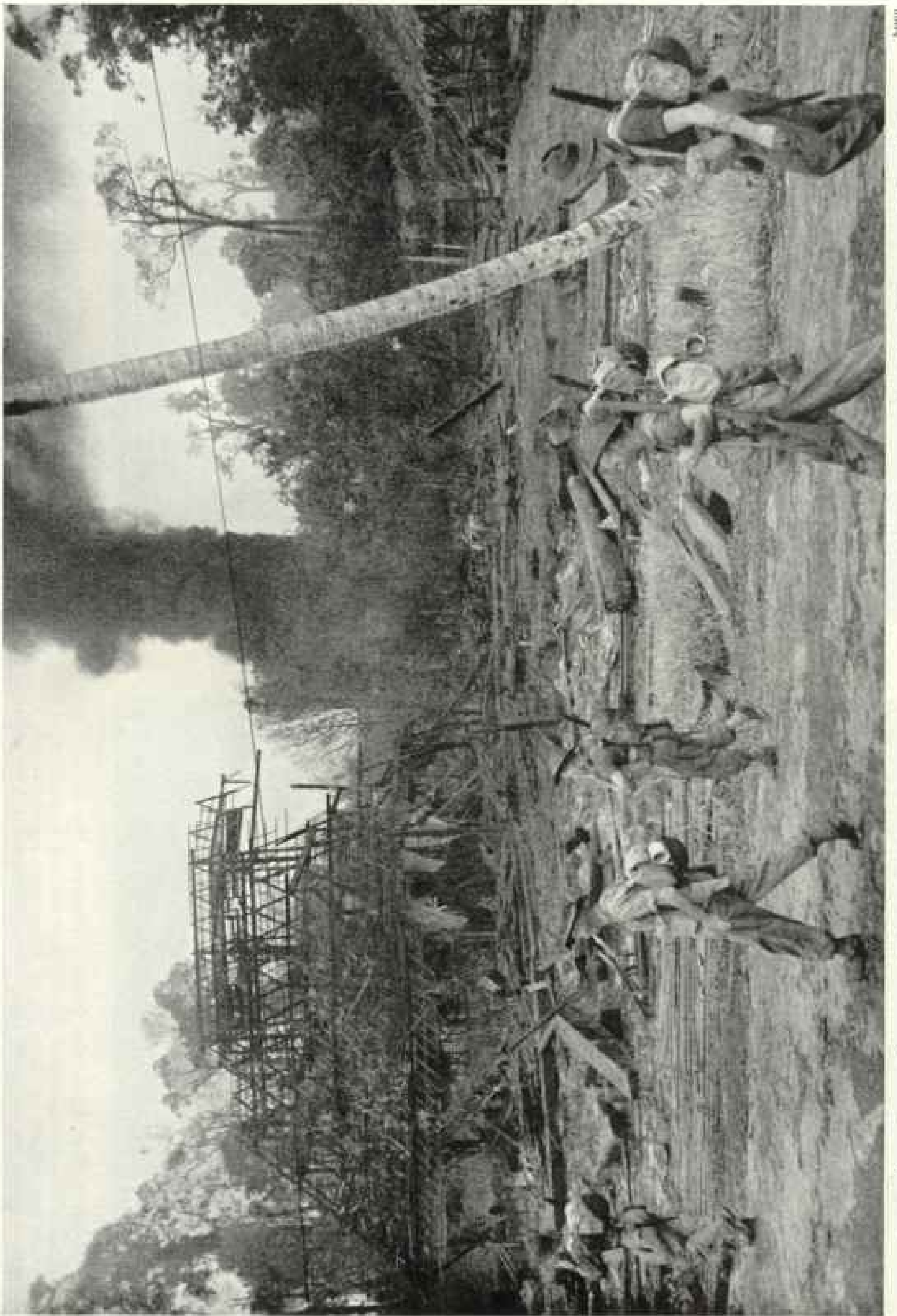
In girlhood her ears were pierced; wooden plugs stretched the lobes. Yearly, metal rings were soldered on. Now her ear ballast sways against her chest as she sews a headed hat (opposite page). For earrings, silver from melted coins is the choice of most Netherlands Borneo women.



© Clifford A. Davidson

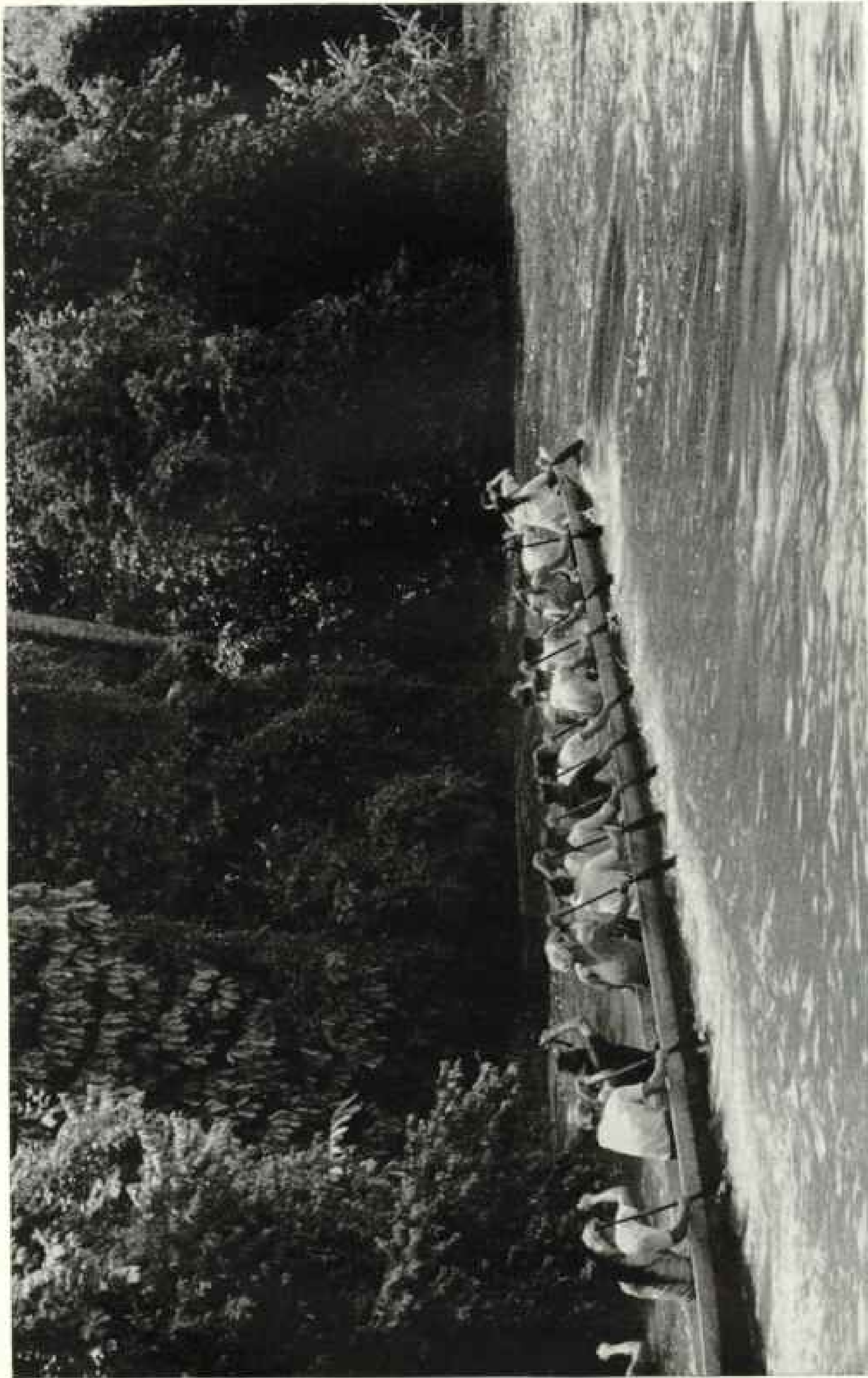
A Sea Dyak, Grandson of Pirates, Patches His Canoe

He devoted months to hewing his dugout from a hardwood. Tropical rot having set in, he inserted a new section. This he caulked with oakum. Now he applies pitch from the bowl. On his hip is a sheath for his sword. For a thrill, Borneo children drive frail canoes into a motorboat's wake.



Australians, Some Veterans of North Africa, Advance Across Tarakan Island, Shattered by Allied Planes and Naval Guns

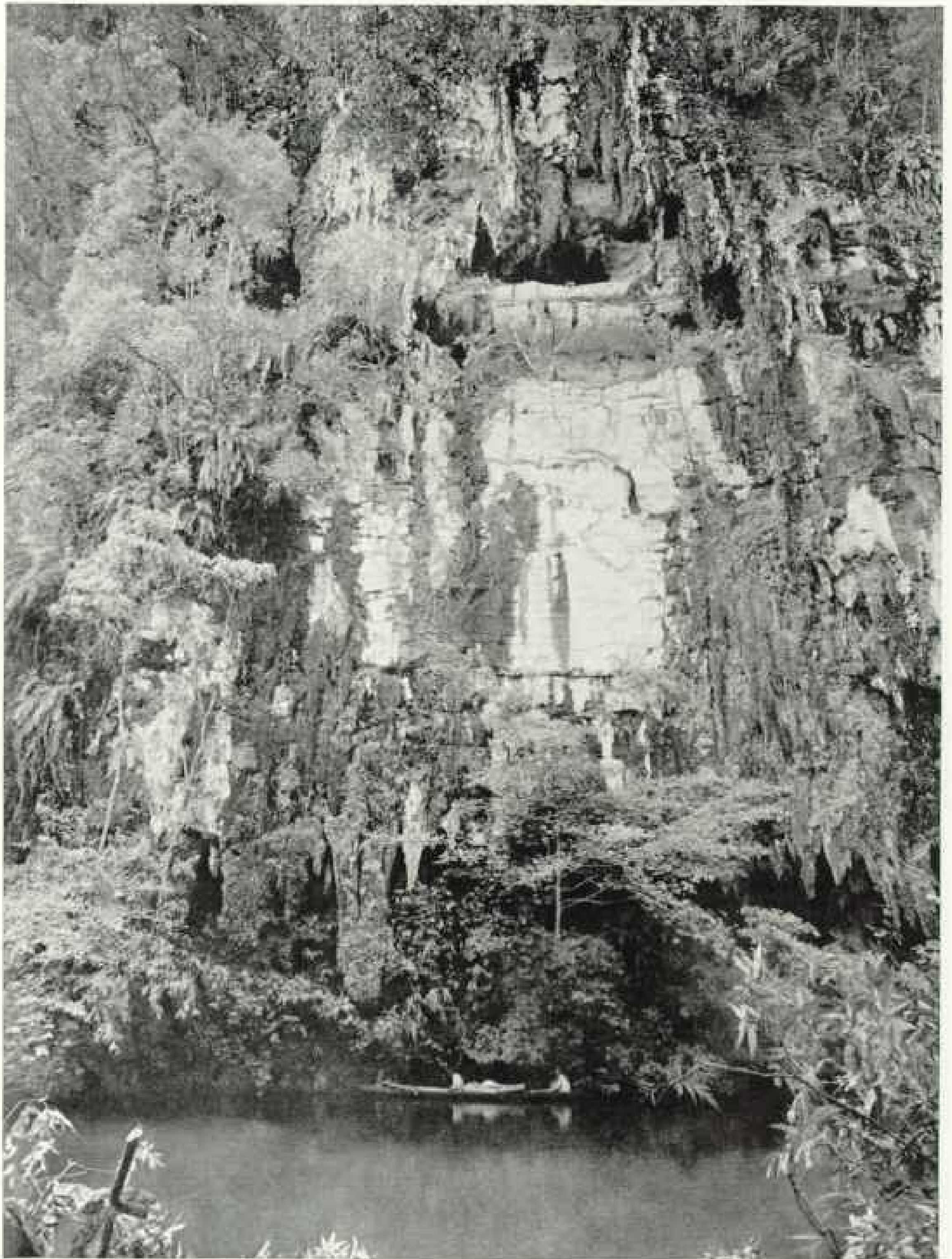
AP/WIDE



CLIFFORD A. BRIDGEMAN

As Paddles Flash, Sarawak Boatmen Breast the Swift Baram, Their Waterway into Borneo's Roadless Interior

This is the life, close to the solid jungle, that tribesmen love. On farm and factory toil they look with indifference, to their island's economic loss. They shed civilization's garments easily. Only last June they put on battle regalia and killed 14 Japanese in the Brunel Bay area. Aiding the invading Australians, they fought from ambush with swords, spears, and poison darts. Wide, short hunting spears fixed to blowpipes served as primitive bayonets.



HARRISON W. FINCH

Trees Festoon a Limestone Cliff; Ferns Fill Every Crevice; Stalagmites Hang Like Icicles

In upriver Sarawak the canoeists found Borneo air and scenery stimulating. They bathed in the Melinau's cool, transparent pools. Gorgeous butterflies were everywhere. To see Borneo's "wild men," the author made a river journey deep into the interior. She found a "wonderland of happy, primitive people" (page 316).

curtain rod in my bedroom one night for two hours while my servants were out and my husband was away. Fortunately, the reptile was as worried as I. Neither of us dared take our eyes off the other till the houseboy came home and quickly made an end of him.

Atmah was somewhat disgusted with me for acting as I did. Didn't I know the snake had come only to warn me that we would be moving soon? Indeed, he was right, for we moved within a week. It almost seemed that there was something to this native superstition. Five times we moved within two weeks of finding a snake in the house.

I must add that usually I was grateful for the change after living in such close proximity to the reptiles.

When I put my hand down on the stair railing right on top of a deadly *ijerlang* ("iron snake"), it jumped farther than I could, and fortunately in the opposite direction. These very small reptiles look like pieces of wire and are hardest of all snakes to see.

Four-inch centipedes were at home in the dampness under potted plants, making gardening not always pleasant. Woolly spiders and black scorpions sometimes found their way indoors. But when I found five young cobras in three days sunning themselves on the door-sill and realized that the parents must be near by, I nearly moved out.

They say that one can survive the ordinary bite of any poisonous creature in Borneo if care is taken in time. But the cobra's venom is so deadly that help does not always reach the victim before the venom has taken effect.

Reptiles and wild animals are not always dangerous in Borneo, nor are they often seen. Usually they see a human first and are the first to run away. Danger comes only when the creatures are caught unawares and realize they must fight or be killed.

There are no tigers on Borneo. Elephants, a source of much destruction but little danger on Sumatra, are found only in the north. A few wild oxen may become vicious, but only if molested; and occasionally a "man of the jungle," the orangutan, will resent a disturbance near his home.

Kidnapped by a "Man of the Jungle"

In the forest near one of our homes a real jungle story took place. One of our coolies was stolen away by a huge female orangutan. The man was found three days later unhurt, but the fright of his experience had permanently unhinged his mind.

Occasionally thieving monkeys robbed our kitchen, one side of which was usually built with a large window of wire netting for ven-

tilation. Tables, cupboards, and even the baby's crib were set in kerosene cans of moth balls as protection from ants. There were no double walls for rats to live in.

Inch-long termites invaded our house at times in such numbers that a room would be clouded with their swarming. Thousands of them crawled into crevices in the walls, leaving behind a layer of glistening wings like a fall of miniature autumn leaves.

Coolies working on oil wells catch large numbers of termites. They cook them on the hot pipes of the engine and make a feast of them.

Always there were a few insects which followed the lights. But in the wet season many nights were made uncomfortable wherever a light burned. Screens in windows added just that last touch of heat which made a room unbearable. But when thousands of bugs were flying, screens afforded the only protection.

Then the evening noises of the jungle entered our home in the metallic buzz-saw din made by cicadas and giant katydids.

Usually green or brown, the cicada was sometimes striped in gay colors. They can grow to three inches long, and they fling their hollow bodies on silver wings to crash against anything in their path. Their bumping and buzzing, my dodging and swatting sent me early to bed in the rainy season, for the netting and darkness were the only protection from the invasion of our house.

There in darkness I would lie awake listening to the hum of mosquitoes, counting the loud *talk-kay* of the big lizard in the trees, for when his call is repeated seven times it brings good luck. I would hear the fluttering of hens when a great prehistoric-looking lizard attacked the hen house and would wish for drier weather and the cessation of so many night activities.

"Flying Things" of the Night

There are other flying things which come with the night, bringing fairyland on their wings. I don't know the names of the many moths. I only know that I could sit for hours near a white wall with a low light shining on it, watching silver and gold lace on tiny white-satin wings, lime and brick-red shades on five-inch wings with trailing spiraled ends.

These dainty things are lovelier than jewels themselves. Their glistening and iridescence, their soft mat qualities hold more beautiful combinations of color and intricacy of pattern than a designer of fine silks or jewelry could dream.

The goldbug came to my house, too. He

was a small beetle which, when he sparkled on the floor, looked at first like a gold earring lying there. He had what resembled a little Greek letter in dull gold on his back. For all the years since he was chloroformed and wrapped in cotton he has continued to sparkle when taken out.

I felt that I must have a collection of these lovely gems, to me the most beautiful things in Borneo. But it was the only collection I made. My husband was always bringing home a *wah-wah*, friendly gray gibbon, or a fawn, lost from its mother. Once a diminutive mouse deer, shiest of them all, wandered into my dining room. I fed them all and set them free.

Many wild things, abandoned by their kind because of some subnormal condition, were nursed to health by kindly Europeans. Once set free, they became village pets, ranging where they wished but never far from humans. They seemed to know that they could never return to their kind and that survival depended on the friendliness of people.

Kees, a red-haired baby orangutan, had special permission to live in the village, for these apes are protected by the Government and are rarely allowed in captivity. He had the friendliness and mischief of a two-year-old boy. Hans was a deer who bullied the dogs with his antlers. Pete, a solemn, stiff-legged marabou, visited tea tables in the gardens.

Ever-present sparrows twittered in the leaves and hornbills squawked in the distance. Suddenly, on walks through the jungle, we would come upon a cleared space where the ground was trampled to a hard floor. This was the dancing place of the argus pheasant.

Greek mythology tells us that Hera set the hundred eyes of Argus, the monster guard of Io, in his handsome plumage. In the sequestered leafy theater, vivid feathers spread, the great bird performs a strange ritual to fascinate his mate.

Aroma of the Durian Season

Just before the durian season began, the jungles held a particular smell, forecasting the time of ripening for the strange tree fruit. Soon an intangible odor permeated villages and jungle alike, and the market was full of durians for sale.

The large, hard, prickly-skinned durian is very popular with the Indonesians. Europeans who cannot learn to eat it are sorely tried during the short season of the ripe fruit.

I started eating durians in self-protection, as one eats onions when everyone else does.

At first this was no real triumph, for after I had managed to get close enough to one—fingers pinching nose—the soft, creamy sections of the fruit seemed quite unpleasant to my taste.

Perseverance brings great satisfaction, however. To eat a durian is to learn to like it, even though the nearest thing to it in consistency and flavor would be a mixture of melting maple mousse and garlic.

Indies fruit is of many sizes, colors, and shapes peculiar to the foreign eye. The *sawo* resembles a common potato, but has a luscious malty flavor. Pale applelike *jamboes*, the fleshy stalks of the cashew fruit, are known only in America for the curved nuts which grow on the ends. There were so many different, tangy flavors that our buffet could always hold a colorful basketful.

Orchids of Many Colors

Surpassing the fruits in exotic color and diversity—indeed, vying in beauty with the moths—are the orchids. The path to my house was lined with potted ground orchids.

The wire netting of our chicken coop hung with some 18 varieties. Besides the big lavender ones there were sprays of inch-high white pigeons, lifelike scorpions, tiny yellow-and-brown bees, and many others, in shape and color resembling insects and butterflies.

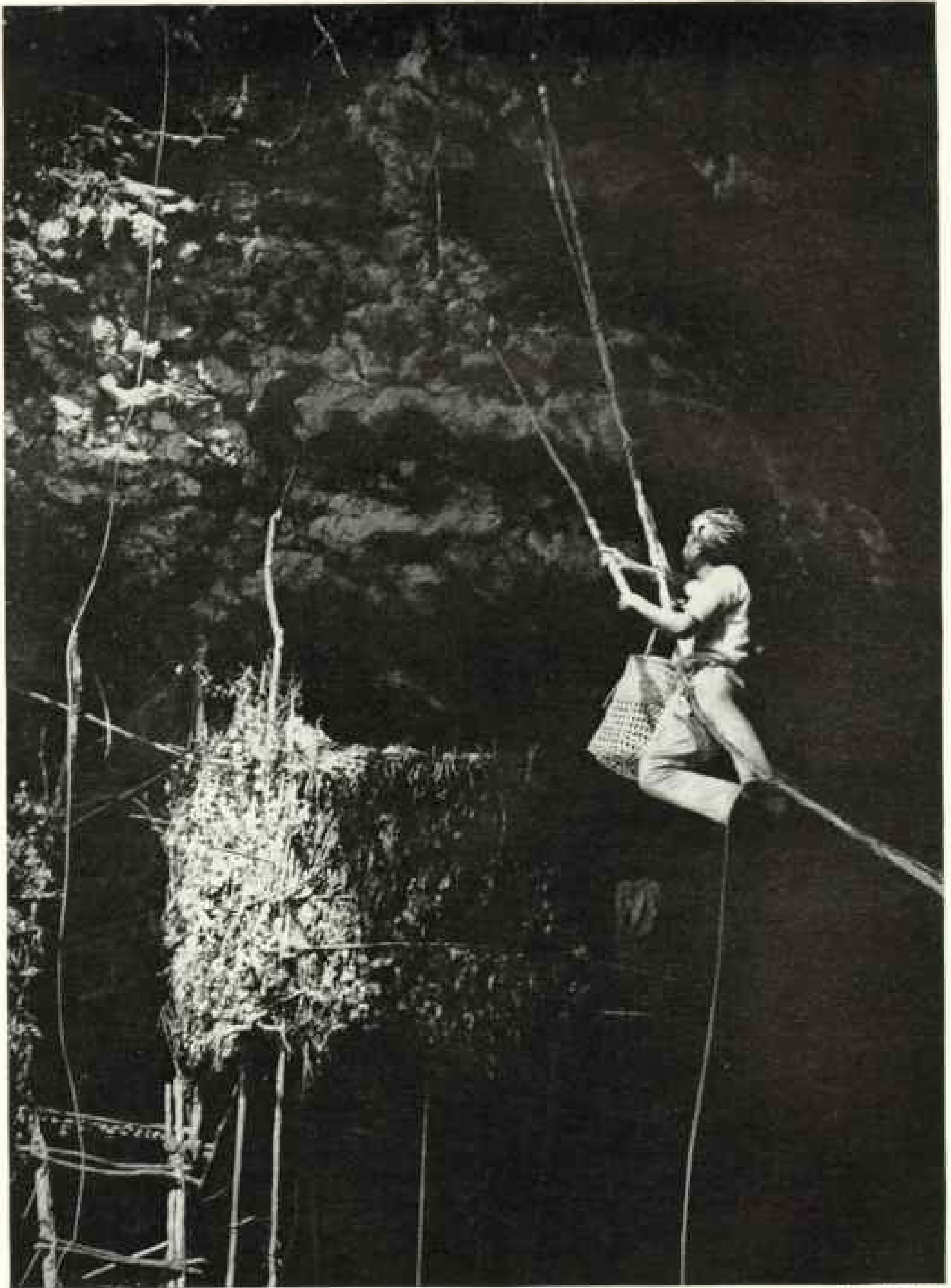
Many orchids have no scent. My favorite, however, had the heavy fragrance of tuberose. In shape and size like the common lavender blossom, in color vivid chartreuse green and velvety black, these exotic flowers held almost a sinister fascination in their startling shades and heavy perfume.

For a last glimpse of Borneo let me take you up the wide, winding Mahakam River to a land and a people little changed over the ages.

Leaving Balikpapan at midnight, we had breakfast at the Sangasangadalem oil field. From there on, our 65-foot boat made about twelve miles an hour for three days. Samarinda was the last European settlement.

Past Tenggara, home of the Sultan, native villages were scarce. We were alone in a green world of pure primitive living, on a highway of shining brown water where there were no straight stretches or long-distance views.

Except for an occasional crashing fall of a heavy dead branch, the jungle was almost silent. Numberless shades of green composed the jungle, while the type of foliage gave variety and quality to colors. There were the deep, dull shades of the wild-rubber leaves; the gray-green needlelike tassels of the *tjimara*



Ewing Galloway

A Slack-rope Climber Risks His Life That Chinese Epicures May Have Bird's-nest Soup

Using a salivary secretion as cement, *Collocalia*, one of the smallest swifts, builds its egg platform against rocks. Almost pure gelatin, the best nests sold for \$15 a pound. Whitish, edible nests were an 80,000-pound-a-year export before war stopped Borneo-China commerce. Old nests were of no value; hunters destroyed them to ensure a fresh crop. This Bornean scales a liana near the sunlit mouth of a limestone cave. Into a basket go nests detached by his long spear. A candle for lighting the darker recesses is attached to the pole.



Methodist Board of Missions

A Desperate Passenger to Borneo Goes Ashore in Shackles

When aroused, the water buffalo is fierce. Often the despair of men who cannot manage him, he may respond to a child's command. This burden bearer's tough flesh is not worth ration points. Sampling buffalo meat, the author considered an old shoe equally good (page 308).

(beefwood); the low plumes of the banana tree; and the feathery fronds of the giant fern. Waringin, a fig, and other spreading shade trees tried to force space for their thick branches.

The impertinent trunk of the coconut-palm, with its tousled head, seemed trying to show the great *kajoe radja*, king of trees, how to push its heavy trunk and sparsely covered branches to the sky.

Only at the highest point, which each tree seems struggling to reach, does the blue sky begin to show.

Dead trees, still upright because there is no place to fall, make streaks of tan or startling beige. Half-dead trees with yellowing or red-

brown leaves add an autumn touch. Young growth brings vividness, while occasional flashes of red, delicate lavender, and small cascades of white pigeon orchids lend excitement.

There was much we could not see, many blossoms blending their small loveliness with the dense vegetation. Each plant and tree seemed vying with the others to reach light and air, while all appeared bound together with lianas and parasitic plants.

The year round, twilight is a matter of minutes only, but it is the grandest time of the day. A fresh, cool breath comes from the darkening skies, where clouds turn for a moment into wondrous hues, haze to a pink glow.

For a short while here in the lonely jungle I could almost imagine I was living inside an opal. It was then that the colors of the foliage acquired new and still more varied shades, for the slanting rays of the sun touched spots which never felt the sun at

another time. One could believe that the lower trees were giving thanks for this momentary glimpse of the wonders they would perhaps someday reach in their struggle to grow tall.

Our voices were stilled in awe at the beauty surrounding us. The boat's engine, chugging so long, was finally stopped for the night; and the splash of the anchor put a period to the last sentence of its chatter. To our ears came no civilized sounds.

As the night stretched black curtains across the sky and huge solitary bats appeared, a crescendo of sound filled the jungle. Millions of insects began their buzzing, monkeys called, and another animal howled. Later the crea-

tures would concentrate on hunting, and the jungle's voices would be modulated.

On our boat, anchored in the middle of the river, we could see the trees along the banks fill with twinkling fireflies' lights, and only a whisper of sound told us the jungle was awake through the night.

The river narrowed and became shallower on the third day. As we neared Tring, where we knew we would find human beings again, a sandbank less than six feet under the water stopped our boat. For just such an emergency we had taken along the *Butterfly*, a 35-foot motorboat drawing 3½ feet of water. Our crew and servants remained reluctantly on the *Rienzi*, in fear of what might become of them at the hands of head-hunting Dyaks.

Far away from any settlement except a few Dyak kampongs, Tring was the home of eight valiant Catholic missionaries. Their pastor and three brothers met us at the dock, wearing long white robes and wide smiles, for we were the first white people they had seen in nearly a year. Soon we met the four nuns, who showed us through the mission school for boys and girls.

Life Lonely at Tring

Here were about one hundred pupils learning simple arithmetic, trades, and house-keeping. In the nearly forty years of the mission's existence, its main contribution to the natives had been what it could teach of a common language and what very little its pupils would take to their widely scattered tribes. Intelligent, hospitable, excelling many other peoples in truthfulness and honesty, few Dyaks have as yet adopted modern ways and Christianity.



U. S. Navy, Official

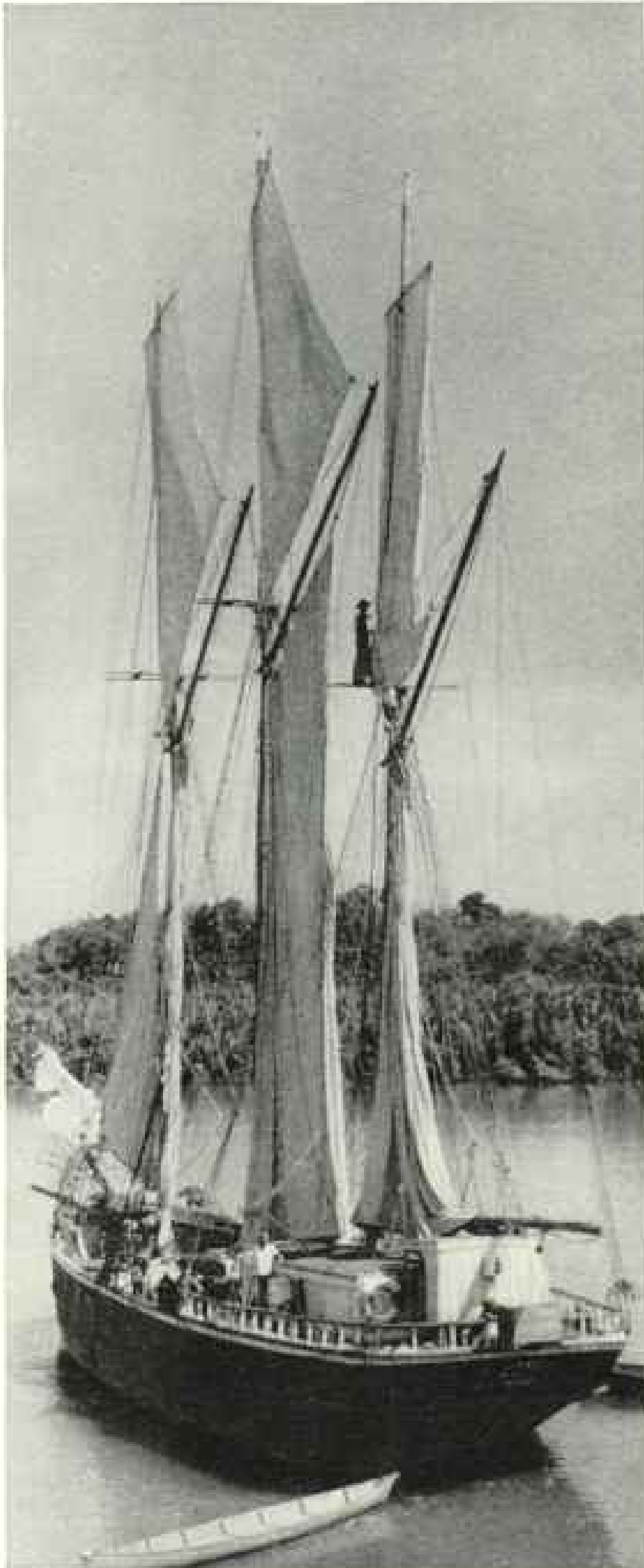
For Aussies, Japan's Stolen Oil Makes a Beautiful Bonfire

Tarakan's equatorial sun did not stop these signalmen in their climb uphill. Now, however, they feel the heat from the blazing tank. It is too much for the walkie-talkie operator; he unloads.

It was a lonely life at Tring. All the missionaries had grown old there. One of the nuns had been as far away as Samarinda only three times in 30 years.

A radio was a novelty which we promised as a present the next time a boat could bring it from Balikpapan. We marveled at the unquenchable gaiety and good spirits of these Hollanders, which they combined with indomitable will and faith.

The ladies served us a delicious lunch, as we perspired freely under the influence of a small glass of sweet wine reserved for such an occasion. The dessert arrived in the form of rice pudding with a sauce of long-saved dried prunes and apricots. We laughed with them when it turned out to taste like the moth



Clifford A. Davidson

A 3-master Furis Her Sails off Borneo

In peacetime, Borneo ports are congested with interisland sailing ships. Out they go with sago, jelutong, and edible birds' nests. Home they come with dry goods, lamp oil, and furniture. Cargo-starved Japanese, their steamers torpedoed, used such native sailing ships. Off Borneo in 1945, Allied planes strafed them. American patrol boats, venturing into muddy rivers, sank them.

balls the fruit had been saved in. But they had given us the very best from their small store of imported foods, and we were grateful for the good will of these kind people.

When we left, the pastor and a Dyak guide went with us.

During the day we poled constantly to find a channel deep enough for our little boat, but there were times when a groan and a lift made us feel a leak was inevitable. Many old tree stumps under the water endangered our small craft.

In this dry season, here where the river was shallow, we should have seen literally hundreds of wild pigs crossing the water. But the jungles kept the secret of where all creatures were. Seldom did we see more than swaying branches or bending grass to tell us that animals watched us pass.

Finally a reef of rocks under the water made it impossible for us to go farther. There had been no rain for several weeks. One good downpour in the watershed farther up would have given the river depth enough, but no rain came.

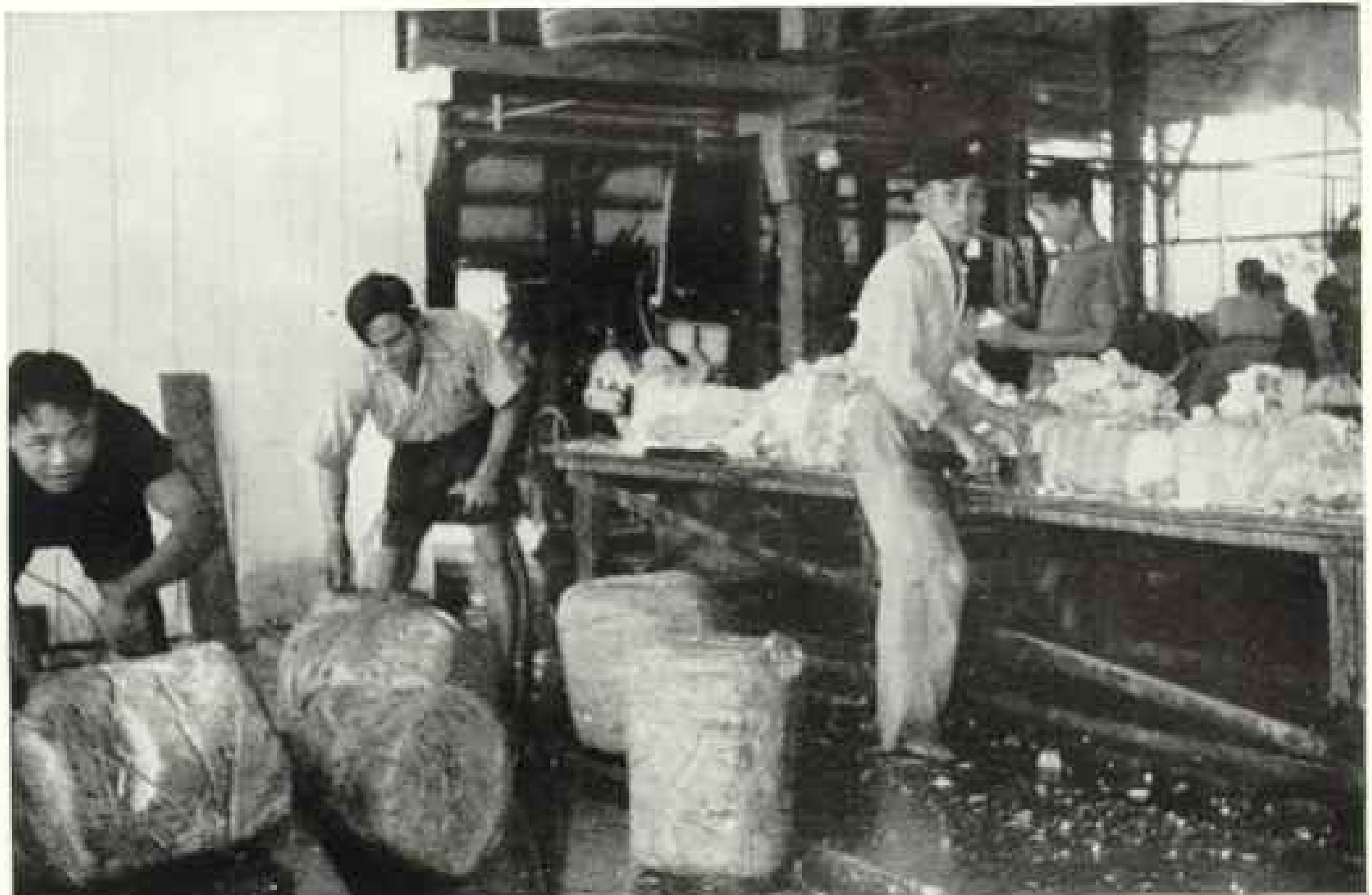
There was no kampong where we could hire native dugouts, as we had hoped to do a day farther on. Then we could have paddled a day more to rapids, new scenery, and tribes that had seen only an occasional white government official in all their lives. Our disappointment at having to turn back was keen.

Witch Doctors and Sorcery

In Tring again, after a hurried dinner, we walked in darkness to a kampong ten minutes away, where witch doctors had been hired to expel evil spirits from the sick. These men came from distant villages to perform their witchcraft for several days. Even here, so close to a mission, sorcery was constantly practiced, and the medical care the mission afforded was taken advantage of only after the spells had been unsuccessful and the patient was at death's door.

The whole kampong was one huge house about 1,000 feet long.

Built on piles several feet above the ground, the house had hardly a nail to hold it together. There was a wide veranda along the front length, from which doors led into separate rooms. Each was the home of an entire family, from grandparents to swarms of babies



Out of Borneo Jungles Comes Jelutong, a Low-grade Rubber, for Gum Chewers

Tree tappers gather the chicklike latex and coagulate it. At Bintulu, Sarawak, the balls are sliced for processing (right). The plant was managed by Americans; its loss to Japan contributed to the gum shortage. Jelutong is used also in waterproofing, varnishing, and insulating compounds.



Clifford L. Davidson

Is This Granary Rat-proof! Each Leg Has a Wooden Disk Meaning "Stop, Thief!"

Rattan binds the posts. Walls are of reeds. Palm leaves form the fringed door (left). On similar shacks in rice fields, children work as shouting, waving scarecrows.



Clifford A. Davidson

Tiny Target for American Airmen Was This Toy Railroad in the Seria Oil Field

Before the Japanese took it, the narrow-gauge line was operated through jungle by a British petroleum company. In June, 1945, the Yanks strafed the line, and a few days later Australian troops captured it. Seria's oil, like Tarakan's, can be burned by ships without refining.

and little children. In spite of the congestion, rooms were neat. Hand-woven mats covered the floors. Everything from dried meat and herbs to clothing hung from the rafters.

In the darkness we searched each room until we found the one where the sorcerer was at work. Through the long hours between dark and dawn the dancing witch doctor and his assistants fell into trances, fainting frequently near the end. Evil spirits are thought to enter the body of the sorcerer, finally to be expelled with smoke and flames from the fire lit in his headdress.

It was an eerie ritual to see. Leaning against the wall, sitting, standing, and lying on the floor were some thirty members of the Dyak family. Players of wild, surging gong music, frenzied dancers, tense faces and naked bodies of all the gathering were lit only by flickering firelight and two candles.

Next morning there was a celebration in our honor. In the sun were assembled all the Dyaks, crowding the wide veranda and steps.

Under the trees, girls from the Catholic school sang Dyak words to the tune of "America." Several Dutch folk songs were sung in the Malay and Dyak languages. Then a

little princess from a faraway tribe shyly danced and sang an improvised song of greeting to the white guests.

Dance of the Wild Pig

The men of the village danced covered from head to foot in costumes of fringed banana leaves. Grotesque white-and-red wooden masks hid their faces as they slowly danced, imitating wild pigs. A hunter, calling impromptu jokes to amuse the audience, blew imaginary poison arrows from his long blow-pipe or stuck the "pigs" with the sharp metal point on the end of the pipe.

Clinging from palm trees by his bare toes, dancing and shouting, he made the audience scream with delight. Dressed in typical hunter's costume, he wore a loincloth, bananas around his neck, and stripes of white paint on legs, chest, and arms. His face was also painted, and his hair was decorated with feathers and pigs' feet.

Hunters usually wear feather headdresses as a camouflage when stalking game. Flapping behind them, attached to the waist, they wear also a large flat reed mat, which is used to sit on, eat from, or for drying fish or cleaning their game (page 306).



Ernst Gallmer

Rattan, the Tropics' Jungle-born Rope, Is Stacked Like Lumber

Rattan gives the Occident canes and wickerwork. In Borneo houses it substitutes for nails; on ships, it is cordage. It makes baskets, ties bundles, binds the feet of market-going chickens. It is the strong, flexible stem of a climbing palm, sometimes 200 feet long. At Pasir, Netherlands Borneo, these sections await shipment.

The celebrating over, we gave combs, brushes, mirrors, and bright bandannas to the dancers. Several kerosene tins full of tobacco, which we had also brought for presents, together with all the beer bottles we had saved, made acceptable gifts for the whole village.

Dyaks are taller than the true Malays and often handsome. The majority of the women and some of the men have ears stretched from six to ten inches long. Into a hole pierced in a child's ear is inserted a plug of wood.

When the lobe has stretched to an inch in length, a silver ring, thick as a pencil and bracelet-size in diameter, is inserted. Weighing the ear down further, more rings are gradually added, until a dozen or more jangle on their owner's breast (page 311).

As the girls reach the age of ten, it is customary to tattoo feet and hands. The job is finished when they are about 15 years old. The tattooing fluid is made from the juice of various trees and results in an unattractive dark-bluish color.

Among the Dyaks I visited, this work resembled lace mittens from the end joints of the fingers to about three inches above the wrist. In other sections the "mittens" extend

almost to the elbow. Only the backs of the hands are tattooed, and the same pattern is produced on the feet.

The Dyak Style in Sarongs

The women wear sarongs that are more like long aprons than skirts. The top corners cross to tie around the waist. Being very narrow, the sarong opens in the back, leaving little or nothing as a covering from the thighs down. A two-inch-wide band of reed, covered with red material, is worn on the head.

The Dyak hobby of beadwork shows here to advantage. From the back of the head the hair hangs over a stiff frame covered with material. In deference to the near-by mission most of the women wore cotton jackets, but often above the waist there is no covering at all.

A proud and handsome gentleman, the chief of the village, introduced us to his wife and mother, who wore gala dress different from that of other women. Shyly they told us that the richly woven, almost brocadelike materials and their curious beaded caps had been handed down from generations long dead.

In the room which was their home the chief



W. L. Irig

To Cook Meals and Repel Mosquitoes, Firewood and Iron Stove Accompany the Paddlers

From Bandjermasin, where they marketed their produce, husband and wife start home by way of a canal. Under the tropic sun, she wears her scarf over her head and "trims" it with a spare cloth. To visit a distant village, this couple thinks nothing of traveling for days in their light canoe.

proudly showed us more heirlooms. Among them, still in use as containers of food, were several pieces of exquisite Chinese porcelain which would have been museum pieces in any other part of the world.

We left this wonderland of happy primitive people and the kindly missionaries, returning all the way to Sangasangadalem in the *Butterfly*, for there still had been no rain to set the *Rienzi* free from her sandbank.

The sun beating on the roof of our little boat was terribly hot, and the vibration of the motor made us very tired. Warm beer was our only drink, for our little lamp didn't heat river water sufficiently to make it safe. Nevertheless, we determined to come back again in November or December when rains give more depth to the river.

We marked a spot on our map to which we could fly in a little Grumman amphibian to start our trip where we had been forced to turn back this time.

War Comes to Quiet Borneo

But it was not to be. Three days after we reached home our world changed. The life we had known began to slip away, finally to be changed into a whirling horror of destruc-

tion and death as war swept over Europe. At last, two years later, with all its terrifying force, it even came into our quiet Borneo.

Perhaps we will someday go back there, perhaps even take another trip up that lonely river. I sincerely hope so, although I realize that it may be difficult to recognize those parts of the island which had known progress and European ways before the war.

But I know a place that is close in my memory now and I know that I will recognize it when I go back. It is in the heart of Borneo, which has had no chance to fall apart in blood and ruin.

Yes, Borneo still wears orchids on her dress, feathers and wings of rare beauty in her hair. She still listens to the singing of birds in the day and to the orchestra of animal sounds in the wakeful night. Her trees struggle patiently to reach the sun and sky, casting cool shadows on the primitive brown people who live among them. Her rivers wind to the sea, warmed by tropical sun, cooled by heavy rains.

She knows the great purposeful struggles of Nature, but not the brittle pleasures of material luxuries or the bloody depth to which greed and jealousy can bring some "moderns."

Our New Military Wards, the Marshalls

BY W. ROBERT MOORE

Editorial Staff Correspondent in the Pacific

With Illustrations from Photographs by the Author

AFTER nearly 30 years of jealous Japanese control, the Marshall Islands have been opened under entirely new management!

Uncle Sam now has taken charge.

The opening began on D Day, January 31, 1944, when our forces unleashed a superbly coordinated amphibious attack against Kwajalein Atoll, center of the Marshall Islands area.

While the 7th Infantry Division beat down Japanese opposition on Kwajalein and its flanking islets at the southern end of the atoll, the 4th Marine Division was dealing a similar blow against the twin islands of Roi and Namur to the north.

By D Day plus six, organized resistance on Kwajalein Island had ended. Roi and Namur had fallen even sooner. On February 8, authority passed from the commander, amphibious troops, to the commander, garrison forces. Kwajalein Atoll was ours.

So, too, was Majuro, about 250 miles to the southeast, where other D Day forces had landed unopposed (map, page 329).

The assault of far-westerly Eniwetok Atoll followed on February 17, by the combined 22d Marine and 106th Army combat teams.

From these centers our control has since been extended throughout the Marshalls, except for four by-passed atolls—Jaluit, Mili, Maloelap, and Wotje.

Japs Await Help That Cannot Come

On those, as I write, thousands of Japanese still sweat and look for help that cannot come.

They refuse to surrender, though imported food grows scarce and our bombers give them little rest.

Many stories are told of the way pilots have dumped tin cans and garbage onto these Japanese-held islands just to show their contempt!

I know the temptation. Flying up from the Gilbert Islands,* our plane passed so close to bomb-pitted Mili that I felt disappointed that I could throw nothing myself.

Bombers pay these Japs frequent calls. So routine are strikes made against the isolated garrisons that pilots have dubbed the runs the "milk route."

"We make sure that our bombs drop on land," said crews with whom I talked. "If any fall in the water, they only kill fish, which the Japs can collect."

Meanwhile work goes on in the rest of the Marshalls. Scattered enemy groups posted on various atolls have been rounded up and removed. An orderly United States Navy military government administration is in progress for these new military wards, first of prewar Jap-ruled Micronesia to fall to our forces.

As I flew over these atolls or threaded among them on surface craft, I never needed to ask which islands saw fighting.

On untouched islands there is a massed profusion of coconut palms and pandanus (screw pines). Frequently big breadfruit and other trees add to the greenery.

Areas Razed by Bombs and Shellfire

Wherever we uprooted the Japanese and their fortifications whole areas were razed and ripped to pieces by bombs and shellfire.

Take Kwajalein Island. As you make its landfall, only a ragged fringe of a few score beaten coconut trees appears above its flat coral sands.

Hour after hour, following the opening of our assault, planes and battlewagons hurled an erupting fury of bombardment upon this tiny land spot and its flanking islets.

Our forces first swarmed ashore on the adjacent islands and there set up artillery to pour more tons of hot steel onto the crouching Japanese. Then our amtracs lumbered ashore over the coral reef behind this deadly barrage.

When a sea wall stood in the way at the western end of the island, whence the attack was being launched, United States battleships took turns moving in to blast openings through the barrier with their guns at a range of 2,000 yards.

Steadily, systematically, the tornado of bursting steel moved across the island ahead of advancing tanks and infantry. Against it no Jap could survive.

"Someone has estimated that an average of 100 pounds of steel from bombs and shells plowed into every square foot of the island," commented one of the officers who saw the entire action. "The nightmare of noise was almost inconceivable."

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



It's a Tie! But They Measure with Straws to Make Sure

Pitching horseshoes and baseball are two popular sports among American lads stationed on Kwajalein Atoll. One has a fancy haircut, result of his initiation as a "shellback" upon his first flight over the Equator.

Virtually Kwajalein's whole area was ripped up and turned over and over again. Yawning craters pitted this whole tortured strip of land.

American Town on Coral Isle

Only a few months after the amphibious landings it was hard to picture the scene of utter devastation that existed here and at Roi and Eniwetok.

Bulldozers had scooped away most of the scars; tangled masses of wreckage were hauled to the dumps. The areas were cleaned up and made habitable and healthy.

On these sun-blistered coral sands American towns have mushroomed into being. They are not "home towns," by any means, but masculine, mechanical towns geared to war.

Here, however, are all the complements of a city—homes, offices, shops, churches, clubs—though they are tents, Quonset huts, and temporary wooden structures. Here, too, are streets, lights, water (distilled from the sea), sewage-disposal systems, telephones, radios,

theaters, refrigeration units, laundries, and food to feed everyone.

The way these facilities are set up on these war-shattered islands thousands of miles from the United States is one of the marvels of American war planning.

Today the Marshalls seem far behind the battle lines, though thousands of Japs are parked on islands round about and in the neutralized Carolines just to the west.*

Facetiously American lads refer to the rugged life here as "working on the rock pile"! And they gaily banter each other about getting "rock happy." The American Expeditionary station which broadcasts music and entertainment from "Kwaj Lodge" even has a skit by "Rock Happy Roger."

Roaming about one of the posts, I found a group pitching horseshoes in the coral dust.

* See maps of "Pacific Ocean and the Bay of Bengal," supplement to the NATIONAL GEOGRAPHIC MAGAZINE for September, 1943, and "Pacific Ocean—with 73 Island Insets," supplement for December, 1936.



George A. Eddy

Marshallese Passengers Find Seats on the Ramp of a Navy Landing Craft

They have brought with them large ripe pandanus seed clusters. One youngster munches on the inner juicy tip of a fruit segment. Preserves are made from pandanus, wrapped in leaf packages, and eaten during the season when the tree is not bearing.

What attracted my curiosity more even than the question of where the men got the horse-shoes, however, was the haircuts of several of the players.

Some had their heads half shaved. Others had just bristly ruffs extending over the tops of their otherwise bald pates (opposite).

"We've just become shellbacks," one explained. "Yesterday we flew over the Equator for the first time. This is what our pals did to us!"

For pastime, groups of bronze-backed men are perpetually playing catch or having a lively game of sand-lot baseball. Others seek the narrow bands of shade cast by their tents to tinker on souvenirs to send home.

At low tide many comb the reef searching for sea shells. I enjoyed doing this myself.

The living coral furnished a fantastic array of colors and forms. In it were reds, purples, yellows, grays, and other hues. In the shallow water and in the rough coral pockets were

strangely shaped fish, eels, starfish, hermit crabs, queer lifeless-looking sea slugs, spiny sea urchins, and other bizarre creatures.

Then I got the shells I was looking for, but in a roundabout way, because I spotted an octopus. Knowing that many natives like them for food, I called to a young islander.

He came over, grasped the octopus, and, while the writhing creature twisted its tentacles about his arms and face, bit it in the back of the head. When at last the octopus relaxed its grip in death, the native washed away the inky fluid the animal had ejected, then looked at me and smiled.

In exchange for showing him this morsel, the lad gave me a handful of the shells I had been seeking. I profited. I had sampled pieces of rubbery octopus before!

Because of the excessive heat in the Marshalls, there is one task that claims much attention—laundry!

Here again the inventive skill of Americans

has come to the fore. Many of the men have built wind-operated washing machines.

Scores of windmills whir in the breezes at every post. They have been fashioned from a fantastic array of odd bits of iron, boards, and pieces of tin scrounged from the junk heaps. Few are decorative, but they effectively sozzle the clothes in suds-filled buckets or oil drums.

One that I saw which belonged to an air crew bore the bold label "Prop wash!"

Lacking a windmill, I had to wash my sweat-soaked khakis in my tin hat (page 349).

Geography of the Marshalls

Just what are the Marshalls, of which we knew so little until our troops pried open the door?

Briefly, the archipelago consists of 34 coral atolls and single islands arranged roughly in two parallel rows, lying approximately 130 miles apart. Some geographers, however, list only 32 by ignoring isolated Taongi Atoll (also called Pokaakku) far to the north and tiny Knox (Narik), a satellite atoll of Mili.

If you include them with the easternmost group, the Radak (Sunrise) Chain has a total of 14 atolls and two single islands. The western Ralik (Sunset) Chain comprises 15 atolls and three single islands. Two of its members, Eniwetok and Ujelang Atolls, more aloof, lie westward of the main group.

These coral-spawned islands extend in a general northwest-to-southeast direction, scattered over an ocean area of some 375,000 square miles, or a space about one and one-half times the size of Texas. If all their land area could be gathered together, however, it would form a patch covering only about one-twentieth the surface of Rhode Island!

As I flew crisscross paths over these atolls, they appeared below like looped necklaces dropped at random on a vast sheet of shimmering blue satin. Green coconut- and pandanus-covered islands and bare sandspits are the beads. They are linked by chains of reefs and threads of white breaking surf.

Both the island beads and their chains vary in size and shape. The largest atoll of the Marshalls is Kwajalein. In all, some 90 islets are strung around its lagoon, which sprawls over an area of 900 square miles. From Kwajalein Island, at one end, to the farthestmost tip of this boomerang-shaped atoll is 76 miles.

Some of the islands that encircle the lagoons are long, some short. All are slender. The broadest island anywhere in the Marshalls is less than a mile across, though some may range up to 15 miles in length. On islands where the Japanese or we established airbases there is room for little besides the airstrips.

On some of the atolls, but not all, openings in the reefs afford passages into wide, deep lagoons. At times, since we came, we have concentrated more naval might in some of these lagoons than that of the whole Japanese Navy put together!

Rendezvous for Sneak Attack

When they held these airbases and sea anchorages, the Japanese had a double rampart facing Hawaii across some 2,000 miles of open blue Pacific. It is likely that they assembled the force here which made the sneak attack against Pearl Harbor on December 7, 1941.*

With these island outposts, and the Gilberts which they snatched from the British, the Japanese thought they had an impregnable string of outer sea defenses to guard the distant heart of their empire.

But their reckoning was wrong. The bastions of Tarawa and Makin in the Gilbert Islands fell under dramatic frontal attack.

Then came the Marshalls. These strongholds crumbled or were reduced to impotency when our ships, planes, and landing parties swept around to smash the *inner* rather than the outer wall of island barriers.

Japan's outer perimeter was cracked. And that rent widens and deepens day by day.

Because the Marshalls lie only a few degrees north of the Equator, weather here is reduced to the mere mention of heat, humidity, and rain.

"When is your winter?" I asked a young Marshallese.

"It's winter when it rains and summer when the sun shines," he replied.

Rains afford about the only interruption in daytime heat. The tropical sunshine, however, is tempered somewhat by easterly and northeasterly breezes which fan the islands most of the year.

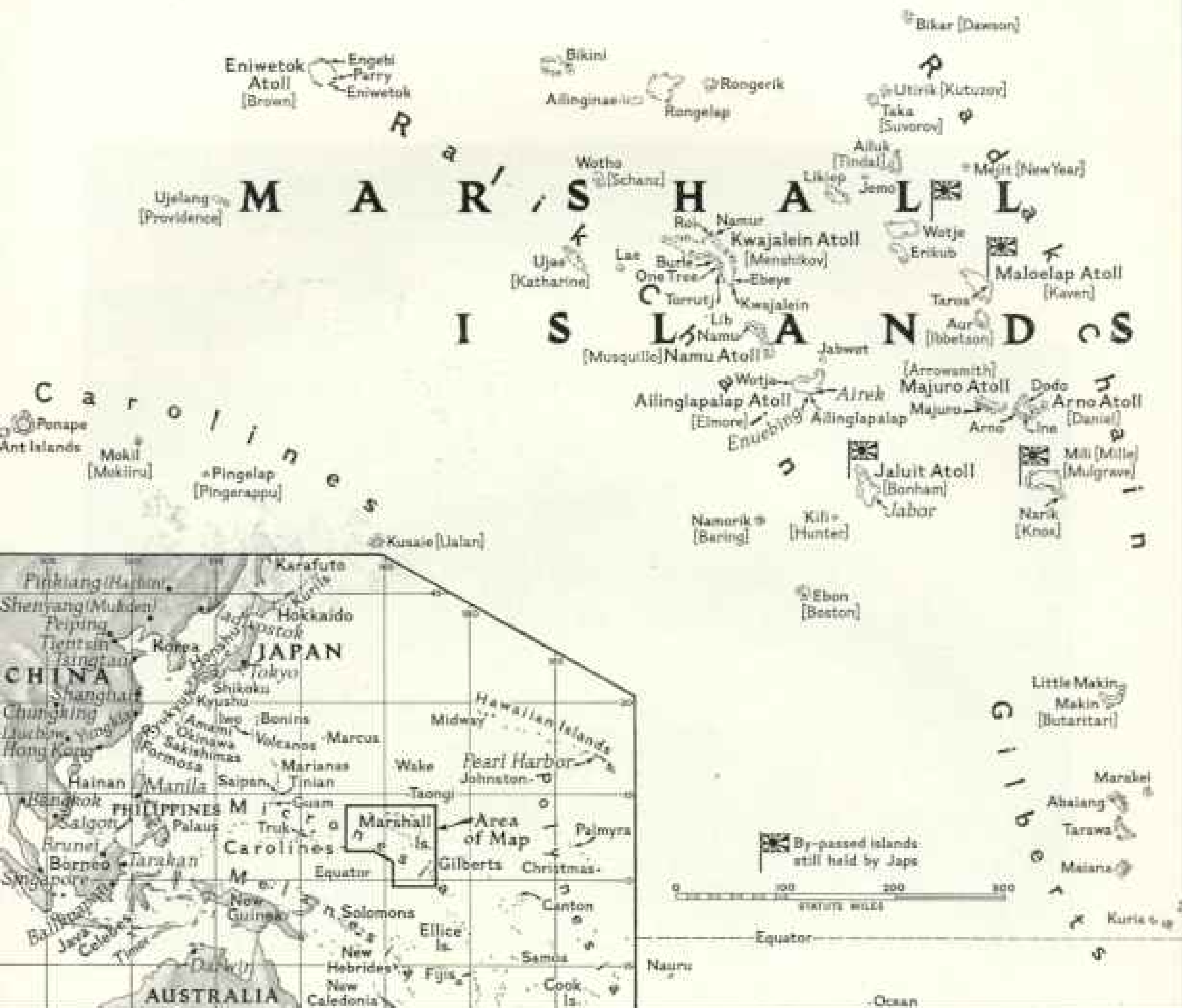
As regularly as the men attend outdoor movies at night, they carry their ponchos or raincoats. Tropical downpours come often.

In ten minutes I've seen a sky studded with stars turn suddenly black and dump a deluge. Thick seething clouds unloose some 160 inches of water annually over the southern islands.

Rainfall is less heavy in the northern atolls, which lie in the trade-winds belt. Vegetation grows sparser from island to island northward.

Coconuts get smaller, as do the papayas. Breadfruit begins to disappear. Occasionally even drought conditions prevail.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Japan and the Pacific," by Joseph C. Grew, April, 1944; and "Hidden Key to the Pacific," by Willard Price, June, 1942.



Drawn by H. E. Eastwood and Irvin E. Allen

"We Must Have Bases; These Island Harbors Paid for by Sacrifices of American Blood"

Thus spoke Fleet Admiral Ernest J. King recently when he made a plea that the United States keep its hard-won Pacific bases for future protection. General of the Army H. H. Arnold, on his return from a recent tour of Army Air Force bases in the Pacific, said: "These key islands—the Marshalls, Palaus, Volcanos, Bonins, Ryukyus, and others—are vital to our future security. Their use by the United States must be unrestricted. How else can we defend ourselves from an enemy who could destroy our cities by long-range bombing? The future peace of the world; indeed, the fate of mankind may depend upon it."

If you visit American-occupied posts here in the Marshall Islands, you see few Marshallese. Only volunteer labor groups are located in the various Army and Navy operational areas. Yet some 10,000 of these native people are scattered throughout the island groups. Of these, hundreds have been evacuated from the by-passed atolls still controlled by the Japanese.

Several atolls are unpopulated. On occupied atolls the villagers usually dwell on a few islands. In normal times they visited the others only to collect coconuts. Then copra production was the main source of revenue.

When our forces landed here the people had suffered many war privations. Their copra trade had collapsed.

The Japanese shipped in no supplies.

Shelves in Japanese-operated stores were bare. For a long time the people could not get soap, medicines, clothes, or supplementary food supplies. They lived on island produce—coconuts, breadfruit, pandanus (page 327), arrowroot, and fish.

Such food was adequate, but the Marshallese lacked their accustomed rice, flour, and sugar.

So long had cloth been unavailable that most of their clothing was in tatters. Some had taken to wearing mats or garments made from burlap sacking. Many outrigger canoes were without sails.

Perhaps their most acute need, however, was for soap.

Lacking it for washing both their clothes and themselves, many were infected with skin



Sunlight and Camouflage Nets Weave a Fantastic Pattern over a Bomb Dump

Loaded on rubber-tired trucks and fitted with tail fins, these calling cards are being readied for air delivery to Japs. American bases in the Marshalls are surrounded by Jap-held territory; in addition to four by-passed atolls in the group, Wake and the Caroline Islands of Ponape and Kusale are within bombing range.

diseases. A large portion of the population was suffering from yaws.

Everywhere homes were broken up when villagers had been taken by the Japanese for laborers. Many men and women between 15 and 40 years had to do forced labor.

Starting even before the guns had cooled, and when their "office" was but a seat in the sand under a canvas shelter half, United States naval officers began work on island problems.

Military Government in Action

Hundreds of Marshallese have been rehabilitated in new homes, wherever war forced them to leave their own villages. Others have been returned to their homes from the labor camps. All now have adequate food and other supplies.

Because periodic inspections and medical treatments are maintained, village life is assuming a healthy, ordered existence.

I made several trips with officers and doctors to different atolls. The first of these

visits was to two of the inhabited islands in Kwajalein Atoll.

Plowing and slapping over the waves in a flat-bottomed LCM (Landing Craft, Mechanized Equipment), we cruised inside the lagoon along the island chain.

We passed one island where the gaunt rusting hulks of three Japanese freighters hung on the coral shelf. They had been beached when our bombers dropped eggs on their decks. In this same lagoon were Japanese cruisers caught on one of our strikes.

Along the way, too, we passed One Tree Island. It is a cartoonist's picture of a Pacific isle for castaways. A single coconut tree towered in lonely isolation above a small patch of coral sand.

Then we came to Bule. Lookouts posted on the high prow of the craft guided us in a zigzag path around coral heads in the lagoon to a spot where we could drop the ramp on sandy beach.



Shaded by Camouflage Strips, Young Plants Grow on a Bomb-churned Coral Island

The Marshall Islands have little soil covering the coral sand, but enough black earth was scraped up to cover this small experimental "greenhouse." In it grow beans, onions, papayas, radishes, and some cantaloupes (page 336). Main products on undamaged islands are coconuts, pandanus, and breadfruit.

Virtually the whole village seemed to be at the thatch-covered meetinghouse to greet us.

Wandering through the village, I found the people weaving mats and baskets, making shell ornaments, and hewing decorative spears and model outrigger canoes under the encouragement of military government officers (Plate VIII).

Since no copra can be exported now, handwork, which the people have always done for themselves, and done well, affords a temporary source of profit. With the money they get from this work, the natives buy the things they need. There has been little necessity for much direct relief.

Goods are purchased by the officers and marketed through ship stores and other channels. There is no native bartering, no inflation of prices.

Among our forces these articles find ready sale. How many homes in the United States will have mats, sea shells from the reefs, small

outrigger canoes, or other souvenirs from the Marshalls, no one can even guess!

"Shell Happy" with Souvenirs

In one trip to five atolls, an officer purchased shell necklaces and headbands made from 1,000,000 shells. It is little wonder that he complained of being "shell happy"!

Of mixed Melanesian-Polynesian stock, the Marshallese are brown-skinned, have straight or wavy black hair, and are of medium build. In general, they appear somewhat slighter and darker than the Gilbertese or Ellice islanders farther to the south.

Both their customs and dress have been so altered under missionary influence that here you see none of the traditionally pictured Pacific islanders with grass skirts, performing sinuous, gesturing dances. Instead, the women are clothed in long Mother Hubbards, and most of the men now wear shirts and trousers supplied by the Navy.



U. S. Navy, official

Aerial Bombs Soften Up Namur Prior to Its Capture by the Marines on February 2, 1944

In the Kwajalein campaign 8,112 Japs were wiped out and 437 captured on the eight occupied islands. The causeway (lower right corner) connects the twin islands of Namur and Roi. More than a year after this atoll had become a U. S. sea and air base, Japs were still being picked up by our bush-beating patrols on tiny islands such as those in the distance. Fat and healthy, they had come in small boats from Maloclap, 210 miles away, on a fishing expedition.



A Yank-built City Now Sprawls Across Eniwetok, Swept Clean by Steel and Fire on D Day, February 17, 1944

Though homes, offices, and churches are tents or Quonset huts, it is a modern city with streets, lights, telephones, water, sewage disposal, refrigeration units, laundries, theaters—and food to feed everyone. The speed with which such facilities are set up on war-shattered islands is one of the marvels of the American war machine.



And the Brides Wore White—Navy Mosquito Netting!

Veils and ribbons for the flowers are of the same material. Two sons of Chief Lejelong at Ailinglapalap had a double wedding in the village church. Chief Lajure, island magistrate, sits at right. Except for relatives and military government officials, all guests sat on floor mats during the Christian service (page 352).

These people have few strange superstitions or taboos. They live a rather free and easy-going life, have no stringent moral code, and, within limits, take their religion seriously. They did tattoo themselves, but the Japanese forbade that custom.

Here at Burle, and at other areas I visited later, a number spoke English. Always when I questioned them about where they had learned it, I got almost the same answer, "From mission schools."

This affords an interesting historical note on the Marshalls.

Missionaries Made Friends for America

For three and a half centuries the islands were claimed by Spain, and then later by Germany. Since World War I, Japan has held control, theoretically by mandate, but

actually as a closely guarded sphere for her own operations. Yet Americans have had more influence here than any other people.

In the 1850's the American Board of Foreign Missions in Boston spread its activities into Micronesia from Hawaii. Subsequently they reduced the Marshallese language to writing; gave the people schools, medicines, a new religion; and brought conflicting clans to peace.

To the Marshallese, America became a friendly land. Before the war Japanese officials complained that, until they stopped American mission influence and replaced it with Japanese education, they could never hope to turn the natives their way.

In recent years they had tried. Japanese schools were established in Jaluit and on some of the other atolls. Some students were taken from various islands for advanced work at

Jaluit. Others were educated in Ponape. A few selected persons were even given subsidized trips to Japan.

However, the Marshallese gained most of their training through native evangelists and teachers who had attended mission schools on Kusaie, in the Caroline Islands.

In the villages now you will see these preachers and instructors still at work in the churches and the meetinghouses. Those who know English have also started conducting elementary classes in the language. Old and young attend. All want to learn to talk with the Americans.

When our forces landed, flies swarmed in millions in most of the Marshalls. A vigorous campaign has since been waged throughout the islands against these pests.

Before we left Burie, the doctor's assistants demonstrated the use of spray pumps and screen traps for combating them. The islanders were also told again how to clean up trash, bury refuse, and eliminate breeding places of the flies.

Natives still find it easy to toss coconut shells at random after they have drunk the water and scooped out the meat. Happily, the fly population is waning.

After more handshakes and smiling farewells, we pulled away from the beach and dropped down the atoll to Torrutj. Here the pattern was much the same, save that the doctor acquired a more comfortable "office" in the cooling shade of a sprawling breadfruit tree.

As in the Gilbert Islands, the people lash their canoes together, from hull to outrigger, with stout handmade twine of twisted coconut



U. S. Navy, Official

Going Somewhere? Consult the Majuro Guidepost!

According to the arrows, American lads here are 6,945 miles from Brooklyn, but still 2,600 miles from their goal, Tokyo. Airline distances in statute miles are approximately 7,160 and 2,800 miles, respectively. These island names have become household words since the attack on Pearl Harbor. Mille (Mill), about 60 miles away, is still Jap-occupied.

fiber. No other fastenings are used. The speed with which these canoes will skim over the water is as remarkable as is their craftsmanship.

Variations in Canoes

Canoes in the Marshalls differ from those in the Gilberts in that the Marshallese craft have heavy arched outrigger supports, while the others are angular and of more fragile construction (Plate VII).

Homes here also differ from those in the Gilberts, as most of them have side walls of

thatch or bamboo. Gilbertese homes are quite open beneath their widespreading thatch roofs. The majority of Marshallese either utilize floors close to the ground or spread their mats directly upon the coral gravel, while most Gilbertese houses have platform floors raised above the ground level.

After returning to Kwajalein, I hopped to Roi and Namur at the northern end of the atoll.

A devastating attack similar to that at Kwajalein was unloosed against these two adjoining islands, which the Japanese had linked together with a narrow causeway (page 332).

The Japs had stripped Roi and on it built an airfield to serve as a main base and source of air power for the Marshalls. Here were hangars, reinforced-concrete control stations, and cement and asphalt runways.

The whole area was drained by a network of covered concrete channels. When the Marines swept across the island many Japs took to these drains. Squirming through them, they sniped at our men through slots in the covering slabs. Appropriately, the taking of Roi has been called the "Battle of the Drains."

Namur was heavily wooded. But beneath its coconut and other trees the Japs had erected a big administration building, barracks, and thick-walled, reinforced-concrete blockhouses with ponderous iron doors. In these they housed ammunition, gasoline, and other supplies. Heavy guns guarded the seaward approaches.

The Japanese spent years building these installations. A few remain, but they are battered, burst open, and smoke-blackened. Trees are gone as a result of the mauling from guns and bombs.

Gardens under Camouflage Netting

In cleaning up Namur, our troops carefully hoarded all the black surface soil they could collect and are now using it for growing young plants and trees. They have even started an experimental garden where radishes, onions, beans, papayas, tomatoes, and other plantings flourish under camouflage netting (page 331).

Here, as everywhere else, the fellows have relieved monotonous moments by thinking up gay, giddy names for their tents. Some are distinctly of "local color," as are two priceless puns I came upon. One was "Weep Namur." The other, a bold sign with triumphal-arch grandeur in front of the tent opening, proclaimed: "Atoll Lodge. No Liquor Atoll. No Women Atoll!"

From here I flew out to westerly Eniwetok. On the way we winged over Wotho, an elon-

gated atoll strikingly rimmed with waters ranging from light jade green through electric blue to the ultramarine-blue depths. Dribbles of green, marking coral patches, spot the lagoon.

Wotho is lovely, but it has not recovered from a severe storm which it suffered some years ago. Fewer than 50 people live on its main island.

Another storm, of hot bursting steel, churned and chopped away almost every vestige of life on Engebi Island, at the northern end of Eniwetok Atoll, and on Eniwetok Island and Parry at the south.

Fighting lasted only six hours on Engebi. Eniwetok took longer. Although it was shelled and bombed heavily, Japanese hiding in holes there still put up stiff resistance. They had no heavy artillery, but used many mortars and a few tanks.

Said one officer who had seen the whole engagement: "When we found so many Japs on Eniwetok, we *really* went to work on Parry. Our ships lay in the lagoon only 2,000 yards offshore and poured it on."

More than 2,600 Japanese didn't live through the fighting on Eniwetok Atoll.

Nozzle of a Fiery Hose

Until our forces moved on to capture Saipan, Tinian, and Guam, this atoll of Eniwetok was the northwesternmost end of the road. Perhaps it might be more aptly described as the nozzle of a hose through which surged a tremendous flow of fire power to spray Ponape, Truk, and other Japanese bases in the Carolines.

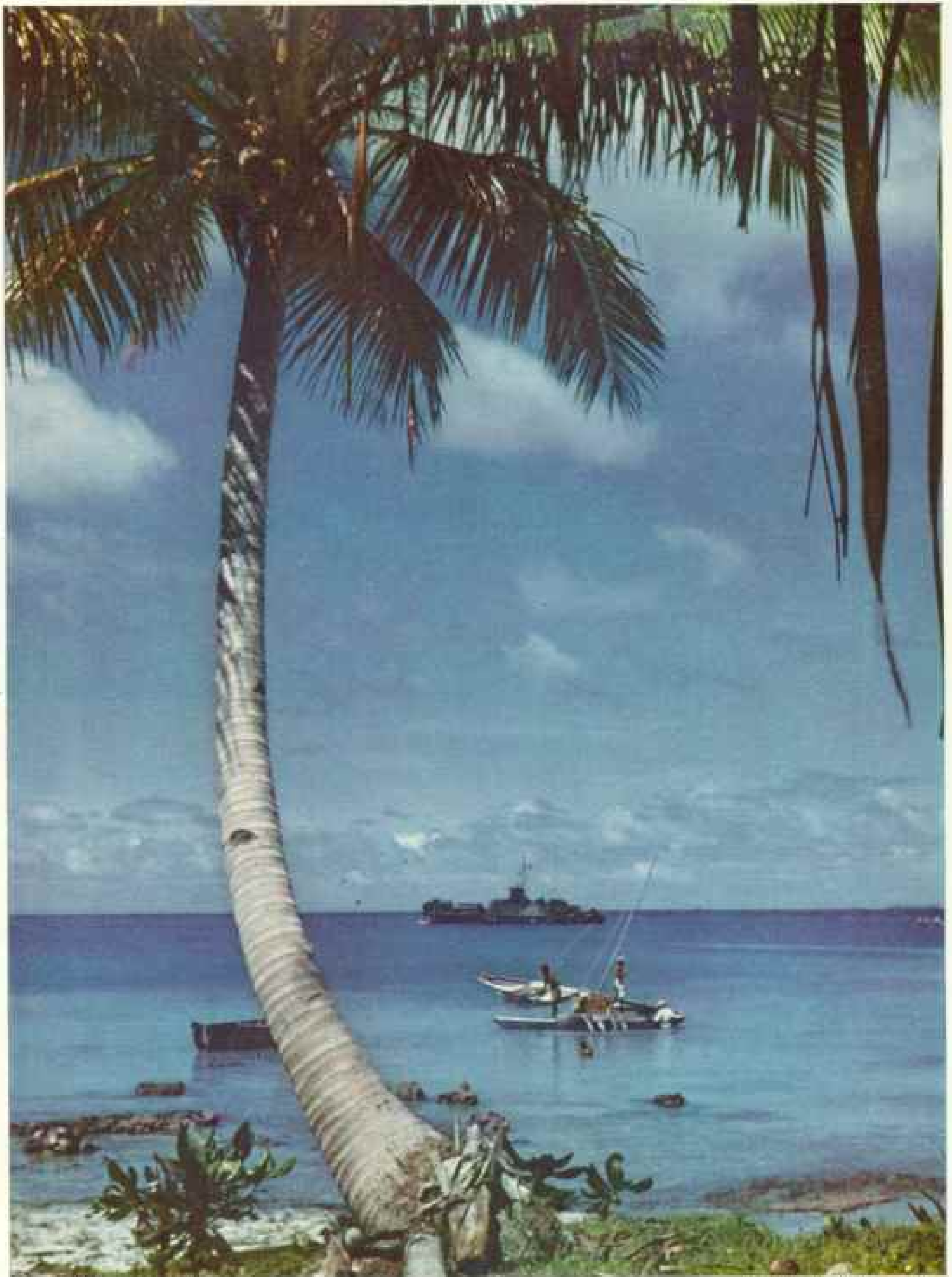
Eniwetok is still busy, and will be for some time to come (page 333). Though its guest-house, a tin Quonset hut, has been labeled "Palmer House," it has few luxuries beyond a cot (sometimes!) to sleep on. Your tin hat, or one you have borrowed, is your washbasin.

Before war swept away their homes, two groups of Marshallese lived on the atoll. One group, with Abraham as chief, dwelt on Engebi; the other, under the leadership of Johannes, lived at Eniwetok.

The military government officer temporarily settled all the people on a single island, each group having half the area. A thatch church, located between the two villages, served both groups. Other islands are now being surveyed with the idea of finding more natural resources with which the people may work, as the present one has only coconut trees.

It so happens that each village has precisely the same sized population—59 persons. They work independently. Both produce almost the same amount of handicrafts—baskets, mats, belts, and even shells!

Marshallese Are Happy Again



© National Geographic Society

Kochubrome by W. Robert Miller

Instead of Invading Troops and Blazing Rockets, This LCI Brings Food and Doctors

Traveling regularly through the Marshall Islands, Landing Craft Infantry ferry strange and varied cargoes. This one bore to Ailinglapalap several native families who had been harvesting coconuts on an outlying island. Scattered about the warship's decks were bundles, bales, 60 pigs, 77 chickens, 52 ducks, 10 cats, and a dog.



© National Geographic Society

Reproduction by W. Robert Moore

With White Sails Set, Homeward-bound Outrigger Canoes Put Out from the Main Village at Ailinglapalap

These Marshallese live on another island in the atoll. They came to Ailek to bring their handcraft and to purchase supplies during the visit of U. S. military government officers. For security, the islanders now are allowed to sail their craft inside atoll lagoons, but not in the open sea.

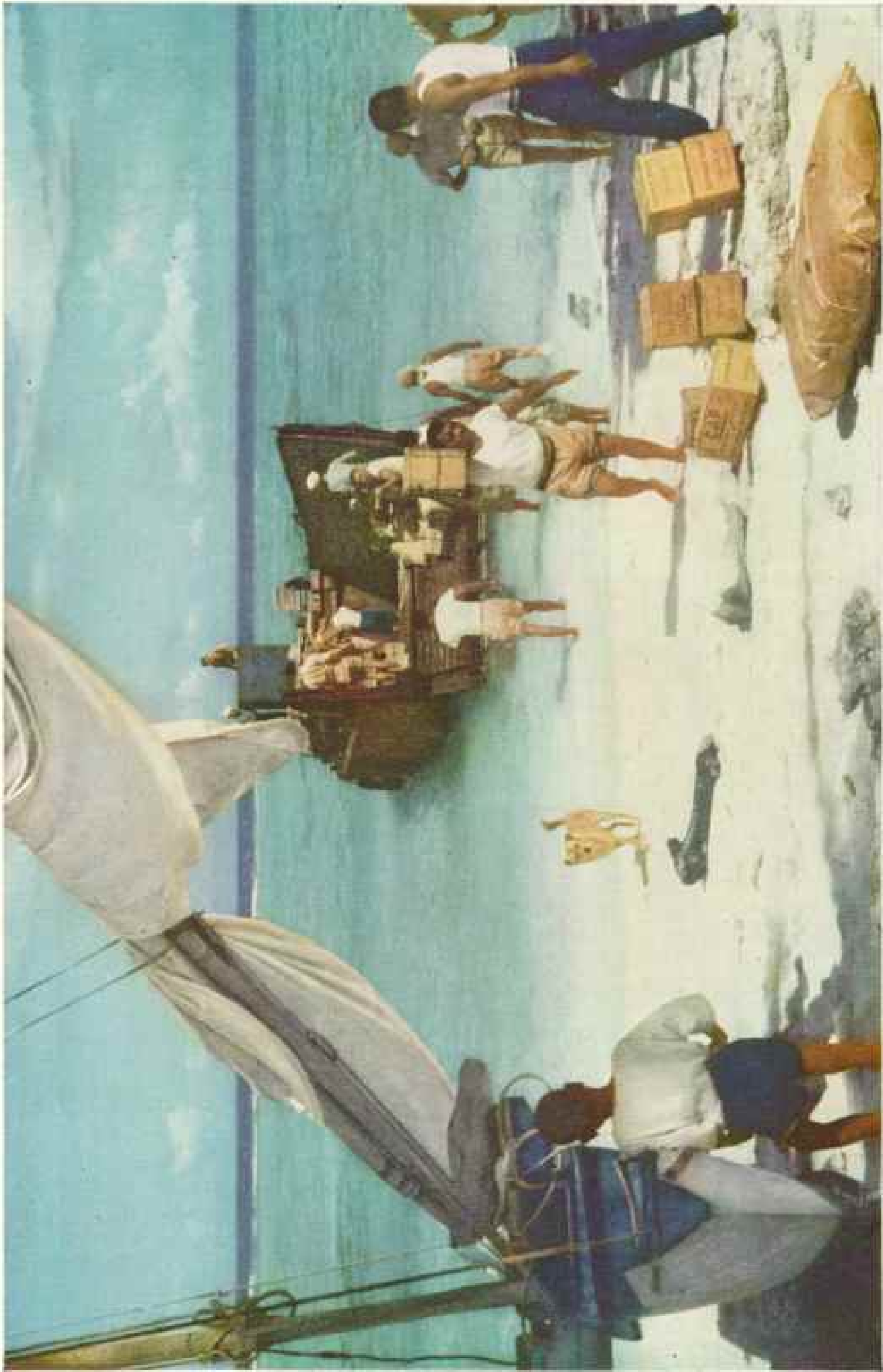


Bokehman by W. Robert Moore

Many Marshall Islands Are So Small and Narrow that Wildcats and Hellcats Must Be Closely Spotted, as on a Carrier's Deck

Few airfields have such steel matting; for packed coral makes splendid runways. From these bases the Jap-held Marshalls and part of the Carolines were neutralized.

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Kaschlanoff H.W. Robert Moore

Perhaps This Picture Foretells After-war Use for Many of Our Thousands of Landing Craft

After winding safely between coral heads and across shallow reefs, the LCM has dropped her ramp right on the beach. Her cargo is being unloaded quickly and efficiently. The cases of corned beef and flour (in waterproof sack) will be sold through a Navy-controlled store, operated by a Marshallese villager.

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Illustration by W. Robert Moore

Arno Atoll Reveals the Fantastic Pattern of Islands and Ringed Reefs Wrought by Coral Growth

Irregularly shaped, the atoll encloses this and one other sublagoon, besides the main large lagoon seen in Plate VI. Coconut-covered islands, formed by heaps of broken coral skeletons, are only a few feet high throughout the Marshalls. Though many are several miles long, none is even a mile wide.



© National Geographic Society

Verdant Island Beads Threaded about a Looping Coral Reef—Such Is a Marshall Islands Atoll

Only a small part of Arno's extensive reef-enclosed central lagoon is seen here. This 25-mile-long atoll lies just east of Majuro, taken without opposition when U. S. forces stormed Kwajalein. Japanese garrisons remain in four by-passed atolls—Wotje, Malorlap, Mill, and Jaluit.

Photograph by W. Robert Adams



© National Geographic Society

Redrawn by W. Robert Moore

A Hearty Heave and the Outrigger Canoe Slips off the Reef for an Interisland Cruise

The sail was made from salvaged U. S. Navy tents, as the Japanese had supplied no cloth in recent years. Several of the 90 islets of wide Kwajalein Atoll appear in the distance across the lagoon. Only a few are inhabited. A Marshall Island canoe can be spotted by the arched outrigger and platform for passengers and cargo.



Deftly He Finishes a Model, Lashing Hull and Outrigger Together with Coconut-fiber Twine
One of the best canoe builders in Kwajalein Atoll, this Marshallese has constructed many full-sized native craft.



© National Geographic Society

Reproduction by W. Robert Moore

Using Such Charts, Showing Direction of Swells, Marshallese Sailed Between Islands
Shells represent islands; bent withes, the waves, on this "primer" to navigation. Swells are deflected by the islands; where they meet they produce a confused sea, indicating to the navigator his whereabouts.

Months after the battle, Johannes was brought back for a short visit to Eniwetok. He had not seen it since right after the fighting, when it was a chaos of war rubble.

As he made his first jeep tour, his eyes fairly popped from his head at all the changes he saw. When he ended the trip he exclaimed, "Island good, Americans good; all the same plenty fine!"

I should be inclined to bestow the label "plenty fine" upon Majuro. As I flew into this atoll, I saw trees!

When our troops came ashore here, they found that all the Japanese garrison had gone. Only four civilians remained. The Japanese had several well-constructed barracks, bath-houses, kitchens, and a wooden hangar, and had brought structural steel for still another hangar.

One can only guess why they left. They may have considered the atoll indefensible or, having gained the Gilberts, may have moved their forces there.

I slept in one of the buildings they had conveniently provided and wrote up my notes in another.

Proposed "Biltmore-Majuro Hotel"

Though some wag has erected a sign advertising the proposed site of the postwar Biltmore-Majuro Hotel, with 500 suites, baths, and several revolving bars, I felt that the Japanese had provided me with the ultimate in luxury after I had become accustomed to life in a sun-scorched tent.

Coconut trees stand in thick groves here, except where they have been removed to make way for some structure. Some of the men still speak enthusiastically of the fresh hearts-of-palm salads those cut-down trees provided.

Majuro roads have a touch of home. "Speed limit" and "Walk to the left facing traffic" signs are posted along the way.

On one post the commanding officer has issued an order that anyone caught speeding will get a day's work in the garage for every mile an hour he travels in excess of the set limit!

The whole of Majuro Atoll is attractively set. Along its wide, deep lagoon once existed by far the longest island in the Marshalls. It was more than 25 miles long. Many maps still show it as such.

A typhoon in 1918, however, whipped and lashed and frayed its narrow lower end into a series of small islets, leaving the main land strip only 15 miles long.

This island is called Majuro, as is the entire atoll. I was shown the big stone slab, covered

with ideographs, which the Japanese had erected on a small artificial hillock in commemoration of the disaster.

The population of Majuro Island, nearly 1,000, is large for the Marshall group. The big church, meetinghouse, and several other structures are built of wood. So is the former Japanese trading store, which now, under native management, bears a United States Navy sign and sells stock goods to the villagers.

In the church, when I first went there, dozens of women sat on the floor weaving mats. Having several special orders for large floor mats, they could find no other place in the village big enough to do the weaving.

Outside the meetinghouse, or "town hall," I met Lazarus, the scribe, busily poring over a list of names. Inside, more women were weaving. Lazarus was arranging shifts of workers to complete the floor coverings.

Among his many duties, he had also just posted a notice on the village bulletin board informing the people which cisterns to draw water from, as some were being readied for cleaning.

As I wandered through the village, I was greeted with many "hellos" and "good mornings." Some of the people were trying new English expressions they had been learning in class. To aid them in studying English, the military government officers have mimeographed a primer of simple expressions and sentences.

Seabees Build a Playground

Near the beach, beneath the coconut trees, the Seabees have built the youngsters a small playground with swings and teeters. One youngster I saw pumping a swing as hard as he could was lustily whistling "Pistol Packin' Mama"!

A naval doctor is at present stationed on the island. He is assisted by two pharmacist mates and by a native practitioner who had gained training under the Japanese at Jaluit. Several Marshallese girls serve as nurses in the wards of the small thatch-roofed hospital.

While I was on the island a baby was born. The father, working at an American base, had asked for time off to be there for the event.

He had had a fortnight's holiday, but when the doctor sought him to tell him of the new daughter, the man couldn't be found. Perhaps he was wearing out a coral patch pacing under the coconut trees.

Marshall community life is closely knit. One villager, a workman, died suddenly of heart attack. He had no family, but the whole village wept about his casket. And though



U. S. Navy, Official

Jaluit Natives Jam an LCI Which Rescued Them from Their Jap-occupied Island

As these men, women, and children escaped from the atoll, the Japs fired machine guns and small arms at them in the water and on board their small craft. Five hundred and ninety were taken off in this operation, typical of many such rescues in the Marshall Islands (Plate I).

the man was of distant kin, the old chief offered immediately to care for the burial.

Long shall I remember the haunting farewell song the villagers sang at the man's parting.

From the eastern shore of Majuro Atoll you can look across to Arno Atoll. Only 11 miles of sea separate them. Yet to ride by boat out of Majuro lagoon and anchor off the main village on Arno, you have to travel 65 miles.

Mail Sack Coral-weighted

I flew over with a pilot delivering mail. Seemingly, we tossed the coral-weighted sack into the midst of the hurrying villagers almost before the plane's landing gear had had time to retract!

Mapwise, Arno looks like an old physiology picture of an amoeba stretched out in the very act of dividing itself. From the sky, however, the atoll with its islands and irregularly shaped

reef appears like a splash of mottled colors against a blue board (Plates V and VI).

At its northern and eastern sides the atoll is elongated into two slender loops. Two small sublagoons are almost separated from the main lagoon.

Because of the irregular depths of water about the reef at these points, the areas are vividly splotted with varying hues of blues, greens, yellows, and browns. Islets vary from patches bare only at low tide to sizable land patches dense with coconuts and other greenery.

The Marshallese are grouped in two main villages, one on Arno Island and the other on Ine. A few people also live on Dodo, near the main channel entrance to the lagoon.

I remember kite-shaped Aur Atoll 70 miles to the north chiefly because it is only about 10 miles from Jap-held Maloelap—and because of its lizards.

The Japanese imported monitor lizards here



A Navy Rubber Raft Helps Carry Marshallese Passengers Ashore at Ailinglapalap

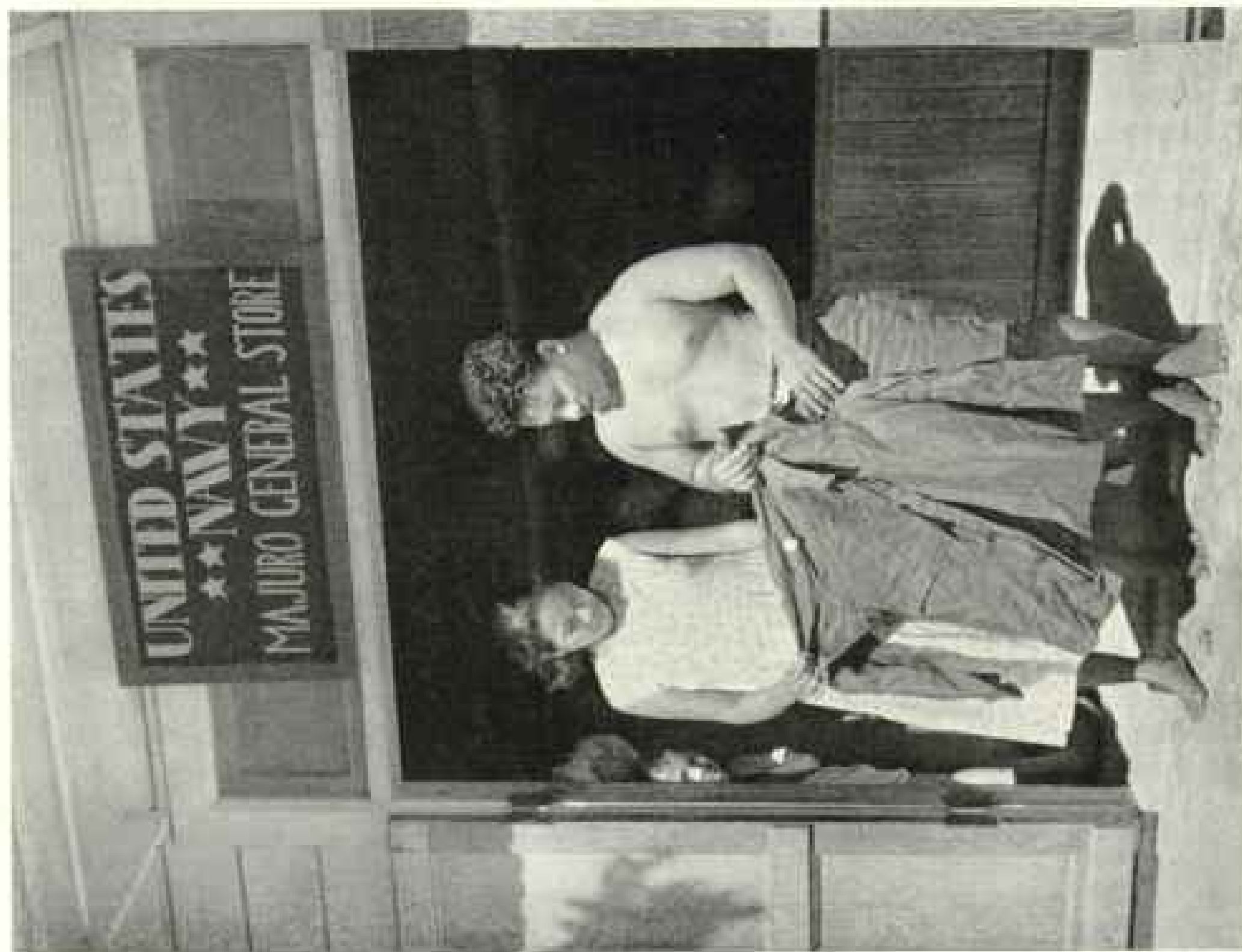
LCIs snatch hundreds of islanders from under the noses of their Japanese captors. When the landing craft appeared off the islands in the night, the natives rolled up their mats, gathered their poultry and pigs, and dumped them into outriggers. Silently they tacked out to the ships, and at dawn the women and children and infirm were hauled aboard. The canoes were towed astern to this refuge island (page 351).



U. S. Navy, official.

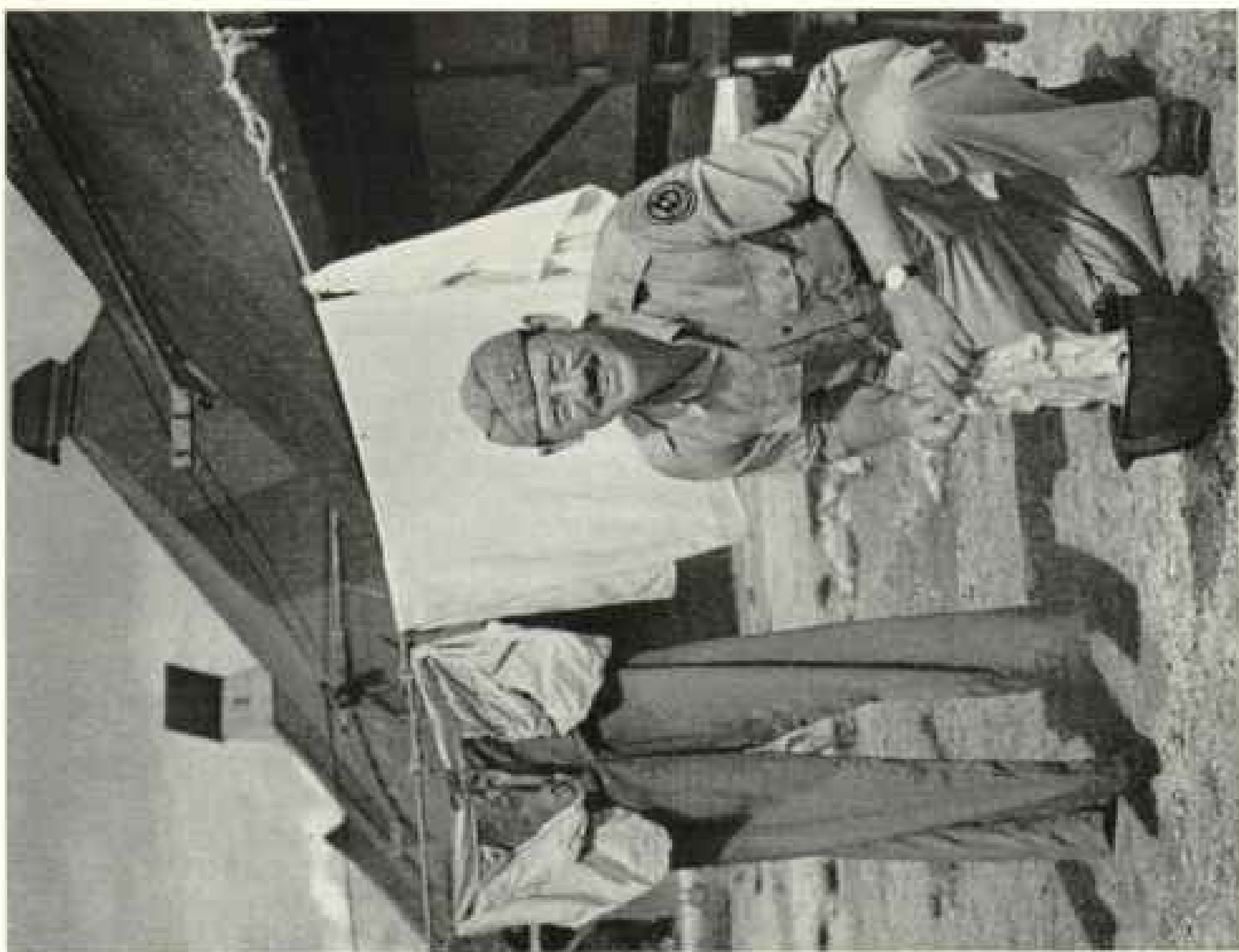
After His Re-coronation the "King" of Majuro Atoll Is Banqueted by Navy Officers under the Palms

Our forces found numerous chiefs when they occupied the Marshalls. A chief may rule only a few families or a group of islets, but his sway is absolute in local matters. Though the islanders had been under Japanese domination for nearly 30 years, they were friendly and welcomed our men.



Uncle Sam's Navy Stocks and Controls This Store

The Navy fatigue jacket, held by the island storekeeper and his wife, is one of the articles of clothing on sale. When U. S. forces arrived, the people needed clothes, foodstuffs, and soap (page 379). They pay for goods with American money earned by making handicraft articles.



In the Marshalls, the Author Was His Own Laundryman

"The tin hat serves as laundry tub, washbasin, and utility bucket," wrote NAROSAI GIOMARUIC War Correspondent Moore. "But it gets a little crowded when you wash khaki trousers. You jerk, wrinkles out of shirts and crease the trousers by weaving them on a tent pole."

from Saipan to get rid of the rats. But the lizards took to getting rid of the villagers' chickens!

Naval officers have taken men to Aur to try to eliminate these creatures. They have shot some measuring up to four feet in length. Natives say that some grow to eight feet or more. The reptiles have comparatively small bodies and long slender tails.

Among the inhabited atolls northward in the Radak Chain (omitting of course those on which the Japs sit) is Likiep.

The Families De Brum and Capelle

Come into Likiep and you see a number of frame houses built on the European pattern. They have clapboarded side walls, corrugated-iron roofs, and windows with glass panes. Paths through the village are edged with coral stones.

On this island live the families of De Brum and Capelle.

Progenitor of the De Brums was a Portuguese who came here in the 1870's and bought Likiep from the controlling Radak chief. Later he took into partnership a German by the name of Capelle.

They divided the atoll into three parts, each having one portion and the third to be controlled jointly. Though the Marshallese had no claim to the land, they remained in somewhat the status of share-cropping tenants for harvesting the coconuts and copra curing.

Today the De Brum and Capelle families through the second, third, and fourth generations are prominent here. Some of them speak German as well as Marshallese. A few know English.

Anton de Brum is the local magistrate, and he also operates the trade store handling naval supplies sold to the villagers.

Before the war these families at Likiep built their own sailing boats in which they carried their copra down to Jaluit to get higher prices.

A few persons went away to study, and others signed up as hands on trading ships. In their homes they use a few dishes and chairs, and they sleep on beds rather than on mats on the floor.

Another colorful character is an elderly German named Hahn. He came here years ago and, although he has made trips away, has liked Likiep so well that he has always come back.

In all, about 500 Marshallese villagers live on this pleasant atoll.

Ailuk and Utirik Atolls and Mejit Island, the other freed inhabited areas in the northern part of the Radak Chain, have a combined

population of only a little more than Likiep.

The people from there normally visited the uninhabited islands and atolls only to collect coconuts and the fruits that grow there. When sailing their outrigger canoes was unhampered by war, they also roamed the waters round about searching for big sea turtles.

"Royal" Families Survive

Traditionally, throughout the Marshalls, native society had functioned somewhat on a feudal system. To a degree it still obtains.

Both the Sunrise and Sunset Chains have their "royal" families, or inherited lines of chieftains who hold land rights over their respective island groups. Many of the individual islands and atolls likewise have their lesser chiefs, or landed gentry.

Among the people these chiefs command certain awe and esteem. They are the social and political leaders.

From copra and other produce the chiefs exacted their shares and received gifts from the commoners. Now they get their portions of the handicrafts, as is their customary right.

When war came, the paramount chief of the Radak Chain was on Japanese-held Wotje Atoll. He isn't there now, but some of his lands temporarily remain inaccessible!

Chiefs of the Ralik Chain live on Ailinglapalap Atoll. I saw them when I joined the military government unit making the southern circuit.

On the way, we cruised past sprawling Namu Atoll, home of somewhat more than 300 Marshallese, grouped mainly on Namu Island. Then we came to bigger, richer, and more thickly populated Ailinglapalap.

Sailing into its extensive lagoon, we headed first to Wotja Island and went ashore through a brief midmorning rain squall.

Standing in Line for the Pictures

The island folk hurried into the village square to greet us. Soon came the business of bringing in handicraft or queuing up outside the thatch hut where the doctor began examinations and treatments.

As I wandered about the village homes, I saw many women roasting chickens over open fires and baking breadfruit in the hot coals.

At noontime I learned the reason. Into the thatch-roofed pavilion which serves as the village meetinghouse came a procession of people bearing baskets filled with food. Women-folk carried the chickens and breadfruit; men brought stems of bananas and freshly husked young coconuts.

These they placed on rain-washed green leaves slashed from near-by banana plants and



Native Chiefs at Ailinglapalap Read the Proclamation of Admiral Nimitz

Following the taking of the Marshalls, these proclamations, written in Japanese and English, were posted in every village on all islands and atolls U. S. forces occupied. This one deals with rules for native behavior, surrender of firearms, turning over of Jap currency, etc. Later proclamations were in English and Marshallese.

laid them on the mats before us. It was a feast in our honor.

And what a feast! They had brought many times what we could possibly eat. Yet they touched not a bit, and saw in the end—as custom dictates—that all the rest of it went with us back to the ship.

As soon as we had finished eating, the women formed in line and marched past us singing a gay *alu* chant. The *alu* is a shell-decorated headband or neckpiece. To the Marshallese it is what the flower lei is to the Hawaiians (Plate XIII).

Alus for Remembrance

Taking *alus* from their own heads, they placed them on ours. Then they vanished to get more.

Again and again they came back singing a song which has this general meaning:

This *alu*!
I bring and place it upon you
As a remembrance of me
On this joyous occasion.

By the time they had finished, our heads and necks were heavily laden with shell and flower *alus*. We looked like overdecorated Christmas trees.

After the *alu* procession, one gay old lady seized a stem of bananas and, substituting the word "banana" in place of "*alu*," started the chant all over again. Within a few minutes enough bananas were heaped at our feet to feed a regiment!

A Week at Ailinglapalap

We sailed soon afterward for Ailinglapalap, the main island of the atoll (Plates II and XII).

The leading village here formerly was Enuebing, at the western end of the island, but it took a bad beating from bombers and destroyers when our forces broke up a small Japanese garrison there. Village life is now centered about Airek, near the opposite end. However, clusters of dwellings are scattered for miles along the coral path under the coconut trees.

Each group has its own name, but names mean little except locally; so Ailinglapalap usually serves for the whole settlement.

Here I stayed for nearly a week. Day after day I wandered up and down the island with a young Marshallese who speaks perfect English, learned at Jaluit and at Kusaie.

The chiefs are descendants of the late warrior chief Kabua, who held control over the

Ralik Chain. It was he who, years ago, espoused the missionary cause and also made the treaty with the Germans at Jaluit that led to their occupation from 1885 until 1914, when the Japanese walked in and gained control.

The eldest of Kabua's sons is Leilang. He is growing aged and infirm now. To a considerable extent he seems to have turned over his control to his younger half brother Jeimata, who is still very active.

Living here, too, is a daughter of Kabua and full sister of Leilang. Her name is Libotok, and she is an interesting figure despite her age.

Jeimata has two sons. Lejelong, the elder, dwells here at Ailinglapalap; the other serves as administrator in Kwajalein Atoll.

Still another prominent figure is Lajure. He not only holds extensive control of lands in Ailinglapalap but also owns properties from Jaluit to Kwajalein. A clean-cut, dignified leader, he is the island magistrate.

Of all the chiefs, I got to know Lejelong best. I think I also envied him most, especially when I had walked miles, for he had the one Japanese bicycle on the island that still worked! I owe him much for his eager assistance during my stay.

One day he arranged a ride for me on an outrigger canoe so that I might get some pictures. On another he suggested a dance by some of the young women of the island.

Camera Speeds Up a Wedding

I shall always feel fairly certain that it was partly the presence of my cameras which made Lejelong speed up the double wedding of his two sons!

Anyway, the wedding took place the last morning I was there. Wedding gowns and long trailing veils, fastened to the heads with white shell-decorated bands, were both fashioned from yards of the Navy's mosquito netting! The bouquets of primroses which the brides carried were tied with the same material (page 334).

And they were attractive. I shall never know, however, where they got their white leather pumps.

The grooms appeared for the event wearing white trousers, black coats, ties, and black oxfords. I had seen them daily, clad always in open-necked navy-green or khaki shirts, GI

trousers, and field shoes, the kind of uniform the military government officers and I wore as we sat during the church ceremony among all the chieftains' families.

Though the island populace crowded the church, filling the floor mats to the very doors, the ceremony had great dignity. For that the elderly Reverend Mr. James was responsible.

We left Ailinglapalap before the wedding feast was given. The people had been too busy bringing in their handicraft and attending to other tasks to take time to prepare the food.

We also were pressed for time. The military government officers had a rendezvous with another LCI at Kili, an island farther south.

A Problem in Logistics

At Kili they had a problem of maneuvers—or should one call it a problem in logistics, of sorts? Theirs was the question of how to load, while lying off the reef, 60 pigs, 72 chickens, 52 ducks, 10 cats, 1 dog, and 9 people with all their household effects and then transport them to Ailinglapalap, where the unloading would have to be done under similar handicaps!

For years Kili has been simply a coconut plantation. Its population was purely transient. The Germans, and later the Japanese, took families there for regular periods to harvest coconuts.

War caught some families still on Kili. Our officers are now bringing their isolation to an end and are returning them to their homes.

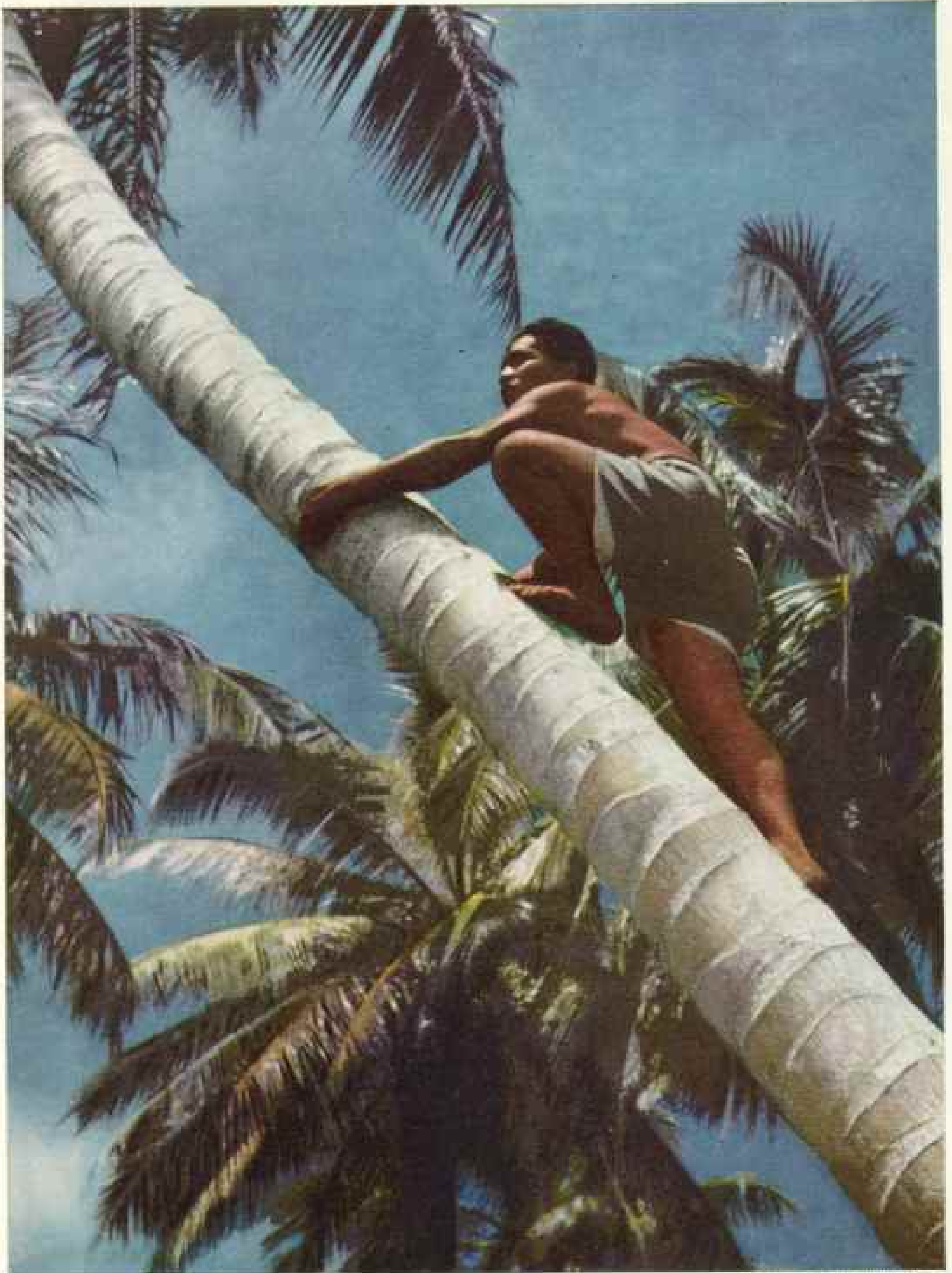
I should like to have seen how the transfer was managed! For I can still hear the military government officer muttering, "Sixty pigs, 72 chickens . . ."

I should also like to have visited picturesque Ebon and Namorik Atolls. But I had seen a large representative group of these new military wards we have acquired in the Pacific, wards which we shall continue to supervise until such time as their final control is decided following the conclusion of the war.

Then, too, I had another rendezvous to keep on other islands farther west which, like the Marshalls, the Japanese had lost or were rapidly losing.*

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

Marshallese Are Happy Again



© National Geographic Society

Kodachrome by W. Robert Moore

With Strong Toes Gripping Narrow Notches, a Marshallese Runs up a Coconut Tree

He is climbing to get young nuts that contain nearly a pint of sweet, refreshing water. A toddy, or fresh sap drink, is also obtained by cutting off the end of an opened blossom and collecting the liquid exuded. In peacetime, copra was the chief export from the Marshall Islands.



© National Geographic Society

Illustration by W. Hubert Moore

Happy Majuro Belles Model Their New Dresses, Acquired Since U. S. Forces Ousted the Japs

Shorter sleeves and skirt lengths are encouraged, to get away from cumbersome Mother Hubbards previously worn. The girl third from left displays a gold tooth set by a Japanese dentist. Nearly 1,000 people were found on this big island, which is about 15 miles long.



© National Geographic Society

It's Easy to Husk a Coconut—if You Know How!

This native thrusts it against a sharpened upright stick, then twists and pries off sections of the tough outer covering. Water is sucked out through one of the nut's three "eyes," or soft spots. Then the nut is cut open by a sharp knife blow and the meat scooped out.

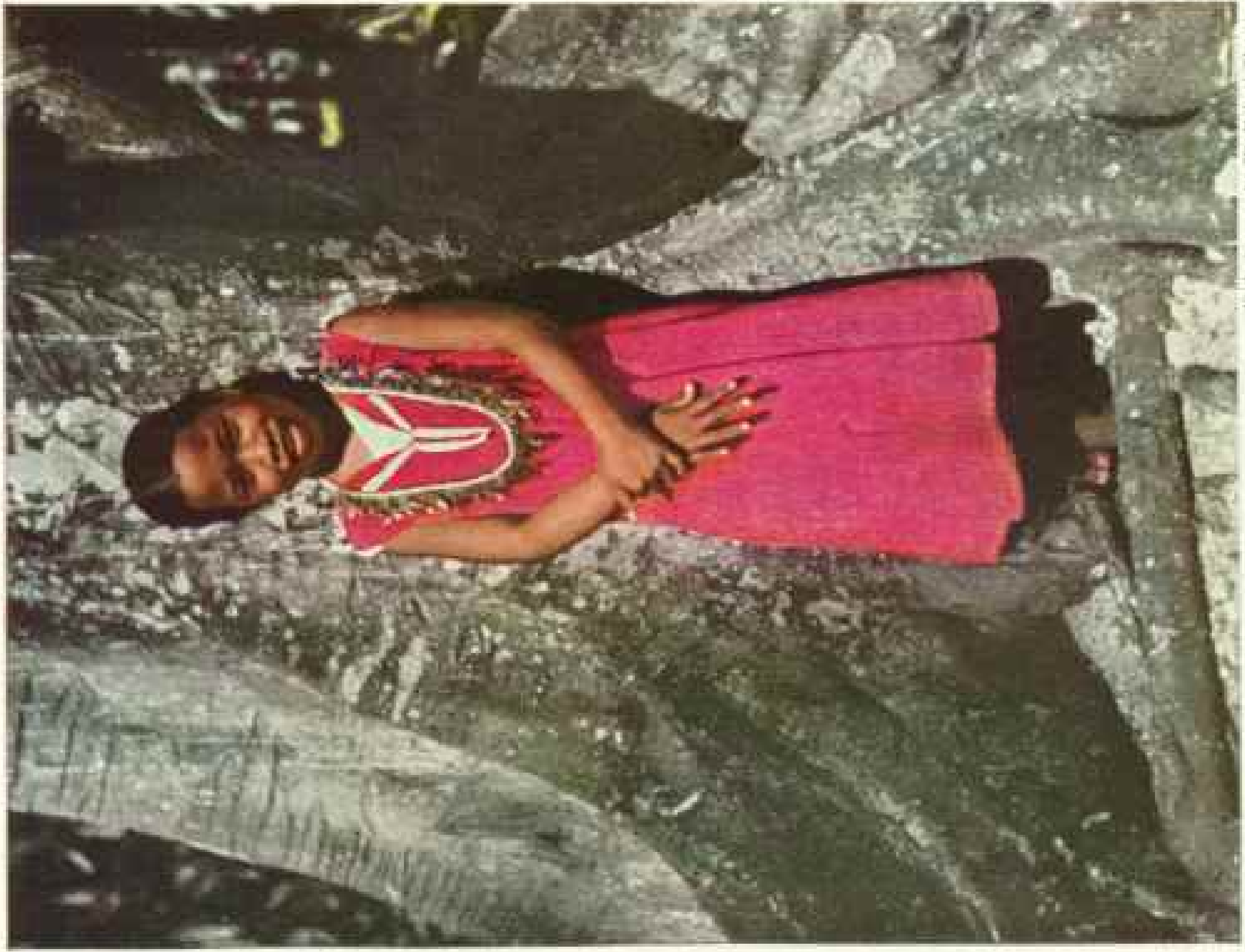
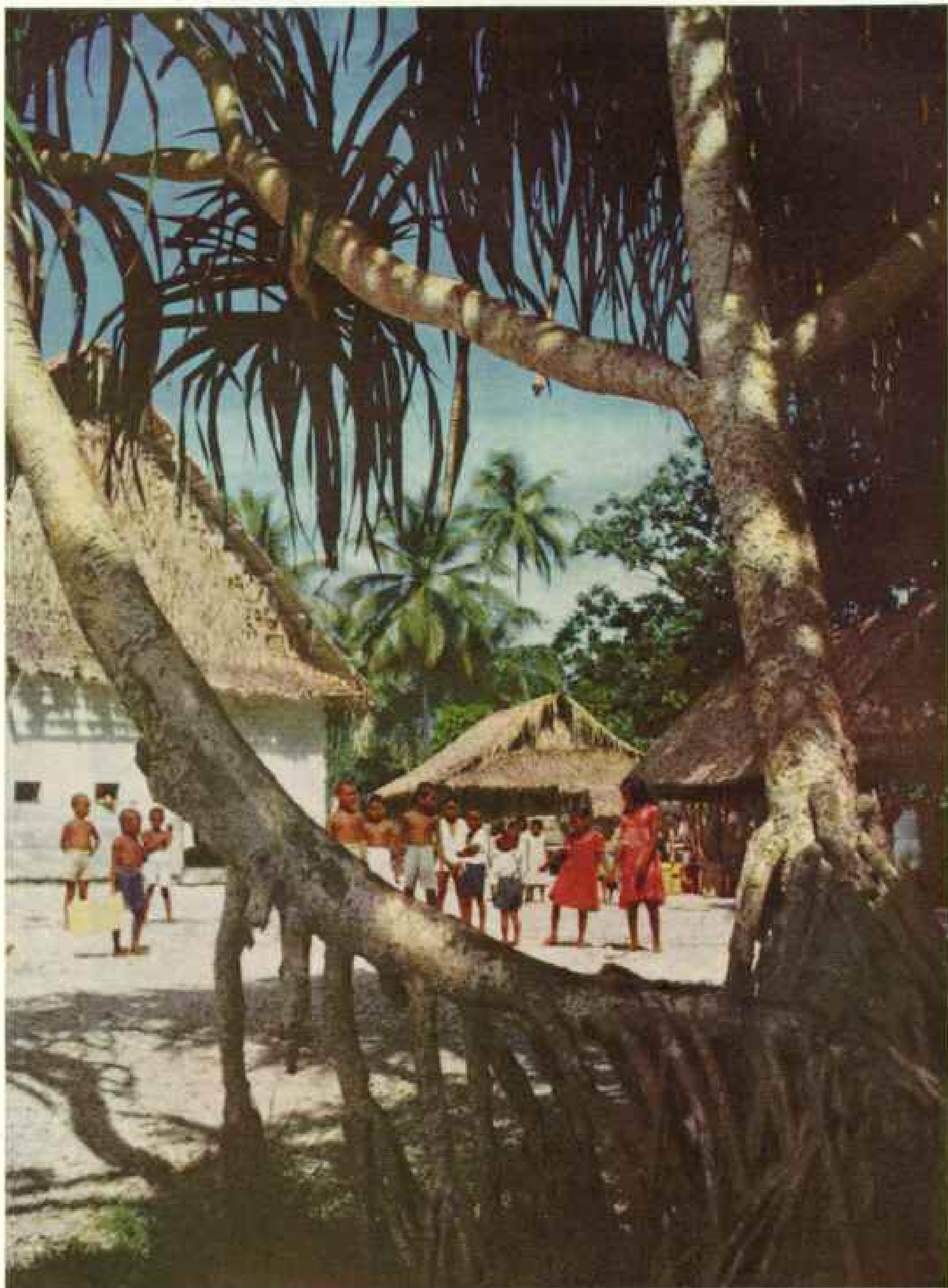


Illustration by W. Robert Moore

A Shy Lass on Kwajalein Atoll Gives Her Best Smile

She is one of the few children of mixed Japanese and native parentage. When our men arrived, they found islanders had suffered many privations. Their clothes were in tatters; some wore burlap sacks and mats. Fish, coconut, breadfruit, pandanus, and arrowroot kept them alive.



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Endonome by W. Robert Harris

Marshallese Youngsters Play Tag in a Tropic-girt Village Square

The church (left), minister's cottage, and the open pavilion "town hall" of the largest settlement on Ailing-lapalap Atoll are framed by a pandanus. Seed clusters of the pandanus are edible; mats are woven from the leaves. In the background are breadfruit and coconut trees.

Marshallese Are Happy Again



She Sells Sea Shells—by a Marshall Island Seaside!

A military government officer tallies the strings of beadhands, called *alu*, which native villagers bring for sale. Shell ornaments, mats, fans, and other handicraft help the islanders support themselves.



© National Geographic Society

Excerpt from *by W. Robert Moore*

Chanting a Lilted Island Song, Women Place Shell Bands on Visitors' Heads

These *alu* are to the Marshallese what leis are to Hawaiians. Recipients are two Navy men (right) and two Marshallese interpreters accompanying military government officers on a periodic visit to Ailinglapalap.

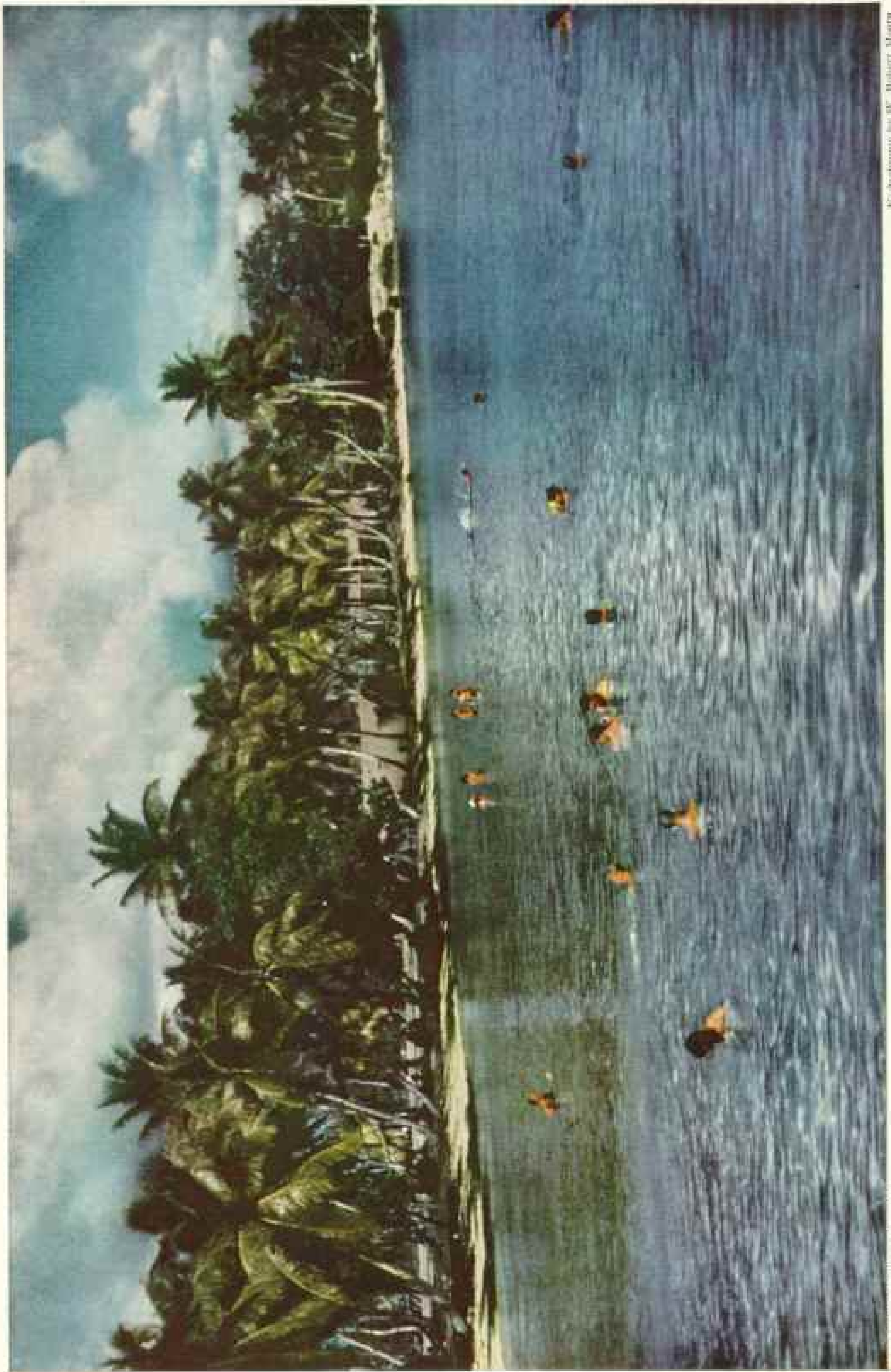


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Endorsement by Mr. Robert Moore

"Let's Hurry and Get the Christening Done While Our Belly Tanker Still Floats," Urged One of the Launching Crew

So over its bow they poured warm, frothy beer! Canoe and outrigger are made from discarded airplane belly and wing tanks. One outrigger club of belly tankers was soon "liquidated" when members tried sailing in rough open water, rather than in the lagoon.



© National Geographic Society

Education by W. Robert Moore

"Bring On Your Sarong-clad Sirens! Make This a Real South Sea Isle," Shouted GI's Swimming in the Lagoon

This beach at Majuro Atoll has become a vacation spot for American garrison forces on days off duty. They drink cold "Cokes" and beer in the shade of feathery palms.



Coconuts, Not Cows, Provide This Ailinglapalap Housewife with "Milk"

She grates ripe coconut meat in the wooden bowl, then kneads it with water and squeezes out the milky liquid. It is used in puddings and some rice dishes. The sweet water from young coconuts is sometimes erroneously called "milk."



© National Geographic Society

Redcrosses by W. Robert Moore

These Smiling Maids Answer Majuro Hospital Patients' Call for "Nurse"

Alert island girls are being trained to assist the U. S. Navy physician in caring for the ill on Majuro Island. Though it is a thatch-roofed building, the hospital for natives is neatly kept.

The National Geographic Society's Map of Northeastern United States

WITH this issue of their MAGAZINE, the 1,250,000 member-families of the National Geographic Society receive a map supplement of the foremost industrial region in the world—the Northeastern United States.*

Printed in 10 colors on a sheet 41 by 26½ inches, the new map contains 10,437 place names, more than any other chart ever produced by your Society.

The 530,000 square miles portrayed encompass America's giant "manufacturing belt." This region embraces only 12 percent of the area of continental United States and 4.4 percent of Canada's. Yet here dwell nearly half the population of the United States and almost two-thirds of the Dominion's people.

More than 644,000 of the million and a quarter members of the National Geographic Society live within the borders of the new map, which stretches on the north from Ontonagon, Michigan, to the coast of Maine, and on the south from Mount Vernon, Indiana, across Kentucky, West Virginia, and Virginia, to the Atlantic. Included are most of the Great Lakes region and the thickly populated sections of Quebec and Ontario.

Of the 31,692 persons listed in the 1942-43 edition of *Who's Who in America*, issued before wartime changed many addresses, more than 18,000 lived in the District of Columbia and the 13 States shown in their entirety.

World's Greatest Industrial Output

In 1944 the United States produced 199 billion dollars' worth of goods and services. This included 43.5 billion dollars' worth of combat munitions—more than one and a half times the production of the Axis nations.

Of 29 major industrial areas in the United States, as designated by the War Production Board, 23 are located in the territory shown on the new map. Factories in those 23 areas produced 73 percent of the Nation's record-breaking 1944 output. They employ 70 percent of the country's wage earners.

In the Canadian area covered, manufacturing and population concentration is also striking. This comparatively small section contains 73 percent of our neighbor country's factories and 84 percent of its factory payroll.

Residents of the northeastern United States pay 69 percent of the Nation's income tax; Canadians in the area mapped pay 83 percent of the Dominion's.

The map shows how nearly all the huge metropolitan centers in this section owe their

growth to strategic geographic locations. Except Indianapolis alone, all are located on navigable water—ocean, lake, river, or canal.

New York, heart of a metropolitan area of 11,000,000 people, is the biggest port in the world. From its hundreds of miles of piers nearly three million tons of shipping moved seaward in a single wartime month.

Biggest single factor in the early growth of New York City was the Erie Canal. Utilizing the Hudson and Mohawk Valleys, the canal made New York the shipping gateway for all the country between the Great Lakes and the Ohio, and between the Mississippi and the Hudson. Later, the New York Central Railroad followed this route.

Today New York is the world's chief financial center. It leads the Nation in manufacture of chemicals and clothing. Every major oil company that does business in the metropolis has an oil refinery there, and their combined output makes New York one of the biggest petroleum-refining centers in the world. Many more "first's" and "biggest's" could be listed.

Great Lakes Cradle Great Cities

The Great Lakes, today the world's busiest shipping artery, dominate the area covered by the northwest corner of the new map.

Imagine the changes on this continent if they were not there. North America would gain more land than the total area of the British Isles, but at what cost!

The Great Lakes project into the heart of the continent's rich grain region and transport most of the grain crop over their waters. They link three-quarters of our Nation's iron ore with the vast coal fields of Pennsylvania, West Virginia, Kentucky, and Virginia.

It costs almost four times as much to send a ton of coal by rail from Pittsburgh to Cleveland, 115 miles, as it does to ship by water from Cleveland to Duluth, 800 miles. To ship a ton of coal from Lake Erie to western Lake Superior ports costs only 40 cents, less than many pay to have it carried from curb to cellar.

Without the Great Lakes waterway, the huge industrial regions of Chicago, Detroit,

* Members may obtain additional copies of the new "Map of Northeastern United States" (and of all other maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices, in United States and Possessions, 50¢ each, on paper; \$1 on linen; Index, 25¢. Outside of United States and Possessions, 75¢ on paper; \$1.25 on linen (postal regulations generally prohibit mailing linen maps outside of Western Hemisphere); Index, 50¢. All remittances payable in U. S. funds. Postage prepaid.

Cleveland, Milwaukee, Buffalo, and Rochester, which produce 20 percent of the Nation's industrial products, would probably have other locations. What would happen to Pittsburgh, Youngstown, and other near-by inland industrial regions if they were cut off from Minnesota, Wisconsin, and Michigan ores?

During the seven-month season, the Soo canals between Lakes Superior and Huron carry more tonnage than the Panama and Suez Canals combined in a whole year. Nearly three-fourths of the entire United States waterborne commerce goes over the Great Lakes. In 1940, Lakes ports handled one and a half times as much cargo as our Atlantic ports and two and a half times as much as our Gulf ports.

Chicago, on the shores of Lake Michigan, is the heart of one of the world's outstanding manufacturing centers. Great Lakes port and marketing center for a vast and rich agricultural region, this giant metropolis is a terminal for 34 railroads.

Continue the roll call of big northeastern cities and see how the growth of each depended largely on navigable water:

Boston on the Atlantic, Philadelphia on the Delaware River, Pittsburgh where the Allegheny and Monongahela Rivers unite to form the Ohio, Cincinnati on the Ohio, St. Louis on the Mississippi, Detroit on the Detroit River between Lake St. Clair and Lake Erie, Cleveland and Buffalo on Lake Erie, and Montreal on the St. Lawrence.

Water also accounted for the growth of New England's scores of manufacturing cities.*

Although industry reigns supreme in northeastern United States, the area is also rich in agricultural products.

In the northeastern corner of the map, three lowland areas contribute much to the farm wealth of the Nation. Aroostook County, in Maine, supplies the United States with one-eighth of its potatoes. Milk pours from the Lake Champlain lowlands in New York State and western Vermont into the vast overlapping watersheds of New York City and Boston. Nearly 22,000 acres of the fertile Connecticut Valley raise high-grade tobacco.

One of the world's foremost producers of commercial vegetables is the Atlantic coastal plain. Although the area of New Jersey, Maryland, and Delaware is less than half that of Ohio, these States yield one-seventh of the Nation's canned and frozen vegetables.

In 1944 they accounted for nine percent of the total commercial truck crop of the United States, including both fresh vegetables for market and vegetables to be commercially canned and frozen.

Value of the vegetables they raised for com-

mercial processing averaged about \$11,060,000 annually in the decade preceding the war. With increased acreage under wartime cultivation, and higher prices, production of commercial vegetables in Maryland, New Jersey, and Delaware in 1944 mounted to \$26,668,000—an increase in value of almost 150 percent.

Two-thirds of North America's oysters are dredged in waters between Cape Cod and Cape Hatteras. Chesapeake and Delaware Bays and Long Island Sound furnish most of them.

Banner agricultural county is Lancaster, in Pennsylvania. Chief cash crop is tobacco, which yields from 1,200 to 2,500 pounds per acre. Potatoes average 200 bushels to the acre. Wheat, corn, and hay are other important crops.

America's Corn Belt extends eastward to include Indiana and much of Ohio. About 3,500,000 acres of Ohio's farmland are planted in corn, and wheat production averages about 40,000,000 bushels a year. Ohio usually is fifth among the States in wheat yield and also grows much corn. Nearly 90 percent of Indiana's land area is in farms.

Famous Resort Areas Mapped

The new map shows the Nation's most visited seaside areas—hundreds of them—from the coast of Maine south through the swarming beaches and resort cities of Atlantic Coast States, including Maryland.

The northeastern uplands—the Adirondacks in New York, the Green Mountains in Vermont, the White Mountains in New Hampshire, and the Berkshires in Massachusetts—form a vast summer and winter playground.

Mountains of Pennsylvania and western Maryland also have plentiful play places.

The new map is the third in the National Geographic Society's series of sectional charts of the United States. First was the Map of the Southwestern United States (June, 1940) and, second, the Map of Northwestern United States and Neighboring Canadian Provinces (June, 1941). The large scale of 27.6 miles to an inch is 1.43 times greater than the scale used for the other two maps.

The southeastern New England area, from the Merrimack River south to include eastern Massachusetts, eastern Connecticut, and Rhode Island, is shown in an inset on a scale of 11.84 miles to the inch.

Like its companion maps, the new chart shows Federal and State highways and points of particular interest, making it ideal as a reference or road map.

* See "Northeast of Boston," by Albert W. Atwood, in this issue of the NATIONAL GEOGRAPHIC MAGAZINE.

Flying Our Wounded Veterans Home

BY CATHERINE BELL PALMER

FROM where I stood, facing the runway at Mitchel Field, Long Island, New York, I could see a tiny dot up in the sky. It was a Douglas C-54, winging in from Europe with a priceless cargo aboard—wounded American veterans returning home.

The giant four-motored Skymaster came closer, light from the sun touching her silver wings. With a graceful dip, she headed into the wind and settled down on the landing strip. As the wheels touched, a base officer asked me, "Did you see that white puff of smoke?"

I nodded.

"Burning rubber," he explained. "Friction of the wheels against the runway causes it. When one of these big planes lands, enough rubber may be burned off the tires to keep an automobile running for months.

"Just one more reason why the Army needs so much rubber and why people have to do without tires."

The plane taxied up the runway. The flight nurse and the medical flight technician opened the huge doors. Quickly a gangway was wheeled over level with the floor of the plane, which is ten feet above the ground.

After the medical officer completed his checkup, the gangway was moved, and the hydraulic lift, which accommodates two litters at a time, was maneuvered into position (pages 366 and 368).

Red Cross Workers Help with Wounded

When the first two litters were placed on the litter cradle, I saw two heads rise up. Both boys had broad grins at their first sight in a long time of the United States. As each pair of litters was lowered, two litter bearers took them to waiting ambulances driven by volunteer Red Cross girls.

Some of the litter bearers were volunteer Red Cross workers, business men in the community who give up a day a week to do this job.

This plane carried 18 stretcher cases. The entire procedure, from the time the unloading started until the ambulances were filled, took only 17 minutes (page 366).

I asked the flight nurse if she had come over with the wounded all the way from Europe.

"No," she replied. "I brought them down from Stephenville, Newfoundland."

"Now that you have delivered your charges," I questioned, "will you get some leave?"

"Oh, yes," she said. "I have 24 hours'

leave, but I'm not going to take it here. I'm flying back to Stephenville for the big dance tonight."

I looked at her. Her lustrous blond hair was blowing about her face, her clear blue eyes were twinkling. In the postwar world a weekend flight from New York to Paris will be a thrilling experience to many of us. It is an old story to her—New York to Newfoundland, approximately 1,000 miles, for a dance!

Routes flown by these Air Transport Command* planes over the Atlantic vary, depending on weather conditions. No chances are ever taken flying our boys home.

One of every five casualties evacuated to the United States in 1944 came by plane.

Early this year casualties from all theaters were being flown at the rate of more than a thousand a month. A record number was made during May, 1945, when ATC planes brought more than 10,000 wounded veterans to the United States.

I went on board the second plane before the wounded were taken off. On each side of the cabin were three tiers of litters, three litters to a tier. This C-54 used the stanchion-type of litter support, consisting of metal poles attached to floor and ceiling. Horizontal metal arms were attached to each pole and litters were locked in place on the arms.

At the rear was the gear belonging to the patients. Life jackets were stowed on one side; on the other was the 75-pound medical chest.

These C-54's can accommodate from 18 to 28 patients, the number depending on whether they are stretcher or ambulatory cases.

"I Was in Paris Yesterday Morning"

As I stepped into the plane, I faced 18 pairs of eyes looking my way and was greeted by a chorus of "helloes."

"Hello yourselves," I answered. "How was the trip?"

"Swell," said one. "Simply super."

"This baby," said another, patting the side of the plane, "really gets you places in a hurry, but smooth. Golly, to think I was in Paris yesterday morning!"

And from another, "Yeah, boy, nothing can stop the Army Air Corps!"

I went to the First Air Force Regional Station Hospital near Mitchel Field, a 10-minute ride from the airfield. Here the

* See "American Wings Soar Around the World," by Donald H. Agnew and William A. Kinney, in the NATIONAL GEOGRAPHIC MAGAZINE, July, 1943.



U. S. ARMY AIR FORCE, OFFICIAL

"Let Me Touch Good U.S.A. Earth Again!"—a Thrilling Moment for a Returning GI

Just arrived by air at Mitchel Field, Long Island, Staff Sgt. Allen Linneborn smiles as he lets the soil trickle through his fingers. Some soldiers pat the earth with their hands, others even kiss it. Some 55,000 battle casualties have been flown across the Atlantic since air evacuation of wounded began in 1943.

patients stay from 24 to 48 hours before completing the trip by air to hospitals where they receive final treatment.

In the admitting office, the patients are given a checkup by medical officers. Each carries a tag giving his full medical history from the hour he was wounded (page 365).

As I entered the room, I saw the soldiers who had just been taken from the planes; some were stretcher cases, others walking patients. On the side reserved for ambulatory patients are comfortable red-leather chairs and divans and a radio phonograph. A Red Cross worker was serving sandwiches and cakes, coffee, tea, milk—and more milk.

Two soldiers were reading recent issues of the NATIONAL GEOGRAPHIC MAGAZINE.

Telephone Call or Telegram Is Free

Each patient is given a notice which reads in part as follows:

"You are now at the First Air Force Re-

gional Station Hospital, Mitchel Field, N. Y. While you are here we expect to give you any needed medical and surgical attention, and as soon as possible you will be transferred to a general hospital selected for you by the Office of the Surgeon General in Washington—a hospital chosen as the one best suited for you, based on your professional requirements and the availability of hospital beds.

"Civilians in this community have provided for you a free telephone call or telegram."

A record is made of each man: his name, rank, medical class, whether he is an ambulatory or a litter patient, and the State to which he prefers to go. These records are sent in code by teletype to the Army Air Forces Medical Regulating Officer, Office of the Air Surgeon, Washington, D. C. To determine destinations of patients, the United States has been divided into 28 districts.

Code is not used for secrecy, but to save time and space in transmission. For example,



U. S. Army Air Forces, Official

His Watch Worn on His Sling, a Wounded Army Engineer Boards an Evacuation Plane:

With one hand a flight nurse steadies this officer for a flight in a C-47 from Mitchel Field, New York, to a hospital near his home; with the other, she checks her passenger list. Attached to the button on his breast pocket is a tag which gives the medical history of the lieutenant's wound. Skytrains carry 24 wounded.



AP Wire Press Ass'n

Flight Nurse Waves Good-bye to Two GI Patients She Has Just Brought from Paris

The wounded soldiers on the litter cradle are being lowered from the transport by a "fork" or "finger" lift (page 368). Red Cross girls will drive them in the Red Cross ambulances in background to First Air Force Regional Station Hospital, a ten-minute ride from Mitchel Field, Long Island, New York.

an enlisted man, litter case, with a fractured leg, who gives his State preference as New Jersey, would be coded as "22KFCY1." The "22" means district 22, which includes New Jersey; "KF," the medical classification, General Surgery; "C," military classification, male enlisted; "Y," litter; and "1," one patient.

Before being evacuated by air, "screening," or examination of each patient, is done by medical officers in the theater of operations.

His First Trip in an Airplane

In general, the following types of cases are designated for air evacuation to the United States: litter patients who require hospitalization for 90 days or more; patients requiring immediate treatment of a type not available in the theater; ambulatory patients who require an extensive convalescent period; and patients expected to die but whose condition is such that they can be sent home.

I wondered about starting a conversation

with soldiers so recently lifted out of the front lines. Would they want to talk? I soon discovered I need not have worried.

As I walked into the ward, I saw the bright blue eyes of a youngster smiling up at me.

"Hello, there. Did you like coming home by plane?"

"I'll say I did! I wouldn't take anything for it. First time I've ever been in an airplane."

This 19-year-old lad told me he had gone to Europe on the *Queen Elizabeth*, which was a "good ship," and added, "But that took six days!"

Proudly holding up a shiny metal cigarette lighter, "See what I got?" he asked.

"From a German?"

"Nope. The flight nurse gave it to me when I couldn't find my matches. Gee, she was swell! The whole thing is swell."

"What whole thing?"

"Oh, the good old American way of doing



U. S. Navy, Official

On Battle-torn Iwo, a Navy Flight Nurse Aids a Wounded Marine

Flying in from a base in the Marianas to evacuate the wounded, Ensign Jane Kendeigh landed on the volcanic island's new airstrip March 6, 1945, only 15 days after D Day. She was the first Navy flight nurse to set foot on any battlefield; later she was the first to land on Okinawa (page 374).

things. Giving me a ride home in an airplane and throwing in a pretty girl to take care of me, for good measure. *Some system!*"

He told me he had lost his left foot when he stepped on a land mine near Prüm, Germany. The one thing that worried him was how to break the news to his family. Finally he wrote his older sister and asked her to do it.

While we talked, a girl from the telephone company plugged in a telephone beside his bed and told him his call was ready. As I moved, he was saying, "Hello, Mom . . . yes, Mom, I'm all right . . . yes, they are giving me everything I need . . . oh, it was swell . . . no, not a bit rough . . . now, you're not to worry. . . ."

A sergeant whose home is in Lansing, Michigan, told me he landed in France on D Day and came through without a scratch, but was hit by a mortar-shell fragment near Remagen.

"I was hit on March 1 and this is only March 16! Why, it took us less time to cross

the Atlantic by plane than it did to make the Channel crossing by boat on D Day!"

He had been hit in five different places, but the only wound that worried him was the one in the right side of his face.

"Hey, Fellows, Come Here and Look!"

"I'm not sure they can fix it up so I won't have a bad scar," he said.

"But surgeons do wonderful work sewing up wounds," I pointed out.

"Yeah, that's what they tell me, but I'm still not sure."

"Well, I had 68 stitches taken in my face as the result of an automobile accident a few years ago. Can you see them?" I asked.

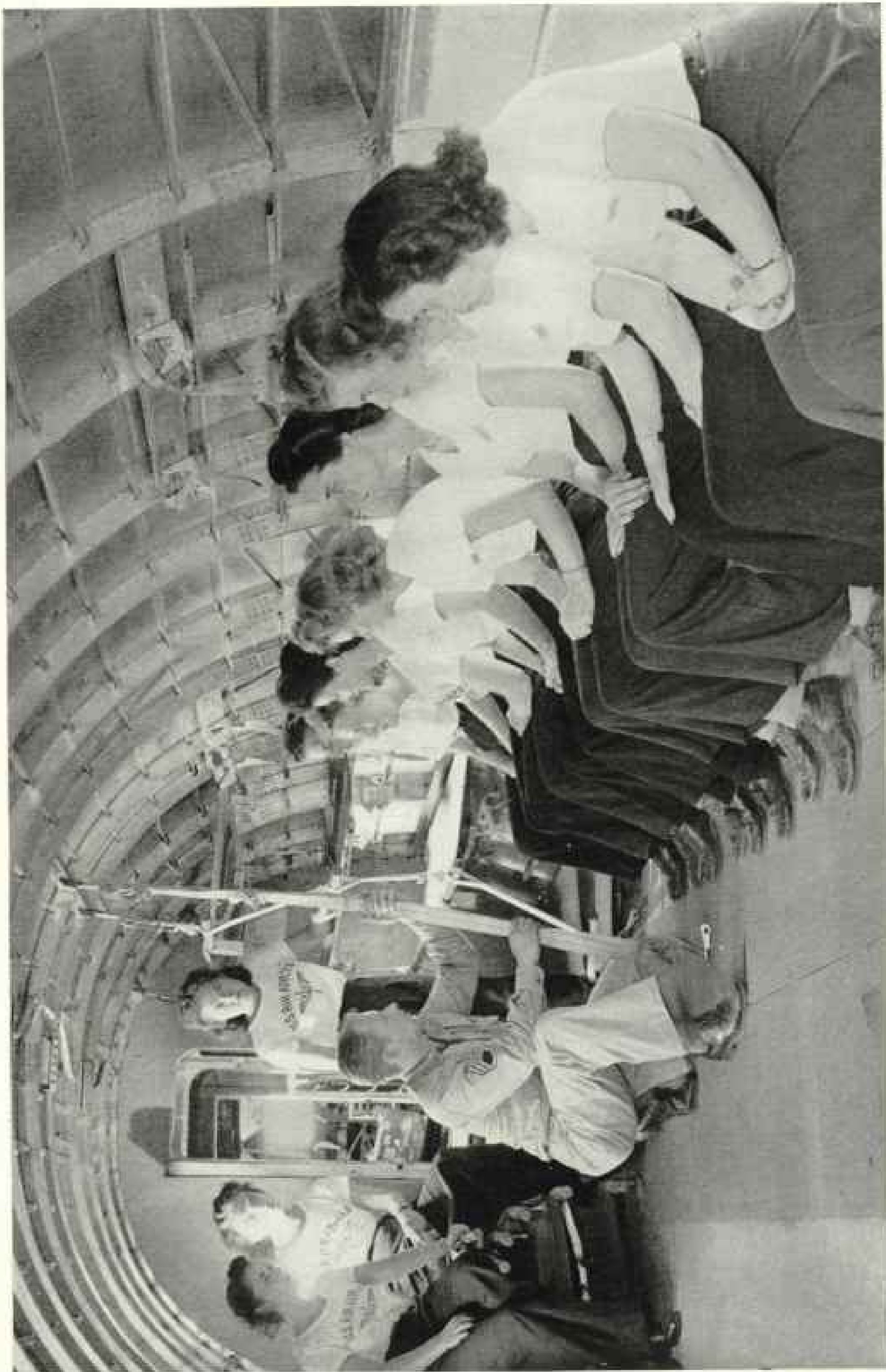
"You're kidding!" he cried, unbelievably. "Where?"

So I showed him. "Well, I'll be a son of a gun!" he exclaimed. "Hey, fellows, come here and look!" A crowd gathered around me and I felt like exhibit A.



E. R. Avery. All Photos. Official

Portable Lift Unloads Litter Cases from a Skymaster at Mitchel Field: Already Mechanics Are Refueling for Return Flight to Europe



U. S. Army Air Forces, Official

Fledgling "Flying Angels" Learn How to Convert a Cargo Plane into a Flying Ambulance

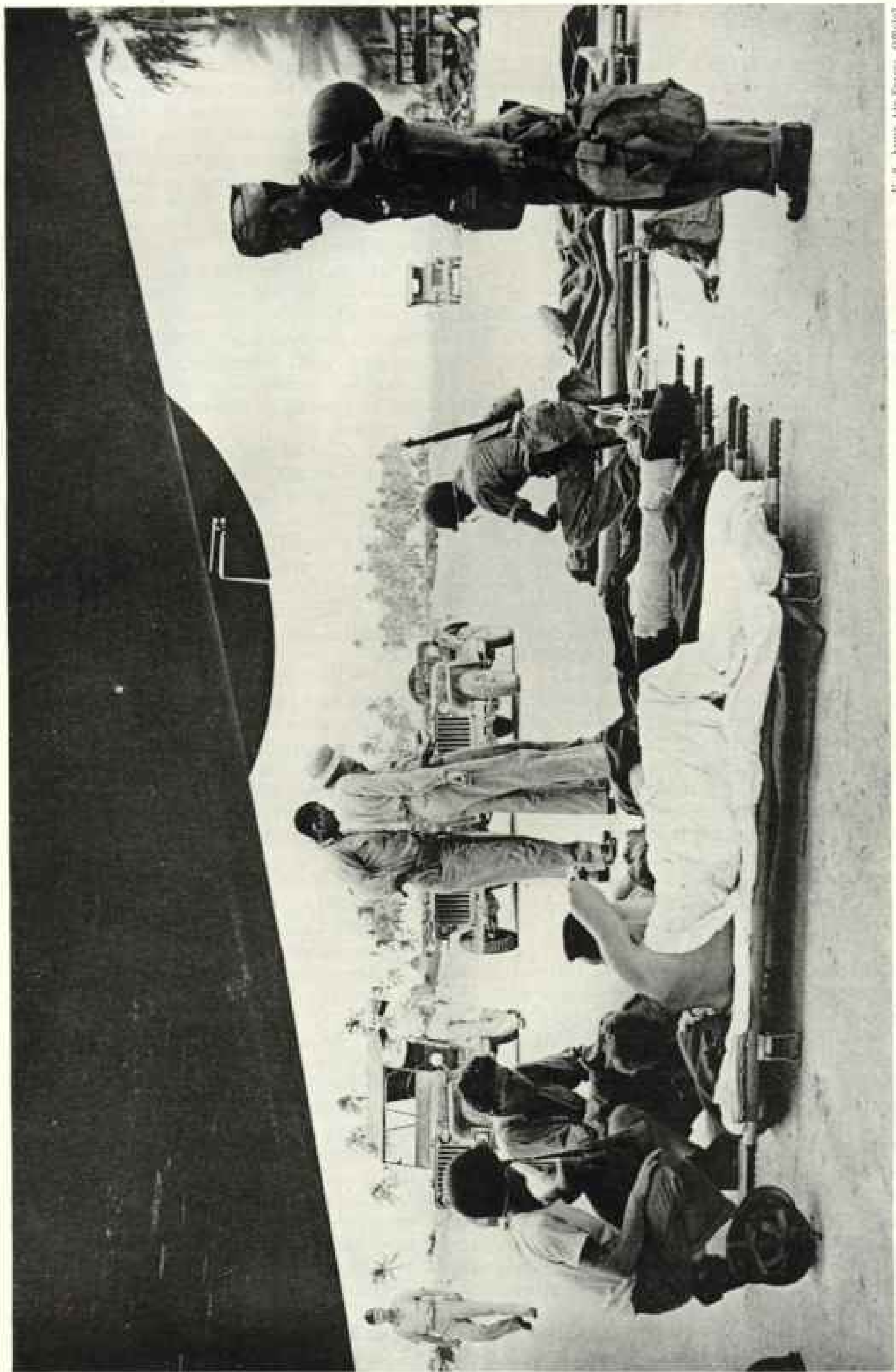
Here nurses are shown how to install litters for the wounded. They are enrolled for a nine-week course at the AAF School of Air Evacuation, Bowman Field, Kentucky. To qualify, they must be registered nurses and have served in the Army Nurse Corps for six months. Some 1,200 have been trained in aviation nursing (page 372).



U. S. Army Signal Corps, Official

Oxcarts Carry Wounded Five and a Half Miles Through Jungles to Myitkyina Airfield, Muddied by Monsoon Rains

By nightfall, these jungle fighters, evacuated by the plane in the background, will be resting in India hospitals. The Burma airfield was captured May 17, 1944, by Brig. Gen. Frank Merrill's Marauders, composed of American and Chinese troops. During the battle, wounded were treated in a revetment off the runway by Dr. Gordon S. Seagrave, of *Burma Surgeon* fame.



U. S. Army Air Forces, Official

Wounded Heroes of a Jap Zero Bombing Raid Await Evacuation under the Wing of Their Plane on Funafuti, Ellice Islands.

Medical officers check the condition of these 7th Air Force flyers and Marines resting on the hot sands of the airfield. The picture was made shortly after the Japs dropped bombs on this important airbase island in April, 1943.

A private, first class, with Lt. Gen. Alexander M. Patch's Seventh Army, told me that when some of the men were on a hospital train waiting to be taken to an evacuation hospital, the general walked through the train and stopped to ask this boy how he got wounded.

"I told him I got mine when we were attacking. The general said to me, 'That's when most of us get it, soldier.' And then he patted me on the shoulder."

The private laughed, then hesitated.

"Something funny happen?" I asked.

"Yeah," he replied. He told me General Patch asked the man on the litter next to his where he got shot. The soldier said he was hit in the back by a rifle bullet.

"Sort of going the wrong way, weren't you, soldier?" Patch said smilingly.

"Well, you know, sir," the soldier replied, "they say that when you're hit in the back it doesn't mean you were running away. It just means you were surrounded."

All these GI's had stories to tell. Not of their own bravery. They did not think of themselves as heroes. One, a rancher in Idaho before the war, said, "We're not soldiers. We're 'camouflaged civilians' doing a job that has to be done and doing it fast so we can all go back to living a peaceful life again."

They talked of their wounds and how they got them. They showed me pictures of their girls, and of their wives and children. They plunged hands into their kits and drew out souvenirs—small pieces of shrapnel, German knives, German money, German pipes.

"I sent my souvenirs home to my wife—50 pairs of pure silk hose," one said. He told me he saw thousands of pairs in one German town. From Japan, of course.

Flight Nurses an Innovation

Flight nurses are an innovation of this war. A nurse must be in the Army Nurse Corps for at least six months to be eligible to apply for the nine-week course in Aviation Nursing at the AAF School of Aviation Medicine, now at Randolph Field, Texas. Prior to October, 1944, the school was located at Bowman Field, Kentucky.

The course is divided into three parts of three weeks each. The first two cover a review of medical and military subjects, plus subjects peculiar to air evacuation of the sick and wounded. Special emphasis is placed on aeromedical physiology and therapeutics, and on the handling of neuropsychiatric casualties.

The nurses learn the conversion of cargo aircraft for the transportation of casualties in fuselages set up at the school (page 369). On actual aircraft in flight, simulated wounds

are bandaged, splints are applied to the "wounded," and "patients" are treated for shock and receive blood plasma and oxygen.

The third stage of training is the evacuation of sick and wounded within continental United States. In actual evacuation the nurse learns to work with a medical technician who has had similar training. Both work under the supervision of a member of the staff while on these flights.

At present, approximately 1,200 nurses have been trained in aviation nursing, 800 of whom are actively engaged in air evacuation. Some of the nurses are awaiting assignment with an air-evacuation unit; others have been rotated to six months' service in a general hospital following 18 months or more of duty as flight nurses overseas.

The first class of flight nurses was graduated from Bowman Field on February 18, 1943, and all were assigned to flight nurse duty.

Since that time 31 Medical Air Evacuation Squadrons have been trained. There are four flights to a squadron, each flight being commanded by a flight surgeon and composed of six flight nurses, six medical technicians, and two clerks.

At the hospital at Mitchel Field I talked with Lt. Jeannette Pitcherella, who was one of the first flight nurses to serve in the China-Burma-India Theater. Attached to the 803d Medical Air Evacuation Squadron, she reached India in November, 1943.

On some trips her patients included men from Brig. Gen. Frank D. Merrill's Marauders.

I asked her if she had ever encountered trouble. One day, she said, when they were taking off from Calcutta to pick up a load of wounded, an engine conked out and the plane crashed. The plane was heavily loaded with gasoline, and, fearing an explosion, the pilot ordered all the crew to jump.

"We did," she said. "And we all made it. But in the excitement and rush to get out of the plane I must have caught one of my fingers in the door, because when I got on the ground I noticed it was gone."

At New Castle Army Air Base, Wilmington, Delaware, I talked with Lt. Elsie Ott, first nurse to fly with a planeload of wounded. An Army nurse, she was serving in a hospital in India when chosen to take charge of five patients on a flight from India to Washington, D. C., in January, 1943.

This flight was made one month before the first class of flight nurses was graduated from the AAF School of Air Evacuation. The trip of approximately 17,000 miles took less than



U. S. Army Signal Corps, Official

Ambulance Plane Lands in Burma Treetop; Casualties Are Brought Down by Ladder

Sgt. W. H. Latta, pilot of the light liaison plane, suffered a fractured leg and face lacerations. He is being lowered by ropes. His three passengers, infantrymen wounded on a jungle battlefield, were treated for additional shock. Unarmed "grasshoppers," or jungle taxis, fly close to the ground to escape enemy fire and often evacuate wounded from places where larger planes cannot land. They form the first link in air evacuation.



E. S. Marston Corps, official

On Yontan Airfield at Okinawa a Famous Navy Flight Nurse Meets Wounded Marines. She Will Fly to Safety at a Rear-base Hospital

While the wounded are loaded through the big doors of the transport, a corpsman checks the condition of the other Marines, and a member of the plane's crew records the names of those making the flight. The girl is Ensign Jane Kendeigh, who was the first Navy flight nurse to land on two jima (page 367). Now she is the first to arrive on Okinawa, only six days after the airfield was seized. More than 15,000 casualties have been evacuated by air from this Ryukyuu island.



P. H. SERRA-COZZI

This Big Navy Flying Boat Will Fly Wounded Marines to Pearl Harbor in 24 Hours—By Ship It Would Take Two Weeks!

Ambulances waiting to transfer casualties line up on the Marianas runway. Coronados often fly to and from islands where there are no landing fields or where traffic on airstrips is heavy. Ordinarily they carry 30 litter and six ambulatory patients, but as many as 60 wounded have been flown.



U. S. Army Air Forces, Official

Not in Flanders' but in France's Fields, These Poppies Grew—amid Land Mines

The poppies are still fresh upon arrival in England, so short was the flight across the Channel. They were gathered from mine-planted fields near an emergency airstrip on the Cherbourg Peninsula. These 9th Air Force flight nurses, among the first to land on the beachhead, brought back battle casualties in C-47's.

a week. By ship it would have taken two to three months.

First stage of the flight was made in a converted B-24 which had none of the comforts and few of the facilities of the air-evacuation plane of today. En route they stopped over each night at airfields so that the patients could be given treatment and be fed.

First Nurse to Receive Air Medal

Lieutenant Ott was the first nurse to receive the Air Medal.* The citation for this award reads in part as follows:

"For meritorious achievement while participating in an aerial flight, Lieutenant Ott served as a nurse for five patients who were being evacuated from India to Washington, D. C. This was the pioneer movement of hospitalized personnel by air over such a great distance. . . . The successful transportation of these patients was made possible largely by the efficiency and professional skill of Lieutenant Ott and her unflagging devotion to duty. It further demonstrated the practicability of long-range evacuation by air of seriously ill and wounded military personnel from theaters of operations and reflected great credit upon Lieutenant Ott and the Army Nurse Corps."

After this historic flight, Elsie Ott took the flight-nursing course at the AAF School of Air Evacuation and upon graduation was again assigned to India. She served with the India-China Division of the Air Transport Command for 18 months.

"I think there has been too much emphasis placed on glamour in connection with flight nurses," Lieutenant Ott said. "More credit should go to the medical technicians, who have had specialized training in air evacuation and who fly with us."

Oftentimes a flight nurse is the first American woman the wounded soldier sees until his return to America. One flight surgeon said, "Just their presence in the airplane makes the men feel better."

When nurses first arrived in the Pacific battle areas, an officer remarked: "The flight nurse does much for the morale of the sick and wounded men. It is like bringing part of America to the war zone. The nurses provide a bridge between home and the battlefield."

Medical Technician, the "Forgotten Man"

The medical technician has been referred to as the "forgotten man" of this war. These technicians, who must be graduated from the AAF School of Aviation Medicine before serving on an air-evacuation plane, have been doing an unsung, little-publicized task in helping evacuate the wounded.

In many instances technicians attend loads of wounded unassisted by nurses or flight surgeons. More than one American soldier today owes his life to the care and professional skill of these men.

Worth of the air-evacuation program and the medical technicians was graphically illustrated during the early days of the hard-fought Saipan campaign.† Marine pilots, flying C-46 Commando planes, with one medical technician assigned to each flight, hauled thousands of wounded men back to rear-base hospitals even while the battle still raged.

Technician, third grade, John Madasz said: "Every time we landed there we were under shellfire, and we picked up our patients many times right off the field where they had been wounded. We had no flight surgeons and no nurses. We had to do the entire job ourselves as far as the patients were concerned."

Allocating Beds by Teletype

In the office of Lt. Col. Franklin L. Ball, Medical Regulating Officer, in the Pentagon Building, Washington, D. C., I saw one of the coded messages come in on the teletype from Mitchel Field. Immediately the Surgeon General's office was consulted to determine the bed space in the hospitals.

I watched an officer from the Surgeon General's office as he checked against hospital bed space. There were 105 wounded to be sent by plane from Mitchel Field to hospitals in all sections of the country.

It took the officer ten minutes to allocate bed space. A telephone call was put through to headquarters of the Ferrying Division, Air Transport Command, at Cincinnati, which has charge of the evacuation of patients by air within the United States.

The number of patients and their hospital destinations were given to the Ferrying Division, and the boys were on their way next morning.

If credit for the instigation of such a tremendous operation can be given to one man, it would go to Maj. Gen. David N. W. Grant, the Air Surgeon of the United States Army Air Forces.

Some transportation of sick and wounded by air was done during World War I, but that was a small-scale operation.

Early in the present war, routine air evacuation of casualties, long advocated by flight surgeons, was regarded with much

* See "Insignia and Decorations of the U. S. Armed Forces," 208-page book published by the National Geographic Society.

† See "South from Saipan," by W. Robert Moore, in the NATIONAL GEOGRAPHIC MAGAZINE, April, 1945.



"Gee, She Sure Is Swell!" GI Heroes Say of Their Flight Nurse

At the Newark Army Air Field Lt. Katharine Shafer checks her litter cases in the Air Transport Command plane which will fly the veterans to hospitals near their homes. She straps the patients to the litters at take-offs and landings. On flights overseas planes carry cargoes out and bring the wounded back (page 379).



U. S. Marine Corps, Official

Four-star Adm. Raymond A. Spruance Comforts Wounded Marine Private on Iwo Jima

In four hours—Pfc. Anthony John Santolla, of Elmhurst, Long Island, New York, will be whisked from the hot cinder strip to a comfortable rear-base hospital on Guam. Sometimes it takes less time to fly wounded back than to move them from island battlefields to hospital ships anchored offshore.

skepticism by medical and military authorities.

It was argued that the medical risk was great and that there were not enough planes for use as air ambulances.

The original concept of a single-purpose "air ambulance" was abandoned when the AAF adopted the Air Surgeon's proposal that troop and cargo airplanes be utilized for the secondary mission of air evacuation, using removable litter supports.

Therefore, in accordance with the Geneva Convention, air-evacuation planes cannot carry Red Cross insignia.

On recommendations made in 1940 by the Air Surgeon, the Medical Air Ambulance Squadron was authorized by the War Department on November 19, 1941. The medical personnel of the first air-ambulance battalion was activated at Fort Benning, Georgia, in May, 1942.

The air-evacuation unit was moved from Fort Benning to Bowman Field, Kentucky, in

October, 1942, and directed to train Medical Air Evacuation Squadrons for care of patients in flight.

The first two Medical Air Evacuation Squadrons were activated at Bowman Field in December, 1942, and entered service overseas in February, 1943.

One was with the 13th Air Force in the Pacific and the other with the 12th Air Force in North Africa.

First Mass Air Evacuation of Wounded

One of the first mass air evacuations in American military transport planes was in Java and Burma in March, 1942.

In Burma, ten C-47's of the Army Air Forces evacuated 1,900 sick and wounded soldiers and civilians from Myitkyina (page 370) to Dinjan, India, within 10 days in April, 1942.

Twenty-four litters were roped in tiers in each airplane, but the largest number evacu-



U. S. Coast Guard, Official

Teamwork: Coast Guardsmen Ferry Soldiers Wounded on Makin to Navy Flying Boat

Wounded men are given first aid and carried from the battlefield by "medics." Then they are evacuated by oxcart, jeep, grasshopper plane, truck, ambulances, or boats to waiting mercy ships or planes which take them to rear-base hospitals. If the injury warrants 90 days' hospitalization, they are flown to the United States.

ated in any one airplane, counting the ambulatory, was 74.

Meanwhile, mass air evacuation had become a military necessity in the New Guinea and Solomon Islands counteroffensives beginning August, 1942.

First large-scale organized evacuation operation as part of a military campaign began almost simultaneously in these areas in September, 1942.

Flight Surgeons in these theaters were directed to improvise air-evacuation service from available medical personnel of tactical units. This was done, drawing mainly on the Troop Carrier and Air Transport units, which likewise furnished the airplanes. During the first 72 days of this service, more than 13,000 patients were flown across the Owen Stanley Range. The trip by air took less than an hour; by foot or on pack animals it would have taken more than a week.

Patients Loaded on Planes under Fire

Soon after the beginning of the Navy-Marine Corps offensive on Guadalcanal in August, 1942, need for evacuation of casualties to rear-area hospitals became urgent. Forward-area medical stations were taxed by the growing casualties from both island and naval operations. Evacuation by sea was unsatisfactory because arrival and departure of ships were uncertain.

By September Marine DC-3's and by October AAF Troop Carrier C-47's were landing by night at Henderson Field, unloading ammunition and gasoline, loading wounded soldiers, and taking off on the return trip of 1,000 miles or more to their base in New Caledonia.

Frequently the loading of patients was conducted under artillery and aerial bombardment and in total darkness.

The first experiment with air evacuation on Guadalcanal was on September 6, 1942. A Marine pilot was shot down behind Jap lines and wandered for days through the jungle. He managed to stagger back to American lines on Guadalcanal. He was carried to a field hospital.

The Japs bombed the hospital. The condition of the pilot became critical. He was flown to a base several hundred miles to the rear. He recovered.

"Best medicine we can give a wounded or sick man is to tell him 'Tonight you can sleep without being bombed,'" reported one officer.

In October, 1942, the South Pacific Combat Air Transport (SCAT) was formed, with the 13th Air Force performing air-evacuation

service in conjunction with Navy and Marine Corps aircraft under the joint supervision of AAF, Navy, and Marine Corps medical personnel.

In those early days it was not always possible to have medical personnel accompany the wounded on the planes. Army nurses began flying on SCAT runs in February, 1943, the same month the first class of flight nurses was graduated from the AAF School of Air Evacuation. Nurses who first served with SCAT returned from the South Pacific to complete flight nurse training.

"The patients were given last-minute medical treatment before being put on the plane," said Marine Lt. Col. Harry F. Baker, Jr., a SCAT pilot in 1942.

"In flight, the co-pilot or I went back and asked the boys if they wanted a drink of water or if there was anything we could do for them."

In the Central Pacific a Marine Corps squadron was based on American Samoa in September, 1943. This was the beginning of the Central Pacific Combat Air Transport Service (CENCATS), composed of Army, Navy, and Marine Corps personnel and later renamed Transport Air Group (TAG).

The primary purpose of TAG was to fly supplies and ammunition from Samoa to other islands in the Central Pacific—Wallis, Funafuti (page 371), Nukufetau, and Nanumea. The planes, R4D's, could be quickly converted to evacuate battle casualties.

"It Was Informal, but It Worked!"

Marine Lt. Col. Edmund L. Zonne, former Commanding Officer of TAG, flew the first transport plane to land at Tarawa, on D Day plus 6. After this flight, wounded were evacuated from Tarawa on the transport planes.

"Many times when we landed, someone would rush up and ask if we could take wounded back with us," said Colonel Zonne. "We said we could, and the crew and anyone who happened to be near by helped load the patients. It was informal, but it worked!"

Conquest of the Gilbert,* Marshall, and Marianas Islands, approximately equidistant from Australia and Hawaii, presented obstacles to evacuation of wounded.

Surface vessels required many days or weeks to transport personnel and supplies to and from the battle areas. Also, aircraft were handicapped by distances as well as by the lack of landing strips on the invaded islands, particularly during early stages of combat operations.

* See "Gilbert Islands in the Wake of Battle," by W. Robert Moore, in the NATIONAL GEOGRAPHIC MAGAZINE, February, 1945.



U. S. Army Air Forces, Official

First Casualties from Normandy Landings Arrive in England on D Day Plus 4

Between D Day and V-E Day, more than 350,000 wounded were evacuated by air transports of the Ninth Troop Carrier Command in the European Theater of Operations. Here medical corpsmen unload both Allied and German wounded from a Skytrain; an Army doctor walks alongside. (page 383).

To overcome these obstacles, surface vessels and, whenever possible, troop-carrier planes of the Army, Navy, and Marines collected casualties in the forward areas and carried them to near-by island evacuation centers. Patients were evacuated by air to general hospitals in C-54 airplanes operated by the Pacific Wing, Air Transport Command, to Hawaii.

The procedure worked so well that orders were issued to evacuate by air all patients who could not be returned to duty within 30 days.

Thus air evacuation of sick and wounded, originally an emergency operation, became a routine procedure. Need for building up large medical installations on remote islands behind the ever-advancing battle front was eliminated.

On December 6, 1943, the War Department established the responsibility for air evacuation as follows:

"The Commanding General, Army Air Forces, is responsible for the development, planning, and operation of air evacuation between oversea theaters and the United States and within the United States. . .

[AAF Regulation No. 20-1 in turn assigned

the supervision of air evacuation to the Air Surgeon.]

"The care of patients in transit from an oversea theater, department, base command, or defense command to the continental United States is the responsibility of the Air Transport Command so far as the medical installations, facilities, and personnel of the Air Transport Command are available."

The Air Transport Command operates air-evacuation service from ten divisions: Pacific, Caribbean, North Atlantic, South Atlantic, European, North African, Central African, India-China, Alaskan, and Ferrying (Domestic).

In the Mediterranean Area

Throughout 1943 and 1944 operations in the Mediterranean Theater, the 12th Air Force evacuated more than 183,000 sick and wounded patients from front lines to base hospitals.

The Surgeon General of the United States Army, Maj. Gen. Norman T. Kirk, said that the surprisingly low mortality rate among American troops wounded in the Tunisian campaign could not have been achieved without the wholesale use of aircraft to evacuate casualties



E. H. Army Air Forces, Official

GI Polio Victim in "Iron Lung" Flies Home from Panama by Evacuation Plane

Lt. Margaret Richey, Army flight nurse, feeds Cpl. Charles Moeller by glass tube. He was taken to Billings General Hospital, in Indiana, the one nearest his home having equipment for treatment of infantile paralysis. The 3,500-mile trip was made in 22 hours and 20 minutes.

to base hospitals 600 to 1,200 miles behind the front lines.

Capt. Ellen Church, Army Nurse Corps, who served with the 802d Air Evacuation Squadron, the first squadron in the North African Theater, says that of all the problems a flight nurse might encounter in air evacuation of wounded, one that had never occurred to her was language difficulties. Her first flight in North Africa was one to be remembered.

"All my patients," she said, "were French colonists with flowing robes, bright turbans, and black, curly beards.

"None spoke a word of English. Even their records were written in French, and I didn't know a word of French. Fortunately, at the last moment a French medical officer came aboard and accompanied us on the trip.

"My patients may not have understood a word of English when we started, but when the flight was over they knew two—'gum' and 'cigarettes.'"

Wounded Flown from Normandy

During 1944, as a result of heavy casualties in Normandy, and following our advance into Germany, evacuation by air reached its greatest peak (page 382).

Wounded American soldiers were evacuated by the Ninth Troop Carrier Command from Normandy on D Day plus four. And on June 29, 1944, the ATC brought the first planeload of those wounded on the Normandy beachhead to the United States.

Between D Day and V-E Day more than 350,000 patients were evacuated from forward to rear areas in the European Theater of Operations by the Ninth Troop Carrier Command. During this same period, ATC flew more than 26,000 patients from Europe to the United States.

Evacuation of Navy's Wounded

The Naval Air Transport Service (NATS) was established by the Secretary of the Navy five days after Pearl Harbor. Some wounded were carried out of battle zones in the Pacific area by these transport planes, but there was no organized system of air evacuation.

In December, 1944, the Navy established the Navy School for Air Evacuation of Casualties at Alameda, California, designed to train Navy flight nurses and pharmacist mates. The first class was graduated February 13, 1945, and assigned to duty overseas.

Navy flight nurses and pharmacist mates

first saw action in the battle for Iwo Jima (page 367). During the first two weeks of this engagement, 2,000 wounded were flown from Iwo Jima to Guam by NATS.

Recently the Navy completed plans for a large-scale air-evacuation service in the Pacific area, using Naval Air Transport planes.

From January, 1945, through late June, 1945, the Naval Air Transport Service evacuated by air more than 20,000 wounded veterans within the Pacific area and to the United States.

The evacuation by air of wounded from the Pacific area is a joint operation of the Army and the Navy. Planes of the Army Air Forces Air Transport Command and the Naval Air Transport Service are making many daily flights with wounded from Okinawa to Guam and from Pearl Harbor to the United States.

Wounded are flown by NATS and by the Ferrying Division of ATC from the west coast of the United States to inland hospitals.

Many Types of Planes Used

Many types of aircraft are being used for air evacuation of the wounded. The Army uses four-engined C-54's for transoceanic evacuation and twin-engined C-47's for transportation of patients from debarkation hospitals to general hospitals.

The Navy evacuates battle casualties in twin-engined Catalina seaplanes, four-engined PBV's (page 375), and in landplanes, R4D's and R5D's. Their R4D corresponds to the Army's C-47, the R5D to the C-54.

Light liaison, or "grasshopper-type," planes were used to evacuate wounded in the aerial invasion of Burma (page 373).*

The use of the helicopter for evacuation of wounded is still in the experimental stage, although the machine was used in India to transport casualties. A "litter capsule," capable of enclosing a patient on a standard Army litter, is attached to each side of the fuselage.

The first test of glider evacuation of wounded in the European Theater was made on March 22, 1945, when a low-flying troop-carrier plane towed a casualty-filled glider from Remagen, beginning a spectacular shuttle service for evacuation of wounded. The nearest evacuation hospital was nearly four hours

over rough roads by motor ambulance. The glider, carrying 12 litter cases or 19 ambulatory, took 20 minutes.

Military authorities point with pride to the three-year record of air evacuation. Here are some of its achievements:

By making use of troop- and cargo-carrying planes for the transportation of wounded, the wounded are removed from battle areas and no plane "deadheads," or returns empty.

Air Evacuation Classed as Lifesaving Measure

The record has proved that all patients who can travel can be safely transported by air.

Speed and morale are stressed as important factors of air evacuation. The speed of the airplane enables it to make several trips in the time required for the single ocean voyage of a hospital ship. The morale of the fighting men as well as the wounded is boosted by the knowledge that every cargo plane flying into a battle area is equipped for air evacuation.

The Air Surgeon of the United States Army Air Forces makes the statement that its swift and comfortable delivery of a patient to a hospital equipped for conclusive medical care classes air evacuation with the sulfa drugs, penicillin, front-line surgery, and blood plasma as one of the five greatest lifesaving measures of modern military medicine.†

In his report to the Secretary of War, dated February 27, 1945, General of the Army H. H. Arnold, Commanding General, U. S. Army Air Forces, summarizes the air-evacuation program from its inception to date, as follows:

"Since Air Evacuation began in 1942, a total of 700,000 sick and wounded have been evacuated by the Troop Carrier and Air Transport Command.

"Five hundred and twenty-five thousand were flown in 1944. Despite the large number of critically wounded cases evacuated from the fronts, the low death rate in flight of seven per 100,000 patient trips has been maintained, thanks in good measure to flight nurses and medical flight technicians.

"Over half of all patients are from Army Ground and Service Forces; almost one-third from the Allies; and the remainder are from the Navy, Marines, and Army Air Forces."

Shortly after V-E Day, General Arnold made the announcement that more than 1,000,000 sick and wounded patients of the American and Allied forces had been evacuated by Army Air Forces transport aircraft in all theaters of war.

* See "The Aerial Invasion of Burma," by Gen. H. H. Arnold, NATIONAL GEOGRAPHIC MAGAZINE, August, 1944.

† See "Healing Arts in Global War," by Albert W. Atwood, NATIONAL GEOGRAPHIC MAGAZINE, November, 1943.

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To carry out the purposes for which it was founded fifty-seven years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

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 16, 1926, 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 Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted \$25,000, and in addition \$75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

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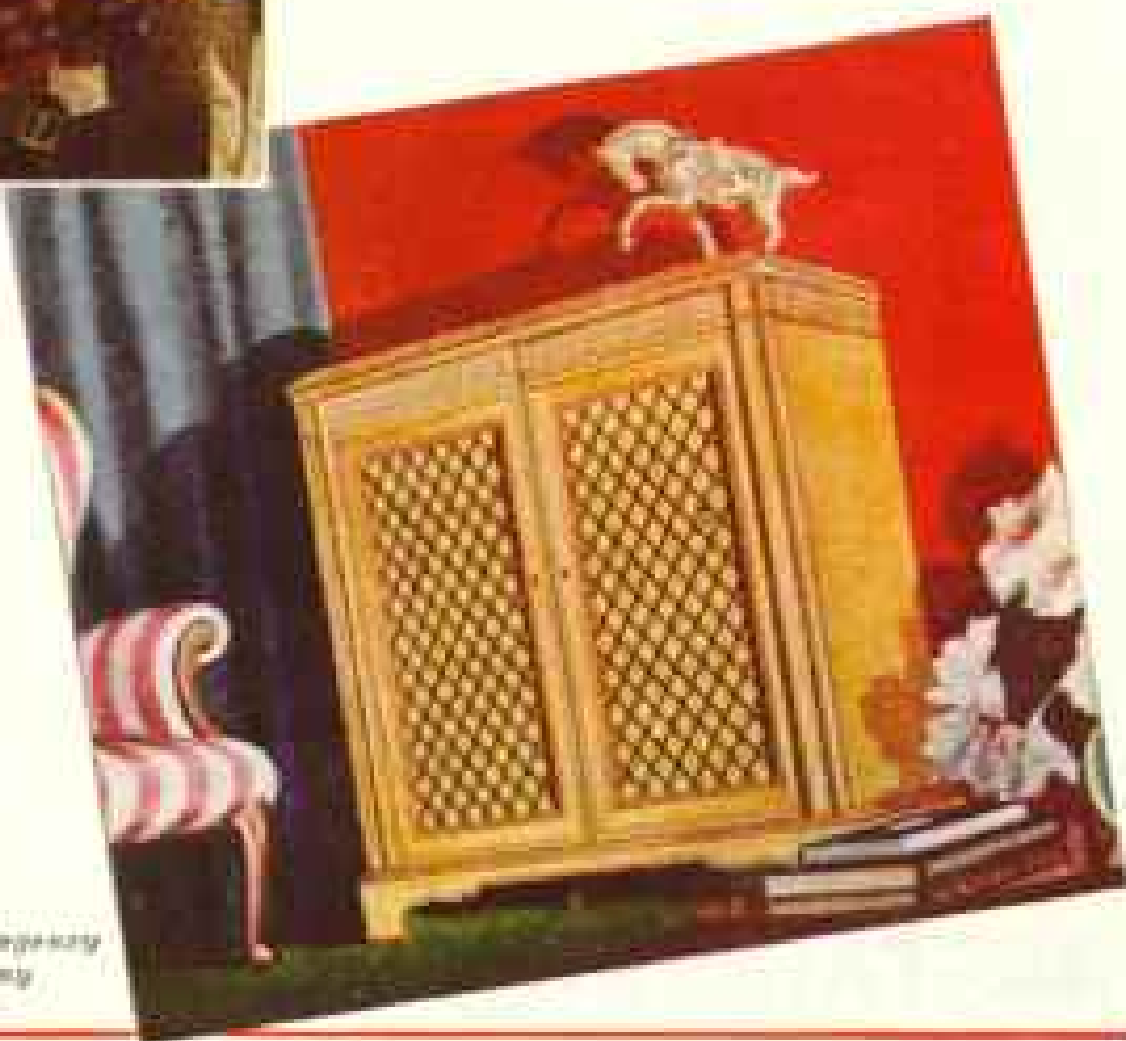
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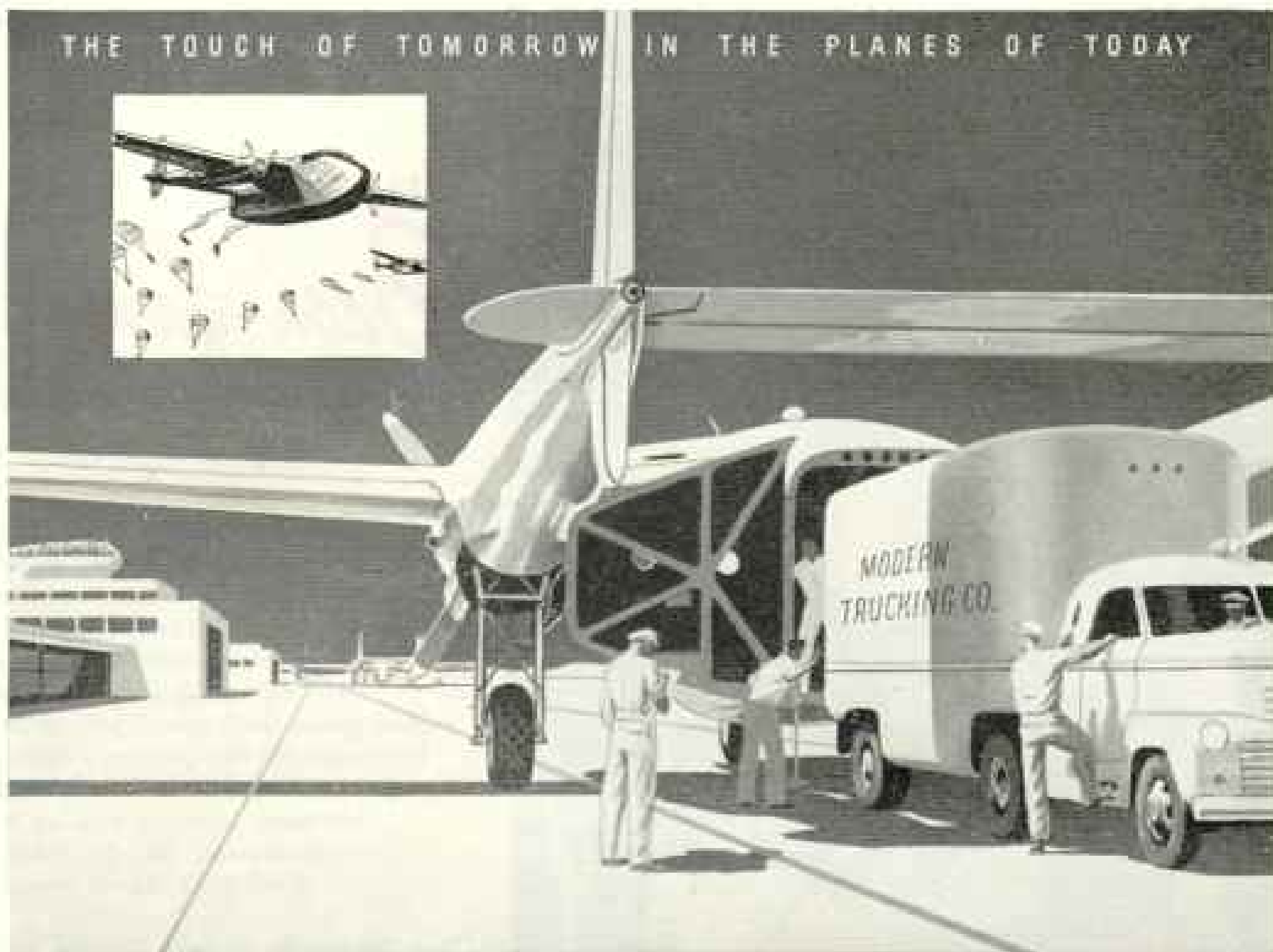
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Routine courier service in the Philippines, speedy liaison between floating repair bases and B-29 flight strips on Saipan, dramatic rescues from inaccessible Labrador wastes and Burmese jungles—these are some of the daily jobs being done now by Sikorsky helicopters in the hands of Army and Coast Guard pilots.

More than 250 Sikorsky helicopters have already come off the production lines at Sikorsky Aircraft and Nash-Kelvinator. Although further advanced than any others in the world, they are nevertheless only in the proving stage

of the long development cycle through which every new aircraft must pass to prove its worth.

Every aircraft which has contributed to American air power has passed through that development cycle—years of design and development by the private aircraft industry; then production; and then more years of testing and proving by the armed services. This process must be continued as national policy, supported by an alert public opinion, if American skies are to remain secure.

UNITED AIRCRAFT CORPORATION
EAST HARTFORD, CONN.



BUY
WAR BONDS

BUY MORE WAR BONDS

BUY STILL MORE
WAR BONDS

.... SO nice to come home to !



No, the fighting isn't over. Nor is Buick's war work finished.

But victory in Europe is releasing many fighting men to come home — and permitting the country to turn, at least in part, to the making of things they will find nice to come home to.

To many a fighting man, this will mean such pleasures as an open road, a glorious day — and a bright and lively Buick.

The roads are here. The days come with each rising sun. And the bustle that now enlivens Buick's factories is the make-ready process for getting back into the production of cars.

We aim to make those Buicks all that returning warriors have dreamed about — cars that from go-treadle to stop-light will fit the stirring pattern of the lively, exciting, forward-moving new world so many millions have fought for.

This is the 1942 Buick which sets the high standards to be surpassed by new models now being made ready.

WHEN BETTER AUTOMOBILES
ARE BUILT
BUICK
WILL BUILD THEM

BUICK DIVISION OF **GENERAL MOTORS**
Every Sunday Afternoon...GENERAL MOTORS SYMPHONY OF THE AIR
—MTC—Hubert

The Army-Navy "E" monthly flag
over all Buick plants





BUY WAR BONDS AND STAMPS

"Hey—it's the ice cream factory!"

There's plenty of excitement in Pacific outposts when this curious craft heaves over the horizon.

It's officially a BRL (Barge, Refrigerated, Large). Built of concrete, 265 feet long, it cost a million dollars. And it's worth every penny of that to lonely American boys who are fed up with alphabet rations, however nutritious.

Each BRL (the Army operates three) is a floating refrigerator and food factory. It carries 1500 tons of frozen meat, 500 tons of fresh vegetables, eggs, cheese and milk. And a big ice cream freezer.

The machine can make 500 gallons of ice cream a day—with storage space for 1500 gallons more. Can you imagine a greater tonic to body and spirit than real ice cream served in steaming jungles or on hard-won beachheads? It's a touch of home as well as a valuable food. Many tons of the powdered ice cream mix that makes this possible are furnished by National Dairy.

Meantime, back home, National Dairy Laboratories are working constantly to bring to soldiers and civilians alike—in newer, better, more useful forms—all the health inherent in milk—*nature's most nearly perfect food.*

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



Eugene Ormandy listens . . .

And Finds New Tonal Quality In Recordings Played By The Meissner

Listen to the majestic beauty of Beethoven . . . to the clear, full tone of each instrument in the hands of a virtuoso . . . to the inspired reading that comes only under the guiding hand of a great conductor . . .

This is a great orchestra . . . Eugene Ormandy himself is directing . . . yet the setting is not a concert hall but a spacious apartment . . . this performance is being reproduced from *records!*

Listen as each stirring crescendo brings the thrill that comes only from the sheer impact of beautifully blended sound . . . blood-tingling in its excitement . . . this is recorded music at its finest . . . this is the voice of the great new Meissner radio-phonograph.

Eugene Ormandy, the noted conductor of the Philadelphia Orchestra heard these same records played by the Meissner. "I had the feeling I was listening to a concert performance in the historic Academy of Music," he said. "I heard every detail of the Orchestra's performance with perfect clarity."

☆ ☆ ☆

You, too, will find new thrills in recorded music with postwar Meissner. The Meissner's Automatic Record Changer—playing *both* sides of any record in

sequence—will astound you with its mechanical perfection. The Meissner's AM, FM and Super Shortwave radio reception will enable you to hear the world's finest broadcasts.

Today, only one Meissner exists. Perfected before the war, it is now on loan to the high school of Mt. Carmel, Ill., the Meissner's home. When the services of Meissner are no longer required for war production, they will turn again to producing the great new Meissner that will introduce you to this new world of sound.

For tomorrow -
A NEW WORLD OF SOUND AT YOUR FINGER TIPS

MEISSNER

MANUFACTURING COMPANY - MT. CARMEL, ILL.

RADIO - PHONOGRAPH - RADAR - TELEVISION

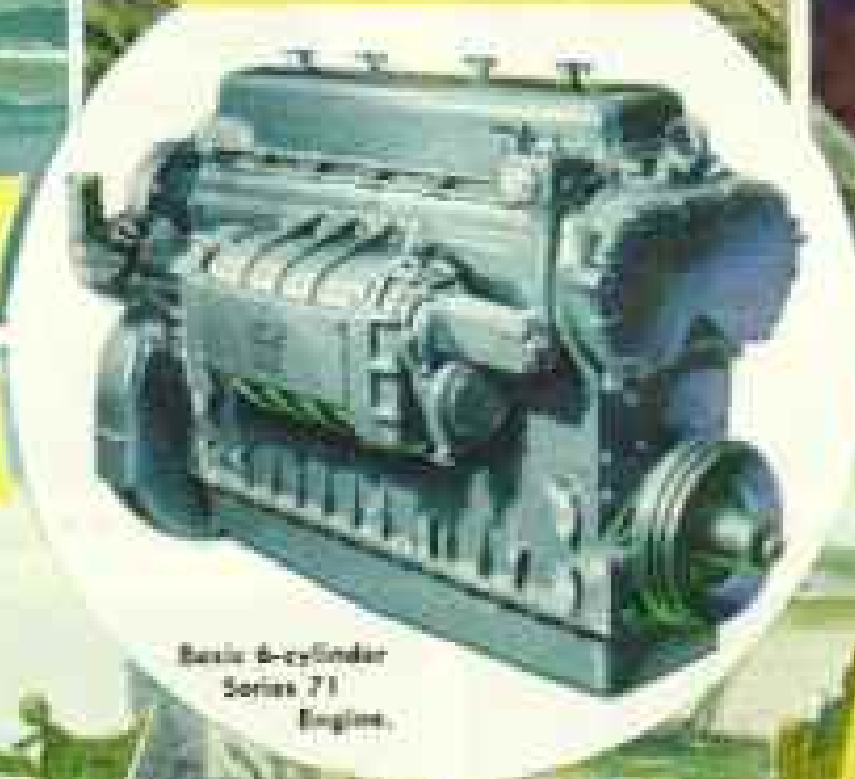


LCI powered by two Series 6-71 "Quad" Engines.

M-4 tank powered by Series 6-71 "Twin" Engines.

Portable Welder powered by 2-cylinder Series 71 Engine.

Army Shovel powered by 3-cylinder Series 71 Engine.



Basic 6-cylinder Series 71 Engine.

Tractor bulldozer powered by 6-cylinder Series 71 Engine.

THERE WHEN NEEDED

In addition to providing plenty of dependable power for the machines our fighting men use, this engine, because of its interchangeable parts, helps them keep everything on the move.

For example, a shell-torn shovel or tractor engine can be fixed with an engine part from a wrecked landing craft. A landing craft can keep going by picking up a part it needs from a disabled tank.

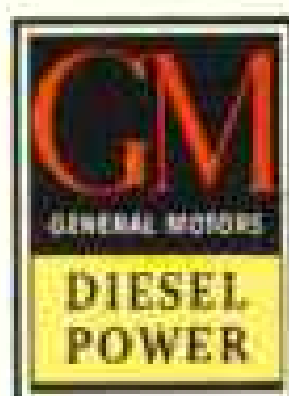
Every GM Series 71 engine, whether a two-cylinder or one of a "Quad" six, has the same bore and stroke, and most moving

parts from one engine will fit and work perfectly in any other.

This feature of interchangeability of parts in these engines will be equally important in peacetime. The elimination of *different* sizes of parallel parts increases the availability to owners of the right part *when it is needed*.

In construction, fishing, transportation and all through industry, these "Single," "Twin" or "Quad" GM Diesels will provide dependable, low-cost and *easily maintained power*.

KEEP AMERICA STRONG
BUY MORE WAR BONDS



TRUCK ENGINES... 1 1/2 to 200 H.P. } -- DETROIT DIESEL ENGINE DIVISION, Detroit 21, Mich.
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ENGINES... 100 to 2000 H.P. ... CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

LOCOMOTIVES ELECTRO-MOTIVE DIVISION, St. Louis, Mo.



Many wounded veterans going to general hospitals . . .



travel in regular Pullman sleeping cars.



This makes their trip as comfortable as possible, but . . .



sometimes makes it hard for others to get Pullman space!

There's the shift to the Pacific, too!

The pictures of the wounded men above—taken en route by permission of the War Department—help explain why the travel situation is more critical than ever.

But they tell only part of the story.

In addition to the many sleeping cars Pullman is privileged to provide to transport American wounded to hospitals in this country, many more cars are needed to carry out the greatest mass movement of troops in history. The need is increasing daily.

More than a million fighting men will cross

America this year. Many thousands of them will travel in Pullman comfort. Many will make side-trips home on furlough, too, before going "on to Tokyo."

So the military load on trains will probably be greater—for the next few months at least—than at any time since we have been at war!

If you have to take a trip—and should find it hard to get the Pullman space you want exactly when you want it—please remember that Pullman's war job isn't over, either!

PULLMAN

For more than 80 years, the greatest name in passenger transportation

BETTY HUTTON starring in *INCENDIARY BLONDE* a Paramount Picture in Technicolor.



Conventional Radio—locks color and richness. Something is missing.

With Radio by General Electric—you hear the tones in all their "natural color" and beauty, virtually free from static, fading and station interference.

More bewitching than ever — Betty Hutton in natural color tone on a great new radio

SHE'S dynamic—this merry madcap of song. Even more magnetic when you hear her vivid performance in the glorious natural color tone of the coming General Electric FM radio.

Breath-taking Realism

On this revolutionary radio you'll hear magic tones and overtones lost on even the best present day conventional sets. You'll listen enthralled to flawless reception unbelievably free from static, fading and station interference.

Everything in Radio and Television

This newest kind of radio is only one of the amazing models General Electric will offer someday soon at popular prices. There also will be

standard radios, radio-phonographs with a startling new system of tone reproduction, and the new revolutionary self-charging portable.

General Electric television receivers, too, with their large clear pictures, will set an entirely new standard in home entertainment.

FREE: A fascinating booklet, "YOUR COMING RADIO," 28 pages profusely illustrated in full color. Previews the revolutionary, new General Electric Radio and Television sets. For your free copy mail a postcard request to Electronics Department, General Electric, Schenectady, N. Y.

Hear the G-E radio programs: "The World Today" news, Monday through Friday, 6:45 p. m., EWT, CBS. "The G-E All-Girl Orchestra," Sunday 10 p. m., EWT, NBC. "The G-E House Party," Monday through Friday, 4 p. m., EWT, CBS.



GENERAL ELECTRIC

LEADER IN RADIO, TELEVISION AND ELECTRONICS

RADIOS

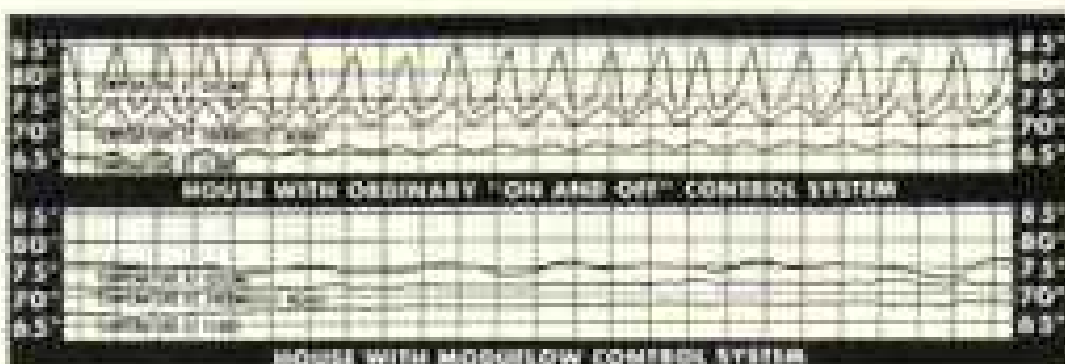
For long life and better reception ask for electronic radio tubes by General Electric.

IS YOUR CEILING 750 miles FROM YOUR FLOOR?

Believe it or not, there is probably greater difference between the temperature at the ceiling and floor of your house than there is between the average temperature of Chicago and Birmingham, Alabama — 750 miles farther South. For, in the average home or apartment, the temperature at the ceiling is often twenty degrees warmer than at the floor. (See chart below.) Unfortunately, the heat that rises to the ceiling is largely wasted, while the floor may be drafty and too cold for comfort or health.

But, Minneapolis-Honeywell has devised a remarkable new heating control system that will correct this situation. It is called MODUFLOW. By an ingenious method of heat control and supply, Moduflow nearly equalizes floor and ceiling temperatures; result, uniformly comfortable temperature from ceiling to floor.

Every home or apartment, however modest, can afford the greater comfort and efficiency of Moduflow. Mail the coupon today for free booklet that tells all about Moduflow.



See the difference
Shows above are actual temperature recordings taken in two identical houses — one with and one without Moduflow. Without Moduflow, temperature varies as much as

20 degrees from floor to ceiling. Moduflow smooths out the ups and downs of the ordinary system — uses heat formerly wasted at the ceiling to increase temperature at the floor.

MODUFLOW

The New HONEYWELL Heating Control System



Free! SEND FOR THIS BOOKLET

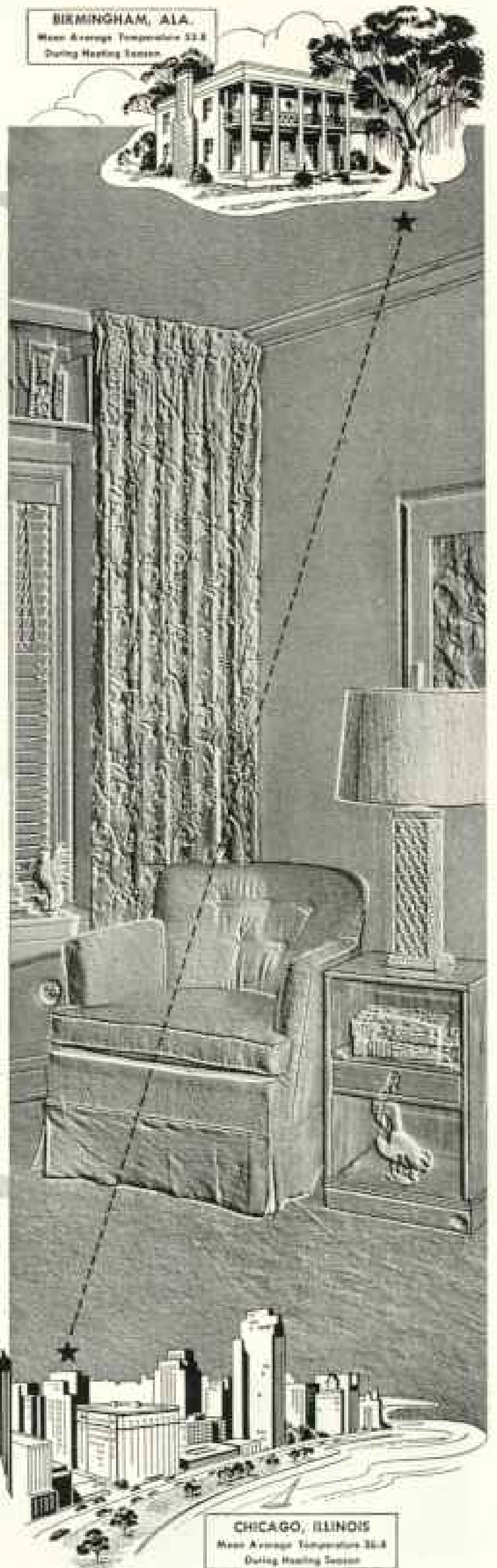
Minneapolis-Honeywell Regulator Co.
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Minneapolis 8, Minnesota
Please send my free copy of "Heating and Air Conditioning the Pasture Home"

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Finish the Fight — with War Bonds

Peacemakers

Peace in the Pacific can be achieved in only one way—by the unconditional surrender of Japan's military masters.

To shorten the road to victory, our leaders foresaw that we must do more than reconquer territory yard by yard and island by island. We must knock out the enemy's ability to make war. And to carry out that strategy they chose the Boeing B-29 as our major weapon.

Built, tested and flown into combat under the terrific pressure of global war, the Superfortresses are doing all that was expected of them and more.

They have enabled us to reduce American casualties and save precious months in striking enemy war production, because they are the only aircraft in the world that can cover the vast distances from bases in the Marianas.

In early operations before present island bases were secured, they transported their own supplies over the "Hump" from India into China. They have not only reduced the output of Japan's war industries by the steadily mounting tempo of their bombing but have taken a huge toll of the fighter planes sent against them.

And they have tightened the blockade on enemy ports by sowing mines.

The versatile efficiency of the Superforts reflects Boeing's unparalleled experience in designing and building four-engine aircraft, and it forecasts the same qualities in the great Boeing planes of the future.

The performance of the B-29 stems directly from Boeing principles of research, design, engineering and manufacture. After victory, as today, you can count on any airplane "Built by Boeing" to lead the way.

DESIGNERS OF THE B-29 SUPERFORTRESS • THE FLYING FORTRESS • THE NEW STRATOCRUISER
THE KAYDET TRAINER • THE STRATOLINER • PAN AMERICAN CLIPPERS

BOEING



Invitation

TO KEEP OUT!

Then as now aggression threatened the new world . . . but a bulwark was erected by bold James Monroe. On a cold December day in 1823, he set his hand to an immortal document declaring any attempt by European powers to extend their system to America was dangerous to our peace.

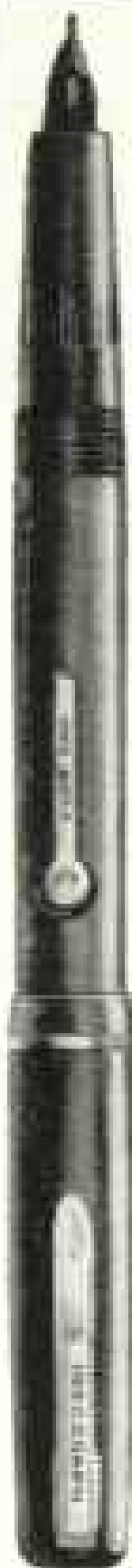
• The author of the Monroe doctrine wrote with quills . . . now patriots have better pens, Inkographs . . . smooth-flowing, with 14kt solid gold ball-like point . . . fits all hands and writing styles . . . writes with the ease of a soft lead pencil.

The needs of service men and women come first—so if your dealer is out of stock, please keep trying.

The name Inkograph on the barrel marks the genuine . . . Sorry, no mail orders—only dealers can supply you.

INK-O-GRAPH²

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Supreme in the arts of
public hospitality



The
WALDORF-ASTORIA

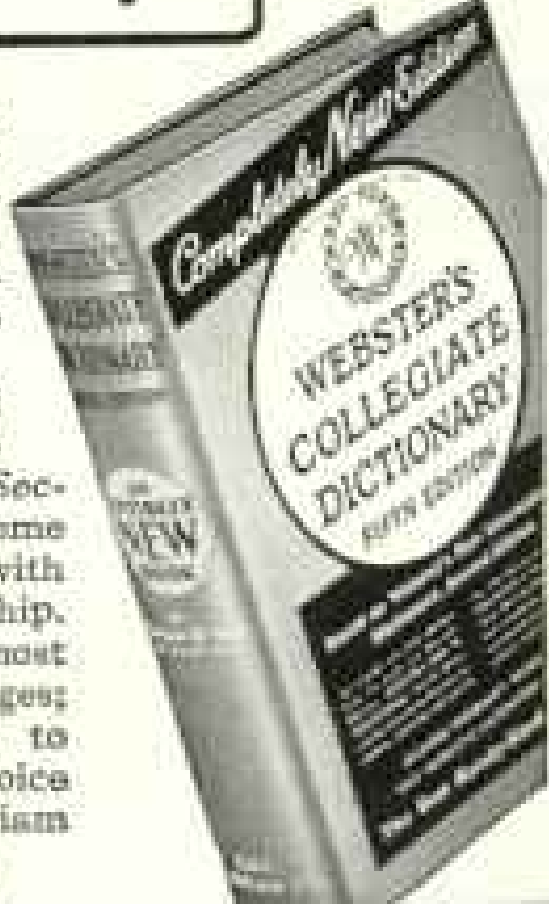
Park Avenue - 49th to 50th - New York

"I'm Waiting
for the BEST
Handy-Sized
Dictionary"

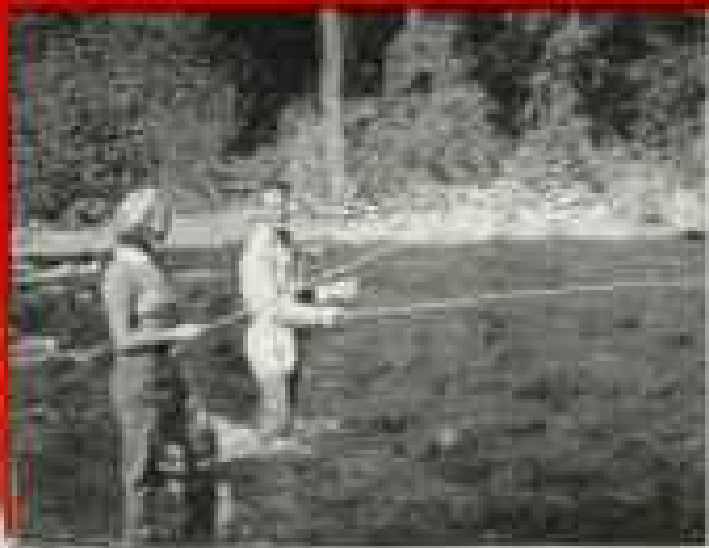
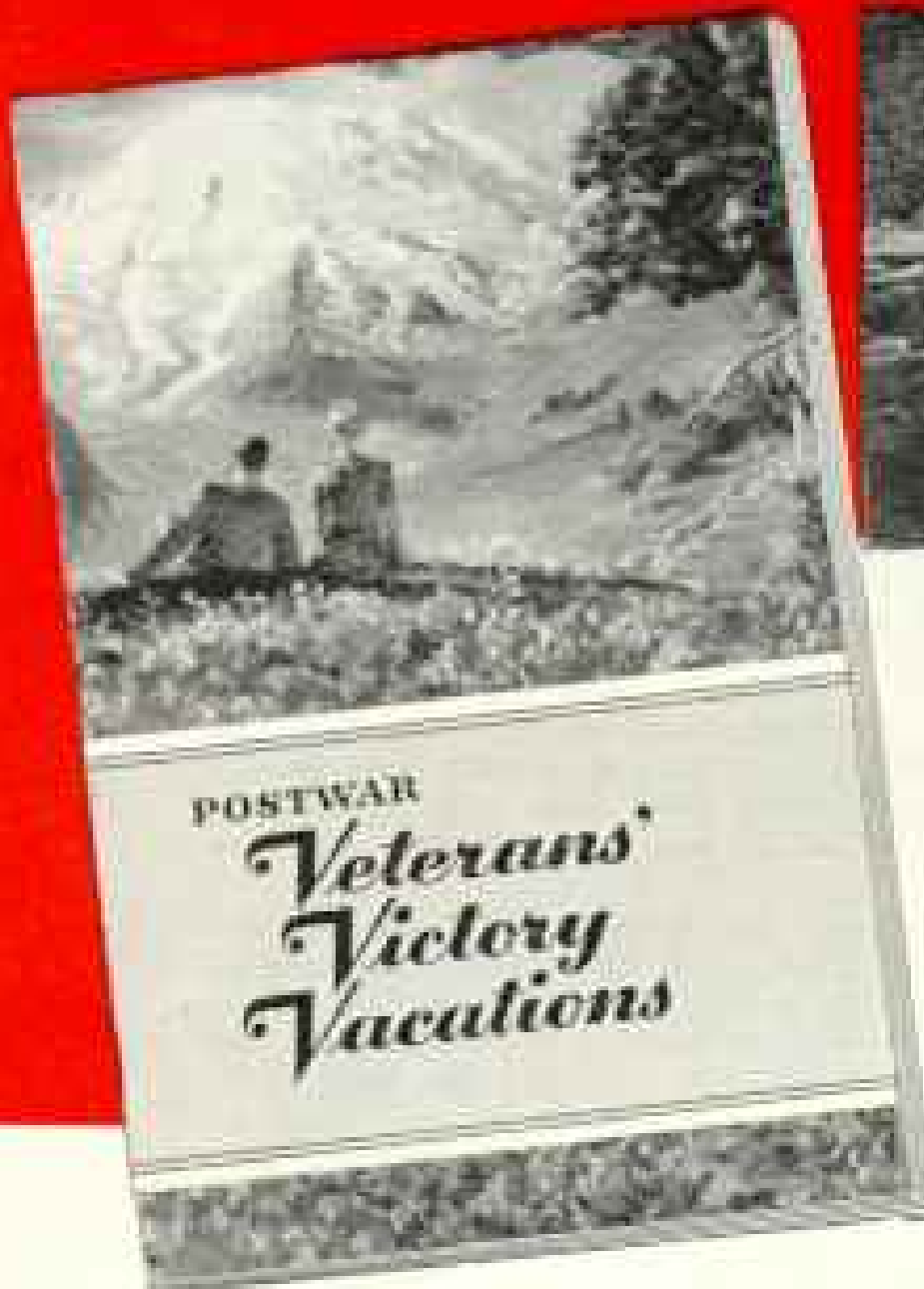


PAPER RATIONING, plus unprecedented demand, has made WEBSTER'S COLLEGIATE hard to get. But your bookseller will do his best to provide your copy!

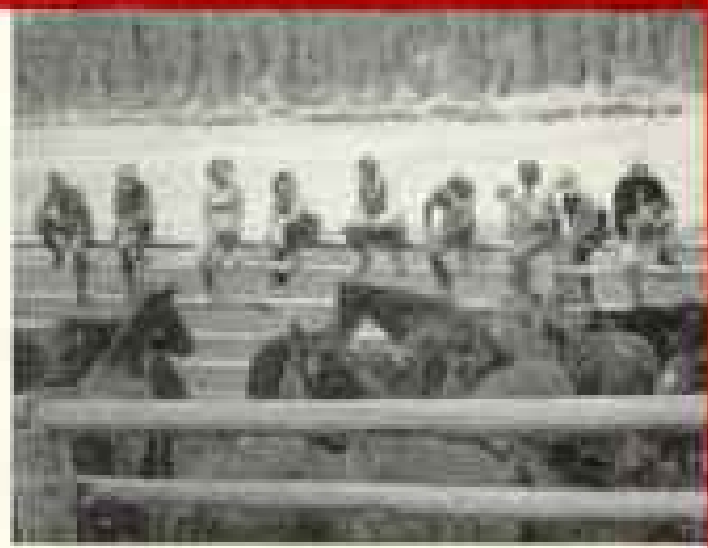
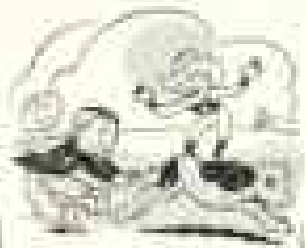
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WEBSTER'S COLLEGIATE
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As the war draws to a close, the millions of men and women in uniform who have served our country are being demobilized. Many of these veterans are returning home to find that the country has changed. They are looking for new places to live and work. This book is a guide to the West and Northwest, showing the many beautiful spots and city attractions that are available to them. It is a free book, prepared for members of the Armed Forces, either overseas or in the U.S.A.



The Milwaukee Road has prepared this book for you. It is a free book, prepared for members of the Armed Forces, either overseas or in the U.S.A. It is a guide to the West and Northwest, showing the many beautiful spots and city attractions that are available to them. It is a free book, prepared for members of the Armed Forces, either overseas or in the U.S.A.



★ ★ **FREE BOOK** ★ ★

PREPARED FOR MEMBERS OF THE **ARMED FORCES** EITHER OVERSEAS OR IN THE U.S.A.

With words and pictures it takes you through the West and Northwest.



Also free to relatives and friends of service men. 76 pages, pocket size.

GET this profusely illustrated, different kind of travel book. It's dedicated to soldiers, sailors, marines, coast guardsmen, merchant seamen . . . to all men and women in uniform. It's about America's Western Vacationlands which after V-J Day will be ready to entertain as quickly as demobilization makes transportation and "help" available.

talked to, see in postwar vacation tours of the U. S. A. an opportunity to look around for a new place to work and live. The idea of veterans relocating is not overlooked.

A few of the high lights . . . Yellowstone Park, Dude Ranches, Mt. Rainier, Olympic Peninsula, Puget Sound Country, the Black Hills and North Woods regions . . . hunting and fishing spots . . . city attractions.

The book is also available, free, to mothers, wives, relatives and friends of service people. As possible participants in Veterans' Victory Vacation Tours, they may be interested in looking it over and then forwarding it to *their* men or women in uniform. Or send us names and addresses of those in service and we'll send direct to them.

You'll enjoy this interesting, easy-to-read book about places to go and things to do and see when you get there. Just leafing through the pages will give you a boost . . . and a thought for tomorrow that may find fulfillment on some not too distant day.

Fill in and mail the coupon below or address us on a penny post card.

For you who are definitely considering a Victory Vacation Tour as a happy means of reconverting to civilian life some approximate overall costs are quoted — on a prewar basis, of course. Servicemen we have

Mail this coupon for free Travel Book

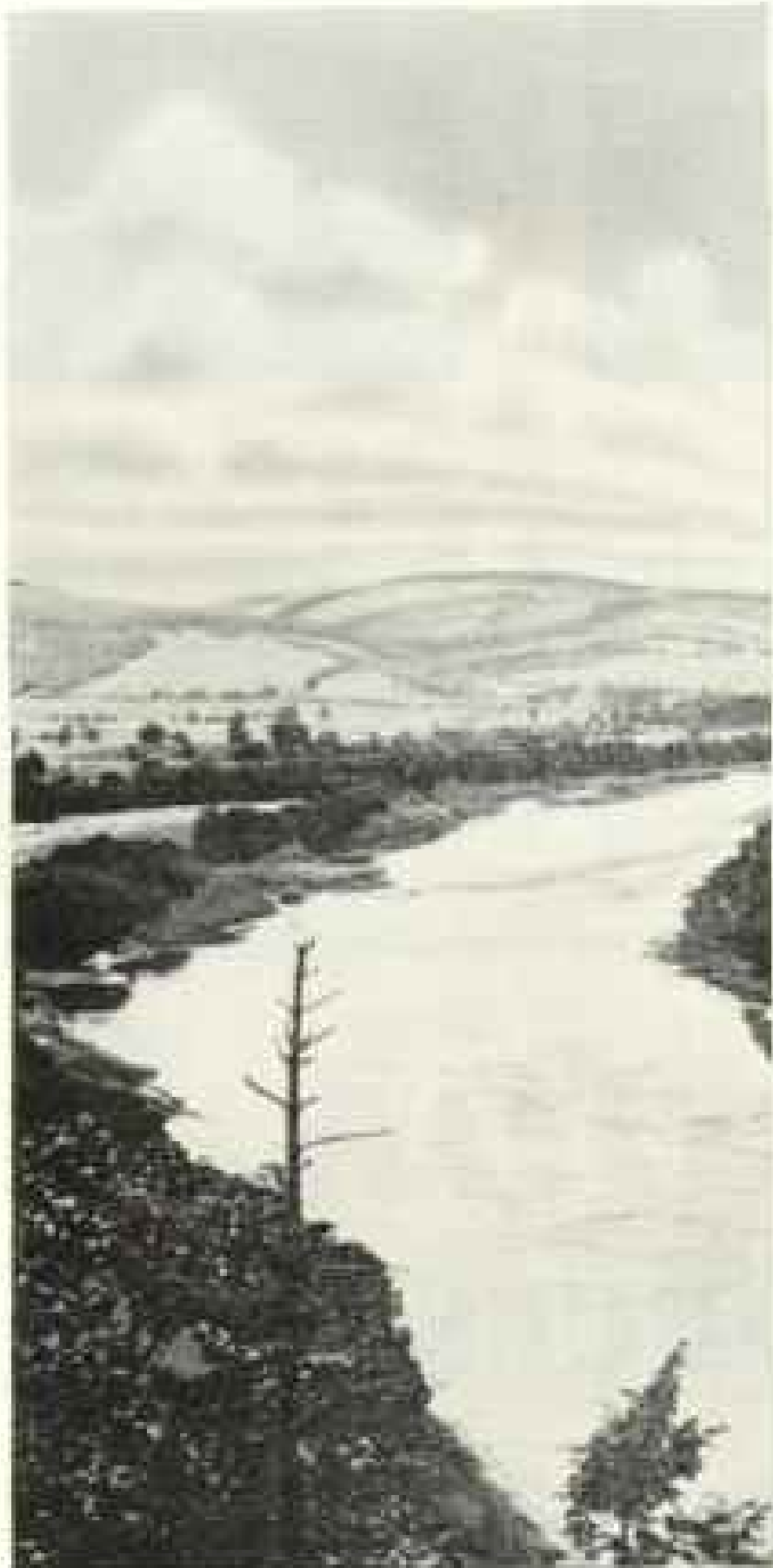
E. N. HICKS, Passenger Traffic Manager
The Milwaukee Road, 712 Union Station, Chicago 6, Ill., U. S. A.
Please send free, without any obligation, 76-page illustrated book "Postwar Veterans' Victory Vacations."

Name _____
Address _____

★ **THE MILWAUKEE ROAD** ★

11,000-mile supply line for war and home fronts

DO NOT TRAVEL NOW UNLESS YOUR TRIP IS NECESSARY



PENNSYLVANIA'S RIVERS ARE PICTURESQUE!

THEY have been highways for civilization. Their names sing the story of history... trade... beauty. The Allegheny, the Monongahela, the Susquehanna, the Delaware, the Schuylkill, the Juniata, the Beaver, the Lehigh and others.

Great cities... small towns... gigantic industrial plants... fertile farms are located along them. Large areas are preserved especially for relaxation and recreation.

Pennsylvania has 264 square miles of waters that flow through mountains and valleys. You will want to see them when peace comes.

For information about your post-war vacation write to the Dept. of Commerce, Harrisburg, Dept. N-3.



Pennsylvania Department of Commerce 



"Fortitude", they call it in men... and the same goes for machines, too! In rain, mud, snow and ice... VICTOR can take it. Letters from G. I.'s the world over attest this. One letter specifically states, "Victor is the one projector that can take the beating."

Such performance and stamina isn't just happenstance... it's the result of 22 years' experience. Victor started to build "stoutness" into its 16mm equipment on that day when A. F. Victor produced the first Victor projector and led the way in its practical application for teaching in schools and churches... speeding production in Industry and training and entertaining the Military. Yes, Victor Equipment is truly 16mm Magic!



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*Ask your dealer for proof of
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Hallicrafters will again assume its position of leadership in the field of peace time communications — with equipment especially designed to give new standards of transmitting and receiving performance on land, at sea or in the air. Communications receivers and transmitters for amateur and commercial use; two way radio telephones for marine and aviation use *plus* the finest kind of new equipment for further experiment and research at very high frequencies will all be included in Hallicrafters postwar production plans.

hallicrafters RADIO

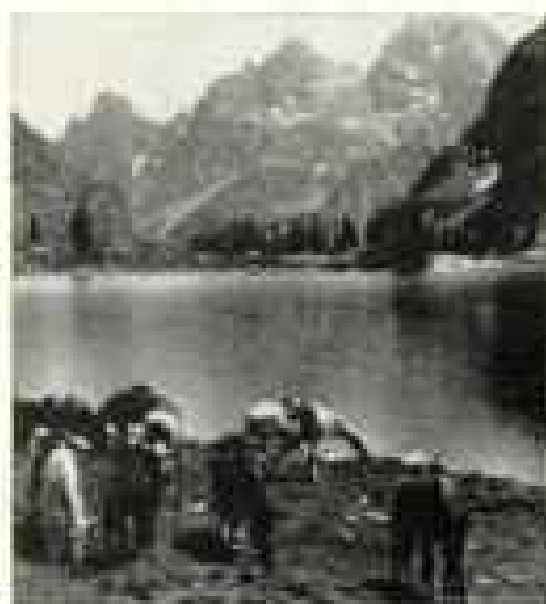
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MANUFACTURERS OF SHORT WAVE RADIO COMMUNICATIONS EQUIPMENT, CHICAGO 16, U.S.A.



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Look Ahead! to the Joys of a Dude Ranch Vacation in **WONDERFUL WYOMING**



Rest and Relax from wartime manual and mental toil—fit yourself to meet the many problems of today and tomorrow—in Wonderful Wyoming's vast, healthful, invigorating "open spaces." For details about Wyoming's recreational and scenic attractions, its numerous agricultural, livestock raising, industrial and other business opportunities, address George O. Houser, Mgr., WYOMING DEPT. OF COMMERCE & INDUSTRY, 205 Capitol Bldg., CHEYENNE.



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Tropical*
DRY BATTERIES

Originally developed by Mallory for the United States Army Signal Corps. When peace arrives, this radically different battery will have great advantages for civilian use. Now, output is confined to war needs.

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**It's Different
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Lavoris does not depend upon high-powered germicidal agents; but coagulates, detaches and removes objectionable matter, without injury to delicate tissues.

"Buy U. S. War Bonds—They Identify You"

"Which way will I live longer?"



OVERWEIGHT and long life are not apt to go together.

In fact, the death rate of people who are as much as 20% overweight is appreciably higher than average!

It is astonishing how gradually overweight can creep up on you. Don't let it! Excessive fat places a burden on more than your two feet; in fact, it is frequently a contributory factor to high blood pressure. It makes your heart, kidneys, lungs, liver, and arteries work harder *all the time*. It tends to increase your chances of developing diseases of these organs—and diabetes, too!

Obesity is usually caused by eating more food than the body can use up. Most of the excess is simply stored up as fatty tissue unless it is burned off in work or play. In other words, too much food and not enough exercise generally makes you fat.

Occasionally, of course, excessive weight is due to a glandular disturbance, which requires expert medical attention for correction or control. But when you plan to "reduce," start by having your doctor examine you anyway. He'll advise you whether or not you *should* take off weight.

Your doctor will tell you how to develop a safe,

sane, and practical reducing program that will help you avoid the harmful effects which sometimes accompany too stringent a diet or too violent exercise. And never use so-called "reducing drugs" except on his recommendation.

If you are past 30 and somewhat overweight, there is no better time than now to get yourself in fighting trim. After this age it becomes increasingly advisable to keep your weight down—even to stay slightly *underweight*. Once you're over 30 it becomes more difficult to take off overweight.

Youngsters—particularly girls in their teens—should be especially careful not to undermine their health on risky "health" diets.

If you are interested in watching your weight, send for Metropolitan's free booklet, 95N, "Overweight and Underweight."

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Metropolitan Life Insurance Company

(A MUTUAL COMPANY)

Frederick H. Ecker, CHAIRMAN OF THE BOARD

Larry A. Lincoln, PRESIDENT

1 MADISON AVENUE, NEW YORK 10, N. Y.





The caterpillar who pretends he's been eaten

THE caterpillar of a West African moth (*Nyctemera apicalis*) is an extraordinary artist when it comes to mimicry.

Like many of his cousins, he has dangerous parasitic enemies.

It is the habit of these parasites to bore through the side of a cocoon and lay their eggs in the body of the caterpillar.

When the caterpillar is full-grown, the parasitic larvae devour him. Then they bore their way out of his cocoon and spin clusters of tiny, froth-like cocoons for themselves on the outside.

So the *Nyctemera* caterpillar goes to considerable trouble to prevent these enemies from breaking into his house.

When he spins his cocoon, he also produces from his body a series of frothy, cream-colored bubbles. As each is formed, he winds a few strands of silk around it, drags it off, and attaches it to the outside of his cocoon.

When his house is complete, the tiny bubbles clustered on it are an exact replica of cocoon clusters made by the invading parasite. Thus

the caterpillar attempts to make his home secure by pretending that it has already been invaded. But if this unique delusion fails, he has no way to protect himself from disaster.

Now man also goes to a lot of trouble to secure his home against housebreakers, not because they're so apt to endanger his life, but because they steal his possessions and destroy his property.

But when, as sometimes happens, the most careful precautions fail, man is better off than the caterpillar. For he can provide a further protection for himself. That protection is insurance. And theft insurance will help to pay the loss and damage that may be suffered.

A Travelers representative will provide you with this form of insurance. If you are already covered he can examine your policy to see that it is up to date.

MORAL: Insure in The Travelers. All forms of insurance and surety bonds. The Travelers Insurance Company, The Travelers Indemnity Company, The Travelers Fire Insurance Company, Hartford, Connecticut.

FOR CREATING GOOD IMPRESSIONS !

These are the pens and pencils that are going to the men and women in the Services overseas. Quantities available for civilians are very limited.

Sheaffer's new, completely-redesigned pens and pencils create good impressions—on all who see them, on all who own them . . . and on all writing papers! Their new beauty is obvious . . . but, more important, this beauty is entirely functional! New features—from stronger, better-writing points to improved clips; from better streamlined balance to matchless mechanisms, from microscopic, precision measurements to visible fluid supply—contribute to greatest durability, utility and pride of ownership!

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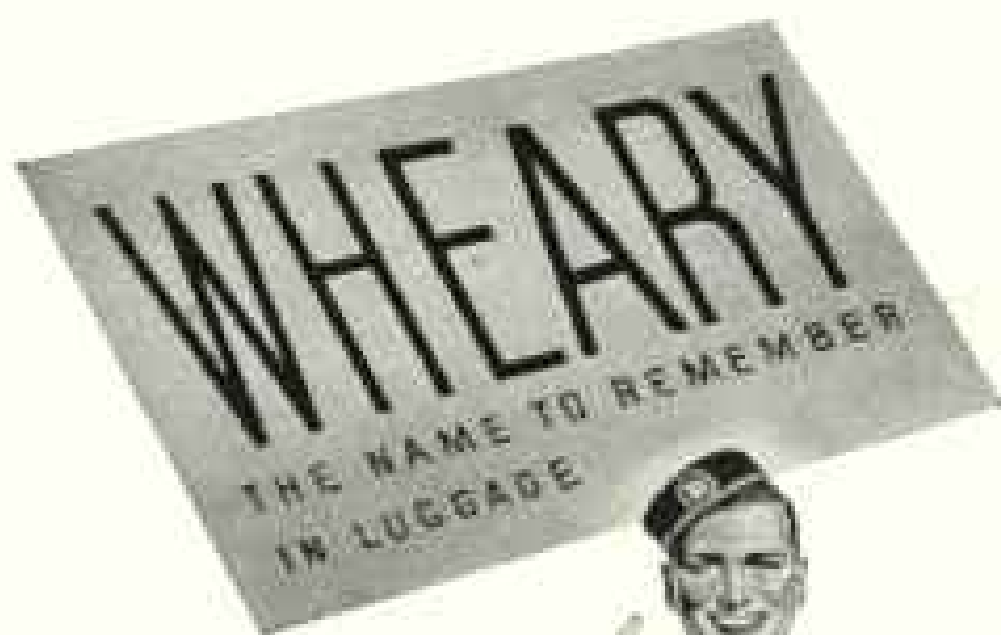


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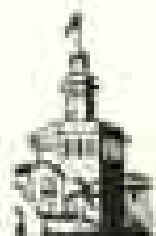
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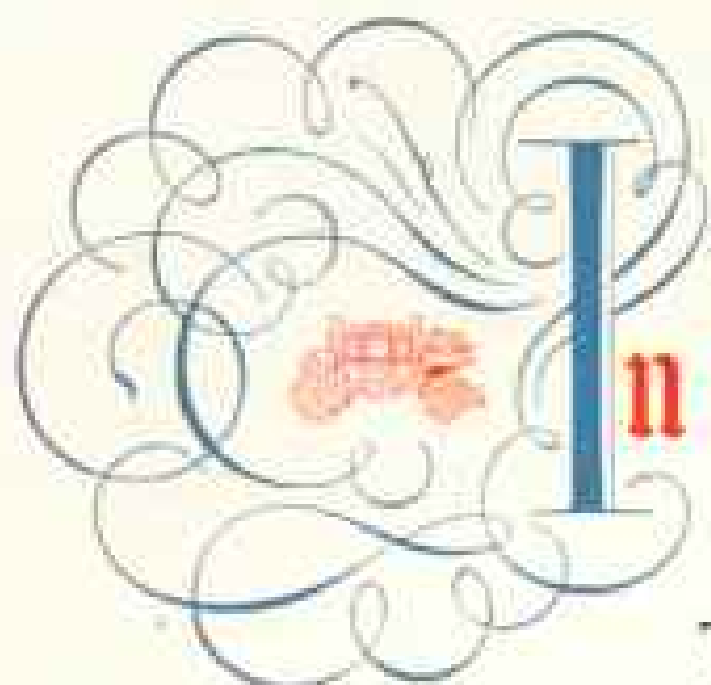
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