

VOLUME LXVII

NUMBER FIVE

THE NATIONAL GEOGRAPHIC MAGAZINE

MAY, 1935



TWENTY-FOUR PAGES OF ILLUSTRATIONS IN FULL COLOR

Maine, the Outpost State

With 35 Illustrations and Map

GEORGE OTIS SMITH

Pine-Scented, Harbor-Dented Maine

39 Natural Color Photographs

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My Flight from Hawaii

With 4 Illustrations

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Life in a Norway Valley

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Tuatara, a "Living Fossil" of New Zealand

With 15 Illustrations

FRIEDA COBB BLANCHARD

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
HUBBARD MEMORIAL HALL
WASHINGTON, D.C.

\$3.50 A YEAR

50c THE COPY



MAINE, THE OUTPOST STATE

Some Forgotten Incidents in the Life of an Old and Stout-Hearted Commonwealth

BY GEORGE OTIS SMITH

THE general use of "State of" as an honorary prefix to "Maine" has been termed the hallmark of Maine folk, who also prefer when in distant parts the title, "State-of-Mainers." This emphasis put upon "State" is the significant vestige of the long conflict for independence from Massachusetts; too long the governmental unit had been the District of Maine.

The name of the State itself may or may not be French; it certainly is not Indian, like Massachusetts or Connecticut. Of the sixteen counties, five recall the mother country, being named for English shires; five others honor American personages of the colonial or Revolutionary periods, and the remaining six retain the Indian names of the rivers within their borders.

As for the other names which have received specific legislative sanction for something over 400 cities, towns, and townships, the larger part are simply descriptive, or repetitions of towns in other New England States. Of the rest, so far as the origin of their names is known, 66 bear Old World names, so that in that delightful tale by Laura E. Richards, "Narcissa, or The Road to Rome," the roadside signpost might have pointed to Vienna, Belgrade, or even China, and kept within the jurisdiction of the County of Kennebec.

Proprietors and first settlers are known to have given their names to 58 towns; governors, generals, and presidents to 16, 12, and 6 towns, respectively; while Indian

names, which so plainly tell their own origin, number only 23.

An interesting touch of idealism was the selection of such distinctive town names as Harmony, Amity, and Hope; Freedom, Liberty, and Unity, these last three being neighbors in Waldo County.

THE THREE F'S

From the beginning the economic life of Maine was founded on fish, fur, and forest. These three furnished powerful incentives for exploration and the chief rewards for settlement.

The fisheries of the Gulf of Maine were even an issue between King and Parliament early in the 17th century, when the English fishermen won their fight for free fishing along the Maine coast, despite the monopoly granted by James I in his patent to the Council of New England.

So it came that the earliest sites of permanent settlements were chosen not for mildness of climate, but by reason of proximity to the cold waters where dwelt the fish that could be converted into a profitable export, without license fee being paid to any patentees of the Crown.

The fisheries continue a major industry. The value of the State's fishing products as marketed approximates six million dollars, the two largest items being the plebeian herring and the aristocratic lobster.

Along with the ancient business of fishing a place must be given to the popular



Photograph by B. Anthony Stewart

A SHADED WALK WINDS BY COLONIAL HOMES IN WISCASSET

From this little coast town, in 1925, the MacMillan Arctic Expedition sailed aboard the *Bowdoin* and *Peary* for Etah, Greenland. Sponsored by the National Geographic Society and the U. S. Navy, its personnel included a young naval officer, Lieut. Comdr. Richard E. Byrd, Jr., who was to make his first air flights over icy regions of the far north.

sport of angling, for which Maine offers unsurpassed inducements, in the lakes and streams and also offshore (see Color Plates IX and XIV).

Last year 35,000 fishermen and fisherwomen from outside the State, and nearly five times that number of residents, obtained licenses. The fees received went directly to hatching, planting, and protecting a new crop of game fish.

The State maintains 36 fish hatcheries and rearing stations, and from these last year went 17 million trout, togue, and salmon for stocking the brooks, streams, and lakes. Nearly half of these "planted" fish

were above legal size, and 10,000 weighed from 3 to 6 pounds each.

The policy of protecting wild life is enforced by a corps of 100 game wardens, who seek to be big brothers to the youth of the State in training them to be good sportsmen. In the severe winter of 1934, airplanes were used to locate deer yards and then cedar trees were cut to feed the starving deer confined there by the deep snow.

Moose are far from being extinct. They can be shot only with a camera; but deer continue plentiful, 18,933 having been killed legally in 1933. More bears are killed in Maine than in any three other States. Grouse, woodcock, and ducks complete the game offering, with pheasants promised as a future attraction.

"AFFRIGHTABLE"
COAST; FERTILE
PLAINS

As early as 1605 Capt. George Waymouth and his companions on the *Archangel*

—many of them world travelers for that day—were deeply stirred by their first views of a Maine river which the captain named St. George's (now St. George).

An exploratory trip inland "toward the great mountains," the Camden hills, convinced them of the "beauty and goodness" of the land, as recorded by Rosier in his *True Relation* of that "most prosperous voyage." And the author boldly affirmed St. George's "to be the most rich, beautiful, large and secure harboring river that the world affordeth."

A few years later (1614), Capt. John Smith was less attracted by this eastern

part of the region he named New England. Yet he saw fit to say of this coast, "Those barren Iles so furnished with good woods, springs, fruits, fish and foule, that it makes me think though the coast be rocky, and thus affrightable, the valleys, plains and interior parts may well (notwithstanding) be very fertile."

So moderate a statement must have been exceeded by other testimony of that day, since only a dozen years later another explorer on the Maine coast, Capt. Christopher Levett, a member of the Council of New England, felt it necessary to "debunk" certain other travelogues, not preserved for the modern reader. In reporting on his voyage of 1623-4, he remarks: "Nor will the Deare come when they are called, or stand still and looke on a man, untill he shute him, not knowing a man from a beast, nor the fish leape into the kettle."

And he continues: "But certainly there is fowle, Deare, and Fish enough for the taking if men be dilligent," which equally well describes the Maine of 1623 and 1935.

The discovery of this part of the North Atlantic shore is usually credited to John Cabot, of Bristol, on his second voyage in 1498.

The honor of making the first detailed contributions to accurate geographic knowledge of Maine must, however, be shared by a Frenchman and an Englishman: Samuel de Champlain and the aforementioned Captain Waymouth.

In 1605 both Champlain and Waymouth were sailing along the Maine coast. So near did they come to meeting that in mid-



Photograph by B. Anthony Stewart

COLBY'S CHAPEL IS A MEMORIAL TO ITS CIVIL WAR DEAD

This coeducational institution at Waterville, chartered in 1813, is, after Bowdoin, the oldest college in Maine (see text, page 590). Among its alumni have been 39 college presidents, six of whom founded other schools of higher learning. The author is an alumnus of this college.

summer Champlain heard from an Indian chief on the Kennebec of the presence of an English ship ten leagues to the eastward, which was undoubtedly Captain Waymouth's *Archangel*.

The race was on between the French and the English; and the Maine region was destined to be eventful borderland for a century and a half in the contest for control between New England and New France.

FIRST SETTLEMENT WAS FRENCH

The first settlement in Maine was made by Sieur de Monts, who in 1603 had obtained from the King of France a trading concession for Acadia, then defined as



Photograph by Joseph Caburn Smith

YARDING LOGS IN THE MAINE WOODS DEMANDS STAMINA

Zero weather and heavy snows handicap the draft horses and woodsmen as they drag pine and spruce to places more accessible to tractors. Standing small trees indicate that the State observes a reforestation program lest its wild lands become too quickly denuded (see text, page 578).



Photograph by Walter M. Edwards

A WATER CHUTE PLUNGES A MODERN MERMAID INTO HIGHLAND LAKE

Vacationists at this inland town of Bridgton, set amid sparkling waters and rugged mountains, are thrilled by a hurtling ride down the runway.



Photograph by H. Anthony Stewart

THE GOVERNOR'S MANSION WAS ONCE THE HOME OF JAMES G. BLAINE

Harriet Blaine Beale, daughter of the Maine statesman, gave this old colonial dwelling in Augusta to the State as a residence for its chief executive. Surrounded by attractive gardens laden with carefully tended rhododendrons, it stands close by the Statehouse (see Plate IV). Among its treasures is a silver service salvaged from the battleship *Maine* after it had been raised from the bottom of Habana Harbor.

extending from Cape Breton Island to the latitude of Philadelphia. With Champlain as his lieutenant, De Monts set sail for the New World fully equipped for his colonization venture.

Some three months later, on June 26, 1604, a small island in a sheltered river was selected as best adapted for a fortified settlement and trading post. This island was named Saint Croix and was not far above where the river now bearing the same name empties into Passamaquoddy Bay. Here, on what is now also known as Dochet Island, was erected a group of dwellings in part built of timber brought from France, with a storehouse, dining hall, kitchen, and blacksmith shop. Gardens were laid out, all carefully planned by Champlain.

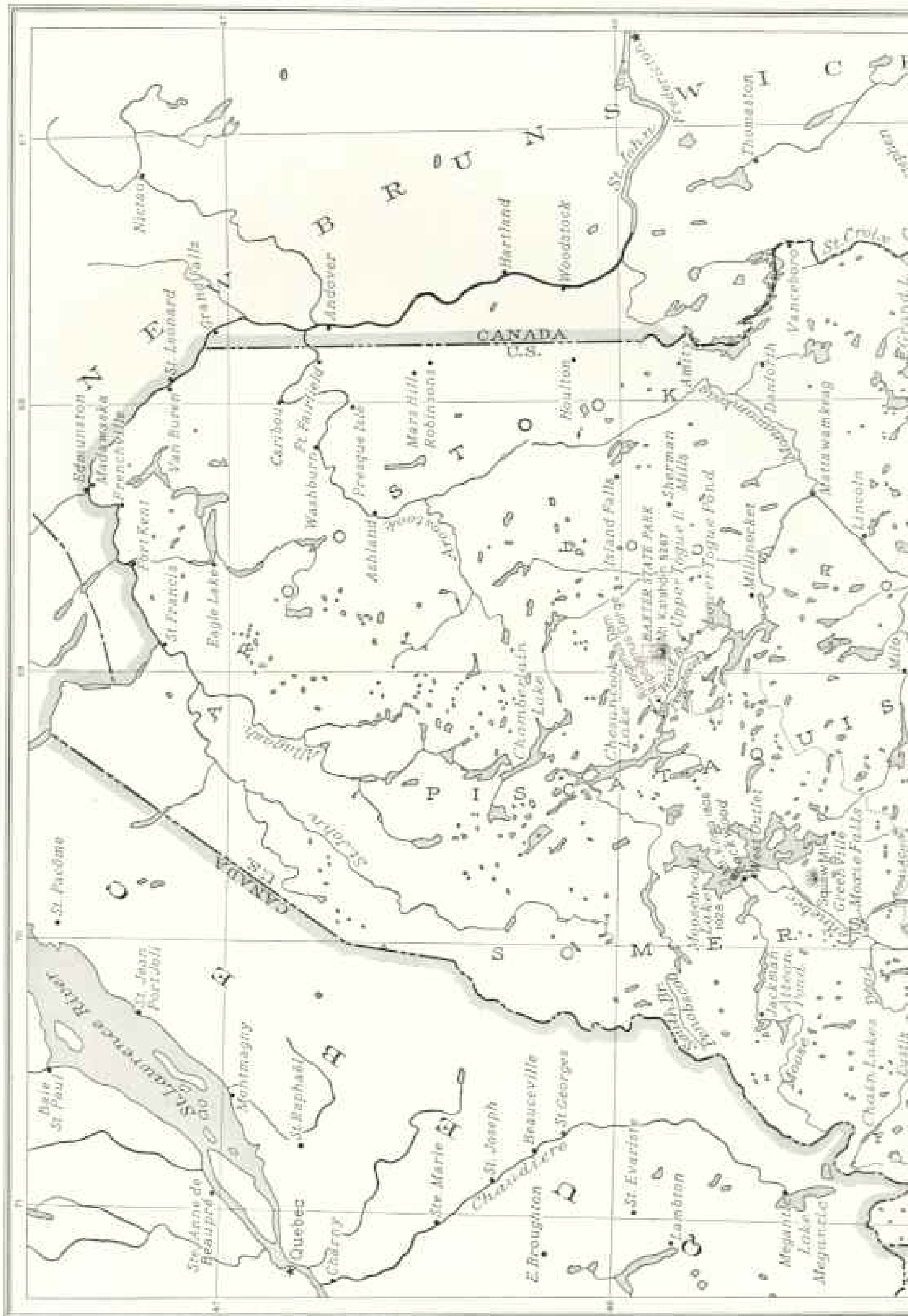
The community of seventy-nine included both a minister and a priest, as the Huguenot De Monts and the Catholic Champlain thought they were founding a colony where there would be religious liberty. But the opposition of Nature on one side of the Atlantic, and that of jealous enemies on the other

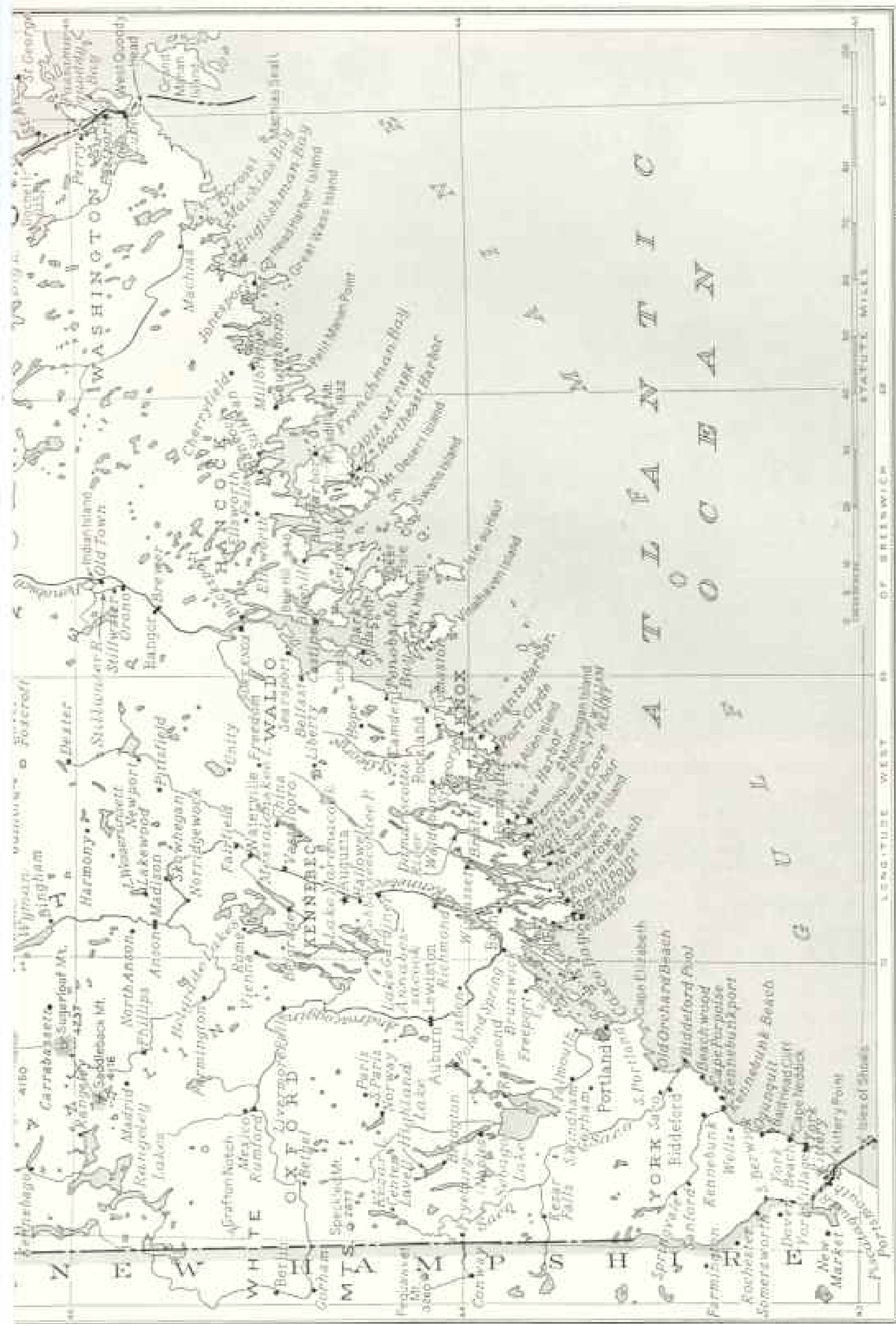
defeated De Monts' high purpose of giving France the lead in the race for empire.

An exceptionally long and severe winter exposed the newcomers to scurvy, nearly one-half perishing before the belated spring brought relief. To escape another such winter De Monts and Champlain sailed down the coast even beyond Cape Cod seeking in vain "a place better adapted for an abode." On their return, in August, the little company was moved to found Port Royal in Nova Scotia, now Annapolis Royal. Two years later the revocation of De Monts' fur monopoly caused the abandonment of this colony.

The site of this earliest but short-lived settlement in Maine, which antedated Jamestown, Quebec, and Plymouth, was not wholly obliterated.

In 1606 Champlain found some plants still growing in the gardens he had laid out; four years later another of De Monts' associates visited the site and offered prayers for the dead. The next year a French trading expedition wintered there, but in





ONE-TENTH SUBMERGED, THREE-FOURTHS CARPETED BY FORESTS, AND LASHED BY THE ATLANTIC, MAINE IS A RUGGED VASSAL OF NATURE

Drawn by Newman Barnstead



STILLWATER RIVER FLOWS LANGUIDLY BY HALLS OF LEARNING AT ORONO

Youngest and largest of the colleges in the State is the University of Maine (see text, page 590). In the foreground is the agricultural school; beyond the college buildings are the stadium and athletic field. Where an old covered bridge crosses the river are clustered the dwellings of Stillwater. From this university, in 1907, was graduated Albert W. Stevens, now planning a second flight into the stratosphere for the U. S. Army Air Corps and the National Geographic Society.

1613 an expedition from Virginia destroyed the deserted buildings. Nearly two centuries later these ruins played their part in international affairs and helped to save the District of Maine to the United States of America (see page 548).

HOW MAINE HELPED THE PILGRIMS

In a speech in Congress 100 years after statehood was granted to Maine, Representative Robert Luce of Massachusetts, himself Maine born, remarked that Maine might more fittingly be called the older sister of Massachusetts than her daughter. And the records of early settlement and trade well bear out this contention, even though it shatters the faith of those who have long believed in the motherhood tradition.

On Capt. John Smith's map of New England of 1614, for example, the site which is now York was named Boston, thus locating in Maine, so far as maps go, the first New World Boston—and all this before the Pilgrims even landed!

When the Pilgrims set foot on Plymouth Rock, not a few Englishmen had already been sojourning on the Maine coast and even had wintered there. The welcome of the Indian sachem Samoset was in the Pilgrims' own tongue, learned from the fishermen on the Maine coast. Indeed, thirteen years before, in 1607, the Popham colonists built a fort in "that northern colony" which mounted 12 pieces of ordnance. They also erected a church and launched a 30-ton vessel—a fine record of English piety and preparedness.



FORT KNOX OCCUPIES A GIBRALTAR ON THE PENOBSCOT RIVER

When war with Great Britain seemed imminent as a result of the northeast boundary dispute in 1839, this site was chosen for one of several forts to be thrown up along the line of defense. The threatened "Aroostook War" was averted by an amicable agreement. The fortification, however, was built, and named for Maj. Gen. Henry Knox. Today it is a part of a State park (see text, page 359).

The economic position of the Province of Maine in those first years of New England colonization was shown in the two notable "relief and recovery" measures taken in aid of the Plymouth Colony.

When in their second year the Pilgrims were in sore need of relief, there was no governmental organization to appeal to—Chief Samoset was the nearest approach to an Uncle Sam; so the Pilgrim Fathers had to send an expedition to the Maine coast, where food supplies were obtained as a gift from the fishermen who made their headquarters in the vicinity of Monhegan Island.

And a handsome tribute was paid by Edward Winslow, later Governor of Plymouth Colony, to the generosity of the masters of the English fishing vessels who gave

"what they could freely . . . provoking one another to the utmost of their abilities."

The other recovery measure of 300 years ago had to do with the liquidation of the foreign indebtedness of the *Mayflower* Pilgrims. The expenses of that voyage had been underwritten by a syndicate of London business men, appropriately referred to as the Adventurers. The region selected by the Pilgrims proved not sufficiently productive to provide any surplus for export, so trading with the Indians for furs became necessary.

To build up a profitable trading monopoly the Pilgrims obtained a patent for a tract of land along the Kennebec River, and a trading station was established at Cushenoc, the site of Augusta. This commercial venture became so successful that



Photograph by B. Anthony Stewart.

DEATH UNITED TWO HEROES WHO FOUGHT TO A FINISH OFF PORTLAND

The British brig *Boxer* and the American *Enterprise*, drifting on a calm sea, loosed broadsides at each other in an engagement of the War of 1812. Only when the *Boxer* was completely wrecked did its gallant crew strike their colors. The English captain, Samuel Blyth, killed during the first broadside, was buried in this Portland cemetery beside his 28-year-old adversary, Capt. William Burrows, mortally wounded in the same battle.

the indebtedness to the London merchants was fully paid with furs shipped to the agents in England. Contributing greatly to the profits of the Pilgrim traders was the use of wampum beads as currency, at that time an innovation with Maine Indians and therefore in demand.

Thus it was that the Kennebec country 300 years ago made possible the financial recovery of the Pilgrims, the one-way tickets for that *Mayflower* expedition of 1620 being eventually paid for with Maine beaver and otter skins.

THE PROVINCE OF MAINE

In the matter of a legal name, furthermore, Maine had several years priority. The "Province of Maine" was granted by the Council of New England to Sir Ferdinando Gorges and Capt. John Mason in 1622, whereas the date of the royal charter to the Company of Massachusetts Bay was March 4, 1629. So it happens that Florida, Virginia, California, New Mexico, and Maine all antedate Massachusetts as State names.

At first the Province of Maine extended from the Merrimack River to the Sagadahoc, now the Kennebec, but on November 7, 1629, by an amicable division, Captain Mason received the territory between the Merrimack and the Piscataqua Rivers, and with the consent of the council gave to his portion the name of New Hampshire.

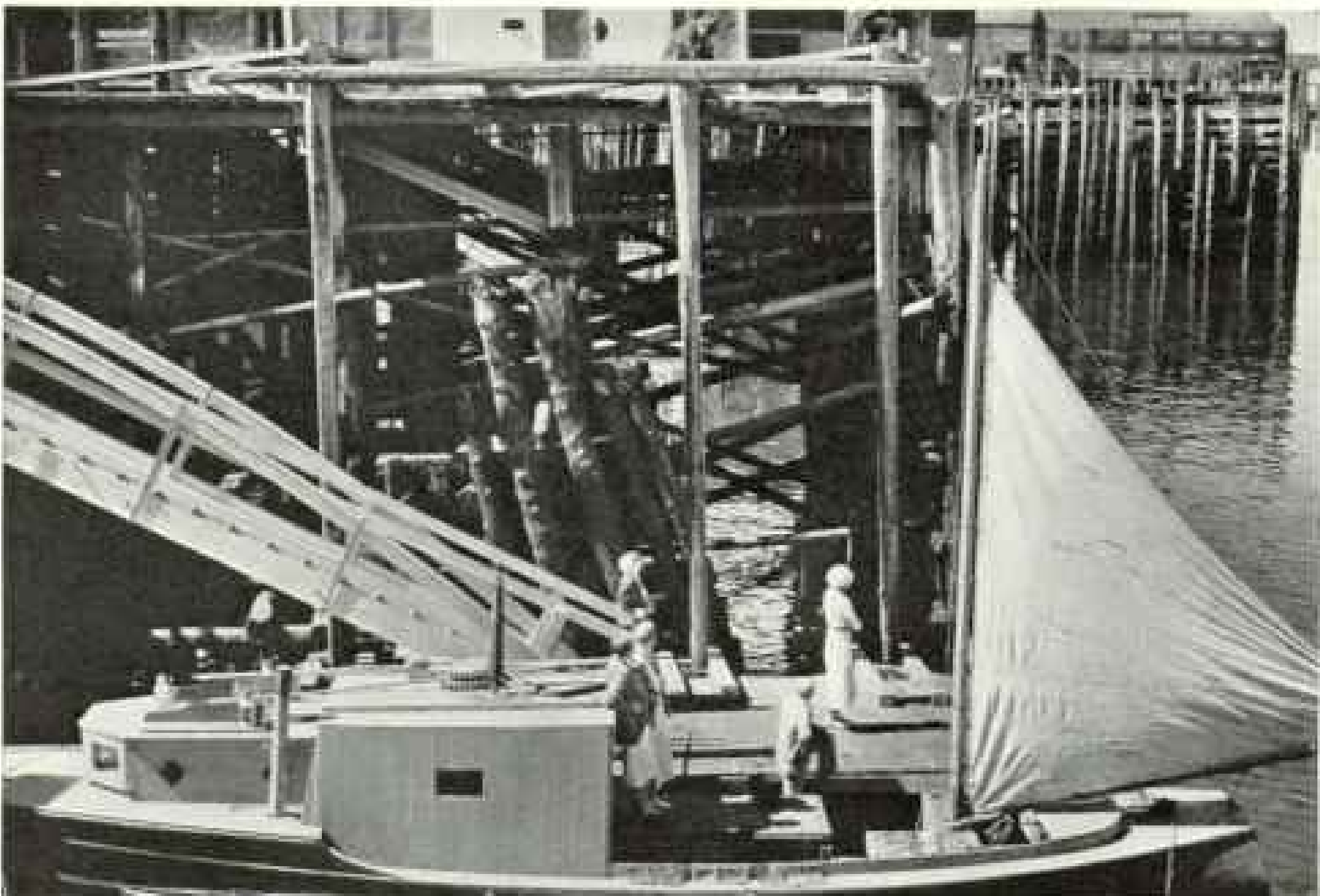
It was as the outpost of early settlement that Maine offered a refuge for those who sought more religious freedom than could be found in the Massachusetts Bay Colony.

The settlers in the 17th century came largely from across the sea, but the wave of emigration from Massachusetts to the New Hampshire and Maine frontier began even before the movement into Rhode Island and Connecticut, and these contributions, like those of the century following, were of the adventurous and independent spirits.

Trained in the French and Indian wars to defend the frontier, the men of Maine were quick to support the common cause of independence. Indeed, a month before the Declaration of Independence, the town



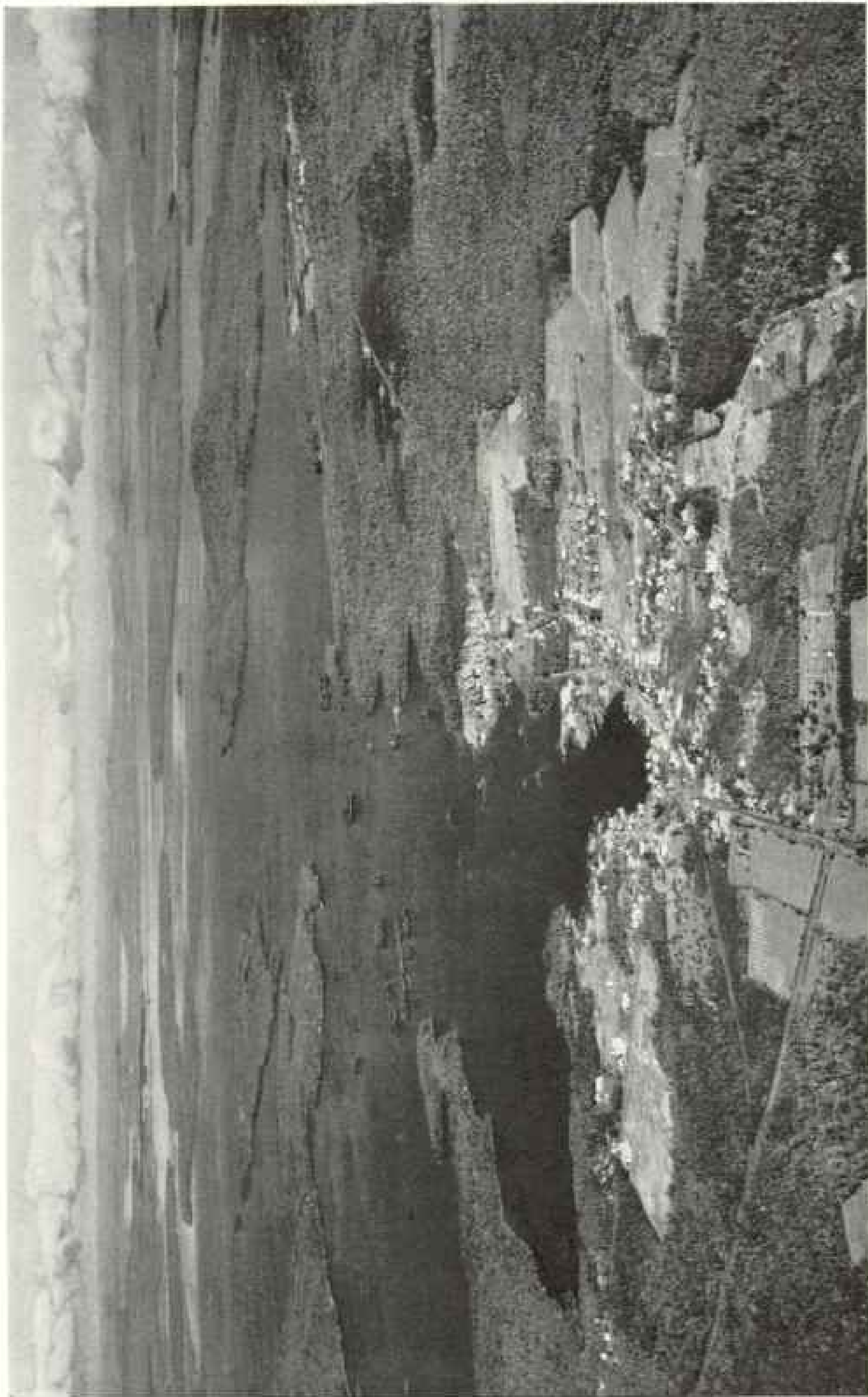
THE OUTLOOK FROM AN EASTPORT PIER VARIES—



Photographs by B. Anthony Stewart

WITH THE TIDE

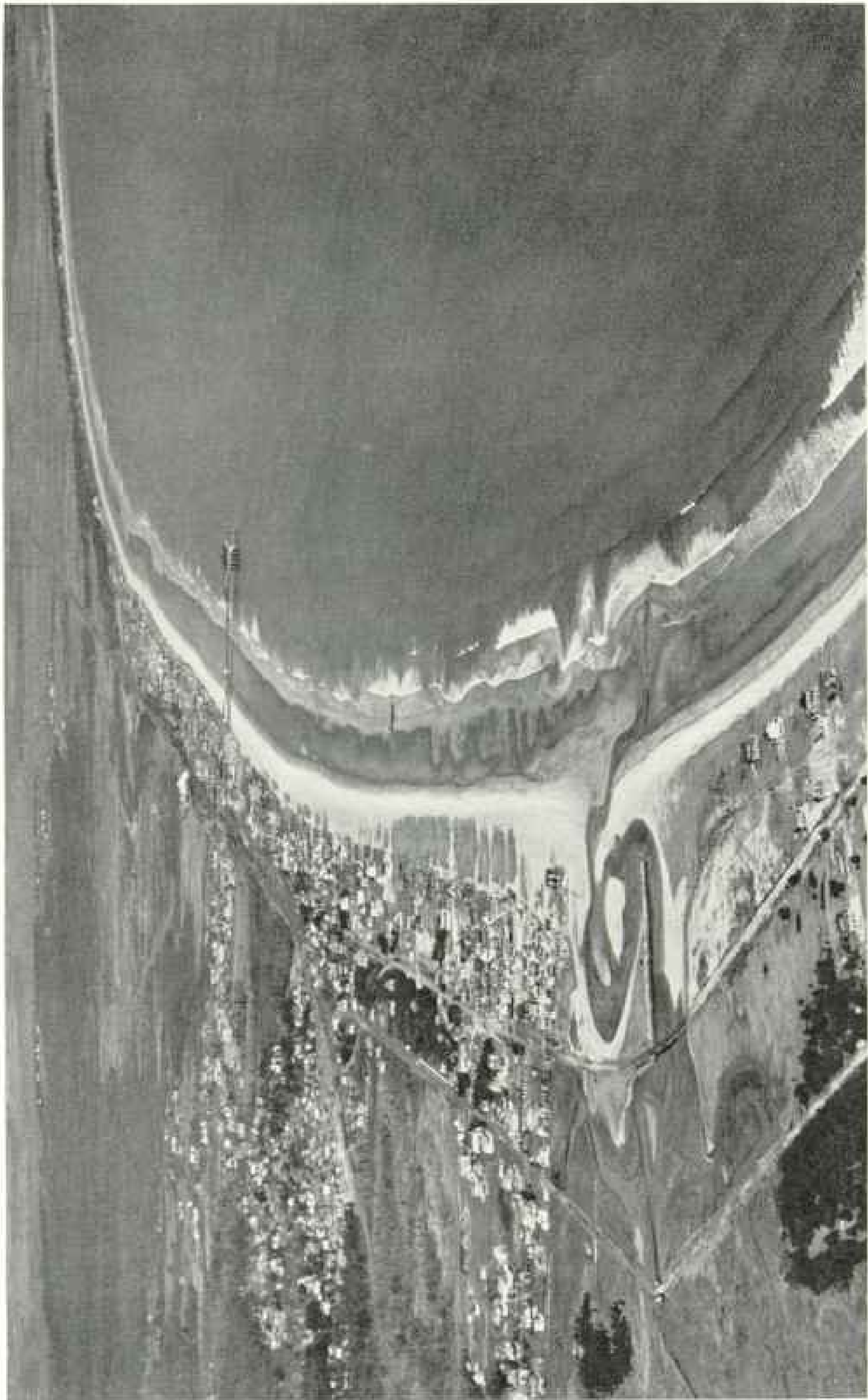
Nowhere else within the continental limits of the United States do the seas rise and fall over such a wide range as at the towns in this farthest east region of the country. Differences of more than 25 feet between high and low waters have been officially registered. A floating pier is made accessible by a hinged gangway. Not far from here is the most easterly point of the Nation—West Quoddy Head!



Photograph by Fairchild Aerial Surveys

"MOOSEHEAD LAKE, ALTHOUGH A THOUSAND FEET ABOVE THE SEA, SEEMS LIKE AN ARM OF THE ATLANTIC"

Greenville, at the southern end, is the gateway to a sprawling wilderness where deer abound, the catfish reigns supreme, and trout, salmon, and togue lure the angler. Many bays and inlets lengthen the lake's shoreline to about 300 miles; ten times its length (see text, page 573).



WHITE COMBERS FRINGE HARD SANDS WHERE A BROAD ARM OF THE ATLANTIC SWINGS INTO OLD ORCHARD BEACH

There is ample room for the thousands who throng this sweeping shore during summer week-ends. For nearly a century it has been a popular resort. Houses and commodious hotels are crowded close to the long curl line that is nearly always swept by a cool sea breeze (see Color Plate XXI and page 546).



Photograph by B. Anthony Stewart

A CHEST OF RARE TREASURES IS BOWDOIN'S HUBBARD HALL

Although second to the State Library at Augusta in number of volumes, its stacks hold fine collections on Longfellow, the Huguenots, German dialect, and the State of Maine. The library was given to the college in 1900 by Thomas Hamlin Hubbard, '57, lawyer, soldier, and President of the Peary Arctic Club which raised the funds for Peary's expeditions of 1900-1909. Bowdoin numbers among its sons President Franklin Pierce, Nathaniel Hawthorne, Henry Wadsworth Longfellow, Robert E. Peary, and Donald B. MacMillan (see text, page 589).

of York sent assurances to the General Court of Massachusetts that if Congress should declare the Colonies independent the inhabitants of York would "engage with their Lives and Fortunes to Support them in the measure."

And the regiments enlisted in these frontier counties made good that promise. At Valley Forge, in the terrible winter of 1777-8, there were more than one thousand soldiers from Maine who patiently endured that supreme test of their patriotism.

As soon as independence from England

had been attained, the idea naturally arose of regaining the ancient privileges of the old Province, later the District, of Maine. Sentiment for the civic change was slow of growth, but separation, finally asked by a decisive popular vote, was granted by Congress in March, 1820.

THE STATE'S LONGEST HIGHWAY

U. S. Highway No. 1, entering Maine by the Interstate Memorial Bridge from Portsmouth, New Hampshire, at Kittery Point passes the site of Fort McClary, erected by Massachusetts early in the 18th century to enforce its rights to commercial use of the boundary river and to protect its merchants from "unreasonable duties" exacted by the Government of New Hampshire. The highway continues for 564 miles to Fort Kent, near the northern tip of Maine.

Fort Kent takes its name from a two-story blockhouse, a reminder of Maine's own private war scare of 1839, when the State called its militia to arms and

Congress authorized the President to raise 50,000 troops for the defence of the country's northeastern boundary. Actual conflict was avoided by Gen. Winfield Scott, who came to Maine and established headquarters in Augusta.

HOW MAINE LOST TERRITORY

This boundary dispute had continued ever since the peace negotiations following the Revolution. The Treaty of 1783 adopted as the northeastern boundary of the United States the southern boundary



RECONSTRUCTED FORT WILLIAM HENRY RECALLS EARLY STRUGGLES AT PEMAQUID

Four other strongholds were erected near this site in Colonial days. The first was built as a defense against the pirate Dixie Bull and his crew. The second replaced an early blockhouse destroyed by Indians. A land force of redskins and three French men-of-war razed the third. The fourth was torn down by colonists fearful lest the British capture and use it against them (p. 557).



Photographs by B. Anthony Stewart

SOLID BLOCKS OF MAINE GRANITE FORM THE SPIRAL STAIRWAY AT FORT POPHAM

Built within circular towers, the steps lead to the upper tier of casements and the parapet. Although wind, rain, and frost have hammered at them ever since they were set in place at the time of the Civil War, none has been displaced or cracked. The fort, located on the west bank of the Kennebec River, was not completed.

of Quebec and the western boundary of Nova Scotia. As agreed upon before the war, these two colonial boundaries had been, respectively, the "High Lands which divide the Rivers that empty themselves into the said River St. Lawrence from those which fall into the Sea" (Atlantic Ocean), and a line following the St. Croix from its mouth to its source and thence drawn due north to the southern boundary of Quebec.

The preliminary negotiations had been largely a debate as to rivers. The Americans had at first contended for the St. John River in place of the St. Croix, and with somewhat similar spirit the British Government had instructed its diplomatic representatives to attempt to extend Nova Scotia westward to the New Hampshire line; if not, then to the Kennebec, "or at the very least to include Penobscott."

But the identity of the St. Croix River was settled in 1798 by the old map and plan of Champlain, which was used to discover the ruins of the buildings of the De Monts colony, already covered by a forest of nearly two centuries' growth—evidence so conclusive that the commissioners were unanimous in the decision.

But argument continued, so the King of the Netherlands was selected as the arbiter. His award was in effect more of a recommended compromise than an interpretation of treaty language. Although his line was in general nearer to the United States claim than to the British, the British Government offered to accept his decision, but the State of Maine entered a protest and the U. S. Senate accordingly refused its assent to the award.

A settlement of the dispute, which had now lasted for 59 years, was arranged by the Webster-Ashburton Treaty of 1842. This was much less favorable to Maine than the spurned award of the King of the Netherlands. Acceptance of that award would have saved it a strip of timberland about 5,500 square miles in extent, as added territory for the future Aroostook County, which, however, is even now larger than the States of Connecticut and Rhode Island combined.

HAUNTS OF ARTISTS AND WRITERS

U. S. Highway No. 1 skirts the open sea at relatively few places.

From Ogunquit to Wells the motorist may look out over a low line of sand dunes facing the ocean. A mile or two beyond

Portland the scattered islands of Casco Bay open up many vistas of the Atlantic. Again, in the Rockland-Camden region, the road follows the shore, with the broad Penobscot Bay in full view, but east of here only between Hancock and Sullivan are there satisfactory views out to sea. So deeply indented a coast does not accommodate itself to a shore-line highway.

Pleasing as is the panorama of sunny farms, quiet villages, and shady woods along the trunk highway, to see the best of the Maine coast, detours are necessary. Of these sight-seeing excursions to the shore, some are over well-surfaced highways, others along single-track, primitive roads.

One detour, over excellent roads, leads through colonial York Village, past bold Cape Neddick to lovely Ogunquit, distinguished as an artists' colony.

Another detour leads to Kennebunkport, the present literary capital of Maine, where an 18th-century village, the winding river, sheltered beach, and wooded shores unite to set the scene for an attractive summer community and an inspiring environment (see Color Plate XVII).

Beyond Cape Porpoise is Beachwood and Biddeford Pool, the latter once called Winter Harbor, because here Richard Vines and his company passed the winter of 1616.

Beachwood is a descriptive name equally befitting many places along the Maine coast: a short beach between rocky points with marsh or pond behind the barrier. On one side of this pond beach grasses and rock shrubs grow, and extending inland from the other shore is the oak and pine forest.

The next detour is a short one to popular Old Orchard Beach. Little could early explorers foresee that this long crescent of firm sand would some day be a crowded pleasure resort, as well as a favored take-off for trans-Atlantic airplane voyages (see Color Plate XXI and page 545).

Portland is modern Maine's metropolis, a busy, thriving world port, making the most of its fine harbor and its geographic position a few precious miles nearer Europe than most other American coast cities. Yet it has never ceased to be "the beautiful town" through whose pleasant tree-lined streets Henry Wadsworth Longfellow wandered when a boy.

Each summer armies of vacationists visit Portland, which well deserves to be called

PINE-SCENTED, HARBOR-DENTED MAINE



© National Geographic Society

Finlay Photograph by D. Anthony Stewart

WHO DOES NOT ENJOY CLAMHERING OVER SUCH ROCKS TO WATCH BOOMING SURF?

Pemaquid Point Light has warned ships away from the rock-ribbed coast of Maine for more than a century. A clanging bell buoy, moored offshore, recently replaced the fog bell affixed to the house near the point. Samoset, the friendly Indian chief who greeted the Pilgrims at Plymouth, gave an Englishman title to this soil in 1625.



BROAD-BACKED MOUNT KATAHDIN, HIGHEST IN MAINE, RULES THE LAKE COUNTRY

The mile-high peak is climbed each year by a host of summer visitors. It forms part of Baxter State Park, reserved as a sanctuary for wild life. From Togue ponds, the mountain's landslide scars of white granite look like snow-filled ravines.



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Finlay Photographs by B. Anthony Stewart

BAR HARBOR IS ON FRENCHMAN BAY, VISITED FIRST BY CHAMPLAIN

The French explorer discovered Mount Desert Island in 1604. From the new road winding to the summit of Cadillac Mountain, the highest section of the Atlantic coast of the United States, a splendid view is afforded of this fashionable summer capital.

PINE-SCENTED, HARBOR-DENTED MAINE



RED-COATED CAMP GIRLS TAKE TO THE BRIDLE PATH BY SEBAGO LAKE

The State was a leader in establishing summer camps for boys and girls. Groups of six to ten campers usually live in cottages, each under the wing of a counselor. A dinner gong pounded vigorously caused the horses to prick their ears.

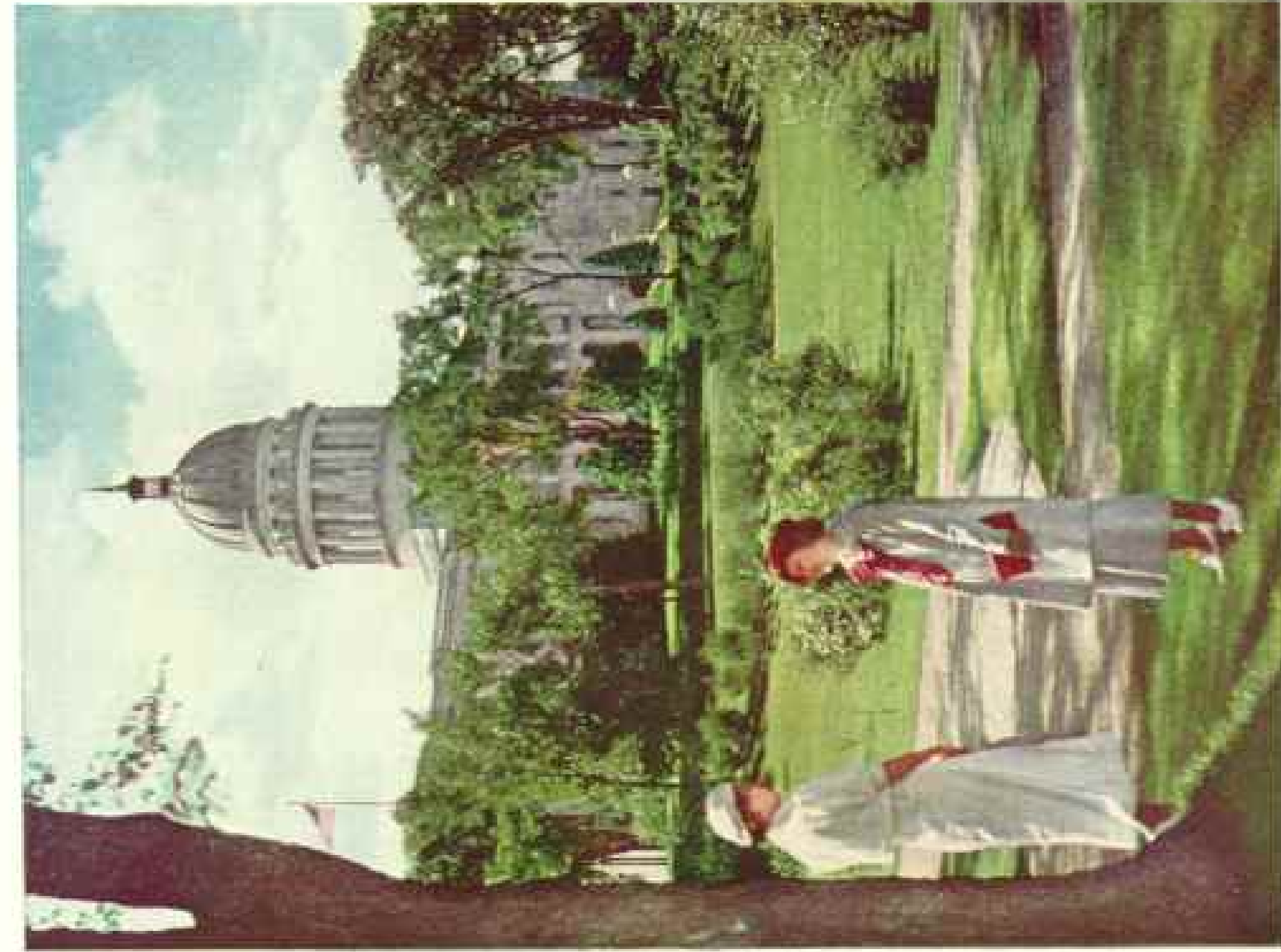


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Finlay Photographs by B. Anthony Stewart

LOBSTER POTS CHOKER THE PIER AT NEW HARBOR, OLD DESPITE ITS NAME

Captain John Smith, on his exploratory voyage along the New England coast in 1614, found Englishmen had traded with Indians near this almost landlocked port. Clusters of buoys, not corn, festoon the side of the fish shed.



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WISDOM CROWNS THE STATEHOUSE AT AUGUSTA

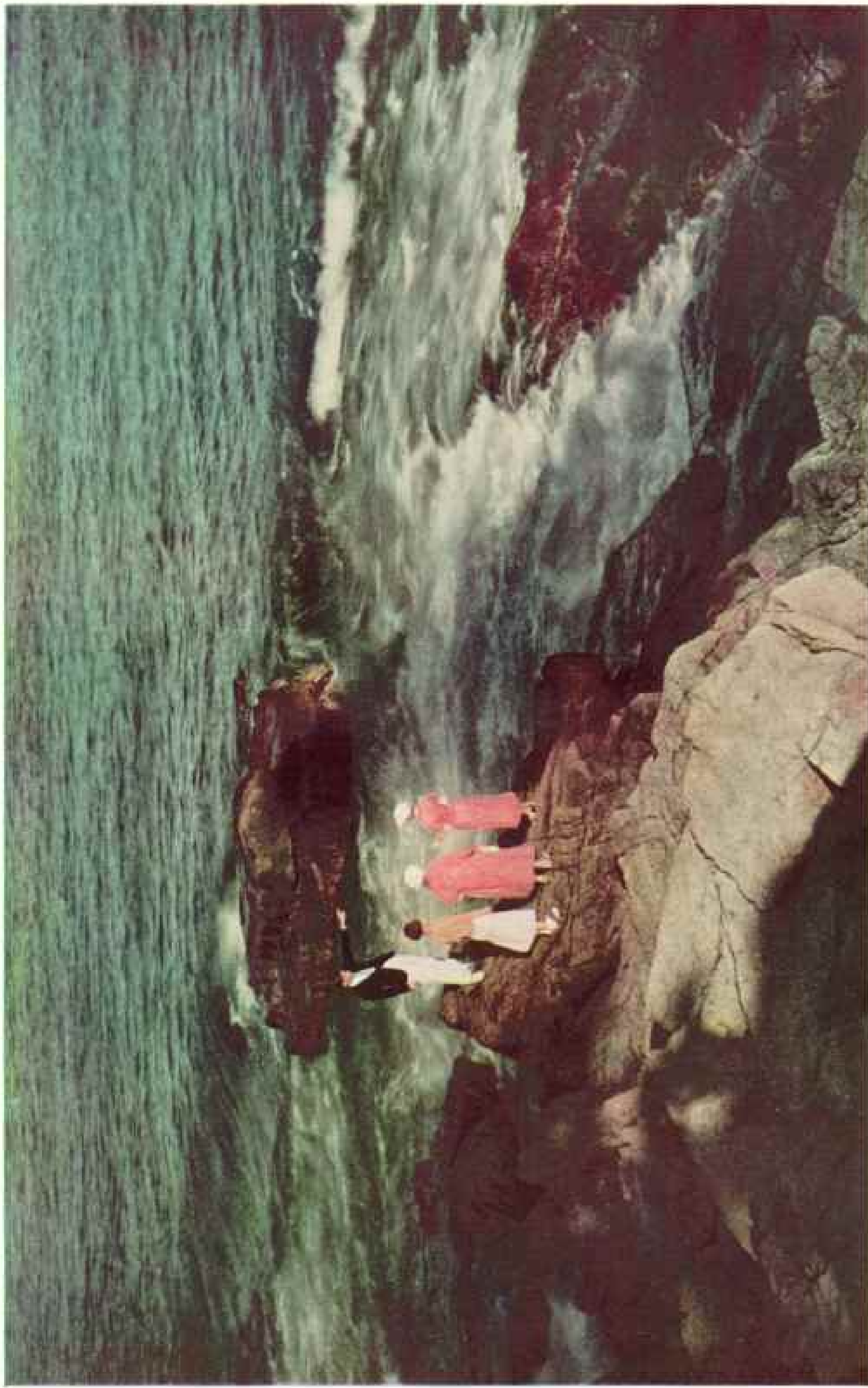
This capitol, one of the oldest in the United States, is a monument to the architectural genius of Charles Bulfinch. It is built of Maine white granite and overlooks the Kennebec River.



Finlay Photographs by H. Anthony Stewart

CAMDEN'S CHARM BEGINS AT ITS INNER HARBOR

The old town, on the inlet of Penobscot Bay, was one of the first to register dissatisfaction with England's policies, and took its name from Lord Camden, who in Parliament vigorously defended the Colonies.



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MOUNTAIN AND SEA WAGE A SPIRITED CONFLICT AT MOUNT DESERT ISLAND

The shore drive leading south from Bar Harbor makes accessible to motorists such views of the open ocean, where lashing, booming waves and rock-bound shore fight without truce (see Color Plate II).

Field Photograph by B. Anthony Stewart



MAINE LOBSTERS MEAN "SHORE DINNER" TO MANY A NEW ENGLANDER

Often when such a meal has been ordered, the waiter goes to the lobster pound, a salt-water storage box at the end of a dock, and brings back a wriggling crustacean, green and crackling. From Kittery to Eastport, thousands of lobstermen go down to the sea to tend the pots.



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Finlay Photographs by B. Anthony Stewart

THE LOBSTER PLAYS THE LEAD AT LAKEWOOD

Sunlight replaces klieg light at "Broadway in Maine," the popular name for this summer colony of many of America's stage and screen stars. At the table are (left to right) Helen Claire, Mary Rogers (daughter of Will Rogers, the humorist and actor), Jessie Royce Landis, and Leona Mariele.

PINE-SCENTED, HARBOR-DENTED MAINE



PARIS MINES THE STONES THAT ARE CUT IN NEIGHBORING NORWAY

The young lady holds a crystal quartz that may become a necklace, a pendant, or an optical lens. The watermelon tourmaline, the green stone with a pink center (right), will adorn rings and pins. The black crystal of mica or biotite below is used for stove doors, lantern windows, and insulating.



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Finlay Photographs by E. Anthony Stewart

A TIER FINISHES THE HEAD OF A YELLOW SILVER STREAMER

Brightly dyed hackles of gamecocks, and the feathers of tropical jungle cocks are wound on vari-sized hooks at Portland to make artificial flies. Bodies are of wound silk banded with tinsel. Anglers argue over the respective merits of the royal coachman, the brown hackle, and the silver streamers.



MAINE YOUNGSTERS ENJOY TO THE FULLEST THE STATE'S HEAVY SNOWFALLS

There is an unforgettable zest in playing out of doors in the winter. Ski parties start early, pause for luncheon at noon, and complete a wide circle over the rolling country before darkness falls.



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Finlay Photographs by Robert F. Maxcy

A THOROUGH-BRED ENGLISH SETTER NEARS A "SET" AMID AUTUMN FOLIAGE

When bird dogs scent game, they stop and point. A straight line from tail to nose usually indicates the hiding place of the woodcock or ruffed grouse, commonly known as partridge. If the scent comes from one side or the other, the well-trained dog will freeze into position like a statue, with his head turned in the direction of the quarry. Then the hunters flush the birds.

"the Forest City" (see Plate XVII). Easily accessible are the famous fish and game forests of Maine, and within the city limits are thousands of splendid old oaks and elms.

To the white marble City Hall go music-loving citizens of Portland to hear the Kotschmar Memorial Organ, one of the largest and finest in the United States. It was donated by the late publisher, Cyrus H. K. Curtis, who was born here, in memory of Herman Kotschmar, the organist and music teacher for whom he was named.

In a walk or ride around the city one may look upon magnificent views of the White Mountains, or Portland Harbor and Casco Bay, or see reminders of the many famous persons Portland has given to the Nation—such varied characters as Longfellow, Thomas B. Reed, who ruled the U. S. House of Representatives with a strong grip; Commodore Preble, who broke the power of the Barbary pirates; and Neal Dow, the prohibitionist. Here, too, one may reflect on the probable amazement of George Cleeve and Richard Tucker if they could return today and see the city they founded as a tiny settlement on a wooded peninsula in 1633.

A FJORD COAST

East of Portland the coast line perceptibly changes, the fjord character becoming more marked, with islands more numerous. All this is explained by submergence of the land. The present coast is now a drowned region, wherein old valleys of the former topography have become bays and sounds and reaches. Long divides between valleys have become peninsulas stretching far out to sea, and old hilltops are the islands of today.

Norway and Maine owe their marvelous beauty, where land and sea join, to similar geologic history, and if, on those unrecorded voyages, the Vikings actually sailed along the Maine coast, the bold headlands and the deep bays, stretching far back into forested hills and mountains, must have called to mind their homeland. Similarly, the State-of-Mainer visiting southern Norway recognizes there the same type of rock-bound coast and islands he had known in the bays of Maine.

Much longer, therefore, are the remaining detours required to reach those communities that select land's-end sites, as, for example, Sebasco, Small Point, or Popham Beach, where, in 1607, the first English

colony in New England was planted on the river bank (see text, page 540).

EAST OF THE KENNEBEC

After crossing the Kennebec at Bath, one has a choice of detours to the south: to Georgetown, to the Boothbay region and Newagen, or to Bristol, Christmas Cove, and old Pemaquid. Close by also is Squirrel Island, with its long-maintained self-governing colony of educators, writers, and other professional men and women, who seek their own high intellectual level, even in vacation time. The summer population of the region using Boothbay Harbor as its shopping center is estimated as from 20,000 to 25,000, or fully four times the number of winter residents.

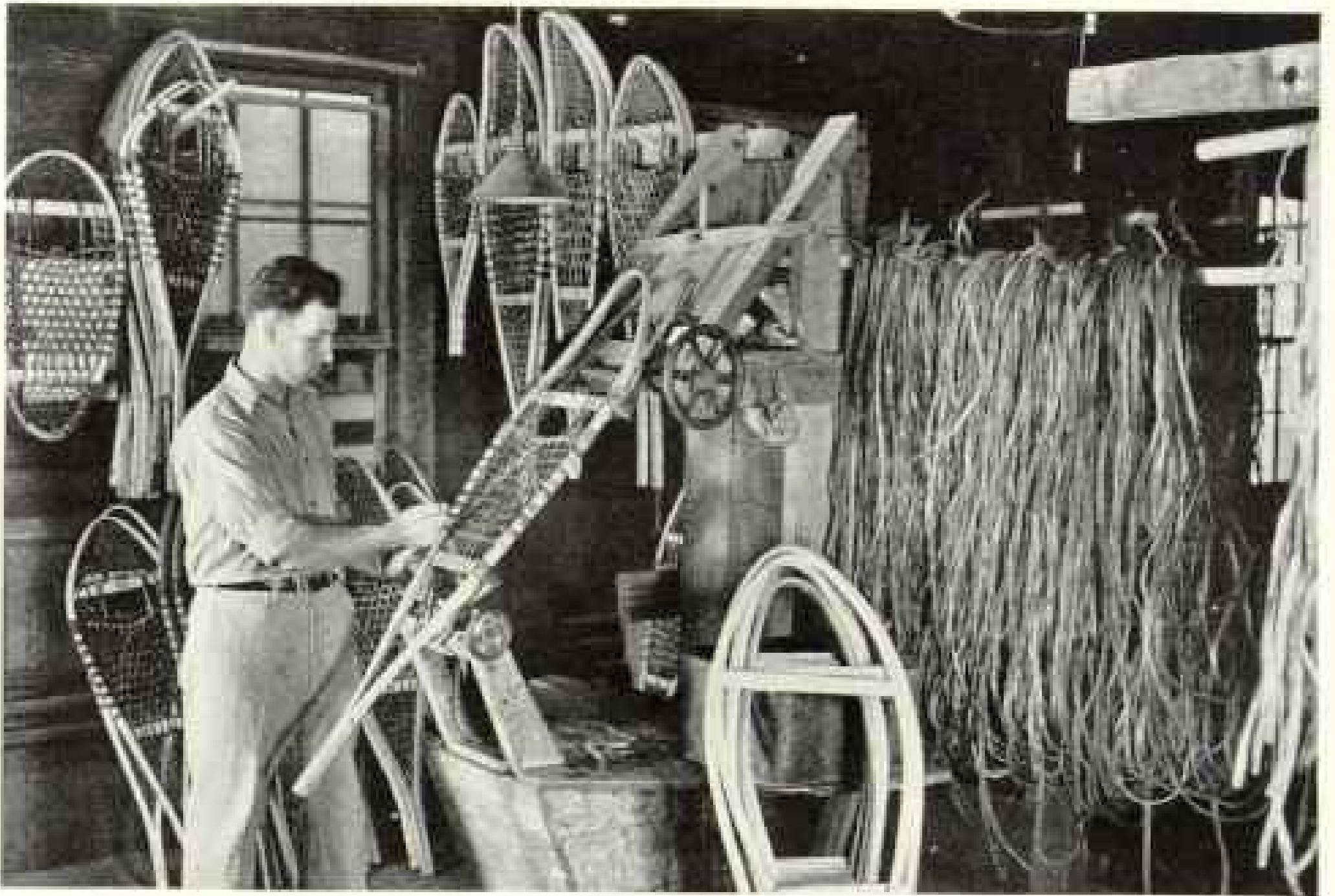
Bristol appropriately perpetuates the name of the home port of Captains John Cabot and Martin Pring, and of John Brown, of New Harbor. The latter, in 1625, secured from two Indian sagamores (one of them Samoset) a sealed deed for a large tract of land, including most of the present town of Bristol.

New Harbor, now a summer colony, is the spot where, in 1607, Raleigh Gilbert landed one of the five Indians captured by Weymouth and taken to England two years before. Another had already been brought back home by Pring. Here, in 1614, Capt. John Smith found the son of Sir John Popham trading with the Indians and enjoying a monopoly founded upon this homecoming of Weymouth's captives.

Close to New Harbor is old Pemaquid, where the scene has been laid for interesting tales that unfortunately must be relegated to the limbo of unverified history. Real enough were the experiences that Pemaquid suffered from raids by pirates and Indians, despite its early defences (page 547).

The next detour leads along a ridge high above St. George River to St. George, Tenants Harbor, and Port Clyde—all slightly country of grassy fields, spruce forest, and bare granite ledges. Off Port Clyde lies Allen Island, on which Captain Weymouth set up a cross and where, two years later, the whole company of Popham colonists landed and "heard a sermon delivered unto us, giving God thanks for our safe arrival into the country."

This religious service in New England, Sunday morning, August 9, 1607, is sometimes referred to as New England's first Thanksgiving Day.



PEARY CROSSED POLAR SNOWS ON SNOWSHOES MADE AT NORWAY, MAINE

Stout rawhide is woven on a wooden frame to form a broad, weblike foot that prevents its wearer from sinking into the snow. Sizes and shapes vary, the shoe hanging in the upper left being modeled like the pad of a bear's paw.



Photographs by B. Anthony Stewart

A HOLDFUL OF "SARDINES" IS SHOVELED OUT AT EASTPORT

Cannery employees can roughly estimate the size of their day's work by the way the incoming herring boats ride the water. This load was judged to be from 25 to 40 hogsheads.

South of the mouth of St. George River and ten miles out in the open sea rises Monhegan, the "round high isle" of John Smith. Once a landfall of early voyagers, this is now a rendezvous of artists who love its quiet, forested interior and high sea cliffs against which pounds the mighty though ineffective surf.

The horticultural possibilities of Monhegan were early demonstrated by the success of Captain Smith's experimental garden, planted on the top of this "rocky isle" in May, 1614, that "served us for salads in June and July"—the second garden venture by Europeans on the Maine coast.

After following Route No. 1 up the shore of Penobscot Bay through the shaded streets of beautiful Camden, then under "the high mountains of Penobscot, against whose feet doth beat the sea," in the quaint words of Capt. John Smith, and past Belfast, with its broad outlook over an arm of the bay, a choice of routes is offered.

One route continues up the Penobscot River past the State reservation at Fort Knox, a granite structure of notable construction, planned almost a hundred years ago as a defence of the entrance to the river against invasion (see page 541); the other and more direct route crosses the Penobscot by the graceful Waldo-Hancock bridge.

THE PENOBSCOT BAY COUNTRY

The excursion should cover the broad triangle extending south of the Bucksport-Ellsworth highway and everywhere dominated by the high landmark of Blue Hill. All this is lovely country, starting with his-



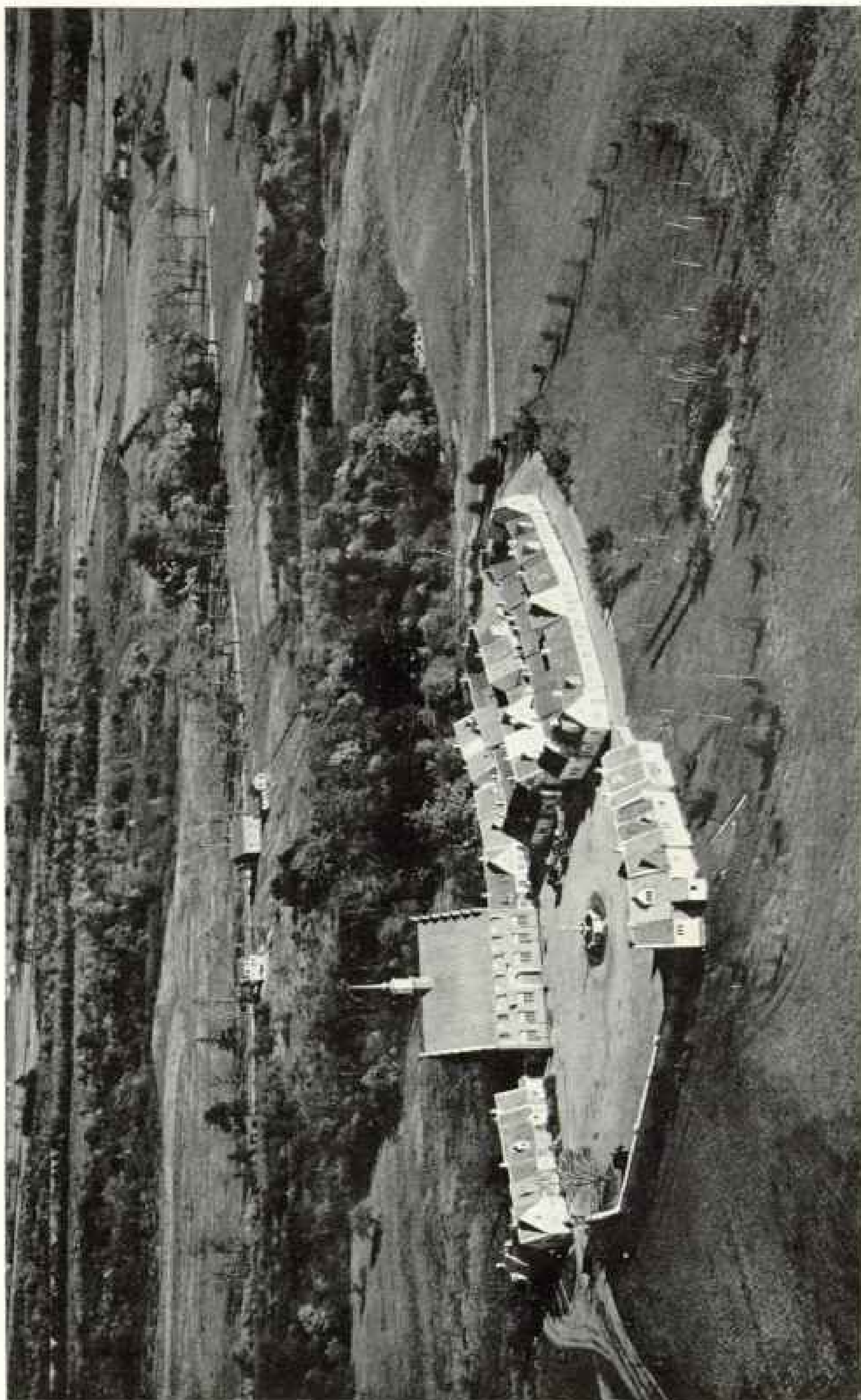
Photograph by B. Anthony Stewart

A MAINE TOM SAWYER PICKS A CHOICE CLIMATE

With his broad grin, freckled face, ready-for-mischief eyes, and battered straw hat, he might have just stepped out of the immortal pages of Mark Twain. All he lacks is a can of worms and a fish pole.

toric Castine, the Pentegoet of Champlain, a lucrative trading post of the Pilgrims until a French raid in 1631, when, as described by Governor Bradford, "this was the end of that project." Here later came from Quebec the gallant young Baron Castin, who preferred the simple life in the forest of Acadia and married a daughter of an Indian chief.

Bluehill, to which Franz Kneisel gave distinction as the summer home of music lovers, Sedgwick, and other villages are attractive old-time places in which retired sea captains have long found anchorage, and where adventures of the sea are the topics in the long winter months after the summer folks have departed.



LIKE KNIGHTS' QUARTERS BESIDE THE MANOR OF A MEDIEVAL BARON IS THE DANISH VILLAGE OUTSIDE PORTLAND

An overnight stopping place in the atmosphere of Old World Denmark lures visitors to this quaint, rambling shelter. The large house is the community dining hall and administration office. Partly surrounding the court, with its fountain, are several domiciles for travelers. Single rooms may be engaged, and there are connecting rooms for families.



SPRING SENDS A ROARING TORRENT OVER MONIE FALLS

Swollen brooks and melting snows make a foaming cataract of this tumbling stream that has cut its own gorge where it plunges toward the Kennebec River through the deep-woods country. No well-marked trails lead to it, and he must search diligently who would view the fall.



Photograph by B. Anthony Stewart

WILL THE ELM BLIGHT DETHRONE THESE MONARCHS?

Leaves suddenly wilted are the first signs of the baneful disease, now being vigorously combated by State and Federal Departments of Agriculture. These splendid trees along Broadway, Bangor, are far removed from the infected area that lies chiefly within a 50-mile radius of New York City.



Photograph by Joseph Coburn Smith

REVOLUTIONS OF THE SPIKED WHEEL GAUGE THE LENGTH OF A LOG

One of ten pointed spokes, spaced six inches apart, is identified by shape or color, marking a complete revolution—five feet. To estimate the board feet in a log the scaler first measures the length and determines the diameter. By computing with a standard scale, printed on his stick, he obtains the approximate answer. Finally he examines the log for rotten knots, big seams, crookedness, evidences of fungus growth, and other defects and applies a discount.

Penobscot Bay is a yachtsman's paradise, but among its many lovely islands only a few of the larger may be mentioned: Deer Isle, famed for furnishing crews for American defenders in the international yacht races, and North Haven and Vinalhaven.* To the former come by air and water summer visitors from New York and from the latter went by sea huge granite columns for the Cathedral of St. John the Divine, in New York City.

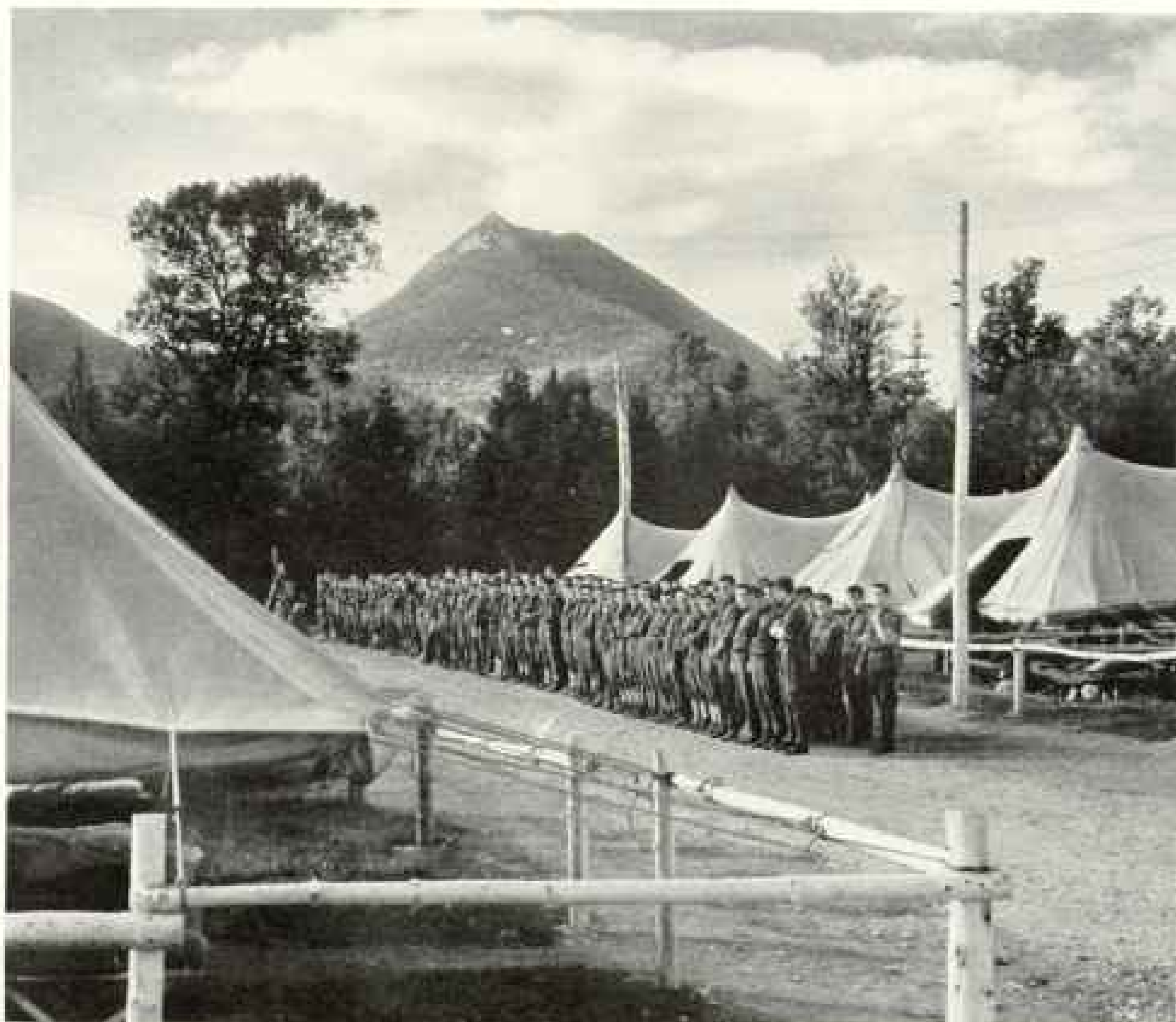
Swans Island visitors can enjoy unsurpassed views of Mount Desert Island; Isle au Haut, high and bold, faces the broad Atlantic and today is nearly as primitive

* See "Flying Around the North Atlantic," by Charles A. and Anne Morrow Lindbergh, NATIONAL GEOGRAPHIC MAGAZINE, September, 1934.

as when Champlain named it; Long Island is so attenuated that at one place, when 30 years ago the writer was "doing" the geology of the Penobscot Bay region, he was told by a fellow Yankee that with a good breeze and a heavy dew he could sail his fishing boat "clean across." Its settlement at Dark Harbor is beautiful and exclusive.

MOUNT DESERT, THE MOUNTAINOUS ISLE

Mount Desert is unique. No other island on the Atlantic coast of the United States can compare in height, and only New York's Long Island is larger. It was these bald mountain tops that commanded the interest of Champlain in 1604, whose record of discovery ends, "I named it Isle des Monts déserts."



Photograph by B. Anthony Stewart

UNCLE SAM TOOK THEM OFF THE STREETS AND GAVE THEM JOBS

Some 300,000 young Americans and War veterans are now in 1,641 Civilian Conservation Corps camps throughout the United States. Under present regulations they may not remain longer than a year. In each camp there are usually 200 men under the supervision of foresters, technical supervisors, and Army officers. Near Baxter State Park, these campers cleaned up dead and dying timber, repaired trails, and arranged picnic sites as part of a general conservation program.

After the Revolution, the conflicting claims of the heirs of Cadillac, to whom Louis XIV had granted the island, and of Sir Francis Bernard, royal Governor of Massachusetts, whose grant by the General Court of Massachusetts had been duly confirmed by King George, were quieted by the General Court, which gave half of the island to the granddaughter of Cadillac and half to the son of Bernard.

The recent creation on the island of the Acadia National Park was made possible by gift and purchase of privately owned tracts of mountain land by public-spirited citizens, under the wise and patient guidance of Charles W. Eliot, John D. Rockefeller, Jr., and George B. Dorr.*

On the maps of this region and further

east as well, the name "Harbor" dots both land and sea, so that Whittier's lines are even more appropriate here than for Casco Bay.

"From gray sea-fog, from icy drift,
From peril and from pain,
The home-bound fisher greets thy lights,
O hundred-harbored Maine!"

The little town of Machias, early the site of a trading post, was not settled until 1763; but twelve years later it made an enviable record as the frontier settlement of Massachusetts. On hearing that "shot heard

* See "Mount Desert Island," by Charles W. Eliot and George B. Dorr, NATIONAL GEOGRAPHIC MAGAZINE, July, 1914; "Holidays With Humming Birds," by Margaret L. Bodine, June, 1928.

round the world," the townspeople held a meeting and erected a Liberty Pole, afterward refusing to take it down at the order of the British captain of an armed schooner. Here was fought against great odds what J. Fenimore Cooper called the Lexington of the Seas, resulting in the taking of the *Margaretta*, the first British vessel captured by the Americans.

Soon thereafter, another armed vessel was captured; and, in 1777, the British authorities at Nova Scotia took the offensive and dispatched two frigates and two smaller vessels, all heavily armed, to capture the rebels at Machias. The male population of the little town, together with some forty Passamaquoddy Indians, manned the shore defences on both sides of the lower river and were able, with the aid of an ebbing tide, to make so spirited a defence that the fleet sailed away without reaching the village.

The D. A. R. marker at the "Foster Rubicon," on the outskirts of Machias, tells in bronze the story of the open-air council on the Sunday morning before the taking of the *Margaretta*, when Deacon Foster, a veteran of the French and Indian wars, put the question of armed resistance to a vote by a show of feet rather than of hands. Tired of debate, he leaped across the brook, calling for those to follow who would support their country's cause.

"Almost to a man the assembly followed and without further formality the settlement was committed to the Revolution," reads the inscription.

The successful issue of this resistance of Machias took on added significance when, early in 1781, as instructed by a mass meeting, the Machias Committee of Correspondence and Safety sent an address to Governor Hancock of Massachusetts, expressing the utmost abhorrence of the inhabitants of Machias to the proposal of certain leading men on the Penobscot for a policy of strict neutrality in the eastern area during the continuation of the war, and further declaring their readiness to defend the liberties of the "United States of America" against all enemies.

Capt. Stephen Smith, a member of the committee penning this spirited declaration, was the great-great-grandfather of the present writer.

At that time Castine and the surrounding country had been for nearly two years in possession of the British.

Without question the militant spirit of Machias throughout the Revolutionary period was decisive in offsetting the fact of British occupation on the Penobscot; thus the American commissioners were able to oppose successfully the British contention that the Penobscot rather than the St. Croix be made the eastern boundary of the United States (see page 546).

On the St. Croix is Calais, the Border City. In other cities, epicures or bon vivants may use imported table water, but citizens of Calais use imported water even for bathing and all other household uses, the municipal supply being piped across from New Brunswick.

ANOTHER MAJOR HIGHWAY

U. S. Route No. 2 crosses the State from New Brunswick to New Hampshire, following much of the way the edge of the uplands. Houlton, at the eastern terminus, is the county seat of potato-famed Aroostook, and is appropriately surrounded by potato fields.

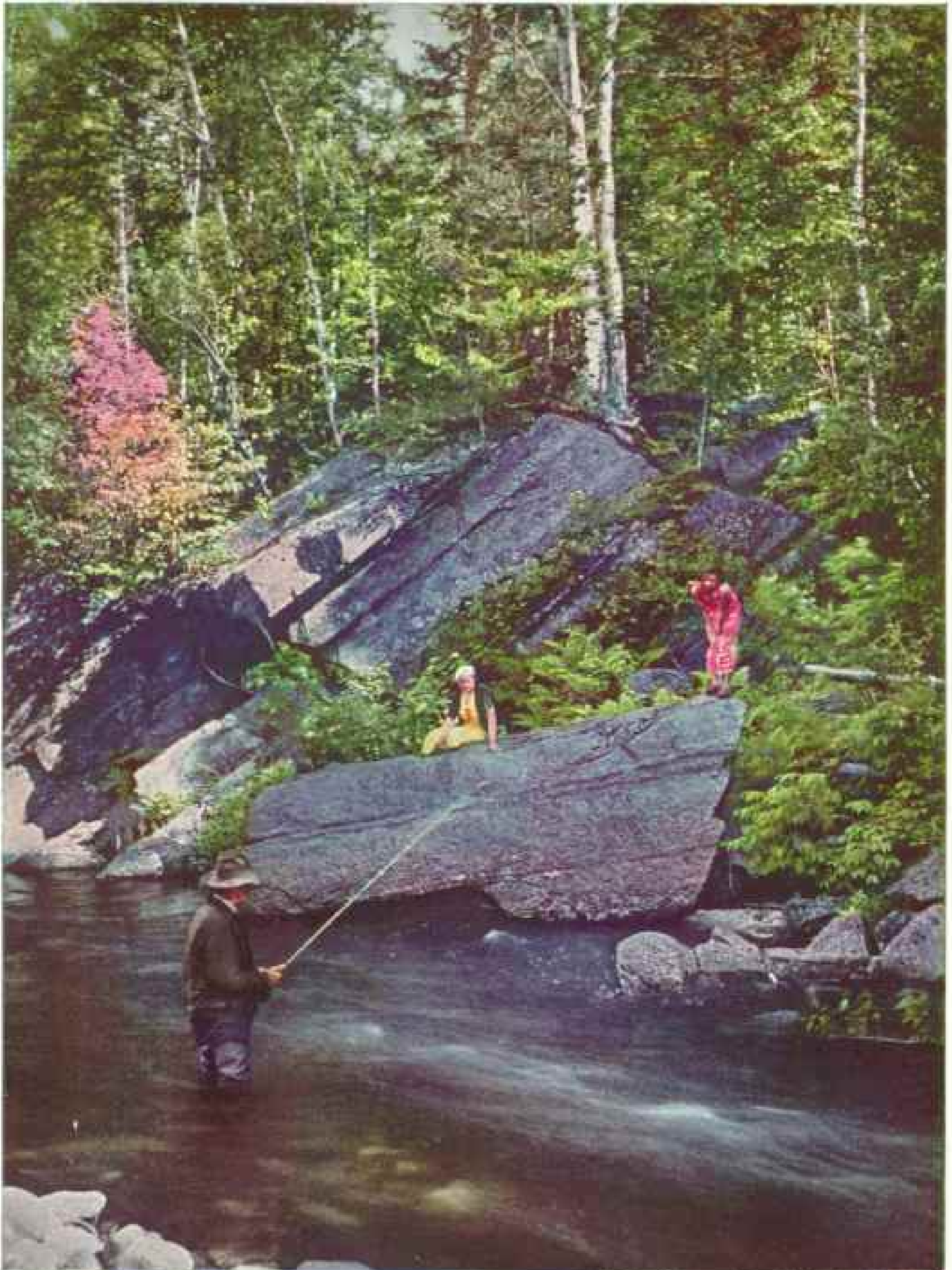
As one leaves Houlton, the western view is across the near-by potato fields and green forest to where Mount Katahdin, Maine's highest peak, looms against the sky (see Color Plates II and XIII). At Mattawamkeag, on the Penobscot River, a side route leads to Millinocket, the gateway to the Mount Katahdin country, and a modern industrial community, with pleasant homes, all dependent upon the profitable operation of one of the largest newsprint paper mills in the United States.

Farther down the river are seen islands, large and small, many of them owned by the Penobscot Indians, whose tribal home is on the largest, Indian Island at Old Town, where some 500 now live (see Color Plate XXII).

However, neither the Passamaquoddy Indians on the St. Croix nor these Tarrantines on the Penobscot can claim descent from the first proprietors of Maine. Antedating even the ancestors of these Indians, and thus the authentic first families of Maine, were the Red Paint People, so called from their custom of placing red ochre in their burial places, which have been found in central Maine.

Bangor, the metropolis of eastern Maine, occupies the site visited by Champlain and other explorers in their search for the fabulous Norumbega, a mythical city supposedly so wealthy that its splendid houses

PINE-SCENTED, HARBOR-DENTED MAINE



© National Geographic Society

Friday Photograph by D. Anthony Stewart

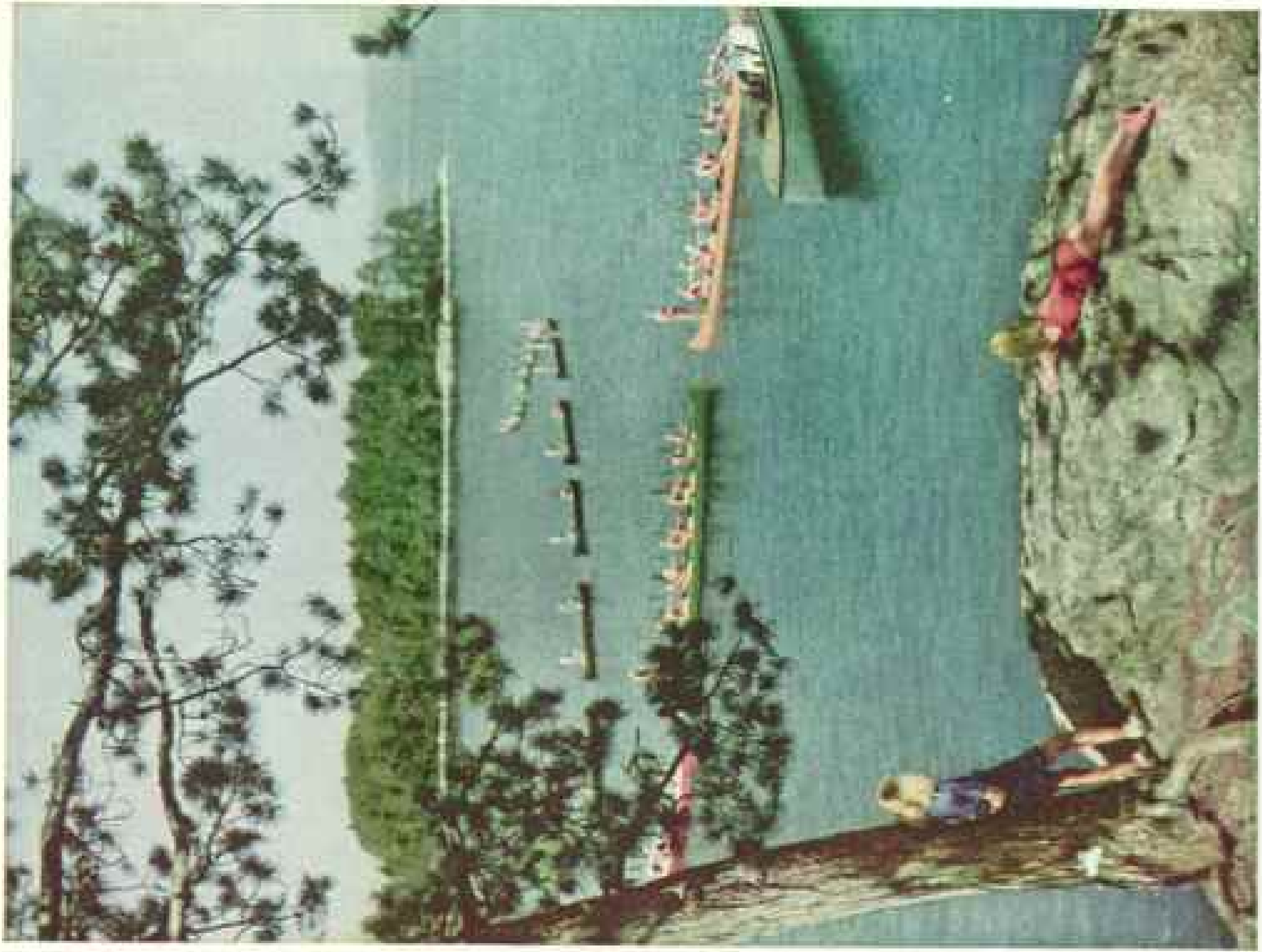
KNEE-DEEP IN HIS FAVORITE SPORT, A TROUT ANGLER AWAITS A STRIKE

Two tense spectators watch the unreeling of "fisherman's luck" in a mountain stream near the tiny village of Madrid. Thousands of Maine streams afford excellent fishing—and fish—to patient Izaak Waltons. Last year, 17 million trout, togue, and salmon were "planted" in State lakes and brooks.



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BENEDICT ARNOLD'S MEN DRAGGED HEAVY BATEAUX HERE
 The Revolutionary soldier followed this branch of the Dead River, near Eustis, on his unsuccessful campaign against Quebec in 1775.



Finlay Photographs by H. Anthony Stewart

CAMP GIRLS BEGIN EARLY TO PADDELE THEIR OWN CANDLES
 At the moment, however, they are being towed in parade formation by a motor boat at a regatta staged on Sebago Lake for visiting parents.

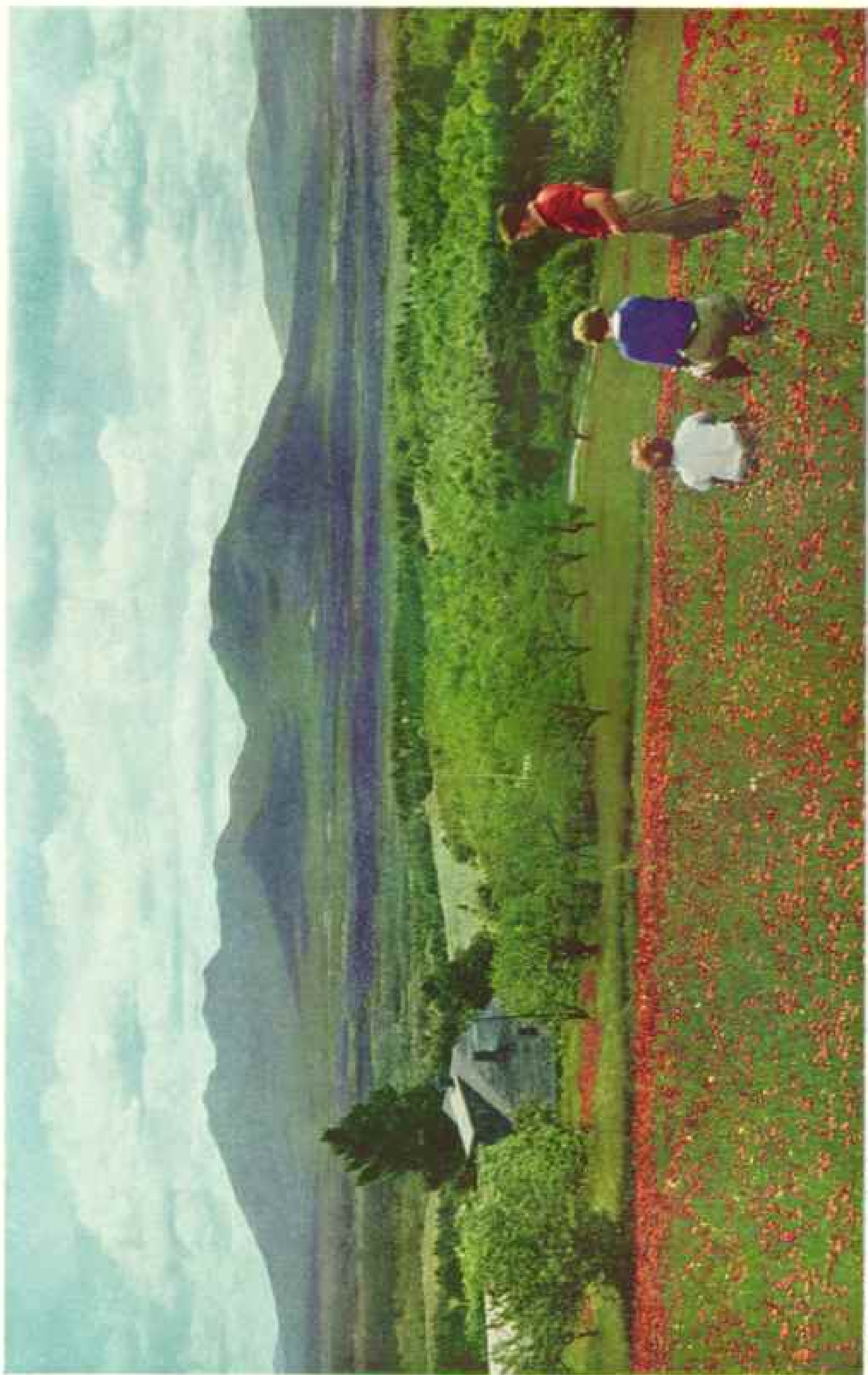


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INDIAN SUMMER TAKES ITS LAST FLING WHEN OCTOBER DONS HER GAYEST GOWNS

Finlay Photograph by Robert F. Maury

Immortalized in the verse of Longfellow and Whittier, the Saco River rises in New Hampshire and follows a long and useful path through Maine. It generates electricity that turns many mill wheels at numerous points. By easy stages and with only a few carries, canoeists may paddle up the river through the York County countryside to the White Mountains.



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BIGLOW MOUNTAIN WAS NAMED FOR A MAJOR ON ARNOLD'S STAFF WHO CLIMBED IT TO 517 UPON QUEBEC

July Photograph by B. Anthony Stewart

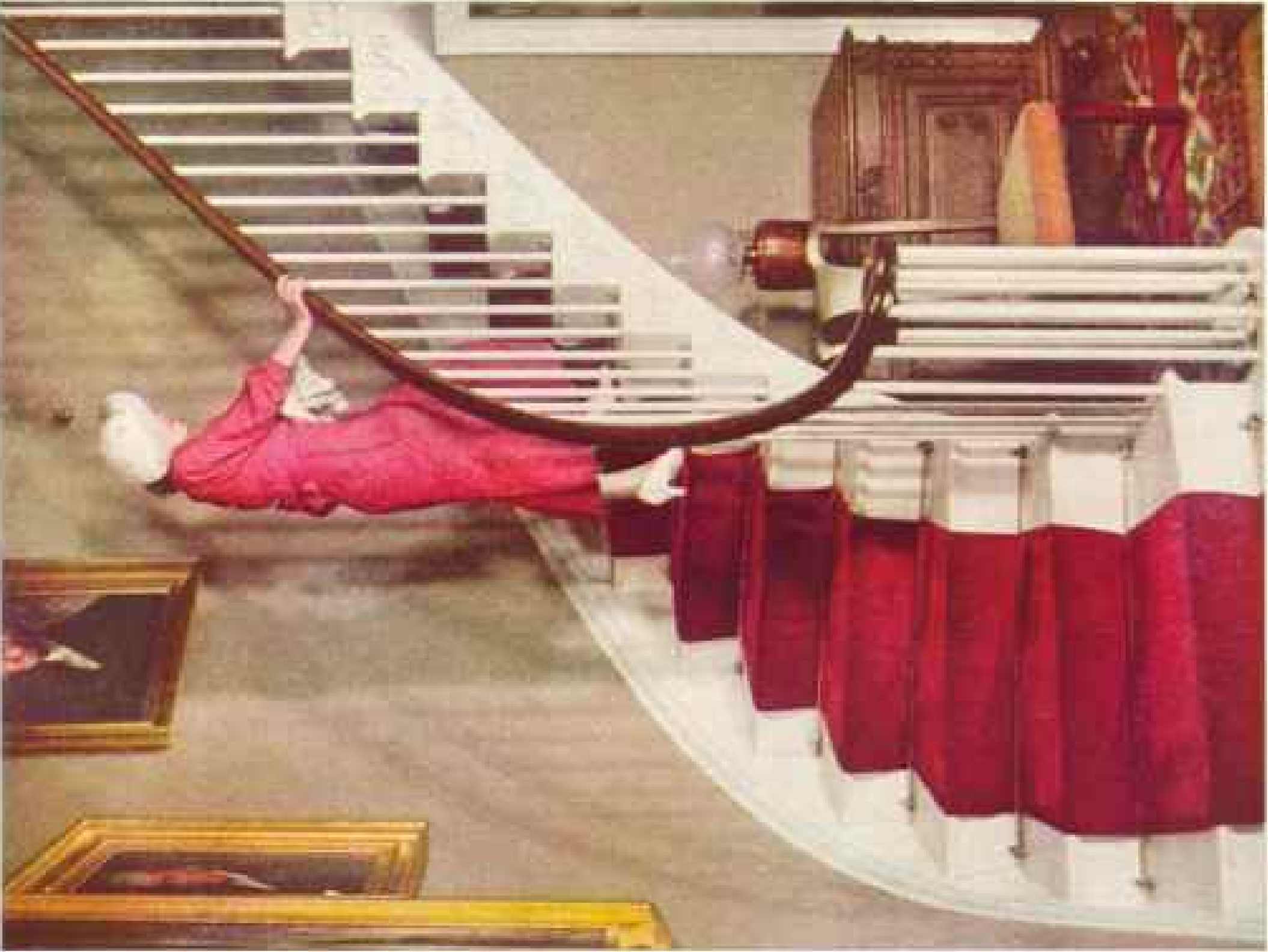
The St. Lawrence stronghold was 125 miles away, however, and the officer rejoined his commander none the wiser for his arduous assignment. From this brilliantly flowered bed of orange hawkweed, lane of the farmer, a colorful panorama spreads across the broad valley to Cranberry Peak (right center), six miles away. At the other end of the range (left) is the highest peak—4,150 feet. Between, The Horns push their points into clouds.



© National Geographic Society

BLOSSOMTIME COMES TO AROOSTOOK COUNTY

For a short period the potato fields become flower gardens on a grand scale, covering more than a hundred thousand acres. Horse and boy literally wade through the tall rows of plants that yield millions of bushels of the staple annually.



Finley Photographs by H. Anthony Stewart

WASHINGTON'S NAME IS LINKED WITH THE BLACK MANSION

The wife of its builder was the daughter of David Cobb, who served on the Commander-in-Chief's staff. The old homestead at Ellsworth is a treasury of antiques. A portrait of the First President hangs by the gracefully winding stairway.



© National Geographic Society

"SAY, MISTER, LOOK AT THAT POLLE BEND!"

So any youngster might exclaim gleefully if he came upon this angler, fly-fishing beside Attuan Pond. Fishermen return year after year to this region along the upper reaches of the Moose River, largest feeder of Moosehead Lake.



Finlay Photographs by B. Anthony Stewart

SOUTH WINDHAM FOLK OBSERVE A QUIET SABBATH

Dotting the countryside of Maine are many of these little white churches, their pointed spires serving as familiar native landmarks, monuments to a faith that has contributed much to sturdy New England character.



© National Geographic Society

Finlay Photograph by B. Anthony Stewart

GIRLS IN CAMP TUNICS ARE A FAR CRY FROM INDIANS IN WARPAINT, WHOSE SWIFT CANOES ONCE CUT THE SACO

Warriors of the Pequawket tribe ambushed and killed a handful of settlers led into battle near here by John Lovewell in 1725. Their brave stand is commemorated in one of Longfellow's earliest poems. The river winds between those granite hills and pine-covered banks near Fryeburg, bearing the canoes of a later generation, whose hardy members summer close to the New Hampshire border.



ONLY BIRD SONGS AND THE WIND IN THE BIRCHES DISTURB THEIR PEACE.

There is no better place for the weary townsmen to "get away from it all" than in one of these rustic log cabins of West Outlet, at the Moosehead Lake headwaters of the Kennebec River. A gay pansy bed brightens the graveyard of an old canoe.



© National Geographic Society

Friday Photograph by R. Anthony Stewart

TWO PAILS AND A BOX FULL OF POTENTIAL PIES

The first early-season crop of Maine blueberries is picked by hand. Later, when canners buy them by the thousands of bushels, pickers meet the demand by scooping the low-bush berries with dustpan-like "rakes" equipped with long teeth.

were supported on pillars of crystal and silver.* Here was built in 1836 the pioneer railroad in Maine to bring the lumber down from the Old Town mills to the Bangor port.

West from Bangor, Highway No. 2 follows the front line of hills facing the lower country to the south, and to the north a line of lakes. One reaches the pine- and birch-shaded bank of the Kennebec before entering Skowhegan, where the river is crossed at a high island over which Benedict Arnold's soldiers had to haul and lift their heavy bateaux during their march to Quebec (see Color Plate X).

For forty miles the route west traverses a broad, open valley, with the Belgrade Lakes hidden among the wooded hills on the south and high mountains furnishing the contrast on the north. All along the highway the farmhouses have a setting of brilliant phlox and petunias, but more numerous are the roadside gardens of Nature's own planting, bright with goldenrod, followed by asters in October, when, too, the stone walls are aflame with sumac.

PATHWAY OF PRIESTS AND SOLDIERS

The Interstate Memorial Bridge at Kittery and the "hundred harbors" of coastal Maine are not the only entrances open to the visitor of today. Along the land boundary, mostly mountainous on the west and largely river-marked on the east, there are well-established gateways through which have passed, first, the Indian trails, then rude roads, and now improved highways. Thus, the Conway Notch route entering Maine at Fryeburg served the raiding Iroquois and Mohawks; and through the Androscoggin Valley entrance, west of lovely Bethel, came the fur trail from Canada to Portland.

Crossing the mountains along the State's western boundary are the two gateways from Chaudiere to Kennebec waters. The "carry" from Lake Megantic to Chain Lakes and Dead River was the route of the Jesuit priests, down which Father Gabriel Druillettes came from Canada to the country of the Norridgewock Indians in 1646, the first European to enter Maine by the "back door."

* Norumbega on various maps of the 16th century designated the east coast of America from Nova Scotia to Florida; later it was restricted to New England, then to Maine, and finally to the Penobscot region.

This was also the route taken by Col. Benedict Arnold in his boldly planned but ill-fated expedition against Quebec in 1775. In the more than a century between the passage of the Jesuit fathers across the mountain barrier and the portage of Arnold's bateaux, nothing had been done to improve this route, and only within the past year or two has the automobile road become passable.

A better-known road for automobile travel between Quebec and western Maine is by the Jackman route, crossing the boundary divide at the headwaters of the South Branch of the Penobscot, but following south mostly along Kennebec waters. This became a crude highway a century ago, and, with the upper valley of St. John River along the eastern boundary, furnished entrance for the thousands of hardy French Canadians who have found homes in northern Maine.

THE LAKE REGION

All of these routes from Fryeburg around to Calais might well be called water gates, for they open directly into the lake region of Maine. Here is a vast playground that competes with coastal Maine and is of even greater extent. The best count of Maine's inland waters has given 2,222 as the number of lakes and ponds.*

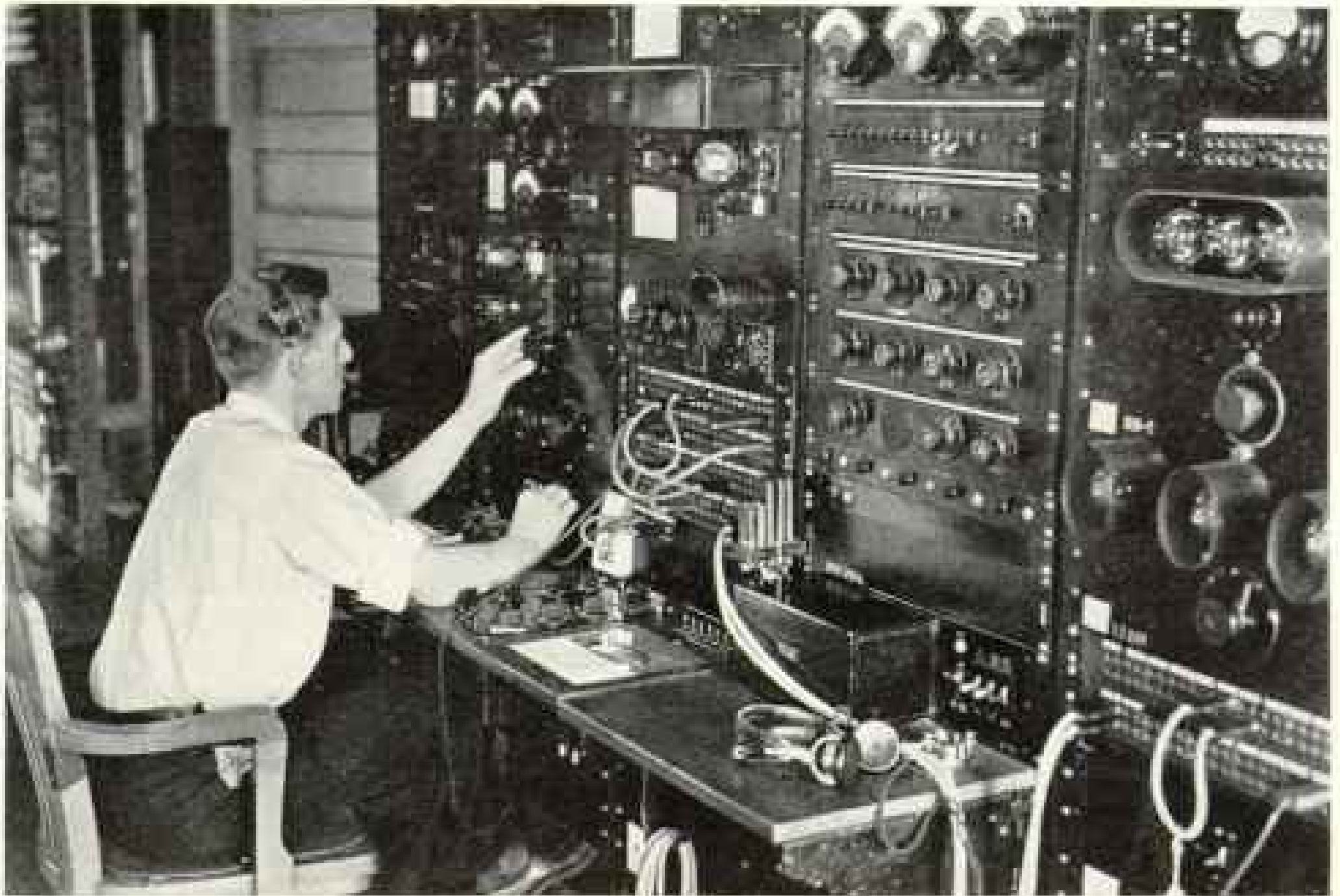
At the headwaters of three great river systems, the St. John, the Penobscot, and the Kennebec, Piscataquis County contains Maine's highest mountain, Katahdin, lacking only 13 feet of being a mile high (see Color Plate II). It also contains Maine's largest lake, and indeed the largest inland body of water wholly within New England, Moosehead (see page 544).

Moosehead, although a thousand feet above the sea, seems like an arm of the Atlantic (see map, pages 538-9).

With a length of about 30 miles, it has a shoreline of some 300 miles, and shores of marked contrast. At the mouth of Moose River lies a broad valley with fields and farmhouses, but directly opposite towers the precipitous front of Kineo, and, as a foil for its grandeur, at its southern base, the golf links.

On all sides the picture is framed in distant blue mountains.

* See "In the Allagash Country," by Kenneth F. Lee, NATIONAL GEOGRAPHIC MAGAZINE, April, 1929.



HERE LONDON MESSAGES ARE UNSCRAMBLLED FOR AMERICAN EARS

Automatic machinery in the Rugby station, near London, transforms spoken words into gibberish before they cross the ocean by long-wave. Four antennae, three miles long, pick up the message at this Bell System station at Houlton, where it is put back into original form and relayed to a New York switchboard.



Photographs by B. Anthony Stewart

WOOD FIBERS ARE SHREDDED OUT TO MAKE PAPER

Blunt steel bars on the heavy roll and bedplate rub and bruise the mass into pulp. The process continues for minutes or hours as different woods require, and is necessary to produce paper sheets of uniform texture (see text, page 560).

Still farther into the big woods man has thrown a dam 834 feet long across the head of Ripogenus Gorge, thus making available by storage 31 billion cubic feet for use on the West Branch of the Penobscot. The road from Greenville to Millinocket, crossing Ripogenus Dam, is now open for automobiles, thus making Mount Katahdin more accessible.

The granite massif of which Katahdin is the culminating peak continues to the shore of Moosehead. For 50 miles across the ridges and peaks of this wild region runs the Appalachian Trail, which two years ago was marked for 173 miles from the summit of Katahdin as far as Bigelow Mountain, and last year on to Saddleback Mountain, within sight of the Rangeley Lakes country.

Of the Maine section of this 2,050-mile footpath, the southern terminus of which is Mount Oglethorpe, in Georgia, there remain uncompleted only a few miles, from Saddleback to Grafton Notch.

Piscataquis County is not alone in wealth of fresh water. Its neighbors, Somerset, Penobscot, and Aroostook, have their own groups or chains of lakes; Franklin and Oxford share the long, popular Rangeley Lakes high among the mountains of western Maine; while under the shadow of the White Mountains are other Oxford lakes, among them Kezar Lake, which affords a fitting foreground for the unsurpassed view from Center Lovell. Its broad sweep commands the front range of the White Mountains from Speckled Mountain to Pequawket Mountain (locally called Kearsarge),



Photograph by B. Anthony Stewart.

FLICKERS MAKE A FEATHERED NECKLACE FOR A CAMP GIRL.

Long bills suggest their family relationship to the woodpeckers. When these youngsters grow up, the males may be quickly identified by the black, elongated patch or "mustache" on their cheeks. Friendly neighbors, they benefit man by eating quantities of ants.

with Mount Washington in the background.

The lakes of the Belgrade chain, including Messalonskee, Maranacook, Annabesacook, and Cobbosseecontee, all tributary to the Kennebec, furnish sites for many boys' and girls' camps.

Farther north on the two Quebec highways are other lakes long known to fishermen, especially along the two Kennebec tributaries, Dead and Moose Rivers. These lakes lie mostly between Moosehead and the Rangeley system, and thus belong to the "big woods," though easily reached by State highways.

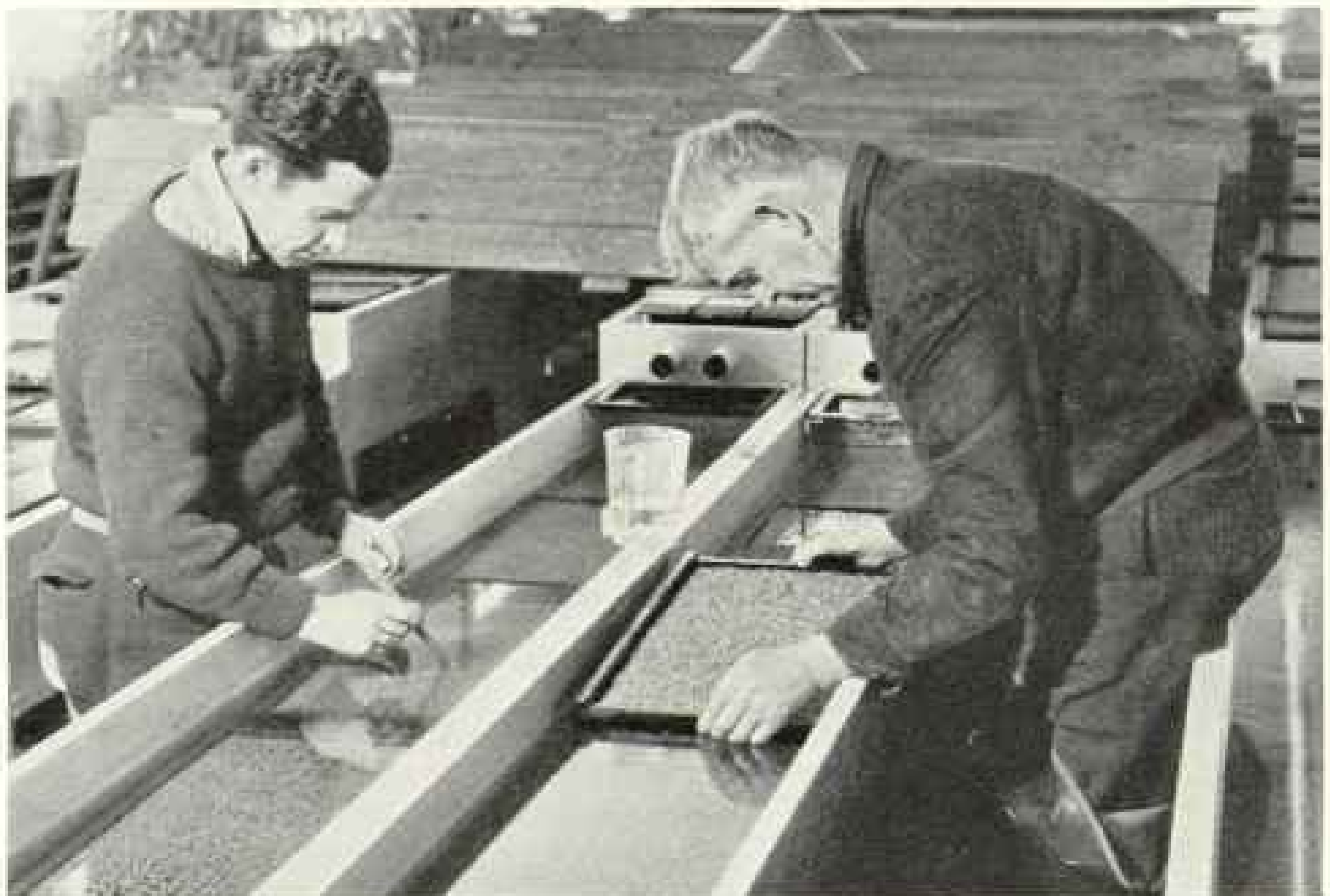
At the entrance to the upper Kennebec



Photograph by B. Anthony Stewart

WITHIN ITS WALLS HARRIET BEECHER STOWE WROTE "UNCLE TOM'S CABIN"

She came to this quiet retreat in Brunswick from Cincinnati, scene of fugitive slave flights out of the South. Brunswick is the seat of Bowdoin College (see illustration, page 546).



Photograph by Robert F. Macey

WORTHLESS SALMON EGGS ARE THROWN OUT AT THE RAYMOND HATCHERY

The attendant at the left uses tweezers to pick out white, infertile ova. Fish are netted or trapped in the fall, and their eggs removed. Incubated during winter, these eggs hatch in spring to become the young that supply the lakes and streams of Maine and other States (see text, page 534).



A LONELY CUSTOMS OUTPOST GUARDS A FRIENDLY BORDERLINE

No fortifications stand along the United States-Canada boundary. A winding road leads across hilly country to this Government station near Eastb.



Photographs by B. Anthony Stewart

THIS ELECTRIC BLADE CUTS 75 SUIT PATTERNS AT A TIME

Bolts of garment material are unrolled on the table, layer upon layer. Then, with a perpendicular knife, the operator in this Sanford mill quickly shapes the summer-weight cloth to sleeves, trouser legs, and other parts of men's clothes. Most men's shirts are also fashioned in this manner.



Photograph by B. Anthony Stewart

THE OLD JAIL AT YORK VILLAGE IS NOW A MUSEUM

Hardened criminals were cast into its damp dungeons, while minor offenders were imprisoned in less forbidding quarters. The debtor's cell is the largest.

country, on the shore of hill-girt Lake Wesserunsett, is a summer colony of theatrical people, producers and playwrights as well as players. Here in the theater set among the birches, the Lakewood Players (see Color Plate VI) for 34 seasons have entertained audiences gathered from summer camps and resorts; and license plates of 23 States have been counted in a single evening.

South of Lakewood is the Eastern Maine Music Camp, where young musicians study under the pines and birches on the shore of Messalonskee Lake.

By whatever avenue he enters the State, the newcomer promptly realizes that Maine can best be described as a land of trees. Forests cover more than three-fourths of the area. The present 15 million acres of woodland represent a shrinkage of less than

20 per cent from the primeval condition.

In recent years the few salients slowly won along the forest border by newly cleared farms are much more than offset by the steady push of pine, spruce, fir, and hemlock seedlings, everywhere winning back abandoned fields.

At the first session of its Legislature, Maine adopted a seal with the North Star as the crest, below which the shield carries the white pine and moose, the two monarchs of the Maine woods. The description of the seal, in the 1820 Laws of Maine, says of the pine: "It is as well the staple of the commerce of Maine, as the pride of her forests." Seventy-five years later, the pine cone and tassel was declared by legislative resolve to be the floral emblem of Maine, having been selected by an informal popular referendum.

As early as 1656, the town authorities of South Berwick passed an order against waste of timber. In more recent times forest conservation was accepted as a business policy, and protective measures against fire were early adopted and generously supported by timberland owners, even before State laws were passed. Maine was the first State to erect lookout towers and also the first to build them of steel. The first lookout station was erected by private landowners on Squaw Mountain in 1906. At present the State maintains 86 fire stations.

The first sawmill in America was built near York in 1623, and another at South Berwick in 1631; and fifty years later there were 24 mills in the Province of Maine, including the first gang sawmill on the continent at a site aptly named Great Works.



Photograph by B. Anthony Stewart

BOOTH TARKINGTON USES THIS SCHOONER'S CABIN FOR A STUDY.

Shored up in an improvised drydock on Kennebunkport beach, the *Regina* of Portland has become a workshop for the Indiana writer. His hands behind his back, the creator of "Penrod" stands in the shade of the veranda roof at the end of the pier.

Opportunity for the infant Colonies came from the depletion of England's forests. During the 17th and 18th centuries, naval reserves meant oak, not oil, but Queen Elizabeth and her Stuart successors squandered the royal forests to provide increased revenues independent of Parliament, while admirals protested. There was a scarcity of oak timbers, and the white pine of New England gradually became Old England's chief source of the masts sorely needed by its Navy. Falmouth (old Portland) was the chief port for the export of masts, which were larger than could then be found anywhere else in the world.

THE "BROAD ARROW" MISSES ITS MARK

In a way the Royal Navy's timber policy contributed to the Revolution. The "broad arrow," which in English forests was the

sign of naval authority over chosen trees, did not hit the mark when introduced into New England. The commandeering of mast pines was regarded by the colonists as an invasion of property rights. An official complaint is on record that only one tree in 500 suitable for masts was sent to England.

A diameter of two feet being the lower limit for "broad arrow" trees, the Maine sawmills turned out boards just within the limit, so that roofs of old houses of that period show splendid pine boards 22 or 23 inches wide, but almost never one of 24 inches.

Scores of "broad arrow" lawsuits were tried, but impartial juries were impossible to find for mast cases. The prejudice against masts reached a climax at the outbreak of the Revolution, when the export

of masts was violently stopped, the opposition at Falmouth leading later to the bombardment and burning of that town. Shutting off the supply of American masts for seven years so weakened British fleets in their rigging that they suffered unduly from storms during the Revolution.

One "broad arrow" inspector in his report mentioned one pine of over 17 feet in circumference. Michaux, the French botanist, early in the 19th century saw a pine stump in the lower Kennebec Valley "exceeding six feet," and the present Forest Commissioner of Maine reports a pine, even now growing on Allagash waters, four and a half feet in diameter.

In time Bangor became the world's largest lumber-shipping port, and in 1830 Maine led all States in output of lumber. Throughout the timber States of the West many of the most skilled lumbermen hail from the Pine Tree State.

The three decades of the 20th century have witnessed the heaviest cuts of the whole 300 years of lumbering in Maine. But there is good reason to believe that at present Maine spruce and fir are growing faster than they are being cut.

PAPER, SPOOLS, AND TOOTHPICKS

More spectacular than the 300-year life of the lumber industry has been the development of pulp- and paper-making. This has become the State's largest industry, with Maine leading all other States in pulp production from 1914-1930. The spruce, poplar, fir, and hemlock from the forests of Maine are converted into newsprint, and also into high-grade paper for books and for the popular magazines, and into writing paper and wrapping paper of all grades, including the finest tissue. Paper bags, cartons, even pie and luncheon plates, demonstrate the variety of wood-pulp uses.

The white birch, which adds so much beauty to the scenery of river bank and lakeshore, is converted into spools, shoe-pegs, clothespins, and toothpicks. In the form of toothpicks, the annual output of which reaches scores of billions, Maine birch is exported largely to the Latin countries on both sides of the Atlantic. This is a case of fair reciprocity, since a Maine Yankee, some 75 years ago, picked up the idea in South America.

Maine has been notable for originating specialties at its small woodworking plants. The network of power lines radiating from

the hydroelectric stations makes practicable small shops in hill villages which can be power-driven as cheaply as the big factories in a crowded river city. Today, neighborhood workshops are a possibility, harking back to the cooper shops of other generations.

THE BIRTH OF SHIPBUILDING

The forests that lined the Maine coast convinced Christopher Levett that ships may be "as conveniently built there as in any place of the world, where I have been, and better cheape." But even 16 years before this bold observation, shipbuilding had already begun in Maine.

The launching in 1608 at the mouth of the Kennebec of that "pretty Pynnace of about some thirty tonne, which they called the *Virginia*" marked the beginning of English shipbuilding on the American coast; and the little craft's record of outsailing her mother ship, the *Gift of God*, on her maiden voyage to old Plymouth, and of repeatedly crossing the Atlantic in the next 20 years until wrecked off the Irish coast, all testify to the honest craftsmanship of her builders.

From this tiny *Virginia of Sagadahoc* it was a far cry to the 20,773-ton *Virginia* built at Newport News 320 years later; yet they were alike in that each in its day was the largest passenger ship ever built in an American shipyard.

For more than two and a half centuries shipbuilding flourished and became the chief industry in fifty coast and river towns. The clipper-ship era was when Maine came into her own with these beautiful ships built of Maine timber by Maine builders, and largely officered and manned by natives of Maine whose birthright was a knowledge of the ways of the sea.

Kittery and Bath had shipyards which brought much fame to Maine. At Kittery was built John Paul Jones' *Ranger*, the first man-of-war to fly the Stars and Stripes, and first to receive a salute from the French fleet in acknowledgment of American independence. Here also was built the *America* in 1782, a dreadnought of her day. At the Kittery navy yard* there have been launched in later years many ships that have brought renown to the U. S. Navy.

*Though officially known as the Portsmouth (New Hampshire) Navy Yard, it is within the township of Kittery.

PINE-SCENTED, HARBOR-DENTED MAINE



FLOWERS EDGE A HIGHWAY AROUND THE HALF-MOON KENNEBUNK BEACH. Snug cottages contrast with modern hotels that overlook a shelving, hard-sand water front. Neighboring Kennebunkport is the summer home of several well-known American authors.

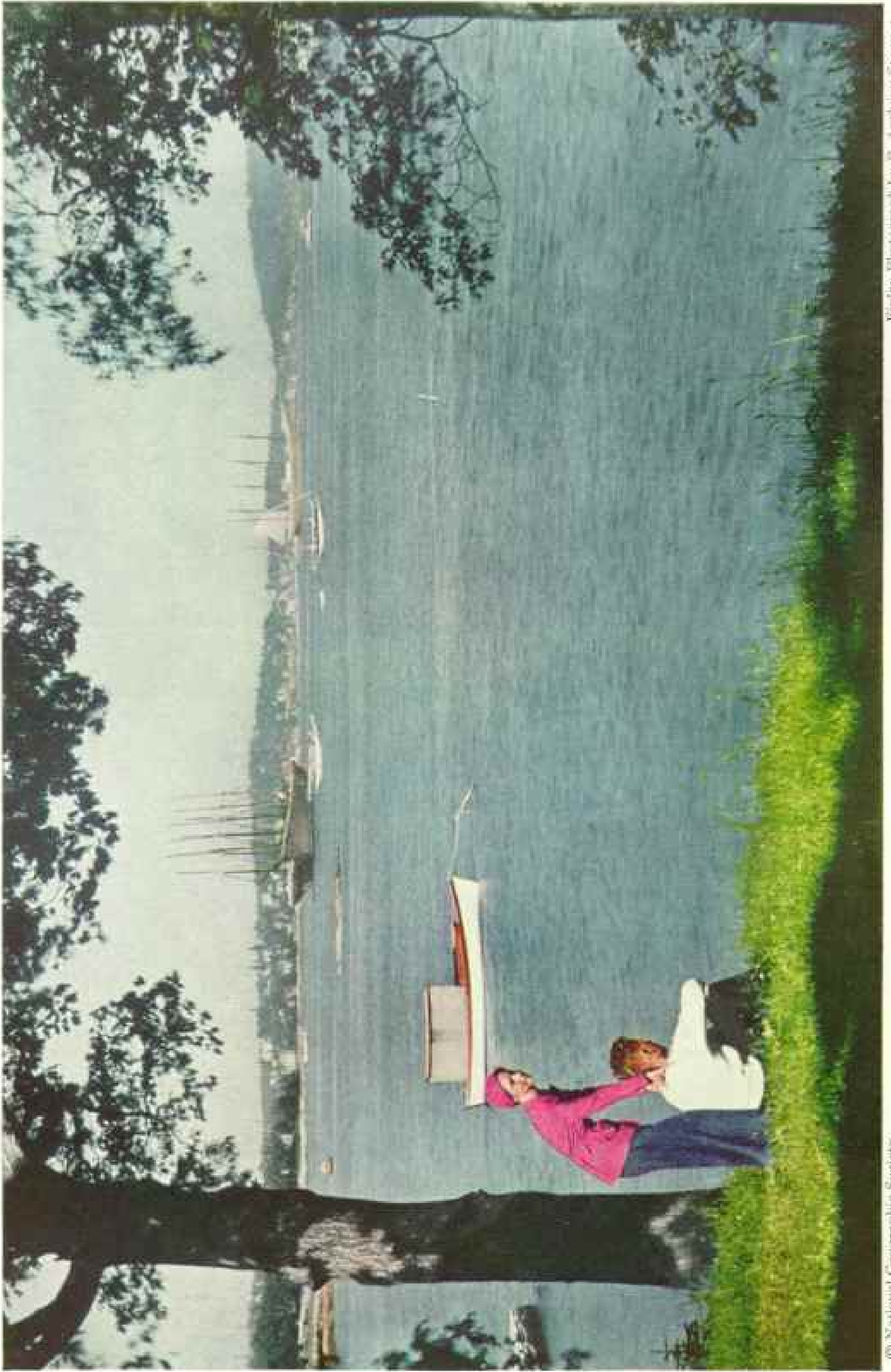


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Fishery Photographs by B. Anthony Stewart

THE FOREST CITY IS A GARDEN CITY IN SUMMER

Flower-strewn Deering's Oaks Park is in the heart of Portland, close by its new post office. First American metropolis to greet the dawn, Portland boasts the busiest port north of Boston.



© National Geographic Society

Finlay Photograph by B. Anthony Stewart

PROUD OLD FOUR-MASTED SCHOONERS ACQUIRE BARNACLES AND WISTFULNESS IN THE QUIET HAVEN OF HOOTHUAY HARBOR

Once their canvas bore the commerce of the world, but steam and oil changed that. The sheltered bay is the center of a populous region, pleasing in its variety of seaport, with narrow, winding streets and queer shops, fishing villages, and secluded estates.



© National Geographic Society

HE STEERS A COURSE TWIXT BLONDE AND BRUNETTE

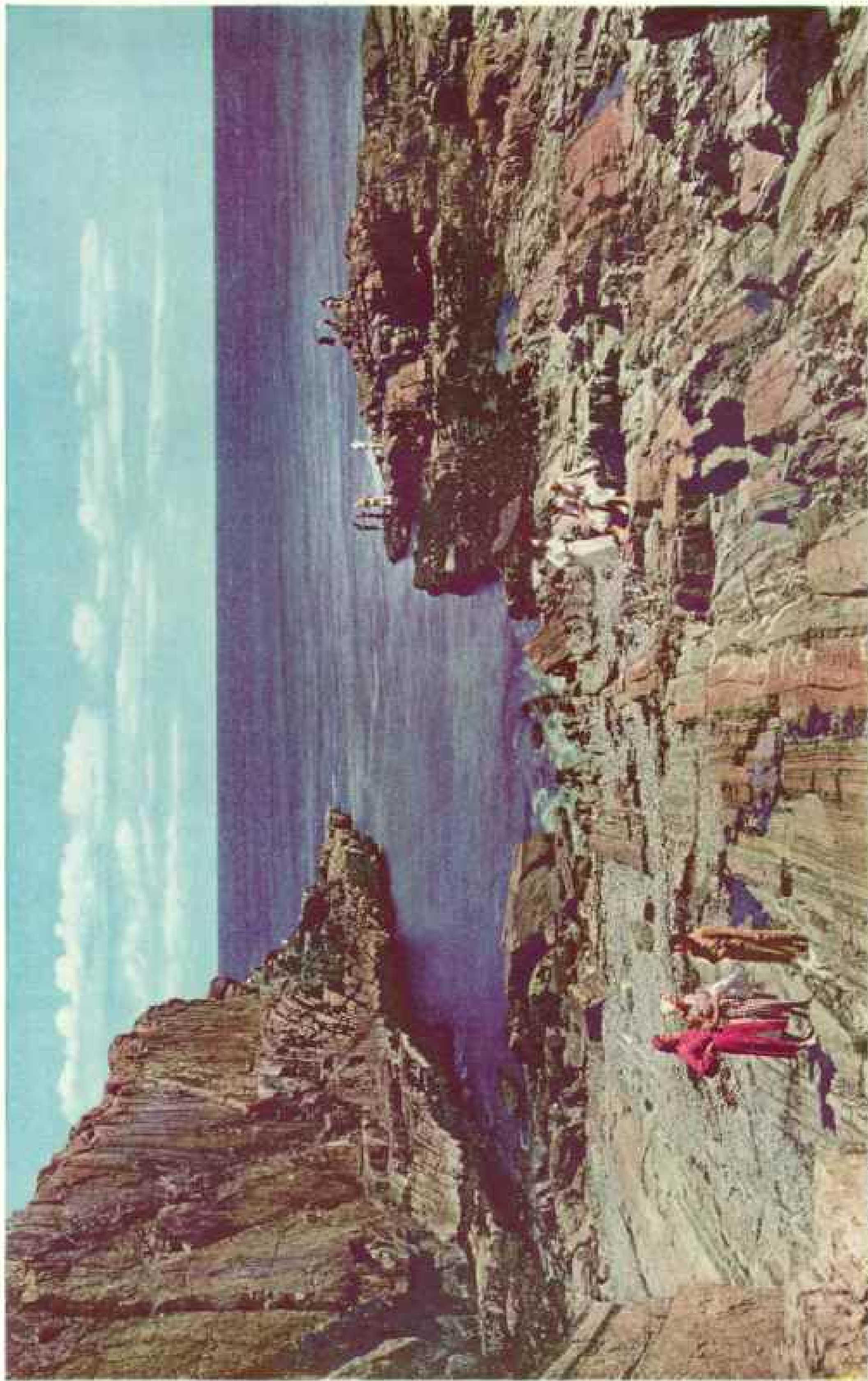
Sleek sailboats and motor yachts hailing from Atlantic ports cruise in summer among the oddly named islands of Casco Bay. Pumpkin Knob, Pound of Tea, Uncle Zeke, and many others are left in the wake of pleasure-bent skippers.



Finlay Photographs by D. Anthony Szwarc

THUS COLOR IS LENT TO THE FISHERMAN'S YARN

Lest they suffer the gibes of skeptics at home, wise anglers who catch such salmon (large panel) and trout in the Rangeley lakes district take them to this artist-taxidermist, who preserves Nature's delicate tints with his skillful brush.



© National Geographic Society

SELDOM DOES ONE SEE SUCH EVIDENCE OF THE IRRESISTIBLE FORCES OF NATURE AS AT BALD HEAD CLIFF.

Finlay Photograph by E. Anthony Stewart

Where the pounding sea has worn away the shore, a cross-section of greenstone and slate (lower center) is polished by pebbles and seaweed. This promontory, between York Beach and Ogunquit, is equally inspiring to one who would read the record of the rocks, or to another who goes simply to share the restlessness of the sea. So deep is the water at the base that schooners have been known to moor temporarily against the flat terraces of the imposing facade.

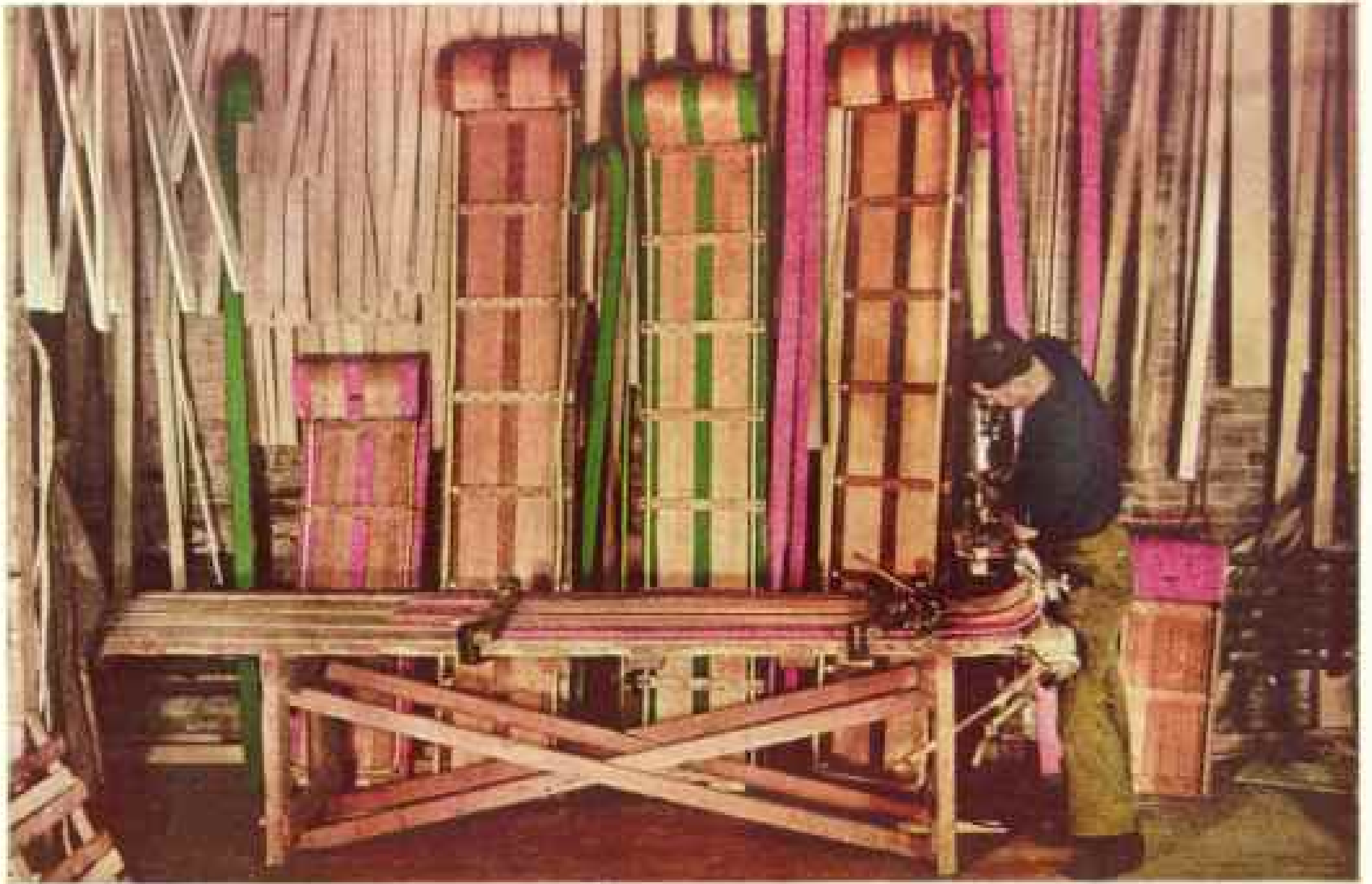


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IT IS DEPUTED THAT CHAMPLAIN FOUND NOTHING TO ADMIRE ON THIS WHITE SAND BEACH

Faded Photograph by G. Anthony Stewart

Had the French navigator received such an enthusiastic welcome when he explored the coast in 1634, he and his men might never have reached Cape Cod. Today, Old Orchard is a holiday playground for thousands who seek relief from sweltering cities in its cold waves. Trans-Atlantic flyers find that its firm sands and tremendous reach provide an excellent point of take-off. The town was named in commemoration of an orchard planted by Thomas Rogers, one of its earliest settlers.



HE WORKS IN JULY SO THAT OTHERS MAY PLAY IN JANUARY.

Like narrow skis fastened side by side are the toboggans made in this mill at South Paris, in the Oxford hills. The long ones might carry the whole family, but the little one seems especially designed for baby.



© National Geographic Society

Finlay Photographs by B. Anthony Stewart

AN INDIAN EXAMINES A COPY OF HIS FOREFATHER'S HANDICRAFT

The industry at Old Town that manufactures these fleet craft is directly traceable to the Penobscot ancestors of some of the employees. Their inherited skill has played a large part in establishing the quality reputation of the widely used Old Town Canoe.



NOT A SCHOOL OF DESIGN FOR FUTURISTIC PAINTERS

Sanford mills make rugs and carpets to suit the most bizarre taste. Set in wool, the patterns and colors somewhat resemble a wood inlay. This textile town is the birthplace of the cool summer fabric—palm beach.



© National Geographic Society

Finlay Photographs by H. Anthony Stewart

"BUNNY" GETS HIS FUR TRIMMED IN BIDDEFORD

Animals that delight the child's fancy decorate these warm blankets. This mill perpetuates the name of Sir William Pepperrell, Yankee shipbuilder and soldier who led the American colonists at the capture of the French stronghold at Louisburg, Nova Scotia, in 1745.



CORK-BUOYED NETS DRY IN THE FISHERY ATMOSPHERE OF A MAINE WHARF.

The scene is familiar to all who have explored the State's hundred-harbored coastline, where fishing villages are the rule. Here a young salt explains to summer visitors how the mesh is mended on spool-like reels.



© National Geographic Society

Finlay Photographs by R. Anthony Stewart

"ONCE HE GETS IN, LADY, HE DOESN'T GET OUT"

Lobster pots resemble chicken crates and function like rat traps. They snare the crustaceans that provide a livelihood for many Monhegan Island fishermen. It was here that John Smith first named this part of the country "New England" (see Color Plate VI).

Bath not only won fame for its wooden ships, but when iron and steel replaced oak and pine, Bath met the new demand by building the first steel sailing vessel, a four-master. This vessel and the last wooden four-master built in Bath were both sunk by the Germans, the wooden *William P. Frye* being the first American ship thus sacrificed. Battleships, cruisers, gunboats, and destroyers, as well as the ram *Katahdin*, are included in the total output of more than a million and a quarter tons of shipping launched at Bath alone.

COOL SUMMERS HELP MANY CROPS

Aroostook potatoes constitute Maine's largest crop, and in average yield per acre (except for one or two irrigated counties in California) and acres cultivated this county leads the Nation. The broad, fertile fields in the gently rolling country in the valley of the St. John and its tributaries favor the highly specialized culture that gives the record-breaking results. Last year the yield for the State exceeded 56 million bushels. Usually from 5 to 10 per cent of this crop are certified seed potatoes for use in the Southern and Middle Atlantic States (see Plate XIII).

The cool summers have given Maine farmers an advantage for many crops where high quality, rather than large yield, is a controlling factor. Sweet corn, for example, has a farm price in Maine higher than that in competing States, the sweetness of the corn and the longer period it remains in good canning condition being the result of favoring temperatures. A similar relation between quality and climate holds for green peas and other vegetables grown for the canneries, as well as for the apples in the upland orchards through central Maine.

Sweet corn, blueberries, peas, beans, and apples, well prepared and scientifically canned, carry the Maine label to distant consumers who demand the highest quality. Under this protective covering of tin the products of Maine fisheries also are marketed in large volume, the lowly clam as well as the lobster, and especially the herring, under the alias of sardine.

The clam might claim a creditable share in promoting settlement during the 17th and 18th centuries. Indeed, not many decades ago, in the Penobscot Bay region the clam hoe was fondly referred to as the "North Haven life preserver."

Fifty years ago many of the highways in eastern Maine were lined with hemlock bark corded up ready for hauling to the tanneries. These piles would extend for miles, for one tannery alone had a capacity for tanbark that required piles a mile long every two weeks. Modern methods use substitutes for the hemlock extract, so that only four tanneries remain in Maine where once there were four hundred.

Another even more spectacular industry of a generation ago was ice cutting for southern markets. The first cargo of ice went to Baltimore in 1826 and was sold for \$700. From that the industry grew until the 1890 cut was more than three million tons, and the Kennebec River during the ice harvesting was a busy scene. Artificial ice has now limited ice cutting to meeting local demand, which is less each year.

Maine's abundance of water power has attracted industry and from early days power sites had become townsites. The mill towns of Maine, Biddeford and Saco, Brunswick, Lewiston and Auburn, Augusta, Waterville, Skowhegan, Bangor, Orono, and Calais, were all settled on the lower waterfalls of five principal rivers. Even in the less accessible parts of the State most communities had their beginning on the bank of some stream, where stood the sawmill, the gristmill, and the carding mill.

SOME FAMOUS COLLEGES

The colleges of Maine are all located in important industrial centers: Bowdoin at Brunswick, Colby at Waterville, Bates at Lewiston, and the University of Maine at Orono.

Bowdoin, one of the older colleges of the country, opening its doors in 1802, began early to specialize in graduates prominent as statesmen and writers. Franklin Pierce, the fourteenth President of the United States, was of the class of 1824, and Henry W. Longfellow and Nathaniel Hawthorne were graduated one year later. And in that later period when Maine occupied so commanding a position at the Nation's Capitol, Bowdoin's representatives were Chief Justice Melville W. Fuller, President of the Senate William P. Frye, and Speaker of the House Thomas B. Reed (see illustration, page 546).

Maine has sent six Bowdoin graduates to the U. S. Senate, including the present able Senator, Wallace H. White, and twenty-five to the U. S. House of Representatives.



Photograph by Joseph Coburn Smith

THE BUNKHOUSE IS A WELCOME SIGHT AT DUSK

Cheerful smoke waves above a distant chimney, promising warmth and rest under the snow-covered roof near Moosehead Lake. During the long winter cutting season, woodsmen live in such cabin shelters built in clearings among the spruce trees. The author, carrying snowshoes, brings up the rear.

To Bowdoin's credit stand the Arctic records of two illustrious alumni: Robert E. Peary, Donald B. MacMillan.

The other Maine college now in its second century is Colby, at Waterville (see illustration, page 535). Of its first class, George Dana Boardman became a pioneer missionary to the Karens in Burma; and the valedictorian of the class of 1826, Elijah Parish Lovejoy, was killed by a mob only eleven years later, "the first American martyr to the freedom of the press." With 39 college presidents, six of them founders of colleges, included among its alumni, Colby's specialty may be said to have been educa-

tors, with a generous addition of missionaries, editors, and jurists.

Bates College, with three-quarters of a century of contribution to higher education, pioneered in college training for women on the same basis as for men. Four out of ten of all the Bates graduates have engaged in educational work.

The youngest and largest educational institution is the University of Maine, with courses in agriculture, forestry, and technology, as well as in arts and sciences.

Of special interest to the members of the National Geographic Society is the fact that one of the University of Maine graduates is Capt. Albert W. Stevens, whose explorations of the stratosphere and unsurpassed photographs from the air are familiar (see illustration, page 540).

Maine was the pioneer in technical education, for at Gardiner in 1823 there was established the first school of science and

engineering in any English-speaking country. This Gardiner Lyceum owed its origin to the enlightened vision of Robert H. Gardiner, and had as its head a graduate of Bowdoin, Benjamin Hale, who said of the Lyceum's students, "They must be made acquainted with machines." This school in 1831 was deprived of its State aid and soon thereafter lost its original character, leaving to Rensselaer Polytechnic Institute at Troy, New York, the honor of being the oldest technical school, although founded a year later than the Gardiner Lyceum.

Not mere chance but the discipline in the hard school of events fitted Maine's children

for the large sphere of influence so faithfully described by a Maine poet:

Their names are writ on
the honor roll
Of every battle for
freedom and right;
Their feet have been
swift in the race
whose goal
Is the wider look
from the fairer
height.

Not content with raising her own Governors, Maine has furnished one or more chief executives to many of the other States, beginning with Sir William Phips, the first Royal Governor of Massachusetts, and coming down even to the recently elected Governor H. Styles Bridges of New Hampshire. Maine sent Vice President Hannibal Hamlin to Washington under Lincoln.

In Army and Navy, Maine has been represented by scores of officers of high rank, from Sir William Pepperrell, the commander at Louisburg, and Commodore Edward Preble, who subdued the Barbary Powers, to Generals Chamberlain and Howard, of Civil War renown, and Rear Admirals C. F. Hughes and W. V. Pratt, the latter a member of the National Geographic Society Board of Trustees.

In the broad field of art, high honors have come to B. P. Akers and F. Simmons, sculptors, and to Ben Foster, painter of autumnal landscapes; to Annie Louise Cary and Lillian Nordica, Maine's prima donnas.

Many have won success in the industrial world. Among them are the Maxim brothers, inventors, John F. Stevens, railroad and canal builder, and Charles Albert Coffin, founder of the General Electric Company.



Photograph by B. Anthony Stewart.

APPETITES RAISED AN OYSTER MONUMENT

Algonquin Indians started the summer rush to the Maine coast. For untold years they came down from the woods to the Damariscotta River to feast upon their favorite seafood. Long exhausted, the oyster beds now promise to yield from seed planted several years ago.

From the "back country" of Maine have come "Artemus Ward" and Bill Nye, laughmakers to the Nation.

In more serious literature, the roll of honor is a long one, with the imperishable name of Longfellow at the top.

In the realm of poetry of today, Edwin Arlington Robinson and the gifted Edna St. Vincent Millay are both Maine-born; in current fiction, Kenneth Roberts and Mary Ellen Chase are leaders.

MAINE AS A YEAR-ROUND HOME

In 1927, by act of the Legislature of Maine, it was "Resolved: That the chicka-



Photograph by Portland Maine Publishing Company

PEARY'S OLD HOME, PERCHED ON EAGLE ISLAND, OVERLOOKS THE SEA

To this explorer The Society awarded its Hubbard Medal in December, 1906, for attaining farthest north; and later its Special Gold Medal for his discovery of the North Pole on April 6, 1909 (see text, page 590). Peary's first published address, "Across Nicaragua with Transit and Machete," was printed in Volume One of the NATIONAL GEOGRAPHIC MAGAZINE, 1888-89; his last article, "The Future of the Airplane," in the NATIONAL GEOGRAPHIC MAGAZINE, January, 1918.

dee is hereby declared to be the State bird for the State of Maine." This choice resulted from a popular movement started at Northeast Harbor. Throughout the State the chickadee was regarded as possessing qualities which make him a good neighbor: optimistic and industrious whatever his surroundings, sociable in town and deep woods, and self-confident in quick motion and cheery call. Best of all, he is a year-round resident in this outpost State, where Arctic temperatures are not unknown.

This hardiness, however, is not always admired. A native of northern Maine traveling a tote road in midwinter noticed above him far out on a poplar branch a chickadee, singing away regardless of the below-zero chill or the bite of driving snow. Man, wrapped to his eyes in muffler and well protected by his fur coat, could imagine the warmer clime of other States, and uttered his disgust at the contentment of this other native: "Little pesky fool, you've got wings, ain't yer?"

Even as this story of Maine is being written, the author is experiencing, at his home in Skowhegan, an early-morning difference of 106 degrees between his living-room and piazza thermometers: $+64^{\circ}$ and -42° .

Experience has shown that many who heed the call of Maine for the summer season learn that other months have their own attractions. When the vacation time is past, Maine's Indian summer is just beginning, and Nature's rock gardens on the hillsides reveal unexpected beauty. Where in summer the ledges were clothed in modest green, they are now flaming with crimson mantles.

Often he who tarries to enjoy a Maine autumn is lost, and, becoming fired with the spirit of adventure, stays to experience a Maine winter. Then the landscape becomes one of pure white and green in the foreground, with the distant hills in purple and blue, which become vivid and brilliant by the sunset light.

MY FLIGHT FROM HAWAII

BY AMELIA EARHART

THE story of my flight from Honolulu to San Francisco begins several months before the date of the crossing. Paul Mantz, my technical adviser, Ernie Tissot, mechanic, and others had worked for some time getting the plane and motor in readiness. On December 22, 1934, these two, with Mrs. Mantz, Mr. Putnam and me, set off from Los Angeles for Honolulu. The airplane, intact, rode with us on the *Lurline*, secured as only sailors could do it, on the aft tennis deck.

During the five days of the voyage we ran the motor up several times, lest it swallow too much corroding salt moisture, and tested the radio. After midnight, as far as 1,000 miles from shore, we picked up the familiar airway station signals. "Sparks," the *Lurline's* radio operator, was much interested in our set and was extremely helpful.

Two weeks in Honolulu were necessary for final testing and checking. Paul and Ernie, with United States Army helpers, worked day and night. I stayed away except for special tests I had to make. This was partly because I could not help the competent gentlemen in any way and partly because I believe it is better for the flyer's peace of mind to back away from the project in hand, occasionally, and get perspective.

By January 11, Paul had completed to his satisfaction final mechanical details on the plane. I was fit as could be and weather was favorable.

THE WIND IS PERVERSE

I had intended to try taking off about 1:30 or 2 o'clock in the afternoon, but late in the morning light rain began to fall. Before 1 o'clock it had turned into a tropical downpour. The wind, instead of blowing from the northeast as it had been doing, came perversely from the southwest.

Wheeler Field, the Army airport which I planned to use, has no hard-surface runways, and I knew the ground would be fairly soft for a heavily loaded plane. I was carrying more than 500 gallons of gasoline, and this, combined with other extras, weighted my plane more than ever before.

However, the field is 6,000 feet long and slopes into the direction of the prevailing winds. A plane takes off against the wind

as does a small boy's kite. Even with unfavorable surface conditions and without the usual help from the wind, I still felt I could lift my plane in a 3,000-foot run, perhaps less. The Army authorities had kindly mowed a pathway for me in the smoothest part of the reservation and had planted small white flags along the edge to guide me.

As lunch time approached with no improvement in weather, a small group of those intimately connected with the flight had luncheon at the home of Lieutenant and Mrs. George Sparhawk. The invaluable aid Lieutenant Sparhawk rendered in connection with radio tests was equaled only by his wife's ability and willingness to turn her home into a temporary boarding house for Putnams, Mantzes, and their associates.

FIELD WET, PLANE WET, AND SPIRITS DAMP

Intermittently someone at the window reported weather changes. I went to sleep for a while and awoke about 2:30—to the continued patter of rain.

About 3:30 the rain slackened. The wind died down and the clouds gave promise of breaking at last. So I drove to the hangar where my plane was housed. Weather forecasts over the Pacific were satisfactory, but would not remain so the next day. Unless I took off, despite the local meteorological upset, I might be held indefinitely.

I found the field wet, the plane wet, and certainly the spirits of the faithful few who were standing by were damp, indeed. However, I asked that the motor be warmed and my few belongings stowed. At 4:30 I climbed into the cockpit and tested the motor. It sounded crisp and lusty.

There were about two hundred people standing silent on the apron, somber weather having discouraged more of the curious. I saw several women with handkerchiefs obviously ready for any emergency.

Out of the corner of my eye I sighted three fire engines and an ambulance posted down the field where "X" might be expected to mark the spot if an accident occurred. The Army to a man seemed to have portable fire extinguishers in their hands.



Photograph from George Palmer Putnam

TWO AIR-MINDED WOMEN EXAMINE A MESSAGE FROM SHORE

Miss Earhart (in trousers) and Mrs. Paul Mantz, the wife of her technical adviser, stand beside the former's sleek Lockheed plane, lashed to the aft tennis deck of the *Lorline*, on the way to Honolulu. Several times during the five-day voyage the motor was tested, or "run up," lest it swallow too much corroding salt moisture (see text, page 593).

Such precautions were wise enough, for the take-off, with excess load, is considered by many flyers the most hazardous moment.

My loaded plane weighed more than 6,000 pounds. Three tons is considerable weight for a comparatively small type like mine to get into the air, even from a smooth, paved runway under favorable conditions. Here I had no runway, and the weather was definitely unhelpful.

A TAKE-OFF IN THE MUD

At 4:45 I taxied to the end of the marked pathway. Paul Mantz freed a ball of mud and grass my tail skid had rolled up. My last human contact was a fleeting glimpse of Ernie, my mechanic, trotting along beside the plane, mud sloshing over his shoe tops at each step. His cigarette drooped forlornly from the corner of his mouth; his face was as white as paper. I hope he saw me smile.

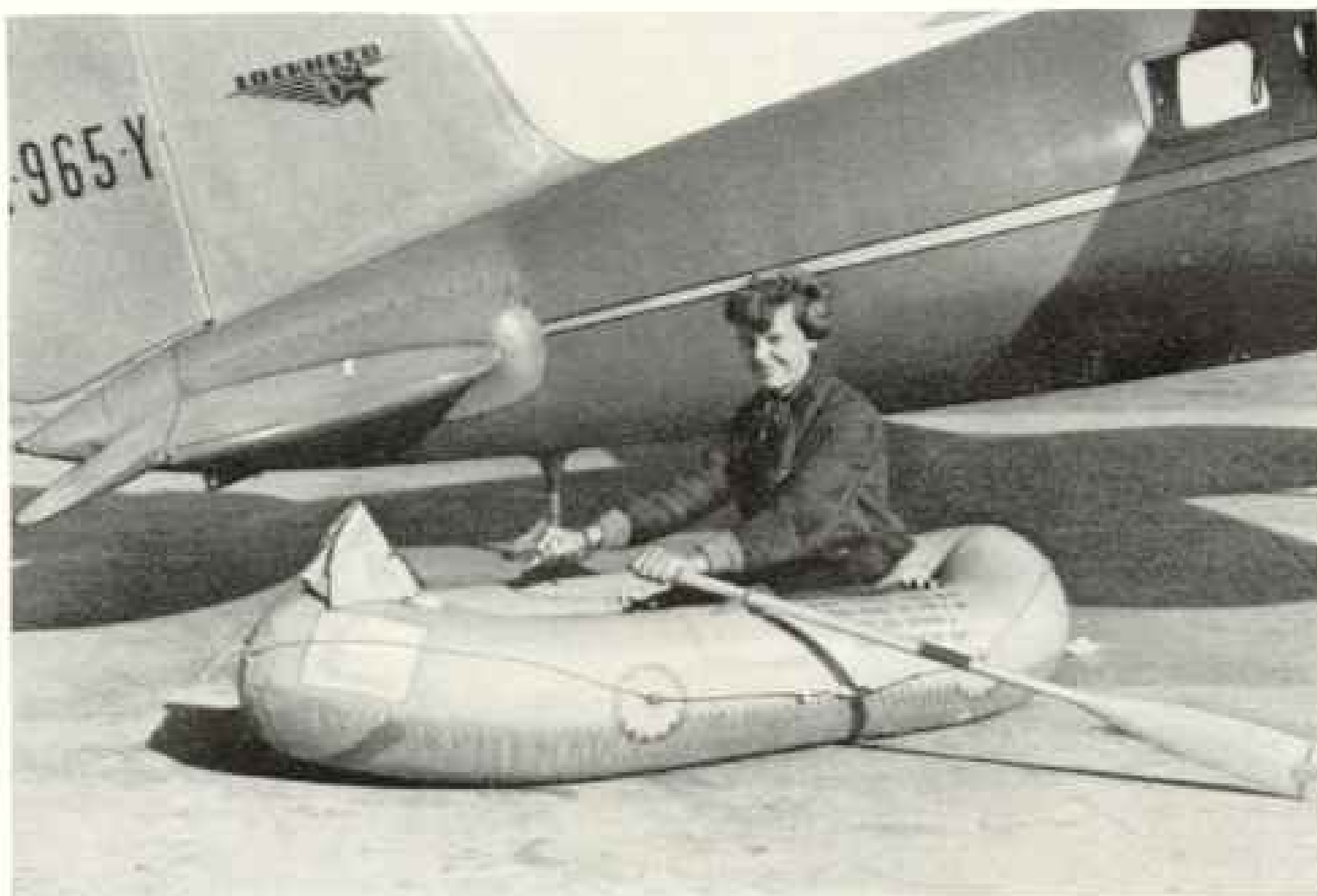
I looked ahead between the marker flags, checked again the spot at which I was to begin to stop in case I was not off the

ground by the time I passed it, and pushed the throttle ahead.

The plane did exactly as expected. The tail came up as it gathered speed, throwing up a cataract of red-brown mud. It grew lighter, as the 550 harnessed horses of the Wasp motor gobbled gas. Then a final bounce and it took to the air, holding it easily as I slowly turned to the right toward Honolulu and Diamond Head. The take-off, I am told, was accomplished well within 3,000 feet—less than half the length of the field.

Skirting Honolulu, I could see the human ants, far below, going home after their day's work. I rounded Makapuu Point, the last island outpost on my course. To my right I could see the long sloping side of Molokai, the next island, blue in the hazy distance. Clouds were all about me from the start, and to get on top of them I climbed 6,000 feet, whence I could look down on their fluffy contours moving against the dark sea.

On three over-ocean air voyages, totaling about 6,500 miles, I have seen little



Photograph from George Palmer Putnam

MISS EARHART TRIES OUT HER RUBBER RAFT BEFORE THE TAKE-OFF

Because the airplane's heavy "nose" would probably submerge first in a forced landing at sea, this emergency craft—fortunately not needed—was stored aft, behind gasoline tanks. It was accessible by crawling along the fuselage and hacking a hole in the fabric with a hatchet which the aviator carried in her belt (see text, page 605). Capable of being inflated quickly by a carbon-dioxide container, the raft was provided with oars, tomato juice, chocolate, malted-milk tablets, and water.

more than a thousand miles of water. On these flights I have been above clouds, between two layers, or actually in the formation most of the time. Certainly, in covering similar distances on ships one gets a much better idea of how mighty oceans really appear.

A NIGHT OF STARS

The night I found over the Pacific was a night of stars. They seemed to rise from the sea and hang outside my cockpit window, near enough to touch, until hours later they slipped away into the dawn.

But shortly before midnight I spied a star that differed from the others. It was too pink and it flashed as no star could. I realized I was seeing a ship, with its searchlights turned into the heavens as a lamppost to guide me on my way. I snapped on my landing lights, which are on the leading edge of the wings midway to their tips, and had them bravely blink a greeting to whoever might be watching.

I was wearing my radio earphones, and after a moment the spattering buckshot of code wiped out everything else on the air, as the radio operator on that ship broadcast to shore stations that I had been sighted. Though we could not converse directly, it was comforting to hear the crackle he produced and to realize that at least thus far I was on the course. Later I learned the vessel passed was the Matson ship *Maliko*, 900 miles from Honolulu.

An interesting data sheet in my "chart room" (a tiny space in the wing beside my shoulder, where reposed maps, tools, etc.) was a blueprint showing the position of every vessel on or near the course, and the exact time I should be over it, reckoned on an average flying speed and a predetermined hour of starting.

But before starting I thought it unlikely that I would sight a ship. The chance of two specks, one on the surface of a very large ocean, the other thousands of feet above it, passing near enough to see each other seemed slim.

About midway the *Ramapo*, Navy tanker, reported me, but I missed seeing her.

TWO-WAY RADIO TELEPHONE

Mine was the first civilian long-distance flight made with two-way radio telephone. This equipment, of course, is regularly used on the air-transport lines in the United States, but hitherto has been perhaps too heavy, costly, and complex to find a place in record flying.

My outfit, in addition to the usual set for beam reception, included a 50-watt transmitter with a possible sending range of more than 2,000 miles. My call letters are KHABQ (a mouthful indeed!), assigned by the Federal Communications Commission under a special license for communication at sea, with frequencies of 6,210 and 3,105 kilocycles. On the Pacific voyage I received certain commercial broadcasting stations, tuning the programs low except when the stations "talked" to me.

I was scheduled to transmit at a quarter to and a quarter past the hour. The radio itself was operated by remote control and was situated in the rear of the plane, behind the fuselage gas tanks. In the cockpit I had a dial for tone and sensitivity control and volume, a selector switch, and a hand-held microphone.

To broadcast, I rolled out the antenna through a hole in the floor by means of a reel under my seat. The antenna was weighted with a small lead ball, and streamed out in an arc below the plane in flight—adding another thing for a pilot to think about when taking off or landing, for it had to be reeled in then.

Commercial stations which generously cooperated with me before and during the flight were KGU in Honolulu, KPO in San Francisco, and KFI of Los Angeles. The latter put on a special all-night program, relayed information, and otherwise kept in touch with me every half hour. The Department of Commerce short-wave airway stations on the coast and at Kingman, Arizona, also stood by for the duration of the flight. They, and the amateurs who cooperated, can never know how much they helped a lone pilot.

Only a few hours after the start, I happened to hear the KGU announcer say: "We are interrupting our musical program so that Mr. Putnam may try to communicate with his wife."

And then, some hundreds of miles out over the Pacific, I heard my husband's voice as though he were in the next room.

"A. E.," he said, "the noise of your motor interferes with your messages. Please speak a little louder."

A few minutes later I talked back to him, through the little cup microphone—louder, as requested.

Crossing the Atlantic, I saw no actual sunrise, because of clouds. This time, with more than half of the Pacific stretched behind me, the rising sun ushered in a new day in orderly fashion. Since I was coming from "down under," the sun flared over the horizon not straight ahead but somewhat to my right, fortunately for my eyes. Flying full into the glare at high altitudes is very trying, even with dark glasses.

All the way I had flown at 8,000 feet, because best winds had been predicted there. From dawn until 10:30 I was over a solid pack of fog in a world utterly remote and quite my own. Once, on the quarter hour, I confided to my microphone, "I am getting tired of this fog." Subsequently I discovered that all of the message which filtered through the static to mainland listeners were the words, "I am getting tired." So shore radio announcers, bless them, had fresh ammunition for their word pictures of the little girl battling exhaustion as well as the elements.

After I had been flying for about 15 hours, the formation began to break up. Large holes appeared, through which I could see the crinkled blue surface of the sea flecked with morning sunlight.

A larger opening appeared on my left and framed in the middle was another ship. Down through the hole in the clouds I went, happy for the company of that toy steamer and exceedingly pleased because its presence proved I still was on my course.

Only 150 to 200 feet above the sea I circled the steamer, which proved to be the Dollar liner *President Pierce*. And then I "lined up" on the wake, which from the air I could see stretching astern for perhaps a mile. The line of that wake checked exactly with the compass course I had been following. So I continued on my way.

Within a few minutes KPO, in answer to my query, radioed me the position of the *President Pierce* as 300 miles out from San Francisco. I did not pull up again to 8,000 feet, but flew at about 1,500 the rest of the way to shore.



© Thomas Edward Blake

THE PHOTOGRAPHER DISPLAYS SOME SURFBOARDS, ALL BUILT BY HIMSELF

He stands before his redwood favorite, 11 feet long, 23 inches wide, and $3\frac{1}{4}$ inches thick, square-edged on the bottom for steadiness. Number 2, of red cedar and a foot longer, is for fast paddling. For big waves, the third, hollow—length, $14\frac{1}{2}$ feet; width, 20 inches; weight, 120 pounds—has proved easier to handle than the fourth, a reproduction of the ancient Hawaiian rider. The fifth, a light, hollow 16-footer, broke all paddle-race records at Waikiki. The last, solid and heavy, is a training board.



© Thomas Edward Blake

HERE COMES A TOWERING SIX-FOOTER, AND FOUR OF THE BOYS HAVE CAUGHT IT

A moment of suspense, a whirl of the mounts, and they are off for a joyous ride. The surfer rise to their feet the instant the boards have slid down the advancing slope, clear of the foaming break which is about to curl over them. A blunder now means a ducking in the blinding spray. Two puddlers in the left background are waiting for the next wave.



© Thomas Edward Blake

TANDEM SURF-RIDING, PLAIN AND FANCY, FURNISHES A VARIETY OF THRILLS.

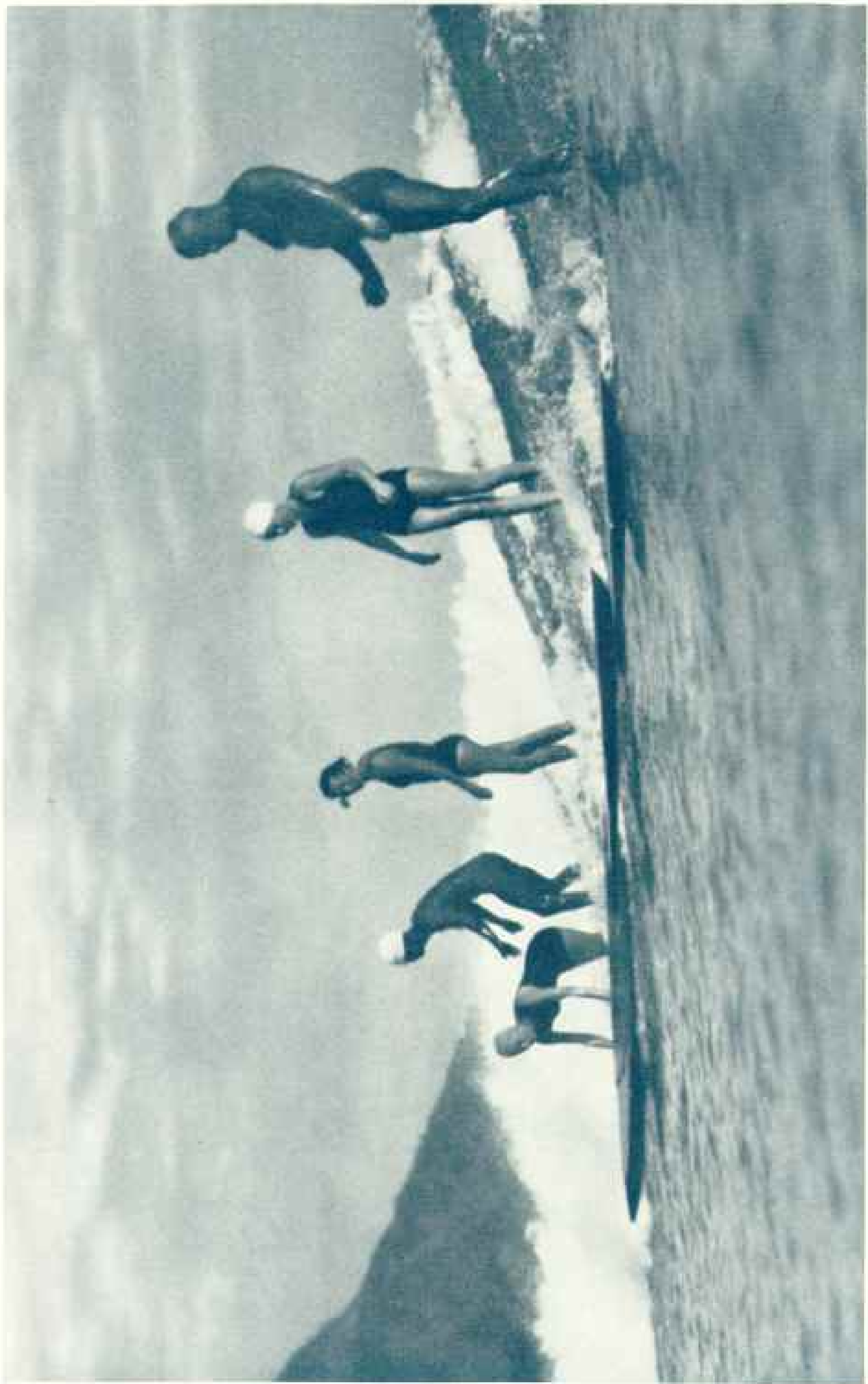
Once the trick of standing on the slippery, fast-moving board is mastered, an attempt at the feat performed by the pair to the left is sure to add zest. The girl rises just as the wave is caught, and the man gets to his feet beneath her. At the end of the ride, if not thrown off violently, they may fall back and kick the craft away, or stay on until it comes to a stop and sinks under them.



© Thomas Edward Blake

WITH THE ADVANCING BREAK PRESSING HARD, ONLY QUICK ACTION CAN AVERT A SPILL

Unable to control his board, the boy lying down will upset the standing riders, if the nearest one falls to push him out of the way. In big surf, strong trade winds sometimes blow from a cresting giant wave white spray 50 feet high and 100 feet back—a glorious sight against the curtain of clouds, mountains, and palm-fringed shore. One who tumbles into such a smother cannot see until the shower subsides.



© Thomas Edward Blake

GIRLS AS WELL AS MEN ENJOY THE SPORT

Only a few women at Waikiki, however, have learned the more difficult tricks. The two standing on their boards are among the cleverest. To do this requires skill. The girl on hands and knees, about to be helped to her feet by the beach boy riding tandem with her, may be a beginner.



© Thomas Edward Blyde

THOUGH HIDING IN PERFECT FORM, THIS TEAM CANNOT ESCAPE A DUCKING

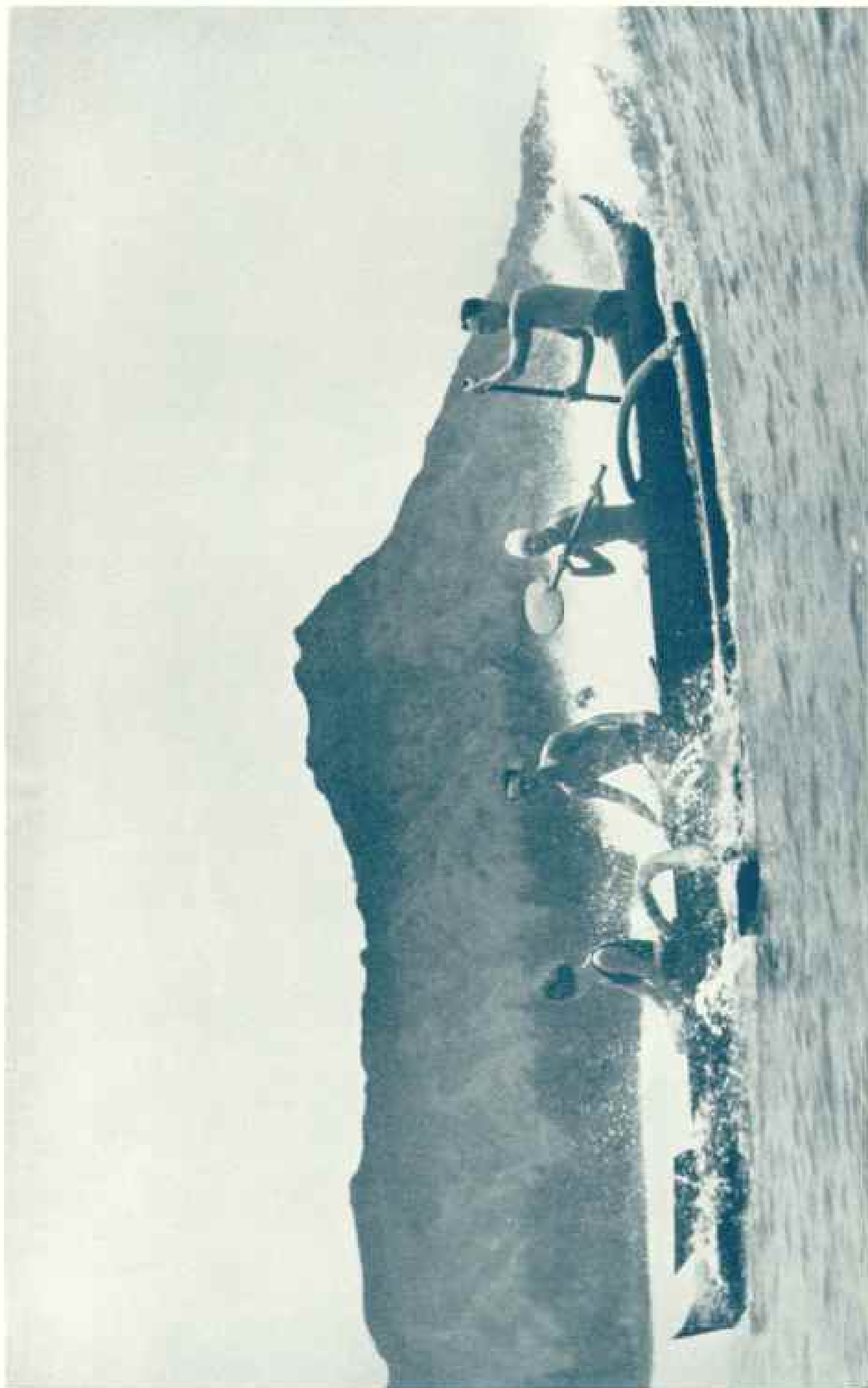
The wave, just the right size for tandem surfing, is about to comb and engulf the beach boy and girl. At the left appears a break which will curl gradually over the entire swell. Diamond Head, marking the southeastern end of Waikiki Beach, rises in the background.



© Thomas Eibartot Blahu

FROM TEN YEARS UP, SCHOOL CHILDREN RIDE THE BREAKERS

Saturday afternoon brings a throng of youngsters to the surf at Waikiki, all with the same ambition—to catch each wave. About half of those who try succeed. The rest take the tumbles and wait for another chance. He who hesitates spills himself and several others. Some may be a bit bruised by loose boards.



© Thomas Edward Blake

AMELIA EARHART, WHILE AWAITING FAVORABLE FLIGHT WEATHER, ENJOYED RIDES IN SUCH OUTRIGGER CANOES AT WAIKIKI

Easier to handle than the tricky board, the canoes offer good fun. When the surf is not too big, gay parties, sometimes as many as seven in a boat, may be seen riding the waves in these queer craft, which are hollowedkoa logs, with side floats to prevent capsizing. At the steersman's signal all paddle furiously till the swell lifts them and bears them fast toward shore. Lashed together and provided with woven grass sails, such vessels have been used by natives for long ocean voyages.

The last hour or two of any flight is always the hardest. If there are clouds the pilot, straining his eyes, is likely to see illusions of land. In my opinion California is letting slip many a sightly acre in the Pacific just off her coast. I saw them, islands and distant shores almost indistinguishable from clouds. Were they only clouds, after all? I did not let myself turn from my course to explore.

If there is any time when experience counts it is in putting down the temptation to wander from that course which instruments declare is true to that which the human mind would like to try. A pilot's maxim should be, "Usually the instruments are right and you are wrong."

I was glad to see land—but not in a state to "scream for joy," as reported in one fervid account. My faithful plane, I believe, would fall apart under me if its pilot grew so senselessly emotional.

A CONTRAST TO ATLANTIC FLIGHT LANDING

The first land I sighted was the outjutting of Pillar Point, about 21 miles south of the Golden Gate, and Pigeon Point, some 43 miles. I did not recognize the territory at all. As there was a little rain squall directly in my way, I went around to the right. Thus I appeared five miles or so south of where I otherwise would have been—but anyway on the continent I aimed for!

Pulling up over a notch in the hills, directly on my course, I beheld San Francisco Bay before me. Over San Mateo I sailed and six minutes later NR-965-Y and I sat down on the runway of Oakland Airport, approximately 18 hours from Honolulu.

My landing was in marked contrast to that of the solo Atlantic flight.* At that time a farmer's best pasture had been my journey's end, and there three Irishmen had come out to see what manner of creature the airplane held. My announcement that I was from America was accepted in dubious silence. At Oakland I did not have to explain whence I came to the thousands of people who waited. Cameras clicked as soon as I opened the cockpit and microphones were raised to catch my important (?) first utterances.

* See "The National Geographic Society's Special Medal Awarded to Amelia Earhart," in the NATIONAL GEOGRAPHIC MAGAZINE, September, 1932.

I have said little about the precautions taken in case something went wrong.

Mine is a land plane, equipped with wheels. Occasionally such a one has come down safely on water, though the landing is generally dangerous.

There are a number of factors which affect the result. Among them are the roughness of the water, the buoyancy of the craft itself, and its position when it strikes. I had dump valves in the two largest fuselage tanks, which permitted almost instant evacuation of the contents. Empty, these alone had considerable buoyancy—added to that of any wing tanks from which fuel had been used. I felt there was every likelihood the plane would remain afloat for some time.

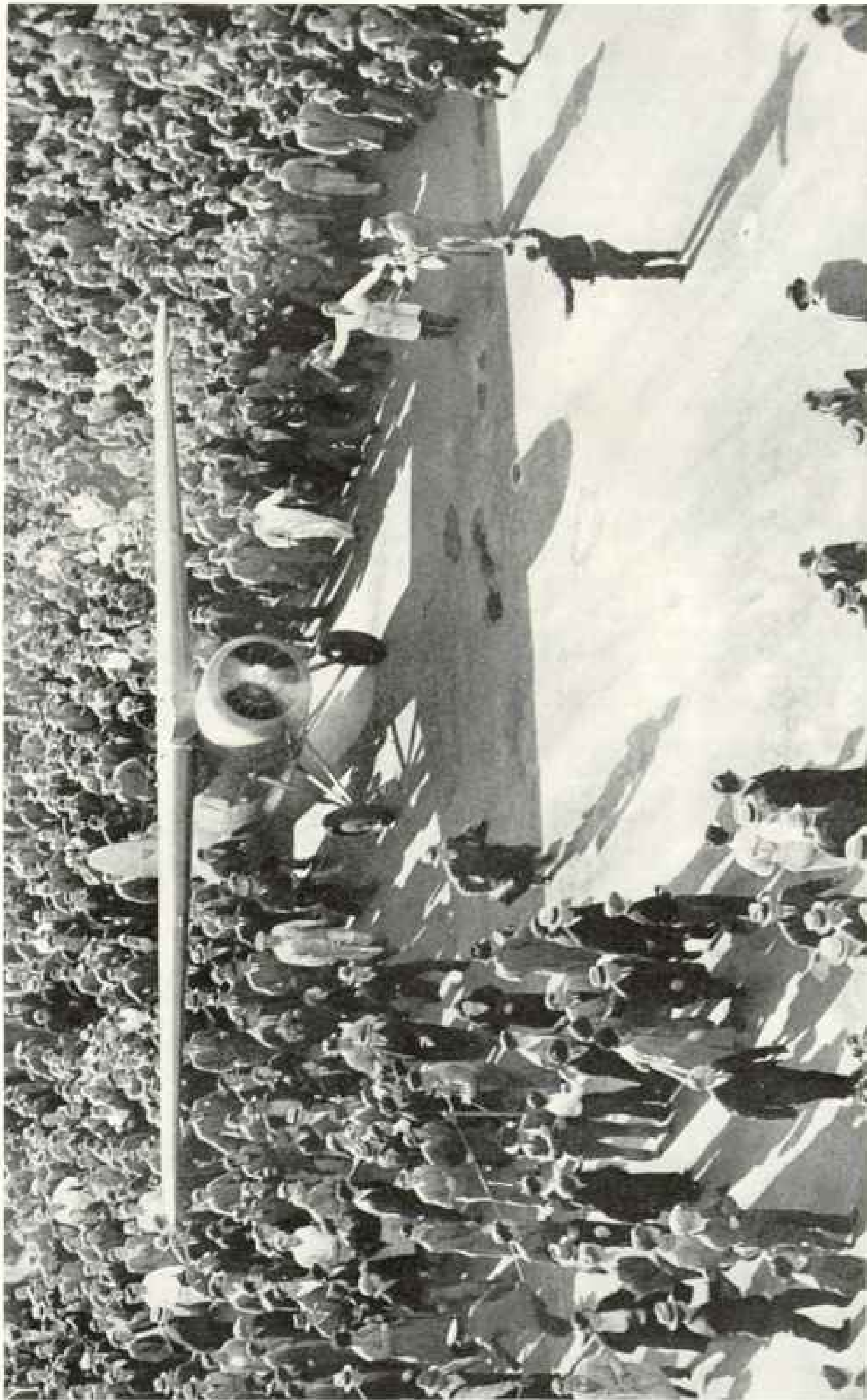
Paul Mantz, my technical adviser, who in his flying for motion pictures makes airplanes do unbelievable things, helped me plan the best way to bring a high-wing monoplane down on water without somersaulting. The feat has been accomplished and a craft of that type has been known to float for eight days before the crew were rescued. Of course, a steep dive into the sea would so damage any plane that it would tend to sink at once. Similarly, high waves would demolish either unfortunate land or water craft forced down on their merciless surface.

Over my warm flying clothes I wore an inflatable rubber vest, divided into two compartments. Each would blow up instantly when I released the compressed carbon dioxide contained in two little metal capsules at the waist.

A HATCHET AND KNIFE ON THE BELT

Strung to my belt I had a hatchet and a sheath knife. Once down and out of the plane, I was to crawl back along the fuselage. Because of the weight of the motor, the tail surfaces presumably would be sticking out of the water. Immediately behind the gas tanks was a rubber raft. I was to hack my way through the light fabric-covered wood of the plane to reach it. It, too, was instantly inflatable from a carbon dioxide container. The sealed compartments of the raft held tomato juice, chocolate, malted-milk tablets, and a container of water (see illustration, page 595).

For distress signals I carried a Very pistol which shot regulation red and green rockets. Small flares which burn on contact with water and several small balloons



Photograph from George Fulsom Putnam

THOUSANDS OF CALIFORNIA ADMIRERS CHARGED THE PLANE EVEN BEFORE ITS PROPELLER STOPPED WHIRLING

Miss Earhart was the first person, man or woman, to fly solo from Hawaii to the United States mainland. She was the first woman to fly the Atlantic in a plane (1928); the second person, and the first and only woman so far, to fly solo across the Atlantic (1932), and she is the only woman who has flown nonstop across the continent.

completed my attention-attracting equipment. The balloons were to be let up on stout fishline and bear aloft a very red silk flag.

The raft, once in action, was to be moored beside the plane, as long as the latter kept afloat. Then, as a last resource, I was to abandon ship.

HOT CHOCOLATE AT 8,000 FEET

What did I eat? My standard ration—plain tomato juice, one hard-boiled egg, and the most memorable cup of hot chocolate I have ever had. Drinking hot chocolate alone over the Pacific at 8,000 feet is a unique experience I shall not soon forget. At that, my larder was overstocked. Katherine Sparhawk, at Wheeler Field, put up sandwiches which I did not consume but know were good.

One seems to require very little nourishment on a long pull of this kind. Though I had had the lightest sort of lunch at noon in Honolulu, when I reached Oakland I was in no hurry for food. Actually my first meal was postponed until evening, 24 hours after taking off. But I vanquished a roast chicken then, with ease.

INFINITE DETAILS OF PREPARATION

The plane I used is at least three years old. It is a high-wing monoplane capable, normally, of carrying six passengers and a pilot. It is closed—like a closed car. I like comfort in flying. More important, I believe comfort decreases fatigue on long flights, and fatigue is a factor to be considered.

The passenger seats in the fuselage were removed to make room for four tanks, which with five in the wing were required to carry fuel for at least twenty hours aloft. The cruising speed with moderate load is 150 to 160 miles per hour; with a top speed, at higher altitudes, about 200 miles.

The Wasp motor used is the same one which performed so well on the Atlantic flight three years ago. It is in the prime of life and, after complete rebuilding and mechanical face-lifting, better than new. Pacific Airmotive Corporation, Ltd., at Burbank, did the job and I believe no engine of mine ever sang a sweeter song.

Both motor and plane were checked and double-checked by competent inspectors of the Department of Commerce, and specially licensed for long-distance flying by the Government before I left for Honolulu.

My cockpit contains every instrument, I think, the practicality of which has been proved for all-weather flying, except a robot pilot. On my solo Atlantic flight the altimeter failed, the first failure of the kind I had ever encountered. Over the Pacific my instrument board carried two altimeters, as well as three compasses and other duplications. Also, metal gasoline lines were encased throughout their length in rubber tubing—double insurance against fuel leaks. Live and learn.

I have long preached that two-thirds of the success of any expedition is in the preparation. Few know the time and patience expended through weeks or months of testing before even so simple a flight as that between Honolulu and Oakland—and simple it was compared to flights such as Wiley Post's round-the-world.

For example, every one of my nine tanks had to be filled, run dry, and checked at different altitudes for various characteristics. In one, difficulty was experienced with the venting (necessary to allow air to enter the top of a gas tank as the gasoline is consumed from the bottom); so changes in the venting arrangements had to be made.

It took hours of work to determine how many gallons of gasoline the motor consumed. If it used more than estimated, the pilot might face a serious predicament. My calculations were about 24 gallons an hour for 150 miles an hour speed. These worked out reasonably well, except that my speed on the actual flight dropped to between 130 and 140 because of head winds.

Oil consumption is as important as that of fuel. I carried 35 gallons of oil, after carefully determining the quantity used each hour. Load and speed tests had to be made with the controllable pitch propeller to find the most efficient setting. Such a propeller works as does the high and low gearshift in an automobile. The pilot takes off in the "low," climbs to the altitude at which he wishes to fly, then shifts into "high," for speed in level flight, or moderate climb. And so it goes through all the intricate phases of getting ready a flight.

THREE ROUTES CHARTED

Under preparation, in addition to mechanical detail should be considered personnel. Pilots and mechanics and all others concerned should be experienced and physically and mentally fit. Worry and fatigue are relentless enemies of good judgment.



Photograph by Wide World

FLOWERS GREET A SMILING QUEEN OF THE AIR

Approximately 18 hours after her wheels lifted off the runway at Wheeler Field, Honolulu, Amelia Earhart felt solid ground under her at Oakland, California—2,400 miles from the mid-Pacific island. She writes: "I was glad to see land—but not in a state to 'scream for joy' as reported in one fervid account" (see text, page 605).

The subject of navigation looms large on long flights. To keep going is useless unless one knows how to get where he wishes to be. My navigation charts were prepared by Lieut. Comdr. Clarence S. Williams, of the U. S. Naval Reserve, of Los Angeles. On them were worked out alternate courses, one to San Francisco, a second to Los Angeles, and a third providing a shift from the northerly route to the southerly, should Pacific coast weather conditions make a midocean change of destination desirable.

The charts called for fourteen changes in compass course, each to be made at inter-

vals slightly over one hour. To facilitate time calculations, I had three clocks in the cockpit, one set on Honolulu time, another San Francisco time. The third was set at zero when I started and thereafter recorded the exact elapsed time of the trip. All of which is another answer to the question, "What does a transocean flyer think about?"

For the last I have left an aspect of the Pacific flight—or of any aerial expedition—whose conduct can spell the difference between success and failure. That is the forecasting of weather to be encountered, a science which, as regards flying conditions over oceans, is yet in its infancy.

When the *Friendship* flew from Newfoundland to Wales in 1928, only the sketchiest weather data were available regarding Atlantic upper-air conditions. During a fortnight prior to our flight, reports were obtained at considerable expense by those immediately interested in the project from a

dozen ships at sea. These reports supplemented the limited material then available to the Weather Bureau. From all of this Dr. James Kimball, meteorological dean of Atlantic flying, constructed the weather maps used. At best the basic information was incomplete and stale.

MARINERS' VS. FLYERS' WEATHER

The situation was much improved four years later, in 1932, when I flew solo to Ireland. The Weather Bureau was then securing reasonably comprehensive reports from ships every four hours. Dr. Kimball's maps were correspondingly fuller and

fresher. However, they still concerned *mariners'* weather. Nautical observers are not equipped or trained to give information exactly as *flyers* wish it. What does a sailor care about the height of clouds or how the winds blow at 10,000 feet?

The meteorological assistance rendered me on the Pacific flight indicated the accuracy that can be attained in the science with trained personnel and a new theory of forecasting.

In Honolulu I was fortunate in obtaining the cooperation of Lieutenant E. W. Stephens, U. S. Navy, aerological officer at Pearl Harbor. Lieutenant Stephens, who was responsible for plotting the weather for the Navy's successful flight to Hawaii a year previously, worked with us early and late. Ten days before the take-off he constructed a hypothetical weather map embracing much of the Pacific Ocean and western America. That chart—a thing of highs and lows, swirling isobars, barometer and temperature readings, wind directions and velocities—he made as he felt it *should be when I started*.

Then we waited for the gods of weather to adjust their caprices throughout this far-flung territory so that their handiwork would at least approximately match our ideal.

FRIDAY THE GOOD WEATHER DAY

After digesting the data that came in by radio from vessels, from tiny islands scattered eastward of Hawaii, from Pacific-coast stations, Lieutenant Stephens on Wednesday remarked: "It looks like Friday. I think things will work out by then."

They did. And because of his satisfaction with the outlook when Friday came, I decided to start, even though that was against advice received from California. The consoling fact is that I found conditions substantially as predicted by Lieutenant Stephens, even on the California coast.

Just now much attention is being directed to the pending possibilities of airlines operating across the Pacific. Momentarily the center of interest has shifted from the Atlantic. But over whatever ocean scheduled air transport may pioneer, a vital factor in its establishment will be the development of meteorological data. With what we now know about weather and with the in-

stant communication of radio, it is not at all impossible, with proper preparation, to command a picture of upper-air conditions prevailing at any given hour over even extended routes. One can also forecast what will "come in" during the time elapsed in the making of a flight.

FLYING THE ATLANTIC AND THE PACIFIC

The western frontier of the United States lies 2,400 miles from the mainland. Though this stretch of water is several hundred miles greater than the shortest land-to-land distance of the North Atlantic, it probably presents less formidable hazards for the flyer. Of course, no definite statements on this score can be made until after considerable research on weather and more actual flight data are recorded. Further, what is applicable to an individual flight such as mine does not necessarily hold true for transport operation.

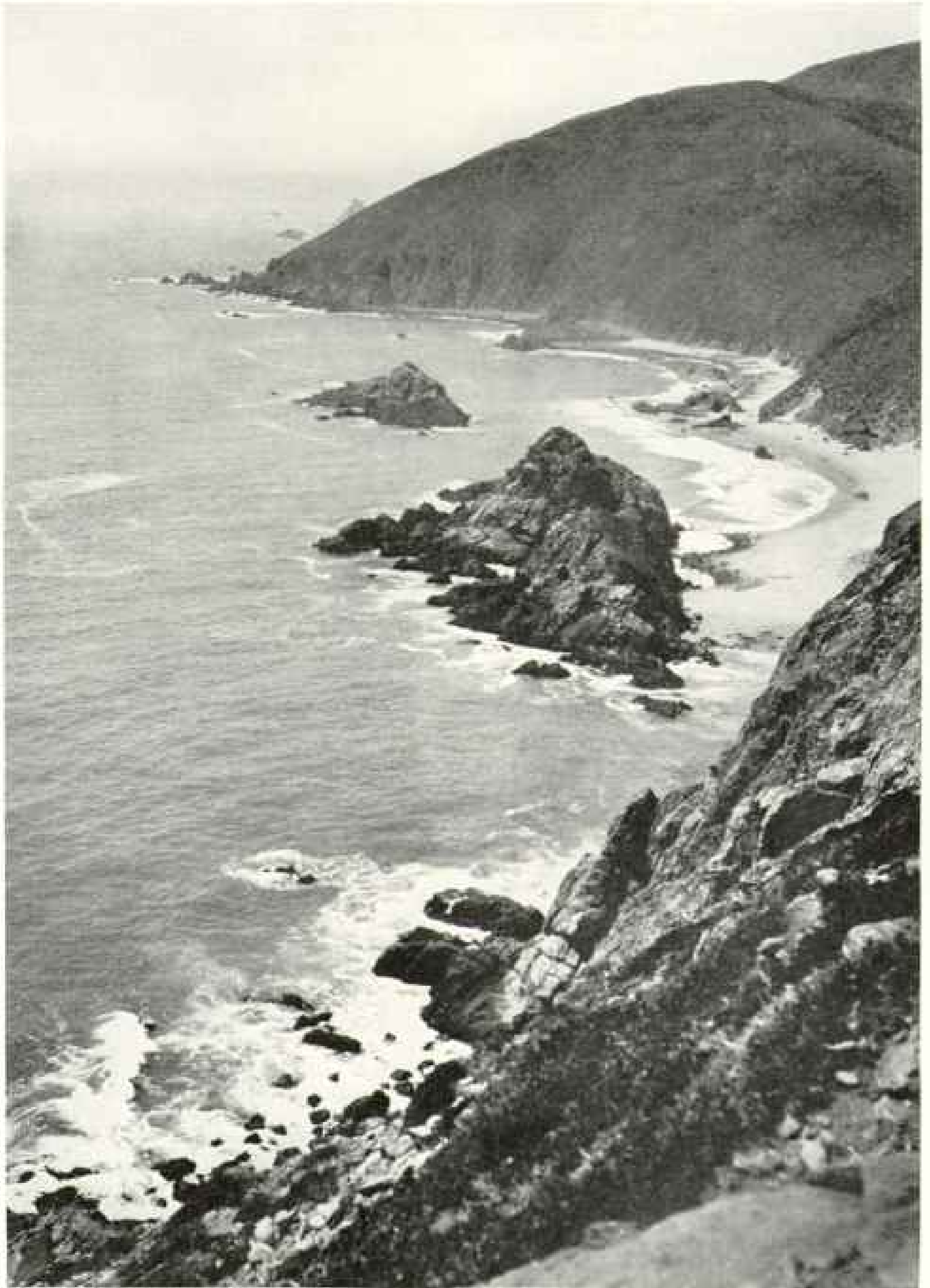
For general comparisons North Atlantic and mid-Pacific weather disturbances are similarly severe at times, but probably ice-formation danger is greater over the Atlantic. The shortest course from America to Europe, followed by most flyers so far, has been somewhat north of the normal steamer lanes. From Honolulu to San Francisco or Los Angeles the route lies directly over that traversed by ships—a definite advantage.

To me it seems that regular air transport across both oceans is inevitable, and will probably come about sooner than most people suspect.

Probably used in such long-range service will be the new radio compasses. These are extraordinary "gadgets," which actually lead a pilot to a selected point, guided by radio operating at that destination.

This uncanny "homing" device is gradually emerging from the realms of experimentation into that of proved practicality. One, the Kruesi compass, after Army testing ashore, has recently been tried out over the Pacific in flights instigated by Eugene L. Vidal, Director of Air Commerce.

Another variety of the new instrument, the Lear compass, is being installed in my own plane. With this latest addition to my already generously populated instrument board, I anticipate instructive experience in this most modern means of finding one's way in the air.



ON LAKE OR CRAGGY SEACOAST MAY DWELL A BOLD WORLD WANDERER

Here on the Monterey cliffs above the foaming Pacific lived a family of duck hawks, American form of the peregrine (meaning "alien" or "wandering") falcon. Its cousins were the noble birds of falconry's heyday in old England. Another relative, the prairie falcon, a lover of mountain ranges and arid plains, is the American representative of the latter, a desert falcon flown in olden times by Oriental potentates.

WEEK-ENDS WITH THE PRAIRIE FALCON

A Commuter Finds Recreation in Scaling Cliffs to Observe the Nest Life and Flying Habits of These Elusive Birds

BY FREDERICK HALL FOWLER

With Illustrations from Photographs by the Author

TWELVE times a year I present myself before the ticket window of our local railroad station in California, slide through the necessary coin, and cry: "Without!"

Back through the window comes a monthly commutation ticket to the distant city—"without" Sundays. Sundays are mine to do with as I will, and for several years I have willed to spend them far afield.

Formerly Sundays and the latter halves of Saturdays had shown a growing tendency to get mixed up with all the other days—days on which with ceaseless care I pursued my interesting but exacting profession of civil engineer, computing with endless labor the stresses in dams and beams, the yield of rivers, and the peaks of floods.

"Without!" was fast losing all significance. A change was imperative, and that change took me back to an interest of my not-too-distant youth—the pursuit of birds.

Before long I was renewing my acquaintance with that interesting bird, the prairie falcon,* in the canyons extending eastward in the Coast Ranges and opening into the northern San Joaquin Valley.

Let me introduce him as he presented himself to me one breezy day when I was making my way along the base of a nesting crag (see page 622).

Suddenly the male swept over the crest, saw me, gave a prolonged scream, and started upward. He did not spiral up in long circles, as these birds usually do, but in short loops and at as steep a pitch as his wildest efforts would permit.

Up, up he went, with an occasional breathless scream, until he was fully 300 feet above me and probably half again that distance down wind. With a few last upward-reaching wing strokes he attained his pitch and balanced for a moment to turn toward me.

* See "Eagles, Hawks, and Vultures," by Alexander Wetmore, with 30 portraits in colors by Allan Brooks, NATIONAL GEOGRAPHIC MAGAZINE, July, 1933.

Then, with a few more strong wing-beats, he started down like a stone from a sling. Once on his way, he closed his wings until they were not more than one-quarter open and held as motionless as the vanes on an arrow. His tail, also, contrary to the ideas of many bird artists, was closed nearly to a point. His head, with beak pointing straight at me, was in such a position that I could note perfectly the dark markings, or "mustaching," so characteristic of the falcons.

One hundred feet above me, sensing that his aim was perfect, he closed both wings completely and came like a bullet.

At 30 feet I forgot all I had ever learned of a falcon never striking a man, and ducked. At the same moment he opened his wings very slightly, set his rudder upward, and whizzed by, not more than ten feet above my head. His speed upward appeared nearly as fast as during his descent, although at first he did not fly a stroke.

When the momentum of his swoop had expended itself, he fought his way upward as before and came at me again, this time down wind.

It was a wonderful opportunity to observe just how a falcon must look to a fleeing meadowlark that gives one last glance over its shoulder before the fatal stroke.

PHOTOGRAPHING A BIRD'S HOME LIFE

With a still and a movie camera, instead of the gun of my earlier years, I stalked the prairie falcon. Finally I set out to watch and record the nest life from the laying of the eggs until the young take wing.

It soon became evident, however, why the falcon's eggs are a prize of the collector. Two years passed before I found a nest within a reasonable distance of my home that was not robbed within a week after the eggs were laid.

This "nest on the cliff," as it came to be known in our pilgrimages, was high on a sandstone ledge in the head of a small canyon near the top of a ridge—a region of mountain pastures nearly 2,000 feet above



A SIX-FOOTER CAN VISIT THESE FALCONS ONLY IN A PRAYERFUL POSE.

"This hurts me more than you," the author may truthfully remark to the young ones visible on the ledge. At the cost of barked skins and bumps on the head he climbed up each week, gently lifted the youngsters into a box, and took them to the base of the cliff to be weighed and photographed for science (see illustration, opposite page).

sea level (see page 617). The two previous years the eggs had been stolen by "party or parties unknown," and the falcons, without laying a second time, had frequented the various cliffs in the neighborhood for the rest of each summer and well into the fall. This time, although the day was April 1, we were not fooled.

Our sudden appearance over the crest of the ridge was greeted by a slight movement on the ledge and a long and angry scream. There, across the canyon, but not 50 yards away and almost level with us, was the falcon, rising slowly from its eggs and screaming an angry protest. Running a few steps, she launched out from the edge of the ledge and circled above us, screaming. Once or twice she set sail, as if to return to the nest, but changed her mind and remained on the wing.

AT LAST—THE REDDISH EGGS!

At least four reddish-brown eggs lying in a shallow depression in the sand and small fragments of rock at one end of the main ledge could be seen through the field glasses.

Their rich coloring reminded me of the description once given by a small boy I had lowered over a bluff to report on the contents of another falcon's nest.

"Four eggs," he called.

"What color?" I asked.

"Gee, I don't know!" Then, after a moment's pause, "Just the color that makes you want to reach out and grab them!"

Even the protracted screaming and high flying of the female had not brought back the male, who was probably absent on some distant hunt; but when the cliff was revisited in the afternoon he appeared quickly in answer to her short alarm cry, and circled and screamed overhead at a great rate.

He was overburdened with a tremendously full crop, however. This made him look like a pouter pigeon, shortened his breath, and forced him to rest on the dead limb of an oak tree down the canyon. The perch, we found, was one of two favorite lookouts used by both birds.

We were back at the cliff with rope and camera less than a week later (April 7). This time the old bird stuck to her nest like a setting hen, while we scrambled around on



JUST TWO AND A HALF OUNCES OF SLEEPY FALCON

Here at the tender age of three days he could keep his eyes open for only a moment. He frequently lost his balance and curled up as if still in the shell while tape and camera were recording his size (see illustration, opposite page). But all at once he began to grow amazingly, doubling his weight in the next four days. In 24 days an enormous appetite had boosted the figure to 20 ounces, an increase of 700 per cent!

the cliff 15 feet above her head and drove in a steel pin to anchor the rope. She finally decided to leave, however, when the loose end of the rope was thrown down the face of the cliff just in front of her.

One who has long since arrived at years of discretion, weighs 200, and is not particularly fond of high places takes no chances. My anchor pin was a stout three-foot length of drill steel, and to it was attached not only a "hand line," which I firmly grasped, but a "bosun's chair," in which I sat while being lowered straight down ten feet to the edge of the ledge. On the upward journey I would dig my toes into the cracks in the rocks, climb the hand line until my breath gave out, and with the last gasp yell to those above to haul in on the bosun's chair.

Gaining the first foothold on the end of the nesting ledge was always a precarious feat, since the rock above overhung slightly. By balancing a moment, however, and getting a little slack in both lines, it was easy to swing under, and then everything was safe, comfortable, and cosy.

As soon as I had time to get a firm foot-

ing and look around, I found the nest contained five instead of four eggs—and they were beauties (see illustration, page 614).

I could have remained indefinitely, seated comfortably on that sandy ledge, high up the cliff, admiring both the beautiful markings of the eggs and the view spread below me; but the anxious cries of the parents from cliff and tree and the fear of their deserting the nest sent me scrambling back up the cliff and away.

The next week-end found me sneaking up behind the sheltering ridge in fear and trembling lest the egg collector on whose bailiwick I was trespassing had been there in my absence.

But luck was still with me. The female was on the eggs, sat tight, and let me take a half-hidden seat under a scraggly oak. She was very nervous at first, but betrayed it only by keeping her head well up, like a poorly made wooden decoy, and turning a watchful eye not only on me, but on everything far or near that looked suspicious.

As her fear wore off, she lowered her head between her shoulders, but did not at any



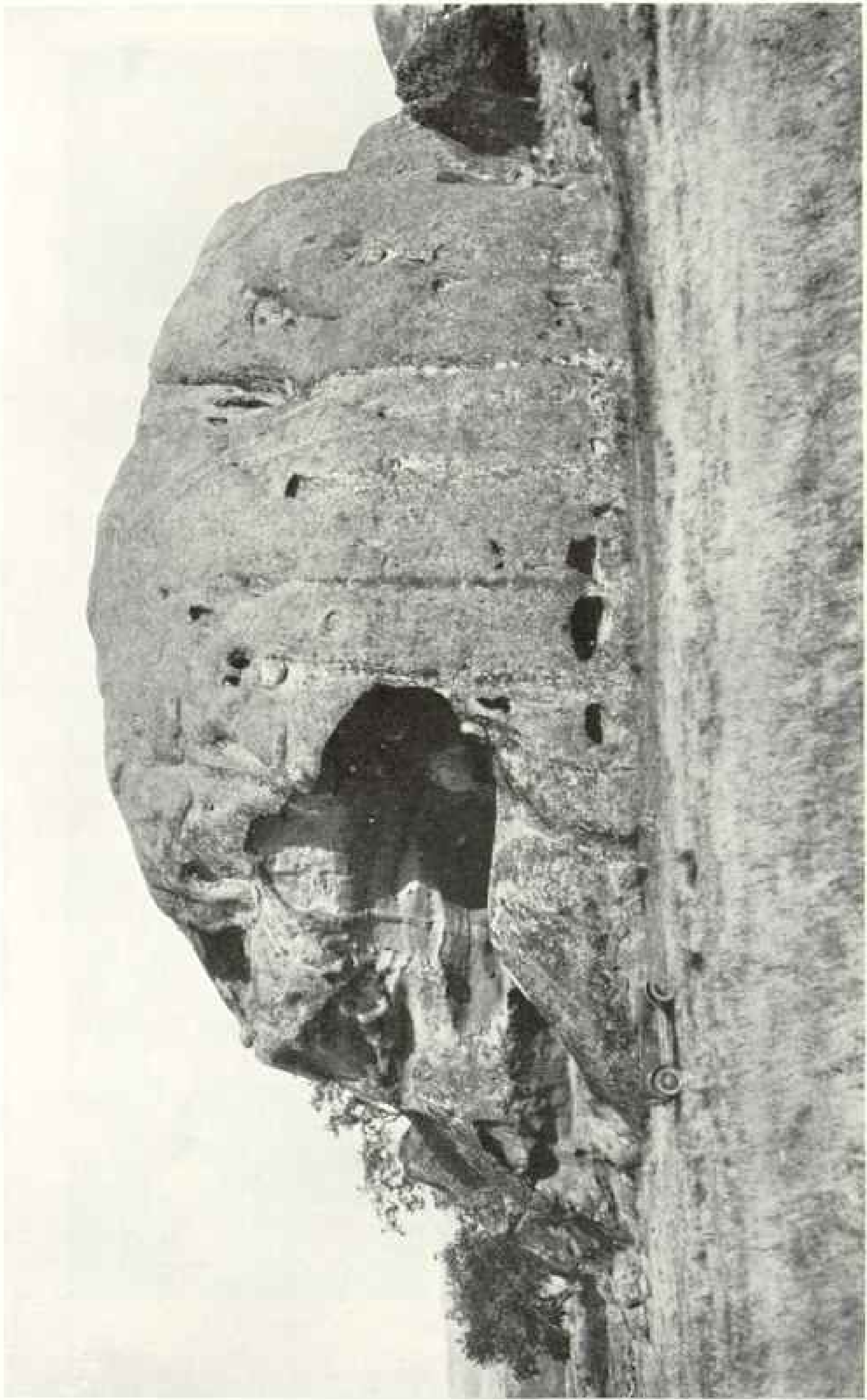
FIVE LITTLE FALCONS AND HOW THEY GREW—

On a high cliff ledge were laid the eggs, creamy white and heavily marked with chestnut and cinnamon—"just the color that makes you want to reach out and grab them," as a small boy put it. Next appear the downy "quintuplets," nine days old, uttering yawns and faint whistling peeps. At 16 days, four of the five seem too drowsy to hold up their heads. The prairie falcon does not construct a nest, but frequently pirates the stick home of a raven or some other bird of prey.



—FROM EGG TO INDEPENDENCE IN 33 DAYS

In their snowy fleece coats, the 23-day old youngsters (top) rest after a meal of meadowlark. As if ashamed of such a banquet, one hides under the pile. A week later feather growth is well started and they wander to a far corner of the ledge. At 33 days old and nearly ready to leave the nest, they pose for a last close-up (below)—first, peevish "Blackie"; then aggressive "Red"; good-tempered "Green"; solemn "Blue," and "White," just outside the picture (see text, page 621).



NATURE SCOURS DEEP POTHOLES IN A SKULL-LIKE ROCK TO MAKE A BIRD APARTMENT HOUSE

A pair of prairie falcons once lived in a hollow just above the large niche at the left, but they went house-hunting elsewhere when a dance hall and frequent picnic parties in this region north of Altamont, California, destroyed the solitude they demand. In the opposite side of the grotesque, grayish-brown rock is a second large niche in which stands the tomb of an old-time rancher.



ABOVE THESE HAPPY HUNTING GROUNDS PRAIRIE FALCONS WHEEL AND SWOOP

Hungry nestlings on the cliff ledge from which the picture was taken gazed out over the tree-dotted ridges of California's Coast Ranges, watching for their parents to return with tempting ground squirrels or meadowlarks (see illustrations, pages 614 and 615). A pair of golden eagles dwelt in the oaks on the peak at the left and sailed in wide circles high above it. When they swung too close to the falcons' eyrie, they were greeted by angry screams from the latter and then by a marvelous diving aerial attack which made the eagles shift their course.

time let it hang forward with beak down. Bluebottle flies, attracted to the nest by scraps of meat left by the falcons, were flicked off her head and beak with a quick twitch.

THE WATCH ON THE LEDGE

An hour and five minutes by the clock I watched, and then the male sailed in, without a sound from either bird to announce his coming, and alighted on the ledge about five feet from the female's head. For a few moments after his arrival he uttered low and not unmusical screams and stood with head hung straight down, looking at his feet—a pose more common with the Cooper's hawk than with a falcon.

After a few moments he ran quickly along the edge of the ledge to the side of the brooding female, who had not yet recognized his presence by movement or call. The moment he arrived, however, she suddenly half-raised, with lower feathers still puffed out, ran quickly out along the ledge, and sailed away without uttering a sound.

The male looked the eggs over and started to settle himself upon them in her place, but his smaller size made it more difficult to cover them and the operation appeared to worry him. He hunched and shuffled around carefully, but uncomfortably, and finally tucked two eggs under his breast feathers by nudging them along with his beak.

Once fairly settled on the eggs, his anxiety did not seem to end, and he humped himself up and buckled down to his task as if the eggs had been on springs and might shoot out from under him if he relaxed his efforts for a moment.

Within five minutes of getting settled, he suddenly jumped up and sailed off the ledge without a run. I think his scare was due to noticing me for the first time, for no other intruder had approached.

SLEEP OVERTAKES THE NEST SENTINEL

After perching near by and cackling half-heartedly, he finally returned and settled on the eggs as laboriously as before. He wanted to be wild and wary, but times were too dull. He became sleepier and sleepier and finally dozed off completely. From time to time he awoke to flick flies off his beak, but only once in four hours did he move his body.

Finally the sun began to strike the spot, and after 1 p. m. he kept a sharp lookout

for his mate. When she sailed in, about 2:35, he awaited no formalities, but immediately jumped from the eggs into full flight.

The female looked at me and cackled hoarsely, but soon settled herself on the eggs with little of the difficulty and discomfort her spouse had experienced.

Soon after, I uncoiled my cramped legs and called it a day. Five and a half hours of steady watching, much of it through field glasses, had been repaid by an interesting glimpse into the division of labor in a falcon family (see illustrations, page 620).

Further observation was delayed for two weeks by a trip east, and when I slid down the rope to the ledge on April 29 I found five amiable young falcons huddled into a single mass of white down, from which heads, legs, and wings protruded indiscriminately (see pages 614 and 615).

The covering of down was scant enough, so that their very pink skins showed plainly through it. One or two of them sat up from time to time and preened themselves. They indulged, too, in many yawns and gave faint whistling peeps.

Between swoops in front of the cliff the old birds sat in dead trees or on the face of the bluff and yelled their disapproval of me.

"BABY SCALES"—FOR YOUNG BIRDS

A strong breeze was blowing from the northwest on the afternoon of May 2, when we again visited the cliff, and the male was standing by the nest with his back to the wind, screening the young. On our approach he sailed off to his own particular lookout down the canyon; as I went over the top the female appeared and both began the usual circling and cackling.

The youngsters showed very marked growth, had far more down and far less pink showing through, and were much more alert than on my visit three days before. The chalky-white knob, or "egg tooth," on the end of the bill was nearly gone.

For identification, I first tried clipping the extreme tip of one claw; but this proved somewhat unsatisfactory because of the growth and wear, so I marked the five with colored strings. With these as guides, a separate weight record was started that continued for the rest of their nest lives, much to the annoyance of the entire family.

By the time the ceremonies for the day were over, the young seemed both bored



AMONG FALCONS THE FEMALE IS BULKIER THAN THE MALE.

Loud screams from the base of the cliff instead of from the nest greeted the author one morning when the youngsters were about 37 days old. All had left the home ledge at the blind and the most enterprising one departed up the canyon when approached, leaving his nest mates for a few final poses.

and chilly and were trying to huddle under the scales—a poor source of warmth and comfort.

Longing for a series of pictures of the young and parents together, but lacking a telephoto lens, I recalled the inventive Private Jones (familiar to the lovers of Bruce Bairnsfather's wartime drawings), who constructed "Little Plugstreet, The Sniper's Friend," a camouflaged sheet-iron tree trunk. Within it the inventor passed a hair-raising morning, overtaken by daylight and under heavy fire while bogged down in a Belgian turnip field.

Our "Little Plugstreet" was a chunk of concrete cast around two boxes set side by

side—one large enough to contain a nine-by-twelve-centimeter still camera with a very fine but short-focus lens, and the other a small moving-picture machine.

With much tugging and puffing, we lugged this heavy contraption to the top of the cliff and swung it down to the ledge on the quiet morning of May 6, while both parents circled and screamed.

Arrival of this large freight shipment on the ledge had the young well bluffed. When I came to interview them they were all backed up against the wall in a "sell your lives dearly, boys," pose, and they opened their mouths in unison every time I made a sudden move.



FLASHES OF A FALCON FAMILY

Mother at the top tucks in her babies, covering them with her warm breast. Just below, father glances around with an air of vigilance before sheltering the young in his turn. Next, he gently feeds the weak, eight-day-old youngsters. At the bottom he loafs. Later the parents are in an endless rush to obtain food for their offspring.

This fright soon wore off, however. The youngsters decided that the one being marked and weighed was also being fed, and all crowded forward to get their share.

FALCONS UNDISTURBED BY "PLUGSTREET"

When finally set in place, Plugstreet faced the nestlings at a distance of six feet; but, although about the size of a cracker box, it did not appear to us greatly out of place against the gray sandstone of the ledge. Whether the old and wary falcons would view it in the same light was another question.

As we anxiously watched from a distance, we were delighted to see them both sail in and alight almost on top of Plugstreet without giving this new addition to their furniture the slightest attention.

After a few moments they both sailed out, circled twice, and then the female, returning to the ledge, scuttled over to the young. They had long been milling around, hungry and chilly, and were happy enough when she gathered them under her. It was interesting to note that she seemed more anxious to warm them than to feed them.

On my arrival on May 9 the young were much more warlike and had developed more than during any period so far. The two on the outside of the pile—on the side toward me—were suspicious and full of fight, a third was screened by their bodies and hence neutral, while a fourth was completely buried under the pile and did not seem to know that I was around until I finally dragged him out for weighing. The surprise was too much for his disposition, which, by the way, early in life developed a set toward peevishness. He yelled all during weighing, while he was hobbling back to the nest, and then turned and kept on cursing me.

As a gentle introduction to the sounds which might be heard the next week-end, a fully wound alarm clock was concealed in the rocks just in front of Plugstreet. Steadily ticking, it made a noise not far different from the well-muffled whir of a movie motor; also, the trip lines for the two cameras were strung from the ledge to a brown canvas blind under an oak across the gully.

"Up and at 'em!" was the slogan on the following Sunday morning. It was May 13, and before 9 we were on the ledge and attaching the camera lines, to the tune of angry screams and hoarse cackling of the parents.

Plugstreet was so located that to sight the camera I had to kneel in front of it, leaning over as if praying to Mecca. While I was in this devotional attitude, with the camera pointed back between my legs, a trial pull on the line started the movie machine. The result was 20 feet of film that shows a puzzled group of young falcons framed between and half hidden by a pair of abnormally large boot heels.

Shortly before 11, however, the lines were successfully adjusted and I crawled into the blind across the gulch.

A LONG WAIT IS REWARDED

For an hour and a half there were no developments. It was hot and flies buzzed sleepily. Ten minutes more and I would have been sound asleep; but precisely at 12:25 the male sailed in past the front of the cliff and screamed musically, but did not land. His approach brought a loud chorus of appeals from the cliff, but they gradually died away as he departed. In five minutes he was back, and lit near the nest to look things over. The young were placing breakfast orders at a great rate, and just as I was about to spring one of the cameras he went off again.

At 12:55 he reappeared and, with a few screams to announce the meal, lit on the ledge. He had a meadowlark and, scuttling up to a point between Plugstreet and the young, was promptly surrounded by the whole yelling mob.

When they continued their eager crowding, he picked up the game in his beak, dodged back, holding it as high as he could reach, and ran in a half circle around the group to the nest. During this circuit he looked like a pouter pigeon in action. They swarmed about him again, and he had to step lively to avoid being tramped on by his vigorous family.

BLACKIE'S CHARACTER WARRANTS HIS NAME

My tugging at the camera lines finally parted them, and a loose end, whipped in front of the ledge, sent the watchful bird into the air in an instant. Inspection showed that the regular camera had not gone off, due to the line fouling on a point of rock, but that the movie had nearly run down.

The young, which by this time were familiarly known by the colors of their respective bands, hissed as usual and for the

first time clawed at me ineffectively when I caught them for weighing. Blue was the tamest, Red nearly departed around the corner to the farther extension of the ledge, and Blackie, who on my preceding visit had been found on the bottom of the pile and had shown an evil temper, now yelled vociferously, again displaying the mean character that was his outstanding trait in all the time I knew him.

By May 16 life on the ledge had changed radically. Instead of huddling together, the young were wandering about. Out on the extreme end of the shelf, seven or eight feet from the nest, was Blackie, who had adjourned from the main party with a meadowlark's wing, which he was industriously picking. The remains of one or more ground squirrels were scattered about and all the young were "full to the eyes."

Blackie, gathered in with a butterfly net, was deposited in a black bag that I hoped would quiet the birds during weighing. When placed on the scale platform, however, he did a war dance and considerable time passed before quiet was restored.

ALWAYS HOPING FOR A MEAL

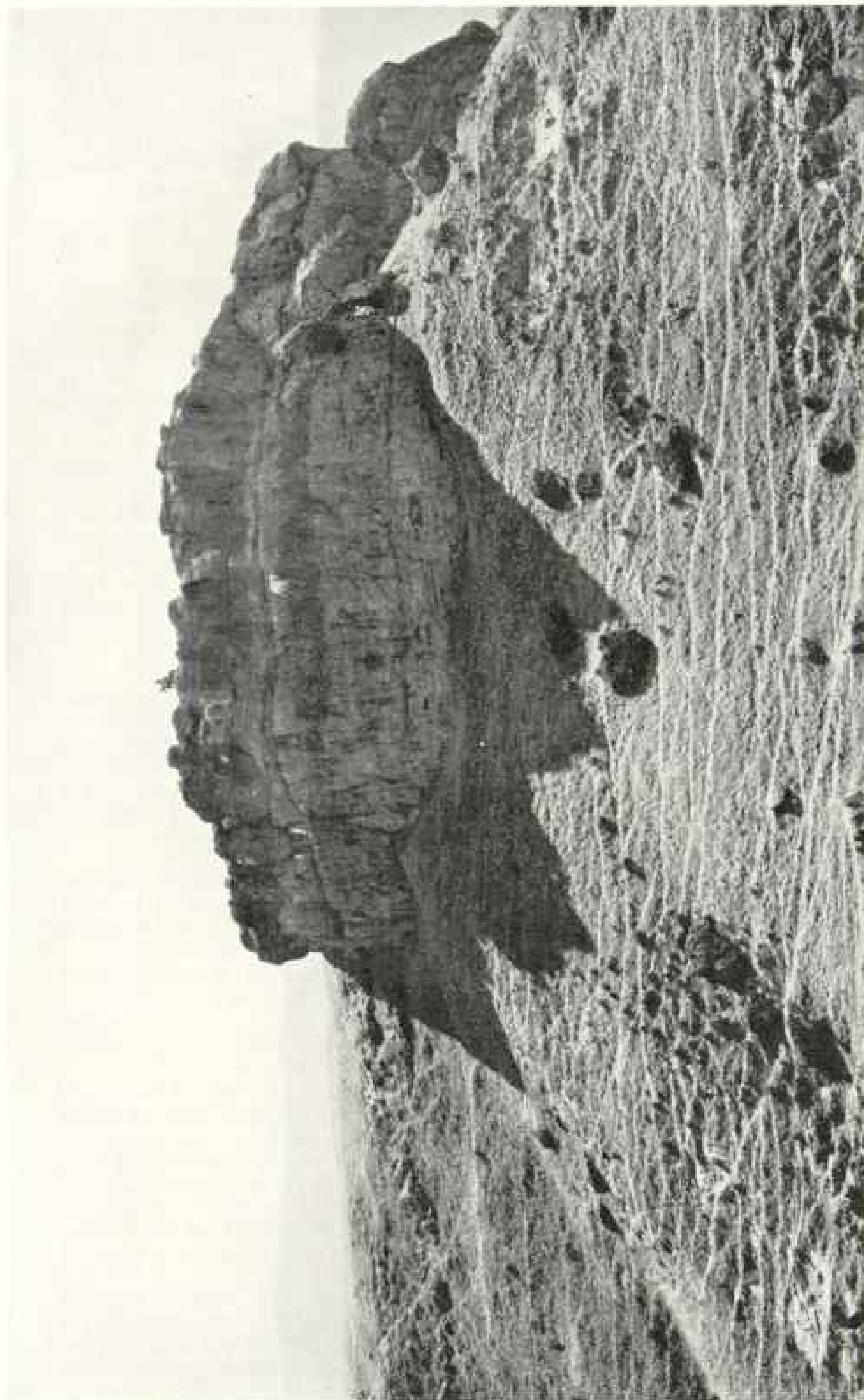
To say they hated that butterfly net was putting it mildly; but, after each one was weighed in turn, they stood around at my elbow and "watched the other boys get theirs." Hope still sprung eternal in their downy breasts that some time I would produce a ground squirrel or meadowlark, and then a general feed would be in order.

The young found their voices for the first time for other uses than calling for food, and tried to answer back the old ones, as they cursed us from the cliff and tree.

As I was weighing the youngsters a gopher snake came gliding along the rock just below the edge of the shelf, and I rolled him over down into the brush at the bottom, where he would do no harm.

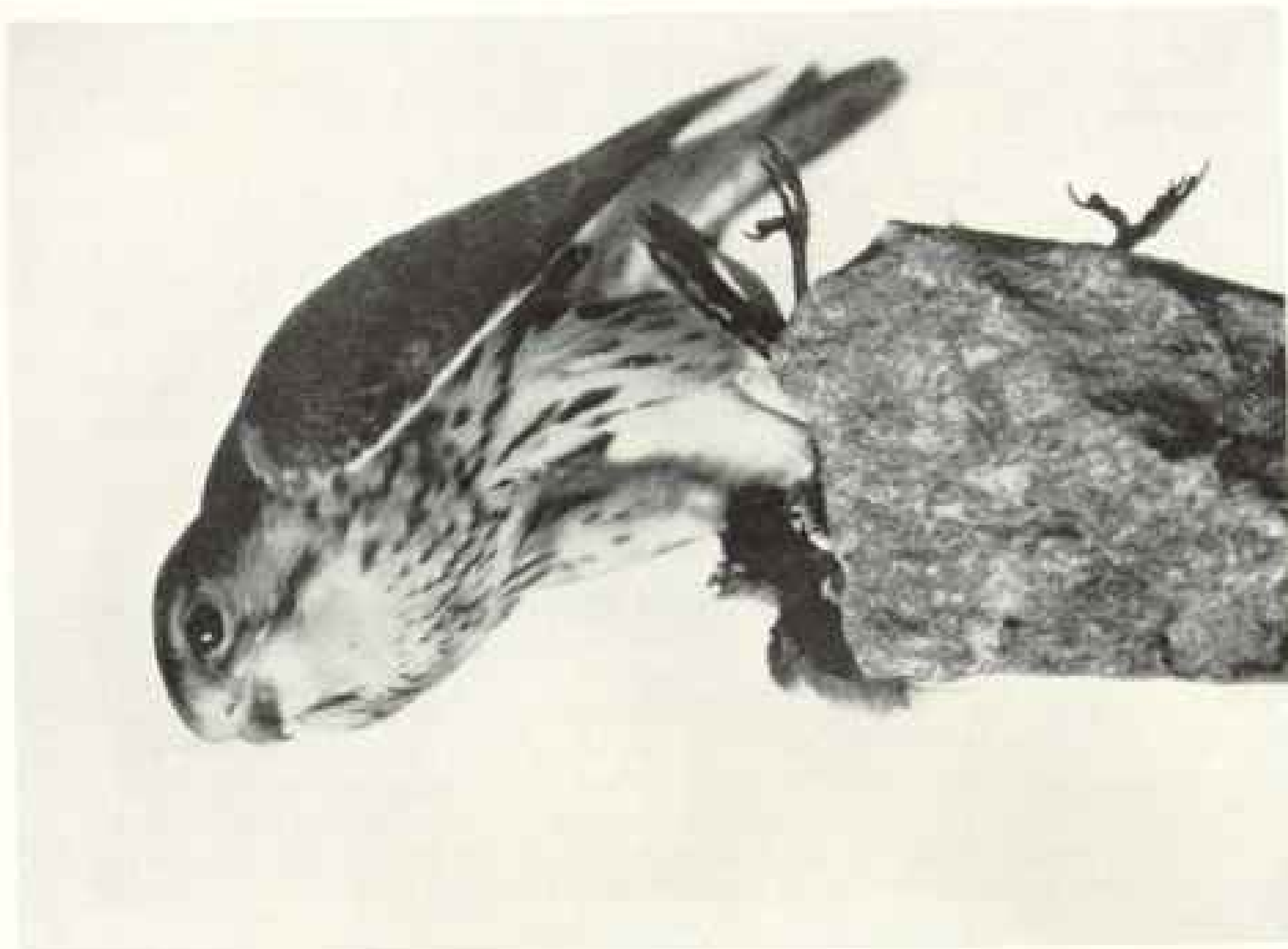
Within half an hour after I had rigged the cameras and lines and taken my station in the blind, on the foggy morning of May 20, one of the old birds came in with food. A strong pull on the lines exposed the still camera and ran the movie for the full time, but a final tug again broke one of the strings and routed the proprietor of the free-lunch counter.

After this feeding the young all wandered down to the end of the shelf (see page 615) for a snooze. Captured in the butterfly net for weighing, they seemed to hate it more



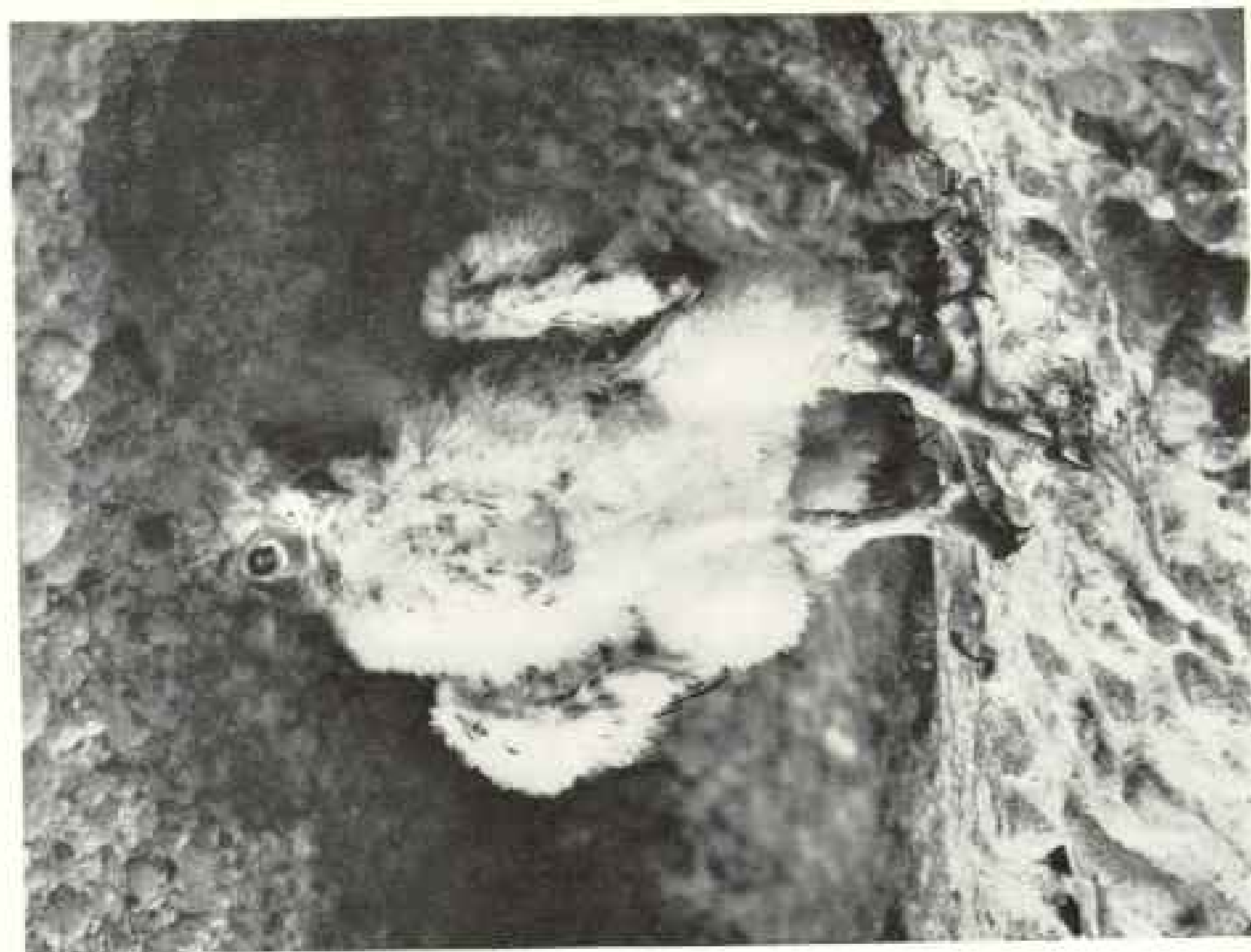
A FALCON THAT LIVED IN THIS TALL BUTTE DIVED UPON THE AUTHOR LIKE A "HELL-DIVER" AIRPLANE

Only at the last moment did the bird veer slightly and flash by, not more than 10 feet away (see text, page 611). The rusty-colored rock above and grayish sandstone below form a favorite nesting site for falcons, sparrow hawks, barn owls, rock wrens, linnets, and a twittering host of cliff swallows. Insect size on the summit appears a horseman, the district fire guard. Sheep and cattle trails weave a complicated pattern across the lower slopes.



THE FRAIBIE FALCON IS STREAMLINED FOR SPEED

The falcon, here about three months old, was tamed by the author. Another one, dubbed "Nilee Baby," because he ate up all his hamburger steak, was trained for falconry. One day a sparrow hawk, little more than half his size, swooped down, struck him savagely on the back, and so startled him that he flew away and never came back.



"FULL TO THE EYES," HE LOOKS LIKE A POUTER PIGEON

Within two feet of the camera in the blind (see illustration, page 625), this young falcon gapes long and steadily out over the promised land that stretches away for miles below him. A thrifty parent has just finished stuffing him until his crop bulges through its sparse downy covering. He draws in his breath with unearthly asthmatic croaks.

than ever. Blackie, of the evil temper, stood and cursed until I left.

The half hour's observation from the blind showed that the young were moving around very freely. Often one would run four or five feet and then exercise its wings. They also kept grabbing at small objects and occasionally pecked at each other playfully. Eating and sleeping, however, were still their main occupations.

Our repeated visits had probably convinced the old falcons that expostulation was in vain. They spent less time on the wing and permitted closer approach while at rest.

By May 23 the young were so far advanced that the riot usually attendant on weighing would probably have sent most of them flapping down the hillside. The scales and the black bag were therefore laid aside.

While pretty well scattered along the ledge, they did not seem particularly timid, and of their own accord lined up in a most satisfactory manner for the family group (see page 615). This, although we did not know it at the time, was to be our last close contact with the family.

OFF TO SEEK THEIR FORTUNE

When we reached the cliff on the afternoon of May 30, although the male came out to meet us, all of the young had left the nest ledge.

Their screams, answering the frantic yells of the parents, finally disclosed two of them sitting on a sunny ridge of a rock about 200 feet east of the nesting ledge and at about the same level. While we watched them, one flew strongly toward a saddle in the hill just above the nest cliff and disappeared behind it.

I tried to get near enough to the other to get a picture, but he went the same way when I had approached within 25 feet. With a tail wind, both youngsters set a fast pace in their first long flights. I caught just one more glimpse of them, perched in the sage and withered grass of the hillside, their breasts showing a rusty orange in the afternoon sun. Then they were gone.

We located the others resting almost motionless on the opposite end of the cliff from the nest. It was impossible to reach and photograph them. They seemed safe and contented, and so we coiled our rope, cut the camera lines, bade them an affectionate farewell, and departed homeward.

Flight characteristics observed at comparatively close range formed a thrilling feature of our falcon studies.

No one who has ever worked his way to the crest of a cliff above a falcon's nesting ledge will forget the first wild screams that greet his arrival, the arrowlike rush of the bird as it launches forth into space, turning its head to view the intruder, and the astounding exhibitions of wild and headlong flying and swooping that may follow.

BUCKING A STRONG WIND

The character of the entertainment will depend upon the individual birds, the state of their tempers, and in many cases on the strength of the wind.

We visited one cliff during a fierce gale. The female, a very large and strong bird, was sitting on the edge of the old raven's nest she had pirated for a house and absolutely refused to launch out against the wind until I suddenly dropped a coil of rope in front of her.

The results were startling. As the falcon launched herself, an unusually strong gust of wind caught her from beneath. The first lightninglike stroke of her wings shot her upward, hardly a yard from the front of the cliff and almost within arm's reach.

Upward and backward, 50 feet, she went, and then with wonderful and spectacular contortions headed into the gale. That day there was no such thing as circling. The gale was so strong that with wings scarcely opened she was buffeted about like a leaf high over head. Even while thus continually headed into the wind, she had a rough time and frequently a side gust would ruffle her feathers, blow her tail around almost at right angles to her body, and partly capsize her.

Often I had opportunity for contrasting the design of modern monoplanes and the structure of swift-flying birds, of which they are more or less crude copies. I never tired of watching a falcon come sailing in from a great distance, with wings held steady and fully extended in a very symmetrical and strongly curved downward bow.

A FALSE START IN HOUSEKEEPING

I once saw a pair of falcons make a rather interesting false start in housekeeping. After a single egg had been laid on a bare shelf, they deserted it completely for no apparent reason and raised their family in a deep pothole 30 feet below.

Another peculiarity in nesting behavior was noted at the "nest on the cliff" in 1929. Instead of placing their eggs in clear view on the ledge, as they had done the previous year, the falcons chose a pothole six feet below it. In this position the eggs could not be photographed, so we shifted the whole set to the old nesting depression.

Then for the next half hour we watched one of the keenest-sighted of all birds fly directly past its eggs, clearly visible and very conspicuous on the ledge, and go back into the pothole from which they had been removed. While in the pothole the old bird mooned around as solemnly as an owl and uttered puzzled clucks.

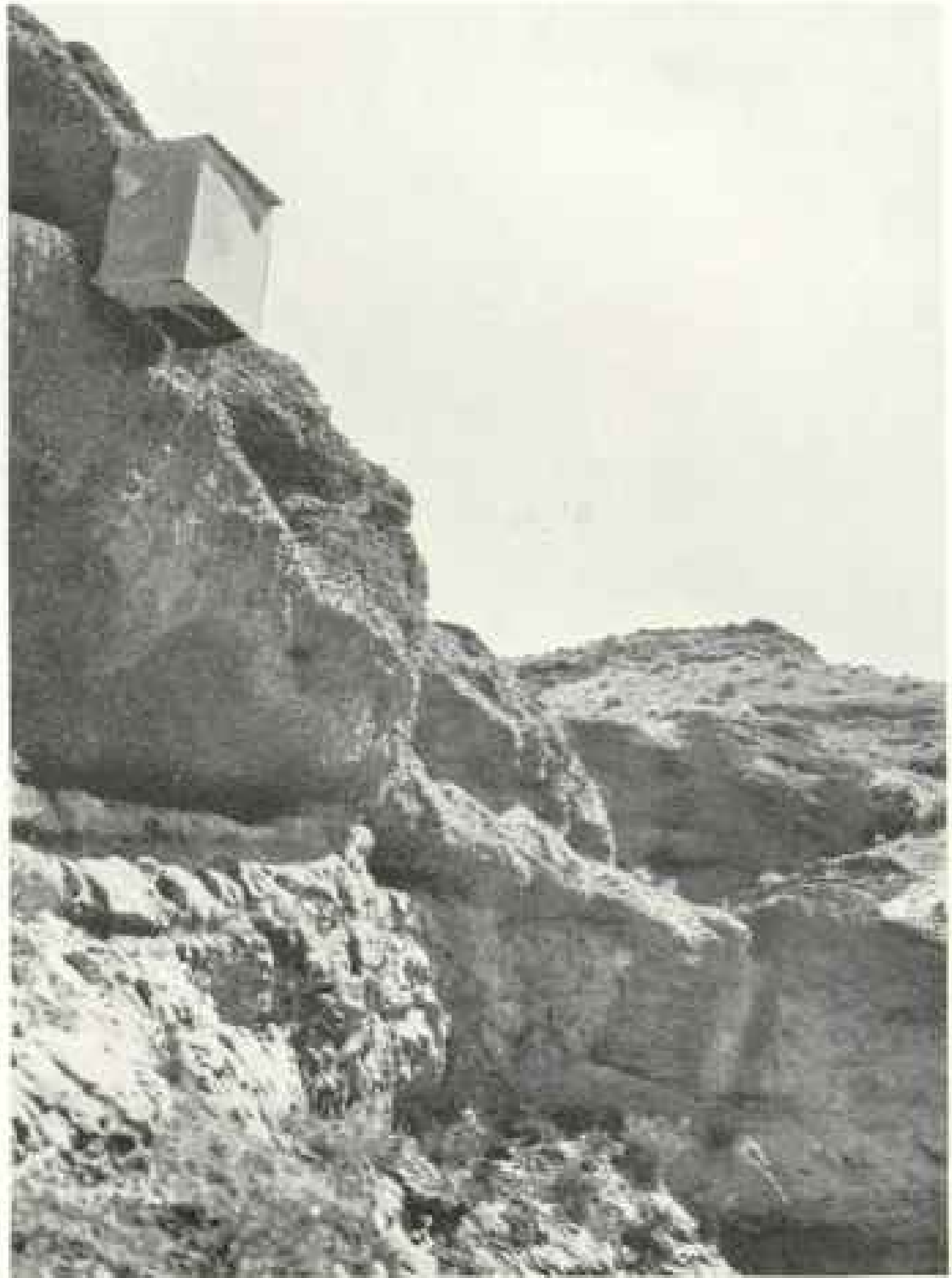
This seems to be a typical falcon reaction, for a fellow observer reports that a duck hawk once refused to follow its clearly visible eggs when they had been moved only two feet! It, too, went back to the exact spot where the eggs had been laid.

After we had watched the antics of the old bird in the pothole until it was certain she would not follow her eggs, they were put back. Soon after, they disappeared and are now probably resting in some collection.

THE VARIED DIET OF THE FALCON

What is the normal diet of the prairie falcon? To this question there is no definite answer.

Food remnants found at one nest by the writer and analyzed through the kind co-operation of Prof. J. O. Snyder, Department of Zoology, Stanford University, by Miss Lydia S. Bowen, then a graduate student,



A "BOX SEAT" ONLY SIX FEET FROM THE NEST

From inside the hanging blind the author watched and photographed his falcon friends nesting in the upper cleft, and even "dined" with them (see page 626). The spot seemed a wilderness, but no sooner was the mysterious box in place than herders, driving sheep to summer ranges, began to concentrate and inquire about it. Two years before, a falcon family occupied the lower ledge under the overhanging rock (see illustration, page 612).

gave a minimum of 45 birds and nine small mammals (gophers and ground squirrels). The most surprising item was a tasty order of eight burrowing owls.

The classified list of birds was as follows: 2 mourning doves, 8 burrowing owls, 3 horned larks, 9 California jays, 15 western meadowlarks, 5 Brewer's blackbirds, 2 California shrikes, 1 rock wren, 1 chicken, 1 unidentified.

The female of this pair was one of the largest and the male one of the smallest falcons I have ever seen, but both were superb flyers and mighty hunters, whose



ALMOST READY TO LAUNCH THE "PIANO-BOX" BLIND

On two steel cables it was lowered over the cliff, near the edge of which the author's son is standing. Entering from above by rope ladder, the observer placed his camera on a shelf, lashed down the cover, and awaited the return of the old birds (see illustration, page 625). When the big box first appeared at their very door, the falcons circled suspiciously, but instead of deserting the eggs they finally sailed in to the nest and continued rearing a family.

prowess was reflected in their varied list of game.

Other families studied in previous years and under different conditions were fed chiefly on ground squirrels. A fellow observer found in the Mojave Desert region a nest of five young raised to a healthy maturity on a diet of chuckwalla lizards, with an occasional collared lizard by way of variety.

My first attempts to secure movies and stills of parents and young together had been tantalizing and only partly successful. One trip down a cliff for each still shot or movie run is too much of a good thing.

Two years later, therefore, a comfortable and roomy box blind, stoutly framed and securely supported by light steel cables from two drill-steel pins, was swung into place at a favorably located nesting site.

An old cotton comforter spread in the bottom and on the bench deadened my foot-falls and made a soft seat. Cracks between the floor boards let in a cooling breeze.

The eggs, which were hatched after the blind was first lowered into place, but before it was occupied, were laid in an old raven or owl's nest instead of on the bare ledge.

The nest itself was within six feet of the cameras, and when the young began to move about the distance was often from two to four feet.

To say that I was on intimate terms with the family is putting it mildly. We even dined together, they eating ground squirrel or meadowlark on the outside, while I had a vacuum bottle of coffee, with sandwiches, fruit, and cake inside the blind.

At first the whir or click of the cameras put the old birds to hasty flight, but soon they became absolutely calloused to these noises and even to the sound of tearing off the paper tabs of the film packs.

It was astounding that one of the wildest of birds could be filmed at such close range that the portrait attachment had to be used, and the operator could have reached out to the bird with his hand.

LIFE IN A NORWAY VALLEY

An American Girl Is Welcomed Into the Homemaking and Haying of Happy Hallingdal

BY ABBIE L. BOSWORTH

EVEN in the flattest section of the southland, Norway is a mountainous country, although it does not quite fit the mental image of the young English girl who asked her Norwegian schoolmate in an English boarding school:

"Is it true that your country is a land of rocks and water?"

"Yes."

"Then how can you bury people when they die?"

She had not yet thought of the more vital question, How can you support people while they live? For the most part, this has been answered by the thousands of small farms which skirt the long, twisting fjords or utilize what level land there is along the rushing rivers in the mountain valleys.*

THE VALLEY IS TWO FARMS WIDE

Hallingdal, a long valley which winds through the central section of the country from Hønefoss to Al is, for most of its length, only one or two farms wide, for the mountainsides rise steeply from the river bottom. This valley is familiar to those who have traveled by rail from Oslo to Bergen.

It was to Nesbyen, a village about midway north in Hallingdal, that I went to live soon after I had landed in Oslo on the first of August.

My entrée into village life was to be through Ragna, who had returned to her native valley to marry and settle down after having been our much-loved guardian and teller of fairy stories when we were children. Accordingly, I wrote her to expect me on the Friday train. I dismounted from a third-class compartment upon the platform of the Nesbyen station on the appointed day, not knowing just what to expect from the experiment of thrusting myself into the family life of a small mountain farm.

Ragna was at the station in her best dress of black and white cotton print. She had

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Norway, a Land of Stern Reality," by Alfred Pearce Dennis, July, 1930, and "Norway and the Norwegians," by Maurice Francis Egan, June, 1924.

not changed in 15 years, but I would probably have been unrecognizable if I had not been the only stranger on the platform.

She told me at once that she had spoken for the "bil," an ancient and noisy touring car driven by a blue-eyed young viking with a nautical cap set at a rakish angle. I realized soon from the way he opened the cut-out and honked as we passed each house that I was a passenger of some note to whom he wished to direct attention.

The driver of this, the town taxi, was among the young men who came to call on me in the evenings after I had lived in the village for a while. Once when he was leaving, he offered to take us for a ride as a special treat. We all climbed into the car and sped along the little gravel road to a point just outside of town where our host stopped and let us out to walk home. He drove off with the self-satisfied expression of a young man who has entertained in a very lavish manner!

Ragna's home was about three miles from the village. When we arrived at "Matthew's Mowing," I was fed, as the first gesture of hospitality, even before my baggage was carried in. There were milk, and fruit, and fresh leaf lettuce, little curled anchovies, and sheets of crisp flatbread.

Then I met the family: Guttorm, the husband, a friendly man in knee breeches, with a hay rake over his shoulder; Old Peder, his father, a dignified man of 80, dressed in the old-fashioned black homespun with a tight vest and a linen blouse woven by his wife, who had been dead for 30 years. Seven-year-old Magdalena was very shy, but minded her manners enough to drop me a curtsy before she ran to hide under the currant bushes.

INTRODUCTION BY HAY RAKING

I had opportunity even sooner than I had hoped to begin my peasant life, for the clouds were sweeping over the mountains across the valley, and Old Peder said that it would rain before dusk. The hay from the high meadow had to be in the barn before then. When I said I wanted to help, Ragna



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HAY MUST BE "HUNG ON THE LINE" TO DRY

An hour after the author had stepped off the train in Hallingdal she was out helping with the haying (see text, page 627). Temporary fences are erected across the fields for curing the grass, because frequent rainfalls prevent it from drying on the ground. Children frolic and roughhouse in the haycocks when they tire of raking.

lent me a voluminous striped apron and a scarf to tie about my hair.

When I appeared in the meadow the grandfather shook his head and chuckled, "Well, well, the fine American dame raking hay!" and leaned on his rake to wipe the tears of amusement on the linen sleeve. Ragna translated what he had said, and added, "He will like you."

Soon Magda forgot her shyness in the dramatic fact that the hay must come in. She crept from her thicket to help me glean the wisps that the others had missed. Every spear of grass is valuable. The Halling farmer still uses a hand scythe and never misses a tuft hidden away in the fence corner or along the river bank. We all helped load the sweet, dry hay into a little hayrack made of unstripped birch saplings.

This we hauled to the barn by hand, for the little dun pony had been sent to the *sæter* (a mountain meadow or pasture; see text, page 635) for the summer along with the cattle, so that every bit of grass on the home farm could be made into hay for the

long winter. It was not a heavy load to push save for the last little way up the log runway into the mow, which we took with a rush and a whoop.

Going back to the meadow, Magda rode in the empty rack, with Guttorm and me prancing before, neighing occasionally for good measure. It was not long until we had stowed all the hay from the edge of the dark spruces on the mountainside to the dusty bank of wild strawberries by the roadside.

When we had hung our wooden rakes against the log wall of the woodshed, Tante (Aunt) Åse, whom I had not seen before, appeared at the garden gate. Curtsyng, she said, "Be so kind as to drink a bit of coffee."

Tante Åse was the great-aunt who was too old to help with the raking. She was the only person in the village who never used the familiar form in speaking to me all the time I was there.

She had spread the coffee cloth out of doors, and we all sat about on the grass under the wild cherry tree and had coffee



© A. B. Wise

"WHATEVER CAN GLE BE GOING TO TOWN FOR?"

On lonely farms, housewives eagerly watch the road and discuss the probable errand of every passer-by. In winter time, too, they like to catch an early down-the-road glimpse of husband or child returning for dinner, in time to get the food hot. While oil lamps still are used in isolated valleys, they are rapidly being superseded on many farms by electric lights.

and little cakes, and wild berries which Magda had strung on grass stems. While we sat eating, two old women came by on the road, walking toward town. There was a conversation which I did not understand at the time, but heard many times afterward when I had learned to speak Norwegian.

"Good day."

"Good day."

"Are you through with the haying for today, then?"

"Ja, our high meadow is all finished. Be so kind as to stop and have a drop of coffee."

"Nay, that we cannot. It is a long road to town."

"But you had best rest for a minute. Be so kind." This oft-repeated phrase, at least (Norwegian for "please"), I understood clearly.

"Well, but only a drop then."

But what excited me was that our guests were dressed in the beautiful embroidered costumes of Hallingdal, made of the coarse woolen fabric known as wadmål. It took

me some minutes to realize that they were not dressed for any especial occasion. They wore full skirts embroidered at the hems with flowers of brilliant-colored wool, tight little vests completely covered with embroidery, and stiff red bonnets with printed challis scarves tied over the backs and under the chins. Over all was a full cotton apron in bright colors.

FINE MANNERS FOR COFFEE DRINKING

They sat with their legs held stiffly out before them on the ground, the copper toes on their heavy boots pointing straight to the sky. They drank their coffee with polite noises, sucking it through a lump of sugar balanced on the tip of the tongue. I tried later in secret to learn to drink my coffee thus, but only burned my mouth and spilled the coffee.

There followed a week or so more of haying. In wet weather the hay was cut and hung over rail fences to cure, lest it rot on the ground. Down by the river there was a field of "green," barley cut while there was



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THERE WILL BE FRESH SALMON FOR DINNER TODAY!

Farmers on the steep fjord shore are also fishermen, laying nets to snare the salmon as they swim in from the sea. Herring, cod, and other fish abound along the west coast of Norway. Salmon rights to some of the Norwegian rivers have been rented to English sportsmen by the farm owners.

still sap in the stalk and the grain had just reached the milk stage. This was dried over racks in the field. It was very prickly to load.

While we others were busy with the green, Old Peder was cutting down a copse of young birch for the winter fuel. He tied the small branches with the leaves on them into bunches to dry for cattle fodder, for even with careful gleaning there would not be enough hay and barley green to last the animals through the winter.

When the hay was all in, the barley and rye grew ripe. Guttorm cut through the shimmering golden fields with great swings of his scythe. The grain fell in a neat semi-circle on the ground with each stroke. We

bound it into bundles to be shocked spirally around tall saplings stuck in the ground. There was a little red ladder to climb up with the top bundles. The grain is not threshed at harvest time in this section of Norway, but later on during the winter, when the horse is home from the mountain pastures and can be hitched to the crude treadmill in the barn.

Aside from fine white cake flour, which is imported from America, most of the family food was produced at home. Barley, rye, and oats are milled locally, the miller getting a share of the meal and flour for his work. The garden yields stores of cabbages, potatoes, and root vegetables for the winter.



Drawn by Albert H. Bunstead

CLAW-FINGERED FJORDS, RIVERS, AND LAKES TATTER NORWAY

Deep valleys, sometimes only "two farms wide," follow the rivers down to the sea. Near Nesbyen, in fields skirting the boisterous Hallingdal River, the author shared with a family their tailsome farming. Along the river, express trains from Oslo, the capital, gathered speed to pass over the high mountains along the route to Bergen, a western port.

Nature is lavish with a large number of berries, both wild and tame. Masses of wild strawberries and raspberries grow along the roadsides. There are currants from which to make sweet wine; wild cherries, the juice of which is bottled to make soup and puddings; little wild "mountain cranberries," which make delicious jam to serve with pork or roast ptarmigan; and, best of all, the arctic cloudberry, growing in the mountain-top sloughs. This last, when stored in great crocks, keeps through the winter, without cooking or other preservation.

I made my *début* into the village society very soon, for there was a festival in the village the evening after my arrival. We

hurried through the work of the afternoon so that we could get dressed in our best clothes, and set out for the village in the golden sunlight of the early August evening.

Just as we were ready, Thor's family, who lived farther from the village than we, stopped at the gate and halloed. Thor's wife was a pretty girl in her early twenties; his son Kristian was a fat-checked cherub who peeked shyly out with one blue eye from behind his mother's skirt to get a glimpse of the American woman.

The men walked stiffly ahead, discussing crops and politics; we women walked respectfully behind. Magda scurried about in the bushes at the wayside to find wild



© A. R. Wise

"BEST MOTHER," AS NORWEGIAN CHILDREN CALL THEIR GRANDMOTHER, ENJOYS
THE SUNSHINE

While the young women of the family are busy in the fields, she spins wool for the winter supply of gaily patterned socks and mittens. An elderly farmer, according to custom, may cede the homestead to his son and in return receive a home for the rest of his life.

berries to pop into the eager mouth of young Kristian.

At the next farm we all stopped and waited for the family to join us; and so we progressed. When we had walked the three miles to the village, we were a large, merry troop, all ages from two to 80.

Nesbyen was in its gayest dress. The men stood at the roadside or sat in twos and threes on the rail of the stone bridge over the rushing little mountain river, watching the girls who strolled up and down arm in arm, giggling shyly and pretending not to know that they were being closely inspected.

I should have been quite upset with the fear that I would not pass the examination of all these pairs of light-blue eyes if Ragna had not whispered to me that I had an escort all ordered. Her brother-in-law's brother-in-law, the handsomest young bachelor of Nesbyen, and one who knew a few words of English, had been told to look after me for the evening.

She nudged me as we passed where he was standing with some other boys against a rail fence, but Gunnar made no sign that he knew us. The men near by chuckled and made some remarks to him which I did not, of course, understand. Evidently the whole town knew what I had just been told, that Gunnar was to be my "gutt" (beau).

We filed into the "Youths Hall" about 7 o'clock. The entertainment for the evening began with an amateur operetta about a picnic party at a saeter. A group of young men from the village had come up the mountainside to call on the girls who were watching the cattle in their summer pasture. Verse after verse was sung to the same Halling jig tune.

The production was very simple. The properties consisted of a large table heaped with real food which the actors seemed to be enjoying; the costumes were the peasant dress which the young people wear for church and parties anyway.

DANCING REQUIRES AGILITY

While we sat in the dark watching the play, my swain slid quietly into the seat at my side. When the play was over, we all crowded to a table in the corner to have home-made beer and potato cakes. Our appetites had been stimulated by watching the feast on the stage.

Then the dancing began. The first dance was for only the young and spry boys. A

young girl held a hat up in the air on the end of a long pole; two fiddlers played a lively tune as fast as they could; the young men danced around in a circle with arms folded across the chest. Each one as he came under the pole leaped high in the air with both feet trying to kick the hat down from over his head.

By great agility they kept their balance and kept time as they leaped. He who missed a beat was cheerfully booed by the audience. But for several turns around none touched the hat. Finally a very blond and handsome boy got the hat down, and there was a storm of cheering and applause. Perhaps it was merely suspicion on my part, but I seemed to see the hat dip slightly as he came along! He danced for the rest of the night with the pretty girl who had held it.

After that we all danced the *springdans* (running-dance), twirling and hopping ONE - two - three, ONE - two - three. Gunnar seized me and threw me high into the air. As I came down, I saw Ragna being similarly treated by a contemporary of Old Peder, and Guttorm having a fine time with the grandmother from the next farm. The children were off in one corner hopping gaily up and down facing each other. Magda jumped about with little Kristian clutched tightly to her, his plump legs dangling (see page 639).

The two fiddlers took occasional turns to sneak out for a breath of air and a glass of beer, but the music never stopped. The floor shook; the rafters trembled; an occasional fox trot seemed very quiet by comparison. The girls' skirts flew in wider and wider circles; the faces of the men grew pink and damp.

It was very hot in the hall, and I went out to stand in the dewy dusk of the street at midnight. There were a few bright stars above the violet mountains and a rosy glow lit the sky toward the north, where the sun had dipped down and would soon come up again after a short sojourn under the horizon.

About 3:30 I was quite exhausted and, feeling like a weakling as I did so, asked how soon we would be going home.

Guttorm said cheerfully, "Well, we are old folk and must be up early in the morning and Magda has had enough."

We started home, several of the village boys walking with us. There was little talking and laughing now. We went quietly



© A. B. Wibe

SEVEN LITTLE BROTHERS SEE BIG SISTER OFF TO THE MOUNTAINS

Her pony loaded with empty tubs and her few belongings, the young girl sets off for a summer tending the herds. Later, when some member of the family visits her hut to bring supplies, he will collect the butter-filled tubs and cheeses and carry them down to the homestead.

through the still morning that smelled of dust and flowers and dew. Soon after we started, the sun rose red above the mountains. The light touched one peak after another down the valley.

My leather bed felt very good to me when I could at last tumble into it and the twitter of the birds in the cherry tree by my window very lulling. I afterward learned that our escorts, who had declared themselves very tired, too, had returned to the dance when they had walked the three miles back to Nesbyen!

ACCEPTED AS ONE OF THE FAMILY

In a very few days I was accepted completely into the farm routine. At first I was served meals in lone state in the parlor. But my protests won out, and soon I had the same food as the others and ate with them in the kitchen.

First, coffee and cakes were brought to us in bed every morning by Ragna. As soon as we had dressed, there was a large

breakfast with more coffee, and bread and butter with all sorts of pickled fish and sausage and goat's-milk cheese to put on it. At 11 the work paused for another snack, which was breakfast all over again. There was a heavy dinner about half past one and then a siesta.

I was amazed to find what I had always considered "an old Spanish custom" just as firmly entrenched in rural sections of this energetic northern climate. After the nap we had more coffee and cakes before the work of the afternoon began.

The last real meal in the day was the evening porridge, at about 8 or 9 o'clock. This meal was unvarying except just after a slaughtering, when a blood pudding was substituted for the usual *gröt*. This porridge I did not, I must admit, like very much at first. It is a thick, leathery gruel made of parched barley meal.

The whole family ate from one large, shallow bowl, each one gradually scooping out a niche in his side until what was left for the



© A. B. Wilce

MORNING MISTS RISE, LEAVING BIRCHES RIMED WITH FROST

Lake Bandak, in Telemark, although it is a fresh-water lake, resembles a long, twisting fjord. Huddled at the foot of the slope are buildings and a small clearing hewn out of the forest, for every tillable plot is used in this rugged northland.

pig at the end of the meal looked like a dull-brown, leathery starfish. Each spoonful of *gröt* we dipped into a little private bowl filled with sour milk which had been bottled, warm and fresh, early in the spring and hung down the well to keep for months. Into the bowl we shredded bits from the big square of brown goat's-milk cheese.

About two weeks after I had come to Nesbyen I was left in charge at "Matthew's Mowing" as housekeeper, while Ragna went up to visit her mother at the mountain saeter and to gather cloudberry for the winter.

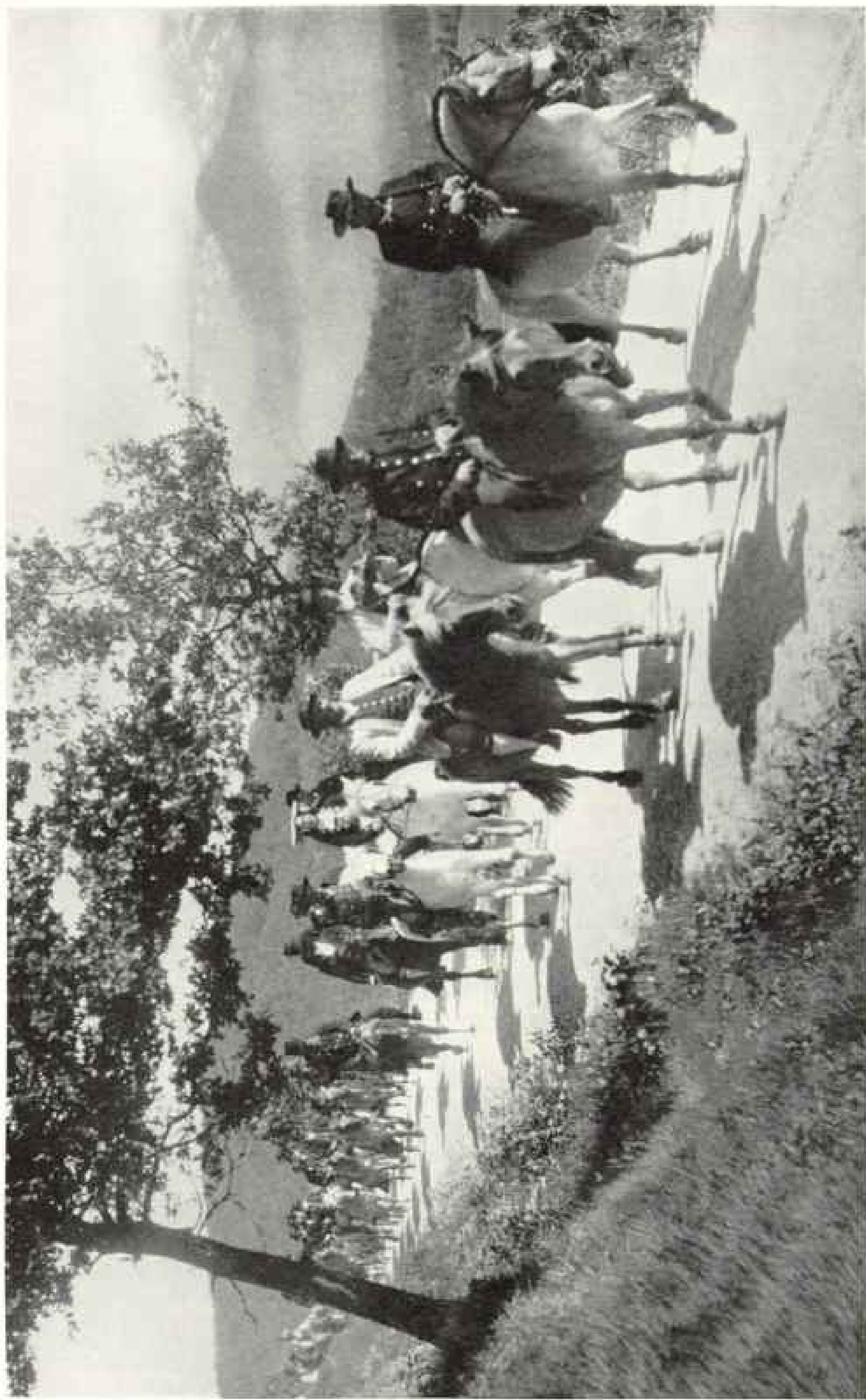
The saeter is as typical of Norwegian life as the herring. Saga and song for hundreds of years have celebrated the life of the young maidens and the old women who go to the mountain tops to spend the summer with the herds. They live in small log huts with turf roofs, passing their days in the mountain pastures, milking cows and goats, making butter and tending the huge iron caldrons in which milk is slowly

simmered to make rich brown cheese.

Farmers who have no saeter send their beasts up to the mountain with a neighbor's daughter, to be tended for a share of the products. When the saeter huts are deserted for the winter before the first snows come, each one is left open, with a supply of food and wood for the safety of any skiman who is caught in a storm or benighted crossing the mountains.

THE AUTHOR BECOMES HOUSEKEEPER

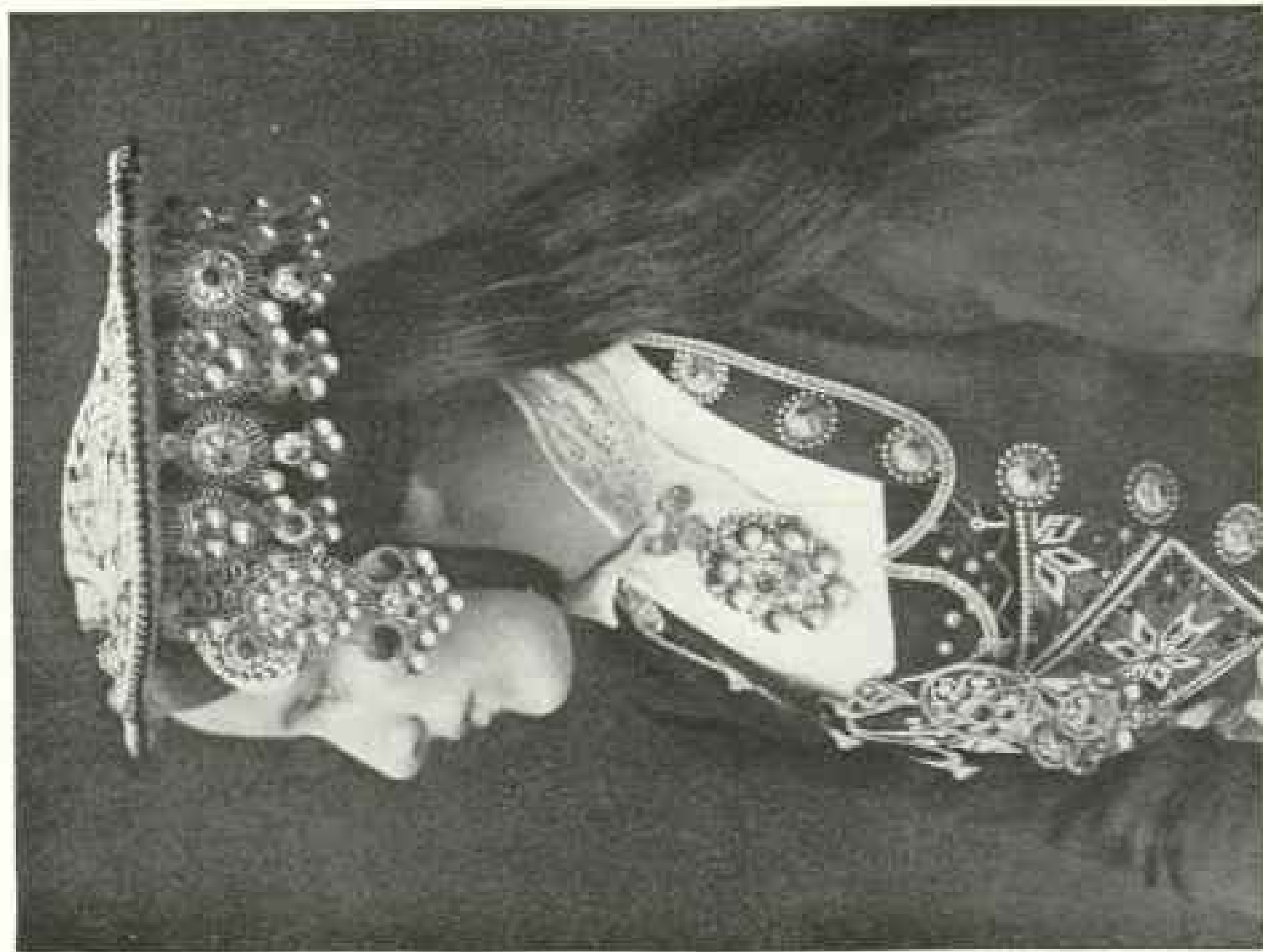
When I was left as housekeeper I was ceremonially given the 12-inch, wrought-iron key to the *stabbur*. These *stabbur*, or storehouses, are typical features of the Norwegian landscape. They are built of logs on high, mushroom-shaped stilts as a protection against marauding insects and rodents. The front porch of the structure is reached by a flight of plank steps separated from the building by a sort of moat of air across which it is impossible for thieving animals to leap (see page 642).



© Per Brautten

A PRANCING CAVALCADE ESCORTS THE BRIDAL PAIR, MOUNTED ON SNOW-WHITE HORSES

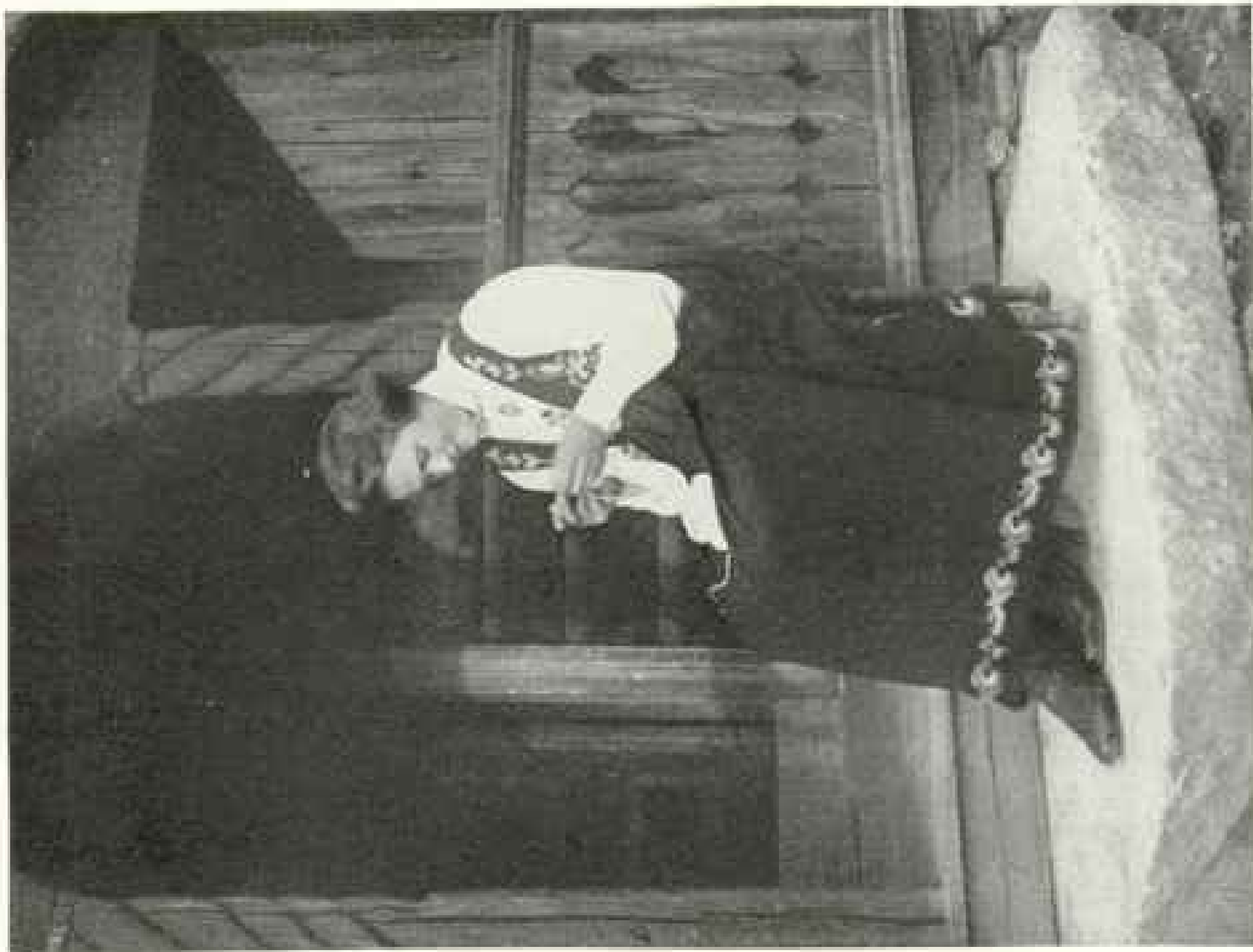
This girl has a silver crown (juggling on her head (see opposite page)). She is preceded by a fiddler on horseback, and, like the fine lady in the nursery rhyme, "will have music wherever she goes." Such processions, with many other old customs, are dying out. This wedding party, in a festive show at Voss, is riding sturdy dun ponies native to Norway.



Photograph by Per Irmann

A YOUNG BRIDE IN AN ANCIENT GOWN

Nowadays the conventional white veil is becoming more popular. Soon the silver "crown," worn with the embroidered national costume, will be relegated from the wedding chest to a museum.



Photograph by Donald McLain

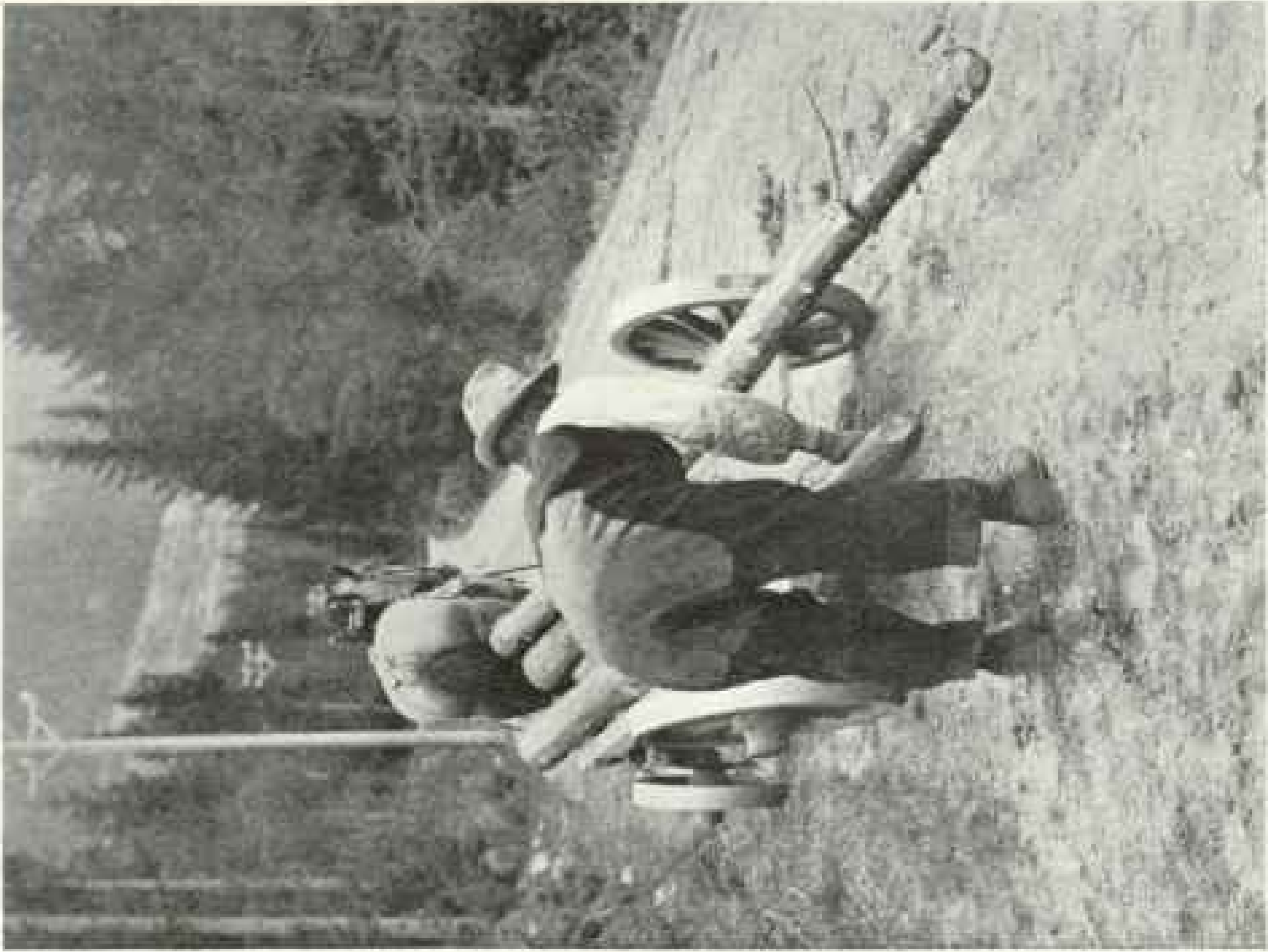
THE BALLINGDAL WAY TO FILL HER WEDDING CHEST

Farm women in Norway are fond of doing all sorts of handwork, such as crocheting coarse lace, weaving tapestries, and making wool embroidery. A mat of fresh-cut spruce boughs covers the stone doorstep in winter.



A NORWEGIAN DONS SKIS AS READILY AS MITTENS

Since men in the country districts must often travel many miles through deep snow to their lumbering tasks, skis are an important part of the equipment (see text, page 645). The knapsack, woven of birch bark, is light and strong and helps keep food from freezing during a day in the forests.



© A. D. White

A LEATHER PATCH MAKER WEARS BREECHES WEAR LONGER

The author often rode home from the village, balanced atop a load of fresh-cut poles, on a creaking lumber cart driven by neighbor Thor (see text, page 631). His son, Kristian, had an insatiable ear for fairy stories on such trips.



© Per Brantzen

ONLY THE STRONG-WINDED MAY LAST THE NIGHT AT THE "RUNNING DANCE"

Partners are flung about in a variety of maneuvers to the tune of a rhythmic jig. The fiddlers spell each other so that the music need never cease (see text, page 633). Old Peder at eighty danced as ardently as the lads of the village. Back against the house is a table heaped with flatbread, potato cakes, and other delicacies.



Photograph by Donald McLeish

IN THEIR BEST BIB AND TUCKER, VILLAGERS WAIT FOR THE PARTY TO START

They stand on the steps of the 17th-century town hall at Ål. Clothing of the men is as somber as the women's is gay. Both sexes wear large, gold wedding rings on their right hands, but when a spouse dies the ring is transferred to the left. The author knew one often-widowed woman in Nesbyen who wore three wedding rings on her left hand and had a new one on her right!

The key in my charge, which fitted a wooden lock in the heavy, carved door, took two hands to turn. The lower story, a small, dark room with heavy log walls unbroken by windows, was used as a storeplace for food. Since most of the family food is produced at home, the stores in the *stabbur* made an impressive collection.

There were large bins full of various kinds of meal and flour, each with a brightly painted wooden scoop hanging above it. There were shelves of stacked cheeses of many kinds. There were gay wooden boxes full of cakes which had been baked in the spring when the cream was rich. In one corner on a low platform sheets of rye and barley flatbread with crinkly edges, temptingly brown, were piled almost to the ceiling (see opposite page).

In another corner was a pile of decorated tubs in which butter was stored, and a special sort of little wooden box with dragon handles. These are filled with dainties,

cakes, butter, and fruit when one goes calling on a neighbor who has had a baby.

From the beams hung hams, sides of bacon, smoked joints of lamb and veal, and many kinds of sausages. Festooned in between were wooden household implements, made by the men in their long winter evenings. There were spoons with long, curved handles, birchwood cups for the foresters to carry to the mountains with them, whisks of peeled birch twigs for beating gravy, twirlers made of the tops of young birch trees for beating the evening porridge while it simmers in the pot.

A great deal of ingenuity and knowledge goes into the fashioning of these wooden utensils. For brides they are elaborately carved or decorated with paint. The name and wedding date of the girl is often worked into the design. I carried flour to the house in a large bowl which said, "Ragnhild Magnusdatter 1837" around the



Photograph courtesy Axel H. Grahns

STRONG ARMS ROLL OUT A TWO-MONTHS SUPPLY OF "FLATBREAD"

Here a housewife is making round, paper-thin sheets of the stiff unleavened dough of rye and barley which was mixed in the home-bewn trenchers (right). After the crisp bread has been delicately browned on a crude bakehouse stove, it will be piled to the ceiling in the corner of a storehouse. Many of these utensils were whittled from wood by the men during winter evenings.

rim. It had belonged to Ragna's grandmother.

THE STOREHOUSE BALCONY IS ROMANTIC

From the front porch of the stabbur a steep little stair led to the loft balcony which overhung on three sides of the building, giving it a rather tipsy, topheavy air. The balcony was enclosed to shoulder height in an elaborately carved and pierced railing through which the sunlight came in little flecks to fall on the assemblage of implements stored there: a spinning wheel and loom, rakes and scythes and cradles for harvesting, sleds, and several pairs of skis.

In the old days, I was told, many a lover courted his lass through the long twilit summer night on the overhanging balcony of the storehouse, for the loft was often used as sleeping quarters by the young girls in the summer time.

The loft itself was a small room lit by one high window. In it there were kept the

wedding chests full of extra linen. All the clothing which was not in daily use was hanging on pegs around the log walls, for there are no closets in the house. Here, too, the beams were festooned, not with hams and sausages, but with mittens and socks knitted in elaborate patterns, with embroidered caps and heavy boots and wadmal petticoats.

When I took over the post of house-mother, I anticipated time in the day to do my painting, which was my real purpose for being where I was. I did not intend to scrub the floors all over the house every day, nor to do the many other tasks which would have shown that I was a really good house-keeper.

Although getting dinner included everything from digging the potatoes first to feeding the pig afterward, there was only one dinner in the day. The first day I scheduled my time very easily, and thought that my new job was to be a sinecure. But the



Photograph courtesy Axel H. Oxholm

STOREHOUSES REST ON STILTS TO PROTECT THEM FROM RATS

The yearly harvests of cereals, the cheeses, cured meats, bread, and cakes are stored in the *stabbur*, elaborately carved and protected against the weather by a coat of wood tar. When a member of the family wishes to dress for a party, she must go outdoors and cross the yard to reach the building that holds in its loft her chests of linens and best clothes (see text, page 635).

second day was full of interruptions. There seemed to be an unusual number of callers. And callers, of course, must be hospitably urged into the parlor and entertained with coffee and cakes and a discussion of the weather.

On the third day it seemed as if I spent every moment making coffee and washing cups. And then Guttorm explained the mystery. He said that the grandfather had been going up and down the valley for six miles telling all his friends that the American dame was now "little mother" at "Matthew's Mowing"; and the countryside had come to see!

I was glad when Ragna returned and I could turn over to her the responsibility of being polite to callers. When she arrived she had with her about 55 pounds of cloudberries which she had carried 8 miles down the mountainside in a wooden hopper on her back. The next day we were all busy in the brewing house sorting them over and scalding the crocks to hold them for the winter. And the day after that, all of our neighbors tasted their first pie, which I made out of fresh cloudberries.

The buildings of the typical farm are many. They are built, as they always have been, of peeled logs chinked with reindeer moss and roofed with turf laid over birch bark, the cheapest, warmest, and most practical roof for the climate. When the log walls are laid up, the lower side of each log is hollowed out to fit snugly over the top of the log below it.

This construction has the dual purpose of shedding rain and snow from the chinks and holding the walls firmly against bulging and sagging in the course of the centuries. It doubtless accounts for the fine state of preservation of very ancient buildings of wood in Norway.

On the inside of the houses the log walls are painted with designs in rich colors, dark red, sky blue, and delicate greens and yellows. The subjects are generally floral, although I saw one old house which had illustrations of Biblical stories all over the ceiling. The simple carved furniture is generally painted to match the room it is made for.

It is very difficult for one not versed in the antiquities to tell the age of a farm



Photograph by Donald McLeish

AS SOON AS THEY CAN WALK, CHILDREN FOLLOW THEIR PARENTS TO THE FIELDS

The mother is dressed in the voluminous apron and kerchief of workaday garb. Potatoes are an important crop in Hallingdal, for they are on the family's daily menu and, along with birch twigs, form a staple item in the winter diet of the cattle.



© A. R. Wilse

THE NORWEGIAN FARM HAS SEPARATE BUILDINGS FOR VARIOUS PURPOSES

Built solidly of logs and roofed with turf laid over birch bark, farm buildings stand for centuries. This ancient group has been reassembled in the Sandvik collection at Lillehammer, an "outdoor museum" where historic buildings are preserved in a landscaped setting.



© A. B. Witte

A BROWN CHEESE LIKE MALTED-MILK FUDGE IS MADE FROM GOAT'S MILK

To conserve the lush meadowland for haymaking, all of the animals are driven up to the mountain farm, or *sæter*, for summer foraging. Usually the young unmarried daughters tend the flocks and make the dairy products which play so important a part in the farmers' year-round menu. A towering square cheese, wrapped in embroidered cloth to keep it from becoming finger-marked, is the centerpiece on the table at every meal.

house. The architecture, until recent years, has changed little through the centuries since the era of the introduction of windows and fireplace chimneys as a substitute for the roof vent.

Our house was new and therefore had stoves for both cooking and heating. It also had water piped into the kitchen from a spring on the mountainside. Some of our neighbors, however, carried their water from the brook and still did their cooking over the *peis*, or corner fireplace.

The *peis* has a whitewashed stone hearth built to knee height, over which is a high hood supported in the front corner by a

single stone, or wood pillar. Thus two sides of the fire are open to the room. The back of the fireplace is made of two solid slabs of stone set far enough out from the log walls to allow space for storing wood and drying garments behind it.

The farm buildings are arranged around a grassy yard which, in the old days, was enclosed by a log stockade as a protection against marauders, both man and beast. The house, and often a second older house for the in-laws, is on one side. Near the house is a storehouse or two, then the byre, with a roost in the corner for the chickens, where the heat of the cattle's bodies will

keep them from freezing to death in the winter time.

The large barn is shared by the horse and the pig. Over their stalls is the mow for hay and grain. On the far side of the yard are the brewing house, the bathhouse, and the workshop; and way off in the corner of the meadow the slaughter shed and the smokehouse. On some farms there were many more buildings.

AWAY TO THE NORTH

Toward the latter part of August I decided that, if I were going to see the north of Norway before winter set in, I must leave Nesbyen. The first tinge of autumn was in the air; the mornings were already crisp with frost; the birches were gold in their topmost branches.

It was difficult to leave, but one day I boarded the train bound north over the mountains to Bergen. When it pulled out of the station, I stood in the corridor so that I could look out across the river to the row of familiar little farms and see the small figures standing in the meadows vigorously waving aprons and scarves and know that they were shouting, "Adieu, adieu, good tour then, and a quick return."

The last familiar sight was old Asbjörn and his wife Ingebjörg raking hay in their island meadow. They were so old that theirs was the last hay in the valley to be got in.

It was the last day of October when I came again to Nesbyen. The taxi skidded through drifts of snow as soon as it left the hard-packed streets of the village. The raspberry thickets along the road were covered now with great white pompons of snow. I could hardly recognize the well-known places.

THE TRAVELER'S RETURN

I came as a returned traveler, eagerly welcomed. My friends in the village all called to hear from me about their own land beyond the mountains. They listened breathlessly to my stories of Lapps and cities and adventures in the far north.

Life at "Matthew's Mowing" was now on its winter schedule. Guttorm went every day on skis to the mountains to his work as Government forester. Large tracts of mountain land belong to the Government and must be carefully tended. The logs which are sold pay in a large part for the labor of keeping brush cleared out and

guarding against fires. In turn the money the men earn this way pays for what each family does not produce at home for its own needs.

Old Peder had a gold medal given him by King Haakon for fifty years of endeavor as forest overseer for the district. This medal he always wore proudly pinned to the breast of his best suit when he went to church.

Magda had begun going to school in the village. Three days a week she set out before it was light in the morning with her little knapsack on her back to go on skis to Nesbyen before 9 o'clock.

A VISIT TO THE VILLAGE SCHOOL

She wanted me to visit school to see how much she had learned in a month, and one day I went into town to go to the school for the last hour in the afternoon. In the first-grade room there were 20 little shave-headed boys and as many little pig-tailed girls, all squirming and wriggling from the heat of the room and their scratchy wool clothing, and shuffling their heavy copper-toed boots on the floor.

The teacher gave me a seat in the back corner of the room where I would be as inconspicuous as possible. This resulted merely in the craning of 40 necks while the lessons went on.

The curriculum consisted strictly of the three R's. The whole class chanted in unison the numbers up to 20 and then did complicated sums orally. When the arithmetic lesson was finished, the children all stood up and sang a folk song. Then they read the story about the three goats going over the bridge.

This Norse folk tale, at least, was familiar to me from my own school days. There was a movement of excitement around the class when the troll declared to the little goat, "Now I will eat you all up."

I knew that Magda had not even known her alphabet before she went to school. The progress the children had made in such a short time was astounding.

The animals were now home from the mountains and had to be tended. Every evening I went to the dark, fragrant byre with Ragna to cut up a wooden vat full of potatoes to feed the cows while she milked them. The chickens clucked sleepily in their corner. Even in the short daytime the byre was lit only with one small window, and the fowls seemed to accept the winter



Photograph by Donald McLeish

HAY TAKES A "SKY RIDE" FROM THE HIGH MEADOW

This labor-saving device brings dry grass down the steep mountainside quickly and with minimum effort. The wire cable is kept taut by winding it around the drum.

as a period of hibernation, laying no eggs and scarcely showing an interest in food.

The cattle are small, brindly beasts with spreading, brass-tipped horns. They have not been bred for quantity milk production. Often a cow will give only a quart or so at milking. Little attention seemed to be paid to breeding. That calf is kept which happens to be born at the most convenient time. I once protested to a neighbor woman who had just slaughtered for veal the calf of one of her best milch cows and was proposing to keep the calf of one of the poorest cows in her herd.

"But the mother of that calf gives scarcely a quart of milk. The calf will probably not be much good, either."

"Ja, but she is small and does not eat much, either, that cow." In a land where every spear of hay has value, this was an argument of great weight.

EVENINGS IN THE KITCHEN

Our evenings in the kitchen were delightful. Magda did her lessons at the table after the porridge had been cleared away. Ragna and I sat quietly knitting. All the socks, mittens, and sweaters for the family are made at home. For the large family this is no small chore. No labor, therefore, is wasted.

When the feet of young Björn's stockings are worn out, his mother cuts them off and knits new ones upon the old legs. Consequently, most of the children are dressed in stockings that change color slightly at the ankle. The men talk politics and gossip while they whittle at wooden spoons or mend harness or skis.

When the lessons were done, the grandfather would tell us stories about a troll who lived in a glacier on the mountain, or about the man who dug a pit to catch Old Bruin and got a strange assortment, not only Bruin but Graylegs the wolf and Reynard the fox and an old woman with a pack on her back, who instructed the others very tartly and in broad dialect to sit quietly in their own corners, please.

At the end of one of these tales Guttorm would stretch and say, "Ah, well," and take the lamp out into the cold hall to light us all to bed. The outside door from the hall was always left open so that there was a shock of cold, fresh air and the smell of snow and spruce logs after the cozy kitchen.

Presently the time drew near for the pig

and the calf to be slaughtered to make Christmas sausages. I had petted them both so that they knew me, and I did not feel able to meet the killing with equanimity. On the day before the village pigsticker was scheduled to come and help the family with this rite, I left for Oslo.

For two weeks at Christmas time there is a rich fare of delicacies, pork and veal, sausages, cakes, a large pickled tongue for the center of the table with *God Jul* (Merry Christmas) written rather gruesomely on it with colored paste. All these things I had elsewhere, but not made out of creatures I had known and petted.

The sausages at Christmas time are made with patterns of different sorts of meat, so that when they are sliced a star of Bethlehem or some other symbol appears.

Horse meat is much esteemed for sausage making. It is common to see a want ad in the local papers: "Fine horse meat for sale." This generally means that the young horse of some farmer has broken a leg or met with other accident and had to be killed. Horses are too valuable to butcher while they can still work.

The central dish at the supper table on Christmas Eve is *lutefisk*, not one to appeal to the American palate but a Scandinavian delicacy. The codfish, which has been slowly dried so that it is of very strong flavor, is soaked in a solution of lye for about a week. When it has swelled up to a quivering jelly, it is boiled until it is a transparent mass and then eaten with melted butter and boiled potatoes. The heads and livers of boiled fresh cod are also considered delicious served the same way.



Photograph by Branson De Cou from Galloway

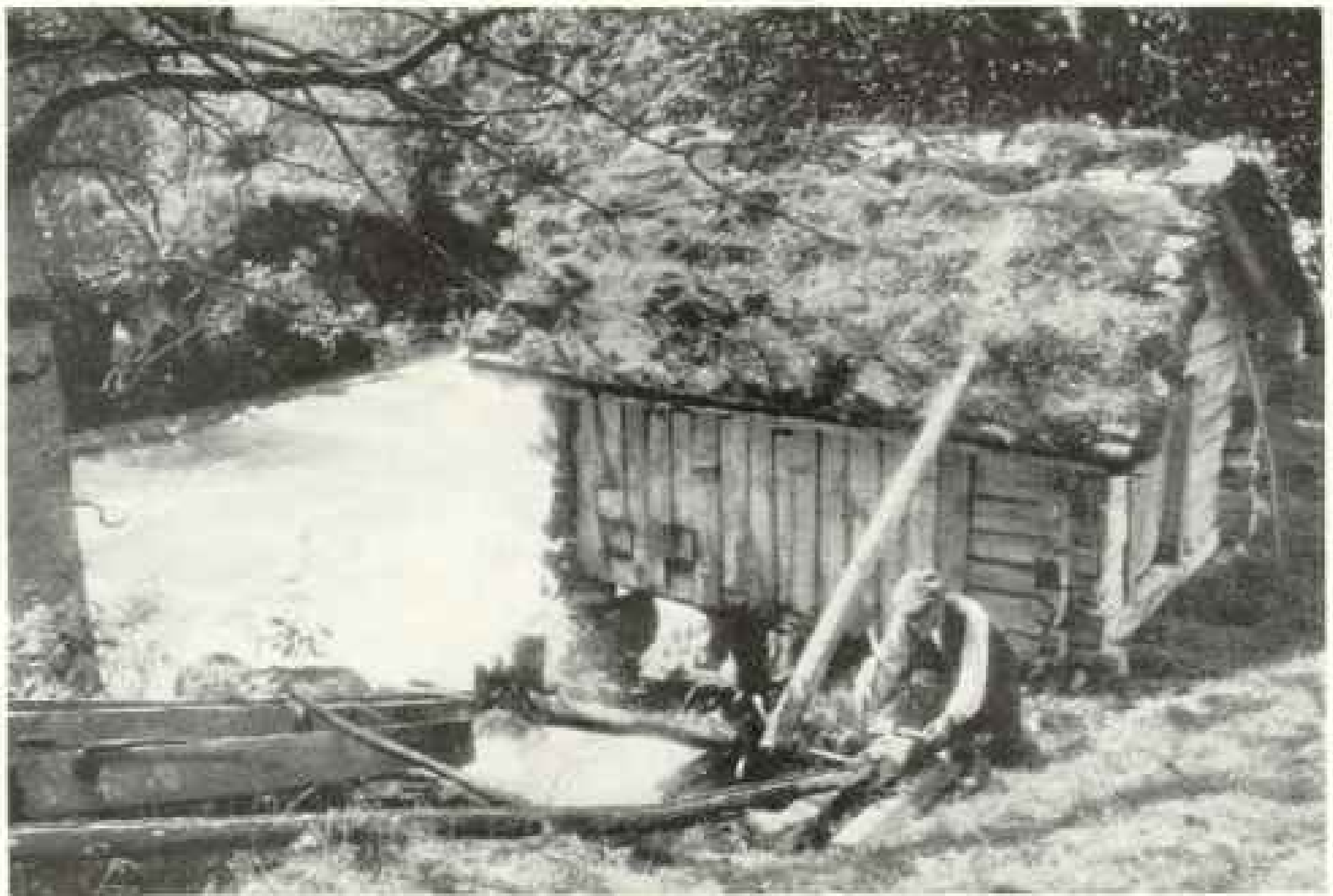
FOURSCORE YEARS REST LIGHTLY ON HER SHOULDERS.

Most old people in Hallingdal cling to the peasant dress, but their grandchildren wear their village costume only to parties and church. Jewelry is handed down from mother to daughter.

Christmas eve is the day of great holiday celebration. After the feast groups of friends dress up in masque costumes and go about calling on their neighbors, talking in disguised voices to escape recognition. There is much merriment and much drinking of punch and eating of cakes. The Christmas tree, also, is for Christmas Eve. The adults do not expect gifts, but there are sweetmeats, mittens, and other small presents for the children.

Then when Santa Claus has finished distributing the presents, the whole family joins hands and dances about the tree, singing old carols.

On Christmas day itself the festivities are almost over; there are no stockings in the



Photograph by Bronson De Cou from Galloway

A FOAMING MOUNTAIN STREAM TURNS AND COOLS A GRINDING STONE

The hollowed-log sluiceway conveys water to the wheel. A smaller trough, carved from birch, supplies a trickle to cool the implements. Large rocks hold the edge of the sod roof in place on the heavily timbered tool shed.

morning for the children nor even a shoe in the chimney corner, for Santa Claus has made his visit at the tree on Christmas Eve. But there are leftovers from yesterday's feast for breakfast, then service at the church, and later on, perhaps, a time to try out the new skis or sled.

The birds are not forgotten during the holidays. Beside each barn door there is a birch sapling stuck in a snowdrift, with its branches tied full of sheaves of grain.

Americans are wont to shudder at the very mention of a far north winter, but most Norwegians declare it to be their favorite season. It is a time of unbelievable beauty. The snow lies deep and soft over the valleys; the trees are a frosted fairyland, sparkling with all colors in the golden light of the sun as it skims along the mountain tops during the short daytime, or glowing white in the light of the moon during the long nights.

The people all love winter sports. Even in the large cities everyone gets off to the mountains for a ski trip on Sundays. Winters are long in Norway. In the upper valleys Easter time does not mean spring

flowers but the height of the winter-sport season. For then the days are longer, the sunshine is warm, and the accumulated snows of the winter make for fine skiing.

I returned once more to Nesbyen for about a month in the deep of winter before I sailed back to New York. The stay this time was uneventful save for the parties which were given to speed me on my way. My coffee and cake consumption was tremendous during the last 10 days.

All the village wives at parties suggested frankly that it would be a good idea for me to find myself a sweetheart (which they thought ought not to be very difficult) and settle down now. As they said good-bye, they urged, "Come again soon and bring a husband and some pretty little children."

I have had letters since from Norway telling me of the weather, the haying, the cloudberry crop, and the logging. Always at the end there is a suggestion. "Gunnar (or Ole, or Björn, as the case may be) is not married yet. He is a fine boy. We hope to see you again." I have felt that it was a very sincere compliment that the match-makers of Nesbyen have not forgotten me.

TUATARA

"Living Fossils" Walk on Well-Nigh Inaccessible Rocky Islands off the Coast of New Zealand

BY FRIEDA COBB BLANCHARD, PH.D.

With Illustrations from Photographs by the Author

"WHAT is this 'Sphenodon' that you are so anxious to see in its own home?" I asked my biologist husband as we steamed along in mid-Pacific.

"Oh, it's a lizard-shaped reptile with some very primitive characters," he replied. "It lives only on the rocky islands off the coast of New Zealand."

Back flashed my thoughts to the zoology lecture room in Cambridge, Massachusetts, where I had learned my comparative anatomy of vertebrates—back to the imaginings of a few moments that had stayed with me through the years since.

Living reptiles, our professor had told us, are put into four orders: first, the alligators and crocodiles; second, the turtles and tortoises; third, the snakes and lizards; and fourth—with an order all to itself—Hatteria, a "living fossil," a primitive reptile belonging to the past but actually crawling about, now, on "inaccessible, rocky islands off the coast of New Zealand."

The isolation of poor Hatteria had caught my imagination. New Zealand was about as far from Boston as it could be! A "living fossil" was remote again, separated by ages from its own kind, all long since extinct! It became for me in that moment a symbol of isolation and loneliness, to haunt my memory.

And now, looking out over the dazzling blue ocean, I could hardly believe my ears.

"You can't mean—Hatteria?" I hardly dared ask.

"Yes, that's a name sometimes used." The native Maoris call it by still a third name, "tuatara."

The whole trip changed for me in an instant. I truly realized now that I was faring to see wonders. We were actually expecting to find my old friend Hatteria, also known as Sphenodon and tuatara.

As I visualized those rocky islands, steep, rough with barnacles where the waves beat in, or slippery with seaweed, I looked at the tiny three-months-old baby in the folding "pram" between us. What

about her? There was no way of leaving her out of the scramble; she must go where we went. I, for my part, did not intend to be left out! I will sling her to my shoulder, I decided—and perhaps she will enjoy it, too.

Chilled by the cold wind blowing straight in from the South Polar regions, we came in at length to "windy Wellington."

DIFFICULTIES HEDGE ABOUT TUATARA

Asking to see the "tuatara" in his natural condition seemed to us a very modest request. But it was not. Sight-seeing, we found, is managed for you, and is very simply and easily done—if you want to see the sights that should be seen. But if you happen to be a biologist, and want, as we always did, to see some outlandish thing, or to go to some place that is not on exhibition instead of to the conventional sights, there are many difficulties.

Arranging to see the tuatara might have been difficult for us were not New Zealanders the most friendly, hospitable, and helpful people imaginable.

In the old Maori days, before the coming of Europeans, the tuatara lived on the main islands as well as on the small islands off the coast; but animals introduced, especially the pigs brought by Captain Cook and left to run wild, have entirely exterminated them except on a few islets. Though they are strictly protected from collectors by the Government, they may not last much longer.

The nearest place to find them now was Stephen Island, in Cook Strait. Stephen Island lies off the north end of D'Urville Island, which in turn lies off the north end of the South Island of New Zealand (see map, page 651).

With the help of Professor H. B. Kirk, the biologist of Victoria University College, we obtained permission from the Marine Department to land on the island, a lighthouse reserve; and a permit from the Department of Internal Affairs to collect one



THE CAMERA CAUGHT THIS TUATARA JUST BEFORE HE DARTED INTO HIS HOLE

Reaching two and a half feet in length, with big head, bright eyes, and serrated crest, the tuatara resembles a lizard, but is distinct from it. In digging his hole, which he can do even in hard ground, he uses his front feet like a dog, throwing excavated earth far behind him (see text, p. 657).

tuatara for the museum of the University of Michigan. A wireless message sent to the lighthouse keepers arranged for accommodations with them, and another secured the service of a launch to take us from French Pass, on D'Urville Island, to Stephen Island.

ADVENTURE BLAZES A TORTUOUS TRAIL

In the dark we landed from the steamer *Arahura* at French Pass, a sheep-ranch settlement of three houses, and picked our way through a few sheep yards to the rambling house offering accommodations. I should guess that guests here are few! We fared comfortably but simply in the sparsely furnished room. The folding pram had been left in Wellington, and the baby had her first chance to sleep in a bureau drawer.

In the morning Charlie, a genial, large, and gentle Swede, called for us. Every week

he makes a trip, going the rounds of lonely houses on the shore, carrying mail, merchandise, food, messages, news, and anything else that anyone may wish to send. Every second week he includes the distant Stephen Island, and we were lucky enough to hit not only the right week but the right day as well.

Before we started, he told us that the wind was from the wrong direction and he might not be able to land us. There is no dock at the island; the landing is made by a jump to the rocks from the carried dinghy. If the wind is on that side of the island, the waves may make landing impossible.

The coast of D'Urville Island is lovely here. The land is apparently a sunken mountain range, Stephen Island being the outermost peak still above the water. It is separated from the peaks forming D'Urville Island by a wide channel. The shores are



Drawn by A. H. Dumitrescu.

IN TINY ISLANDS OFF NEW ZEALAND THE LAST SURVIVING TUATARAS MAKE THEIR HOMES

High up, in mid-center of the map, is Stephen Island. To this remote and tiny isle—from far-away Boston by way of Wellington—the author went with her husband and baby, seeking a specimen of the tuatara. Little penguins swam about the expedition's tiny boat as it neared the island, whose only human inhabitants are three lighthouse keepers, their families, and one girl school teacher.

mostly steep and rocky, with only a few beaches, very small, in the valleys.

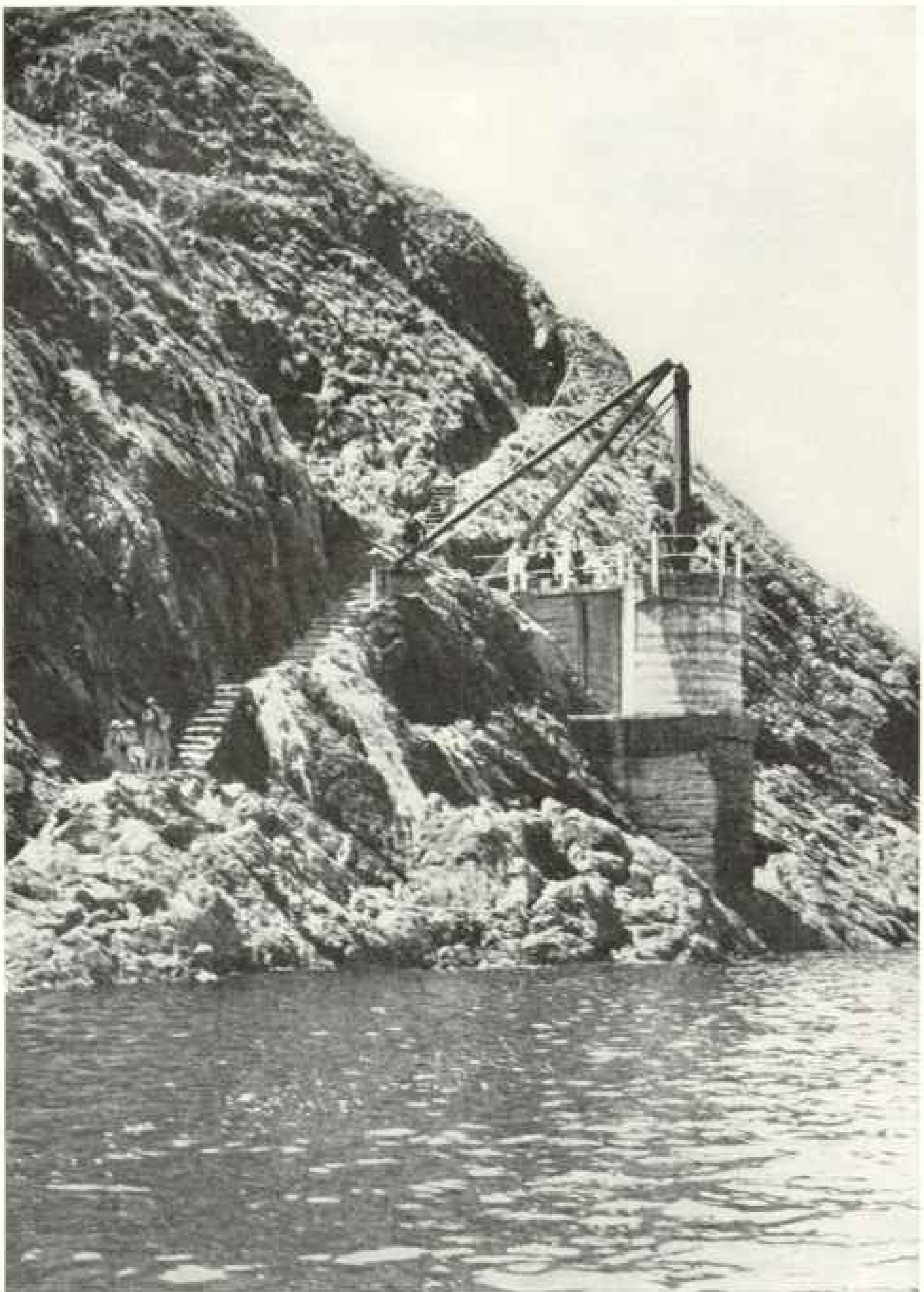
In some sheltered spots are solitary houses, the homes of sheep ranchers. This is all sheep country, except where it is too steep and rocky to hold pasture. Sheep graze where it is so steep that it seems as if they must roll off into the ocean! In places the "bush," as the beautiful primeval forest is called, has not yet been disturbed; but in most parts it has been burned and the land cleared and sown to grass.

At a schoolhouse and Maori home on a tiny beach we made a stop. Charlie's helper, a Maori boy, rowed to the beach in the dinghy loaded high with provisions—tins of jam in conspicuous quantity. The

school teacher, a white man, opened the sack of mail, with a dozen or more Maori children and grown people crowding about him.

The New Zealanders seem fond of the Maoris, who are rather fine-looking, easy-going people. They apparently have equal rights and privileges—in fact, the Maoris enjoy some special privileges. There is no race problem.

With little penguins swimming about us and water birds flying over, we chugged along for hours watching the changing shore. Our passage was calm until we passed out of the protection of D'Urville Island; then we realized that a stiff wind was blowing. The little boat bobbed about. When we



STEPHEN ISLAND'S RARE VISITORS MUST CLIMB THESE PRECARIOUS STEPS

When seas are calm, landing is easy. Heavy supplies for the lighthouse keepers are lifted ashore by the derrick set on the stone foundation. The long flight of steps leads up to gentler slopes above, where a path zigzags to the lighthouse. In rough weather big seas smash against the rocks, smothering the landing place with spray (see text, page 655).



"DON'T DROP THAT BAG! IT HOLDS THE BABY'S CLOTHES"

Only small rowboats may safely approach the landing place, slippery with sea growth, at Stephen Island. Even they must keep clear when the sea is rough and waves break over the barnacled rocks.



ON LANDING, A PASSENGER MUST JUMP NIMBLY FROM DINGHY TO SLIPPERY ROCKS

Often a rope is tied about his body, with which to haul him ashore should he slip into the sea. In very rough weather, no landing is possible. To get ashore safely with her baby, the author strapped it on her back, papoose fashion (see text, page 655).



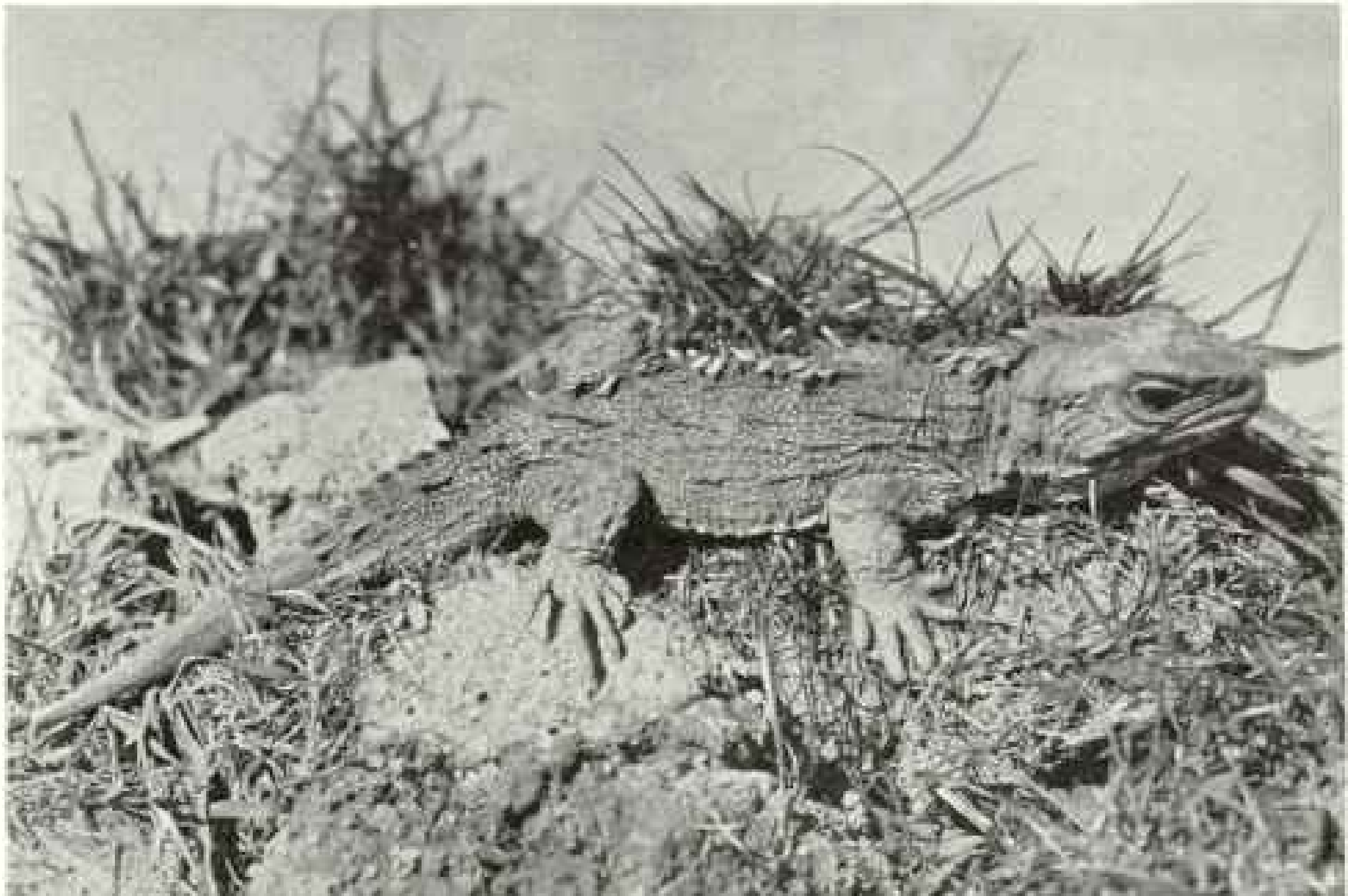
SEARCHING THE STEEP SLOPES OF STEPHEN ISLAND FOR A REPTILIAN RELIC OF BYGONE AGES

Large areas of this brush-grown island are honeycombed with holes where petrels nest. Everywhere, under rocks, among bunches of grass, and brush roots, these nests occur. Wherever found, the tuatara is always living with a petrel family (see text, page 657).



EVERYBODY CROWDS ABOUT TO LOOK WHEN SPADES UNCOVER A TUATARA'S HOME

Not every petrel's hole that was explored yielded a reptile, yet nowhere else could one be found. Though this creature viciously resents the intrusion of man's hand, or his digging tools, it lives in peace with the petrels.



Photograph from E. Spaight

TUATARA'S CHUBBY FRONT FOOT IS FORMED MUCH LIKE A FAT BABY'S HAND

This odd creature digs its own hole, lines it with dead grass and leaves, and often shares the nest with petrels. It eats insects, lizards, and crustaceans, and, in captivity, will feed on minnows. When going calmly about routine affairs, the reptile moves slowly, dragging its body and fat, thick tail (see illustration, page 650).

drew in toward the rocks of Stephen Island, at the end of four hours, we were quite ready to leave her.

TO REACH SHORE, ONE JUMPS

Two men were on the rocks to help us land, and a group of children waited for the excitement. The launch dropped anchor. We scrambled into the tossing dinghy, which was then rowed toward the rocks, stern first. The baby was secure in her sling over my shoulder. Charlie tied a rope about me and threw the free end to those on shore. I stood in the stern as he brought the dinghy in as close as he dared to the rocks, over which the waves were breaking.

"When I say 'go'," he said, "you yump!"

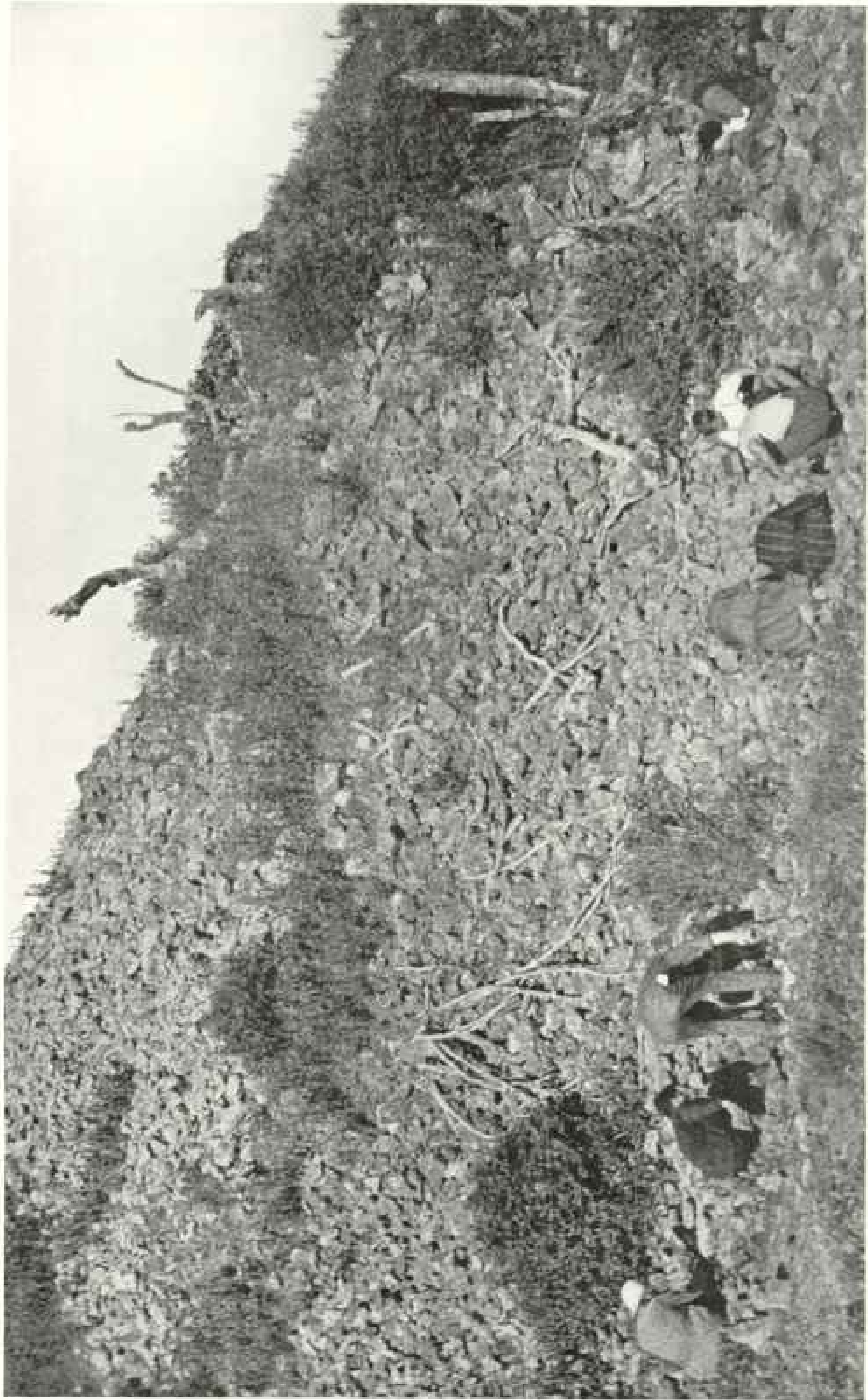
I did my part, and successfully scrambled upon the rocks before the next wave broke over. We learned, then, that the last man landed there had slipped and gone completely under. Fortunately there had been a rope around him. The children were disappointed in us, I fear, for we all came ashore dry! They had begged so earnestly that they had been given a half-holiday from school for the occasion.

We watched the cargo thrown ashore, then started the climb to the houses and lighthouse, more than 600 feet up on the island.

The path at first is merely a narrow ledge cut in the face of the cliffs—just room enough to walk between the cliffs above and the rocks and ocean below. Then the trail seemed to go straight up. Our climb was higher than to the top of the Washington Monument, and, I think, averaged steeper than its stairs; certainly the footing was not so good. It was a hot, hard climb in clear sunshine (see page 652).

As soon as we had hastily eaten a late luncheon, we set out to see the island and look for tuataras. Three keepers, their families, and a school teacher are stationed here. There must be one keeper constantly in the lighthouse to receive messages; but the other two, the young girl teacher, and half a dozen of the older children escorted us.

The sheep kept on the island as the principal food of the inhabitants have made paths along the tops of the bluffs, and it seemed as if they must have enjoyed seeing



A SEARCH FOR STEPHEN ISLAND FROGS IN THE ONLY SPOT ON EARTH WHERE THEY ARE KNOWN TO LIVE

Islanders themselves were astonished when the biologists uncovered one of these rare frogs in a smooth nest beneath an upturned rock. The lighthouse keepers, the teacher, and children had never suspected that frogs of any kind lurked under the familiar mass of broken stone. Strangely, baby Stephen Island frogs hatch from eggs laid in the ground, since there is no running or stagnant water on the island (see text, page 658).

how close to the edge they could go without falling over. The children raced along these paths, apparently unconscious of the drop of nearly a thousand feet to the blue ocean almost straight below.

The island is about a square mile in area, steeply sloping or precipitous around the edge, more gently sloping higher up, and a thousand feet high at the crest. The upper part, above the rocky cliffs, is mostly covered with coarse grass and boulders, and it is here that the tuatara is found most abundantly. A few small patches of the original bush, consisting of small stunted trees shaped by the wind, still are left.

On, or rather in, the open grassy slopes the "dovey petrels," or "dovies" as they are called, have their nests, each in a short burrow among the roots of the grass or under a boulder. They are beautiful small petrels, light gray and white, but very stupid from our point of view.

They will not be driven from the nest, but come right back under one's hands. They can be picked up and handled, put down, and picked up again. The young, a single one in a nest in every instance that we saw, are dark slate-gray fuzzy balls. In parts of the island the ground is spongy with the nests.

"LIVING FOSSILS" IN PETREL BURROWS

In the burrows with the petrels we found the tuataras! They are sluggish beasts, dull yellowish or olive brown, interesting rather than beautiful. Those we saw were 20 inches long.

Although lizardlike in appearance, the tuatara is different from the lizards in many anatomical characters. It is as nearly related to the turtles as to the lizards. It is one of the oldest known reptilian types—old even in relation to extinct types. Among living reptiles it is considered to be the most generalized in its anatomy.

An interesting point about this animal is that it has the pineal eye ("third eye") well developed. On the top of the head is a rosette of small scales with a transparent central scale; below is an organ with the structure of an eye, having a lens and pigmented retina. Tuatara is not unique in this; it is also possessed by some lizards, but in them the nerve of this organ is degenerate, while in the tuatara it is still well developed.

In the top of the skull is a hole for the passage of the nerve from the brain to the pineal eye. The pineal eye doubtless functioned in several extinct reptiles, but in exactly what way we can only guess. It is not known whether or how it functions in the tuatara.

Except for one or two tuataras which we met wandering about the bush, each of those we saw accompanied a petrel in its burrow. They had to be dug out to be seen. Out of cover, they crawl about slowly and are very deliberate in their movements. Even when "running away" they lumber along awkwardly for a few feet and then stop, turn, and gaze back curiously and apparently thoughtfully.

This venerable animal has such a sage expression that it is shocking to learn that its whole brain is smaller, far, than one of its eyes! In fact, if its brain is larger than a pea, it is scarcely so. This, of course, is only another characteristic of the animals of its own proper period.

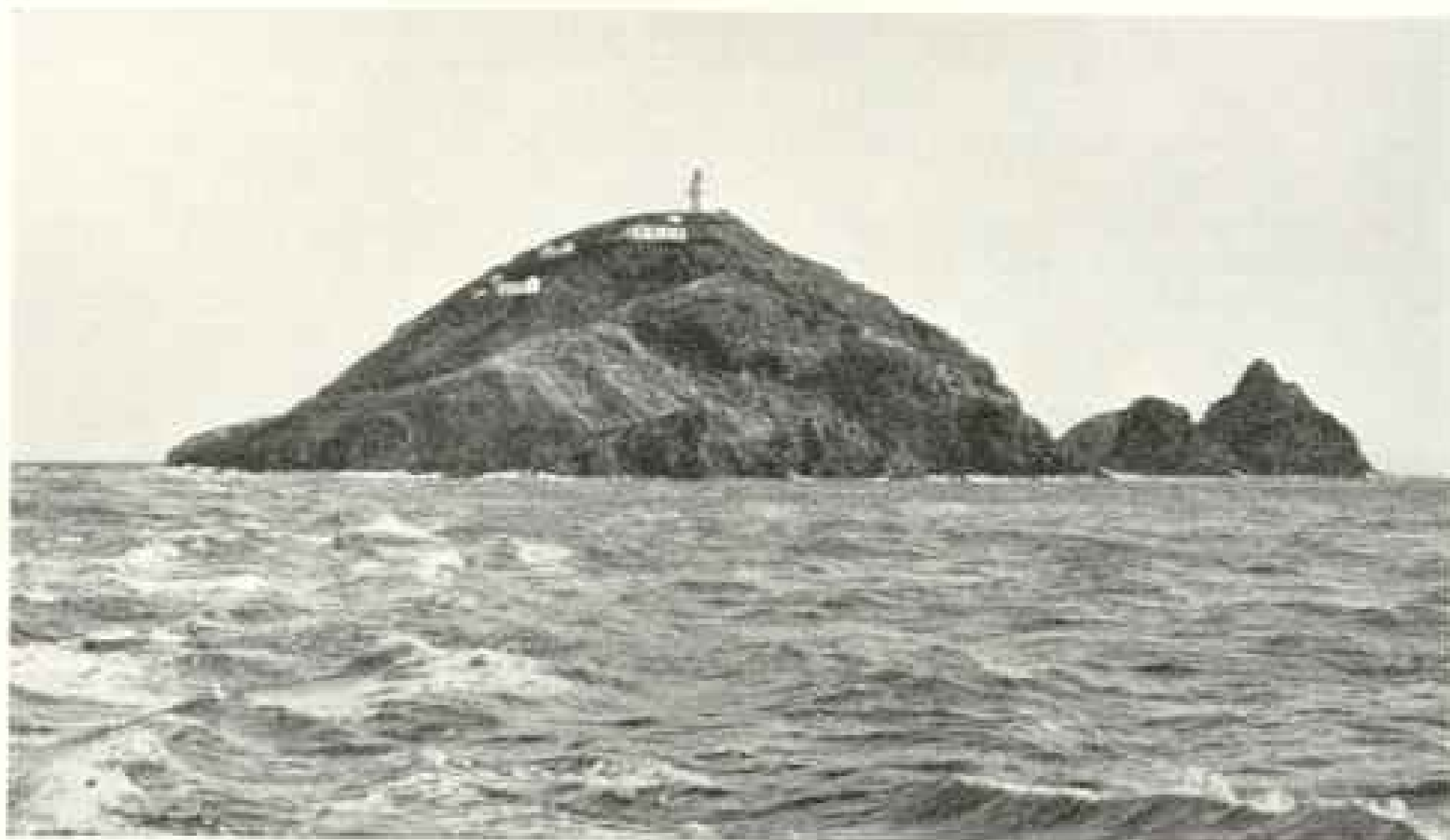
The food of the tuataras consists of beetles, grasshoppers, and other insects; spiders, or any other small living animals. They are even said to eat lizards, though it is hard to see how they could catch such swift prey. One of the chief foods is a huge, wingless, fierce-jawed insect related to the grasshoppers, and looking like a pale-brown wingless cricket three or four inches long. This absurd creature is called a "weta." We saw many of them on the island.

CIVILIZATION SPELLS TUATARA'S DOOM

Perhaps by bringing mutton to the island instead of keeping the sheep there, the Government might save the tuatara from extermination. The lighthouse keepers' sheep wander at large, destroying the undergrowth, and in time killing off the bush.

The patches of bush are noticeably shrinking, and with them the weta and the tuatara will go, for lack of food and cover. After all the changes that this "living fossil" has outlived, this may well prove its last. It is strange to think that a form could live so many millions of years, surviving such geological eras and such changes in its living environment, and then at last be a victim of little, new man's mismanagement!

One reason that we wished to go to Stephen Island rather than to one of the few other last haunts of the tuatara was



THESE STEEP, BARREN ISLANDS IN COOK STRAIT ARE KNOWN AS THE BROTHERS

Atop big Brother perches the lighthouse and its keeper's home. Tuataras are said to live here—one of their few known refuges. The author's party passed this group, between Wellington and the French Pass, on the way to Stephen Island.

that here is a frog, *Liopelma hamiltoni*, the Stephen Island frog, found nowhere else. At the north end of the North Island is the only other species of this genus, *Liopelma hochstetteri*, the New Zealand frog. These two frogs are the only amphibians native to New Zealand!

When we had found several tuataras we desisted from that hunt long enough to go to a steep slope of loose stones near the top of the island, to which we had been directed by Professor Kirk. This stone pile, absurd as it may seem, is the only place in the wide world where this frog is known! No one at present on the island had ever heard of them.

Loose stones, from the size of an apple to that of a pumpkin, on a steep slope in the sunshine, did not seem at all the right shelter for frogs. Our companions looked very doubting; but with the true New Zealand spirit they gave us the benefit of the doubt, offered a helping hand, and diligently set to work turning stones at the lower edge of the pile (see page 656).

Secretly, I did not expect frogs any more than they did. When one of the men gave a yell of delight as he looked at a little crouched frog in the smooth hole left by an overturned stone, I was as surprised as he was. In a few minutes four were seen.

The life history of the Stephen Island frog has not been studied, but it is presumably like that of its very close relative, the New Zealand frog (known only from the Coromandel peninsula in the North Island). Both species live where sea mists continually moisten the air, but where there is no standing or running water in which the eggs can be laid.

TADPOLES BECOME FROGS "IN THE EGG"

The eggs of the New Zealand frog are laid in the ground, and the tadpoles develop in the liquid enclosed in the jelly-like egg capsules. The frogs hatch from the eggs in about a month, when both pairs of legs have developed. There is thus no free larval stage; the tadpole does its swimming within the egg membrane and metamorphosis begins before hatching.

The reptilian and amphibian life of New Zealand is unusual in composition. For the whole class of Amphibia there are merely two frogs (except a terrestrial tree frog recently introduced from Australia)—no toads, no salamanders. For Reptilia, there are about 15 species of lizards, and the tuatara—no snakes, no turtles, no crocodilians.

The frogs are of the most primitive living group—like tuatara, a relic of the past.



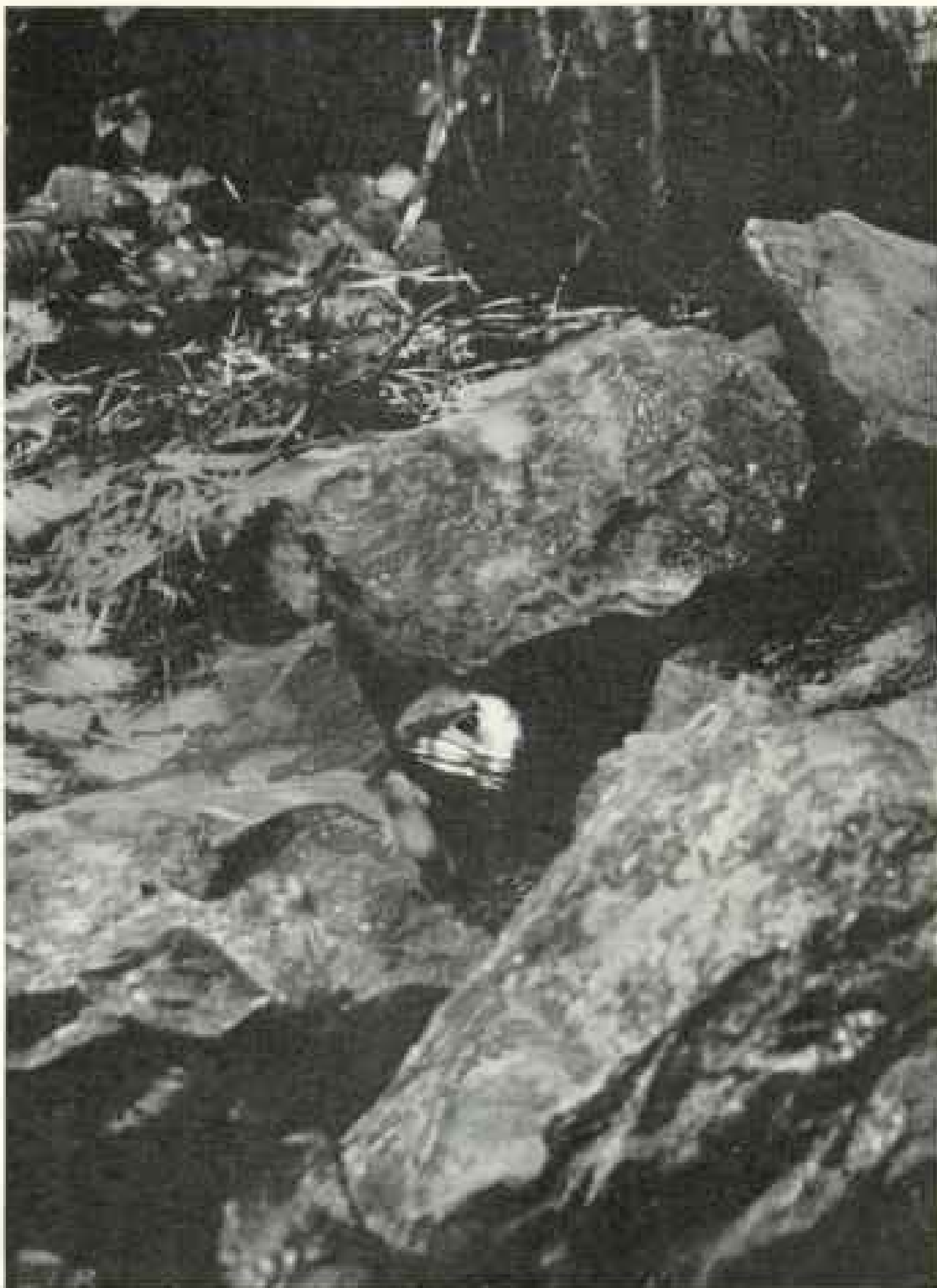
RETURNING TO THE LIGHTHOUSE ON STEPHEN ISLAND, NEW ZEALAND, AFTER A REPTILE HUNT

This lonely island is one of the few spots on earth where the tuatara may be found. It is a "living fossil," a creature from bygone ages.



ON THESE LONELY SLOPES OF A REMOTE NEW ZEALAND ISLAND, TUATARA AND HIS PETREL COMPANIONS LIVE TOGETHER IN THE SAME BURROWS

"Tuatara," the Maori name for the reptiles, means "having spines." Once plentiful on the main islands of New Zealand, this ancient creature has now been largely swept away by brush-burning sheep herders, as well as by pigs, dogs, cats, and reptile-eating Maoris (see text, page 649).



IN THIS PEN AT NELSON, CAPTIVE TUATARAS LIVED FOR MANY YEARS

Though there are recorded cases of tuataras living for many decades in captivity, they have not been known to raise young. Like captive baby crocodiles, they usually refuse food, such as insects, minced meat, or minnows, unless it is put in motion—as on a stick—so that they may snap at it.

The lizards belong to more modern groups, the skinks and geckos; but these are groups common to the islands of the Pacific, easily transported fortuitously, and the New Zealand forms or their recent ancestors doubtless drifted to New Zealand from time to time.

Not only is this part of the fauna unique; the mammal population also is distinctive. Aside from the mammals introduced by man, there are about 25 species. This is not unusual; but the strange thing about it is that, aside from two bats, they are all marine animals—seals, whales, dolphins, and so forth!

Stephen Island was very peaceful. At night the petrels flew from their burrows and made a great noise calling before they left for the ocean; but otherwise it was quiet.

The next morning we awoke to another perfect day, bright and sunny, with a beautiful blue sea. The view from the island top was really magnificent. It is high enough to give almost a bird's-eye view of D'Urville Island near by, very irregular and mountainous and lying almost like a map below us. In the other direction, to the north, no land was in sight save the snow-covered cone of Mount Egmont, far away on the North Island. It seemed separated from the horizon and set in the sky; the sight seemed more like a fancy than true vision.

LEAVING THE ISLAND IS HAZARDOUS

The launch was due at 2 to take us away, weather permitting. We half hoped that we should not be able to leave. But it came. We looked almost ver-

tically down to the sea, and there below us was a tiny thing which we hardly believed could be the launch.

A cement block rises 30 feet above the landing rocks and supports a derrick used, I suppose, for unloading from larger boats. From it a tiny flat truck is pulled by a windlass straight up an incline of about sixty degrees to a little shed some 200 feet above. From here the truck is again pulled by windlass to another shed at nearly the level of the lighthouse. From this upper shed a narrow track winds in and out along the tops of the cliffs to the lighthouse and houses, three-quarters of a



BABY IS AMUSED BY PAPA PICKLING SNAKES AND LIZARDS.

After the quest for tuataras on Stephen Island, the naturalist's work took him to Tasmania's National Park. Here he is at work, preserving his specimens on the balcony of a Tasmanian bungalow, as baby bosses the job.



IN THE ANTIPODES, STANDING ON ONE'S HEAD SEEMS QUITE CONVENTIONAL.

The young lady, daughter of the writer, accompanied the expedition on its long, arduous quest for natural-history specimens. On this bare, hard rock, in the middle of a Tasmanian stream, she is safe from hungry ants.

mile away. On this track the tiny flat car was pulled by a big old horse.

At the house our baggage was put upon this car, and all the children who could find room to sit jumped on with us. Around the curves we tipped and rattled behind the trotting horse, at the very brink of the island, with the steep slopes dropping at places from the very rails. The people seem quite unconscious of these heights and steeps.

This ride was exciting enough for me; but when we reached the shed we were told that we were to go down on the cable, straight over the side of the island. The baggage was lashed to the front of the car, to hold us from slipping off, and a rope fixed for us to hold on by. Four of us filled the toy car to overflowing.

Down we went, headed straight into the ocean below, sometimes over grades so steep that it seemed as if the car would leave the tracks and dangle free in the air. The cable wound off a drum several feet long, and when it had unwound from one end to the other it stopped with a jerk that nearly shot us forward off the front end of the car. Fortunately, we had been warned of this.

The waves were not high, and there was no difficulty in jumping into the dinghy. Our friends all came down to see us off, and then stood waving handkerchiefs until we could no longer distinguish them. After an hour in the boat I looked back, and there was Stephen Island, almost as large as ever but seeming less steep in the distance.

At French Pass we sent a wireless message to the captain of the *Arahuro* to make sure that he planned to pick us up. Since he did, about 3 in the morning, we arranged for a launch—to come from somewhere in the night—to take us out to her.

"But," we asked, when our host assured

us that we could really depend on our boatman, "how are we to know when to get up?"

"Oh, he'll see to that!"

OFF TO THE NEXT ADVENTURE

We lay down trustingly and slept. In this three-house settlement there is no need of even shutting the house doors at night. In the dark, small hours there was an urgent rap at our bedroom door, and the boatman told us to get ready in a hurry, for we had few minutes to spare. In five minutes we were with him in the boat.

It was a fair night, but dark and cold for climbing up the side of a ship far out from shore. I was glad that our boatman had done this thing before. We saw the lights of the steamer, and in about 20 minutes we reached her and made connections alongside. The big ship let down a rope ladder to the tiny boat and a loose rope on either side for handrails.

I had the baby in her sling over my shoulder, and felt that I could negotiate the ropes all right. But our boatman, probably not seeing in the dim, swaying lantern light that both my hands were free, was uneasy. He decided that he should take her up. Of course, there was no way but to obey his orders, so I passed him the baby. Now he was still more uneasy. Two free hands were necessary.

"You had better put—that thing on me," he said, and I tied the sling about him.

Now it was my turn to be anxious, for I could not tell, in the darkness, just how I had placed the baby. Very slowly he climbed the ropes. I could guess how relieved he was to hand the baby over to her father on the deck. I followed up. We steamed through French Pass and away to the next adventure.

Notice of change of address of your NATIONAL GEOGRAPHIC MAGAZINE should be received in the offices of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your July number, The Society should be notified of your new address not later than June first.

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TO carry out the purposes for which it was founded forty-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 which the Magazine can use, generous remuneration is made. Contributions should be accompanied by addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over \$30,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and contributed \$55,000 to Admiral Byrd's Antarctic Expedition.

NOT long ago 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 of California were thereby saved for the American people.

THE Society's notable expeditions to New Mexico 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 have solved secrets that have puzzled historians for three hundred years. The Society is sponsoring an archaeological survey of Venezuela.

TO further the study of solar radiation in relation to long range weather forecastings, The Society has appropriated \$65,000 to enable the Smithsonian Institution to establish a station for six years on Mt. Brukkaros, in South West Africa.

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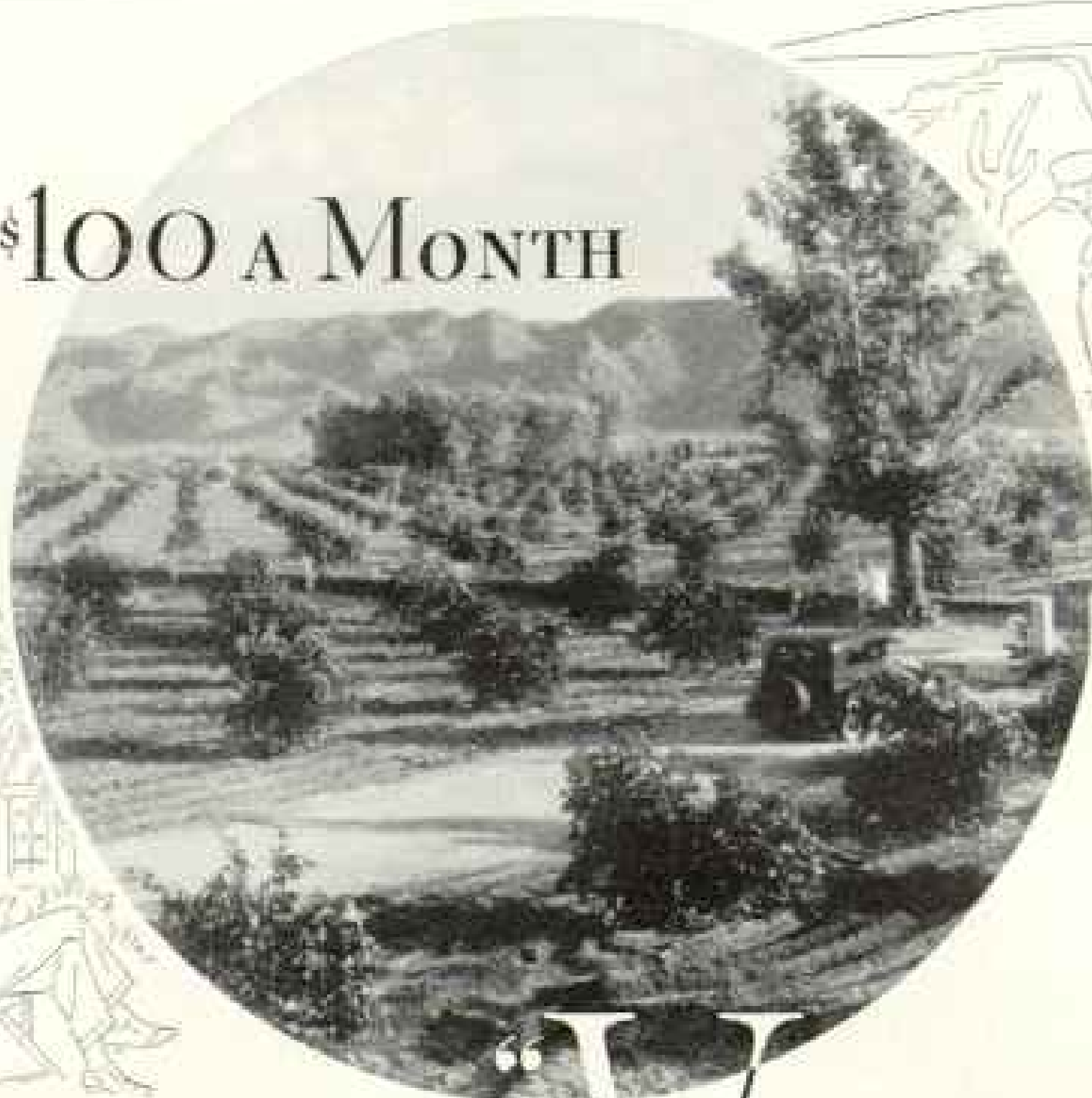
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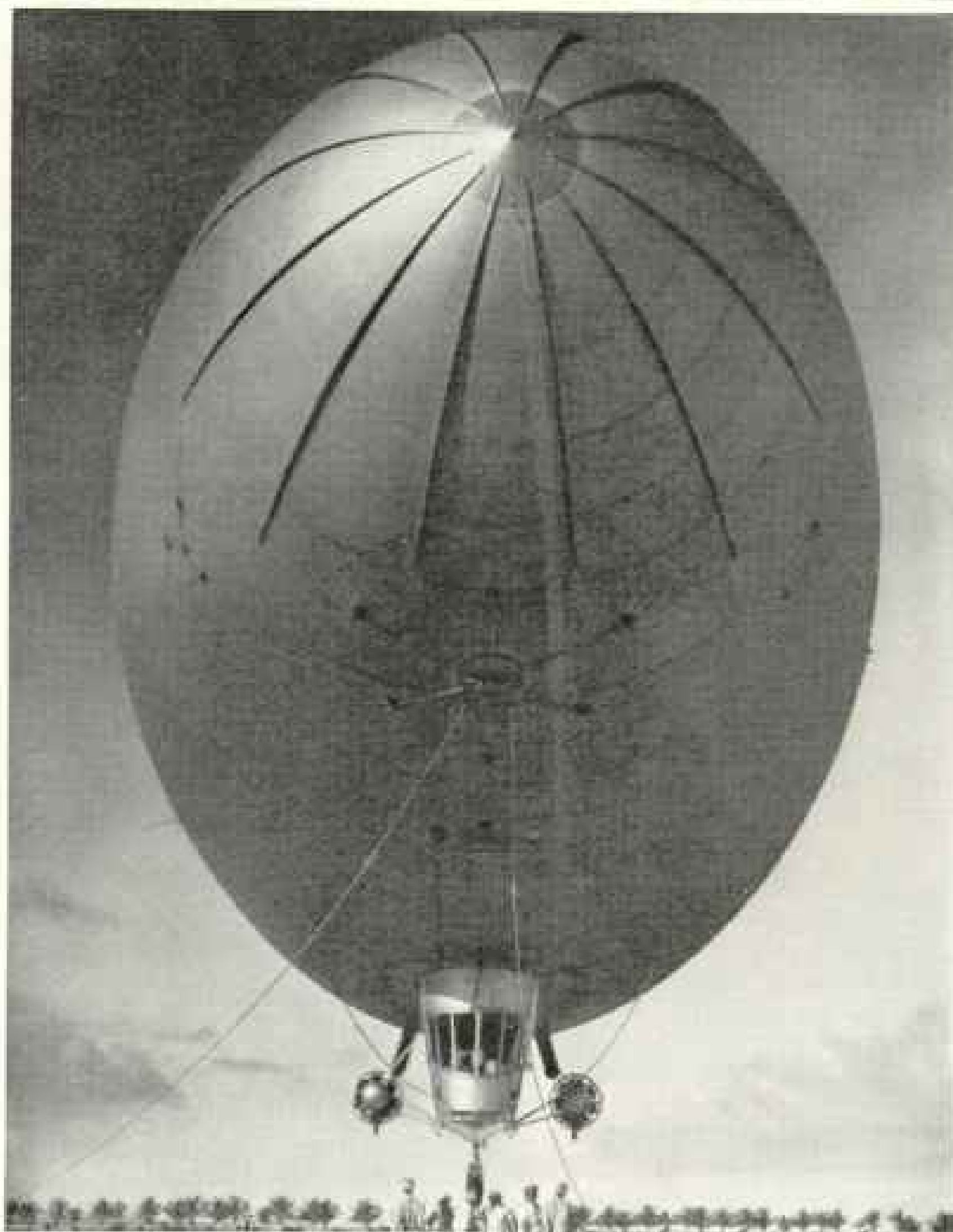
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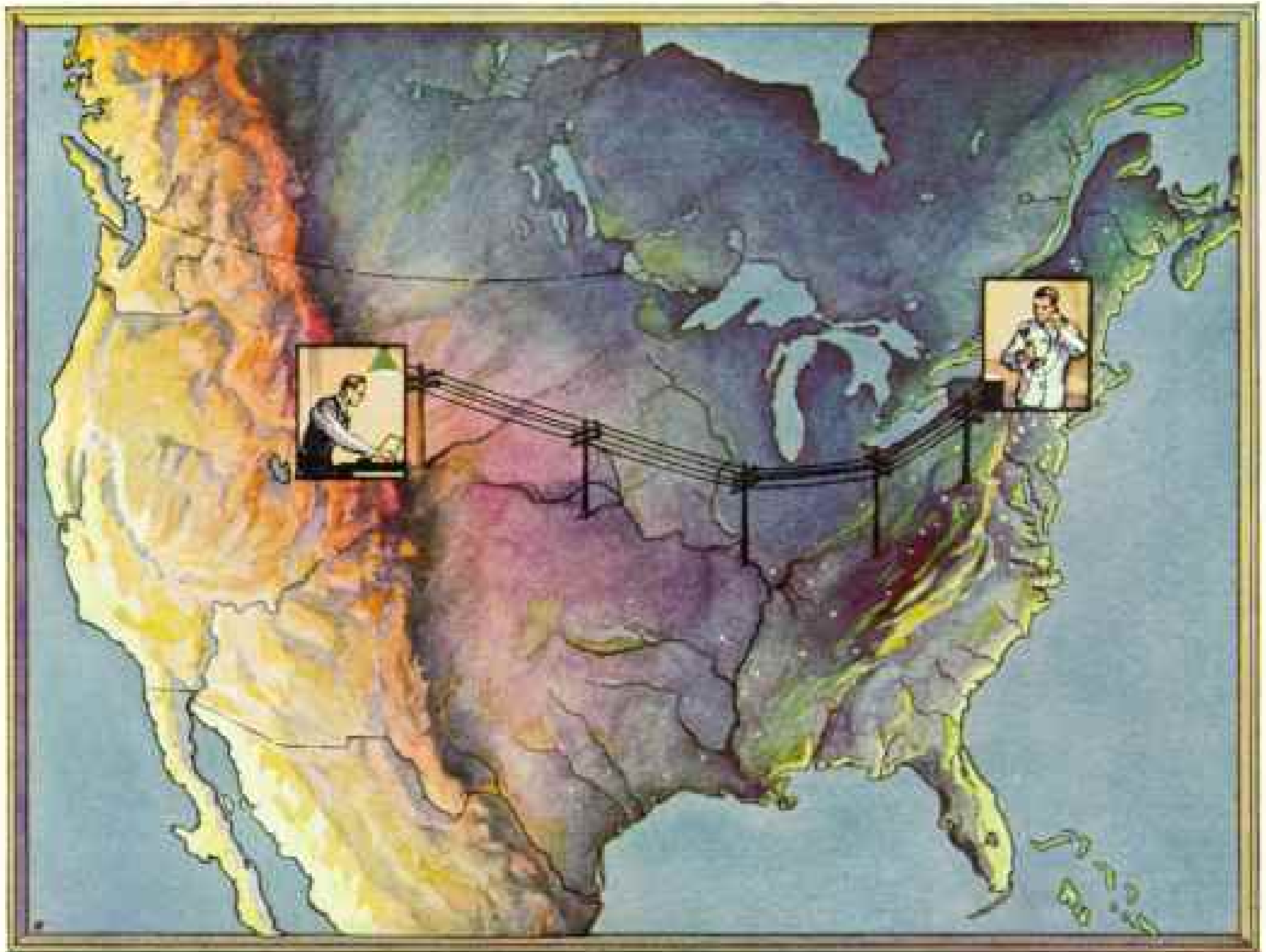
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But he remembered a business friend back home, 2000 miles away. And it was to him he telegraphed his appeal.

The friend at the other end, pajama-clad and ready for bed, immediately wired a reply. He told the tourist not to worry about the matter—to go to bed and he’d have someone there in the morning to take care of everything!

It was only a matter of minutes before the startled tourist read the second telegram. It seemed

incredible to him—how could anyone get there overnight?

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. . .

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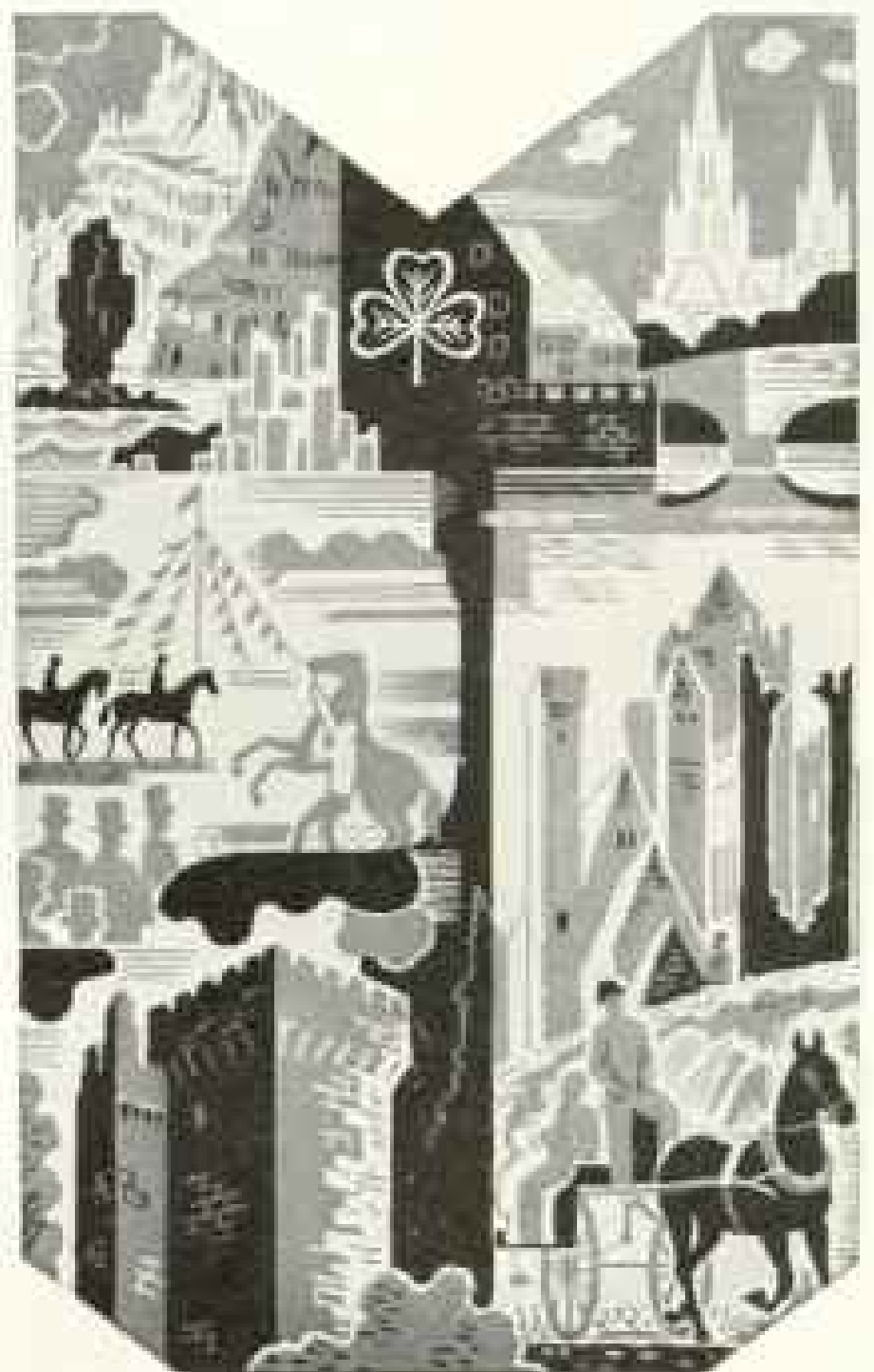
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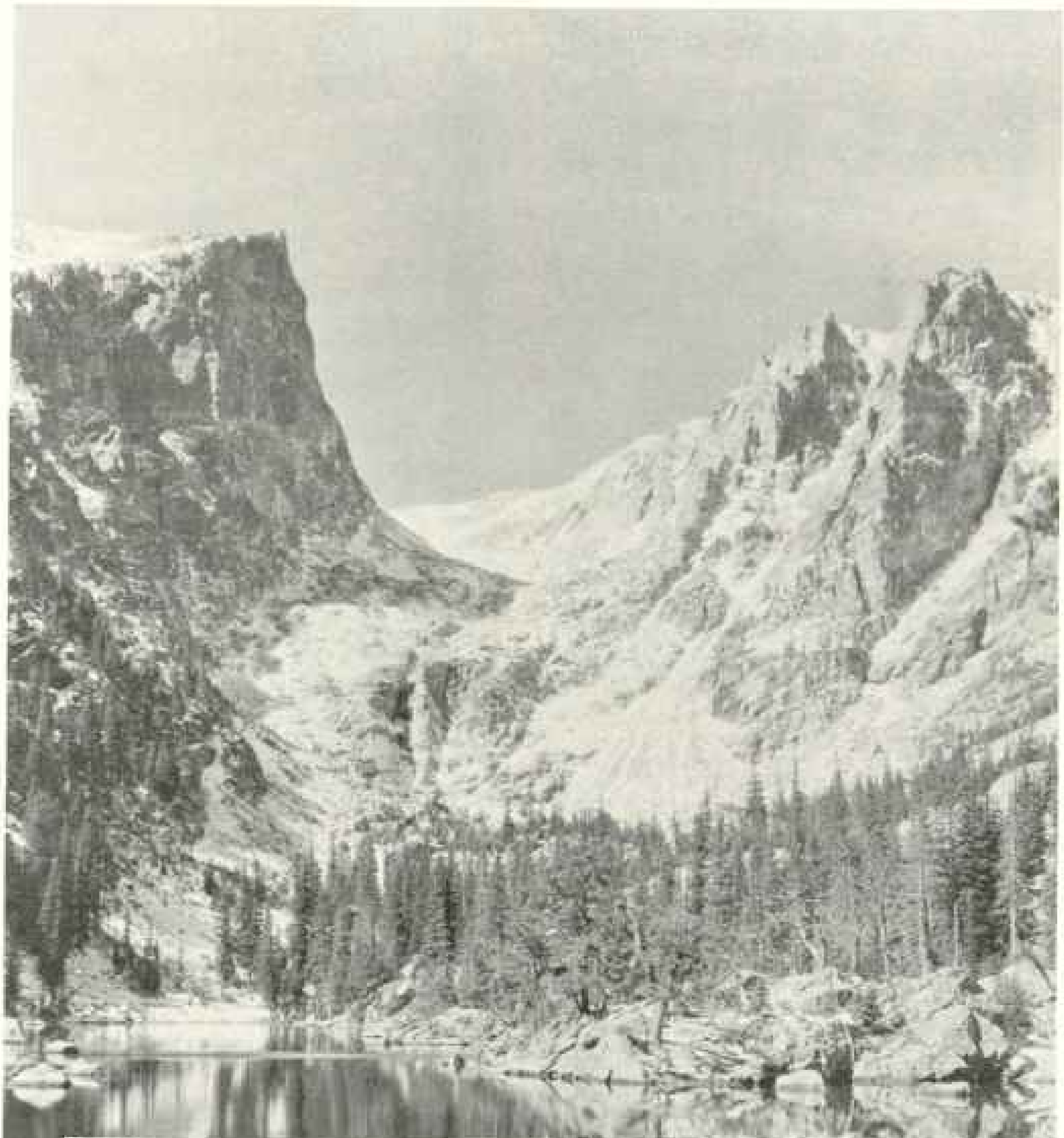
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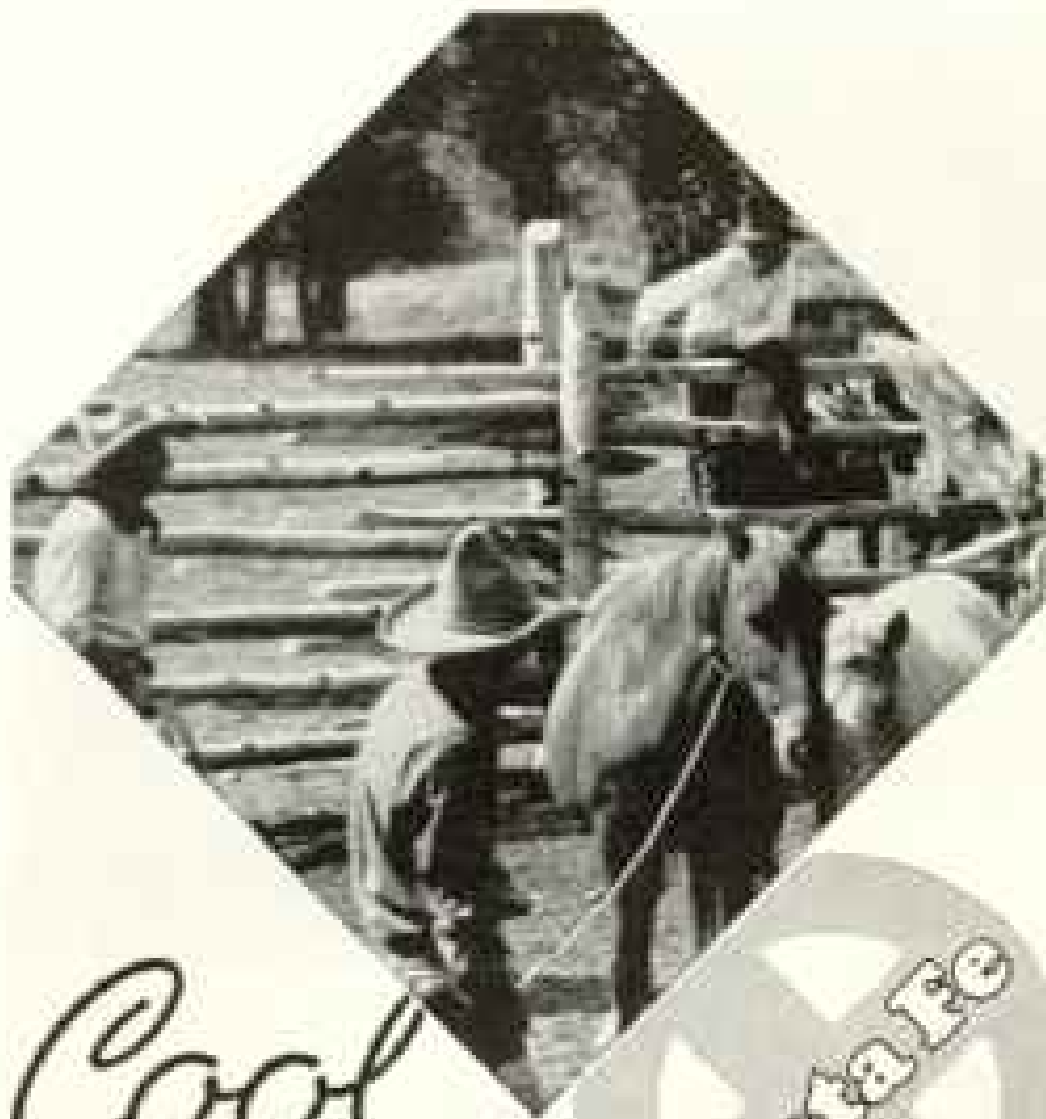
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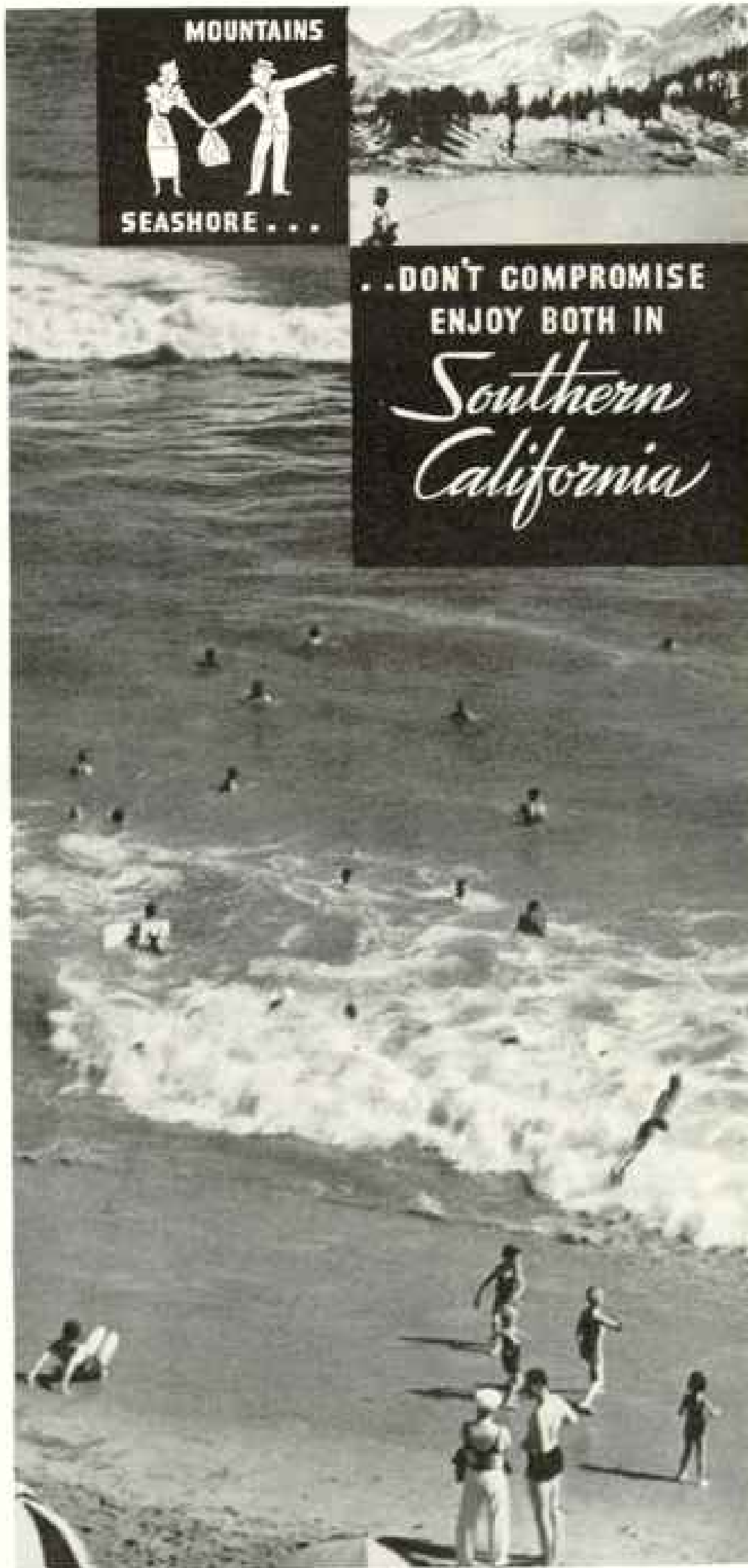
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TIME: *One hour after the argument began.*

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MR: And it's no vacation for me without the mountains.

MRS: Then there's only one place for us to go. I know of a place where we can have *both* mountains and seashore, and a whole lot of other things we'd both like besides—golf, tennis, riding, fishing, swimming, sailing, hiking, hunting . . .

MR: Kindly wait just a minute, I . . .

MRS: Also theaters and dancing, racing, foreign atmosphere, orange groves, old Spanish Missions, movie studios and movie stars . . .

MR: I begin to see the light.

MRS: Where there's no summer rain, and it's so cool you sleep under blankets at night.

MR: Sure. I know. Southern California. But it's far too far, my dear, and much too expensive.

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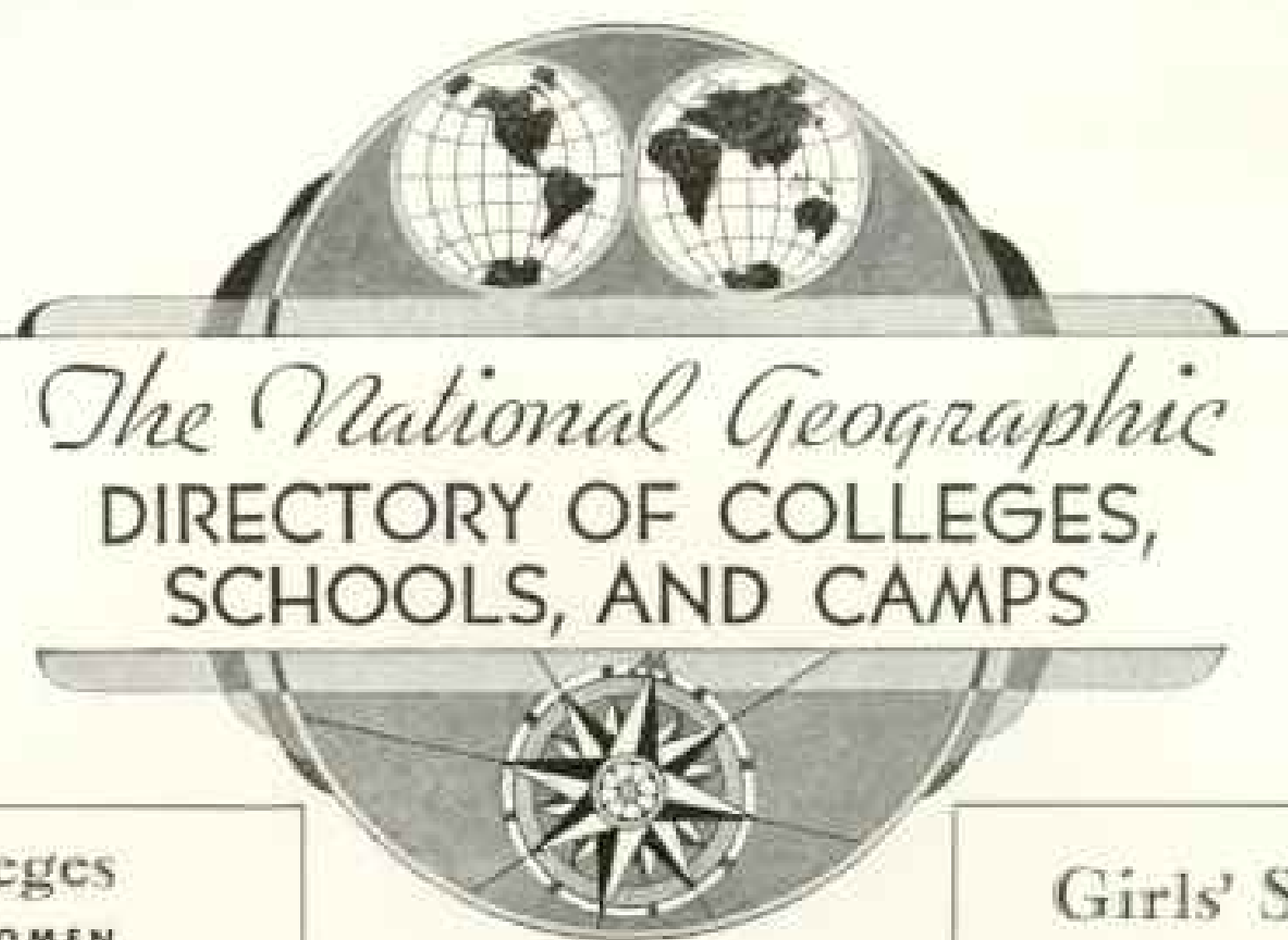
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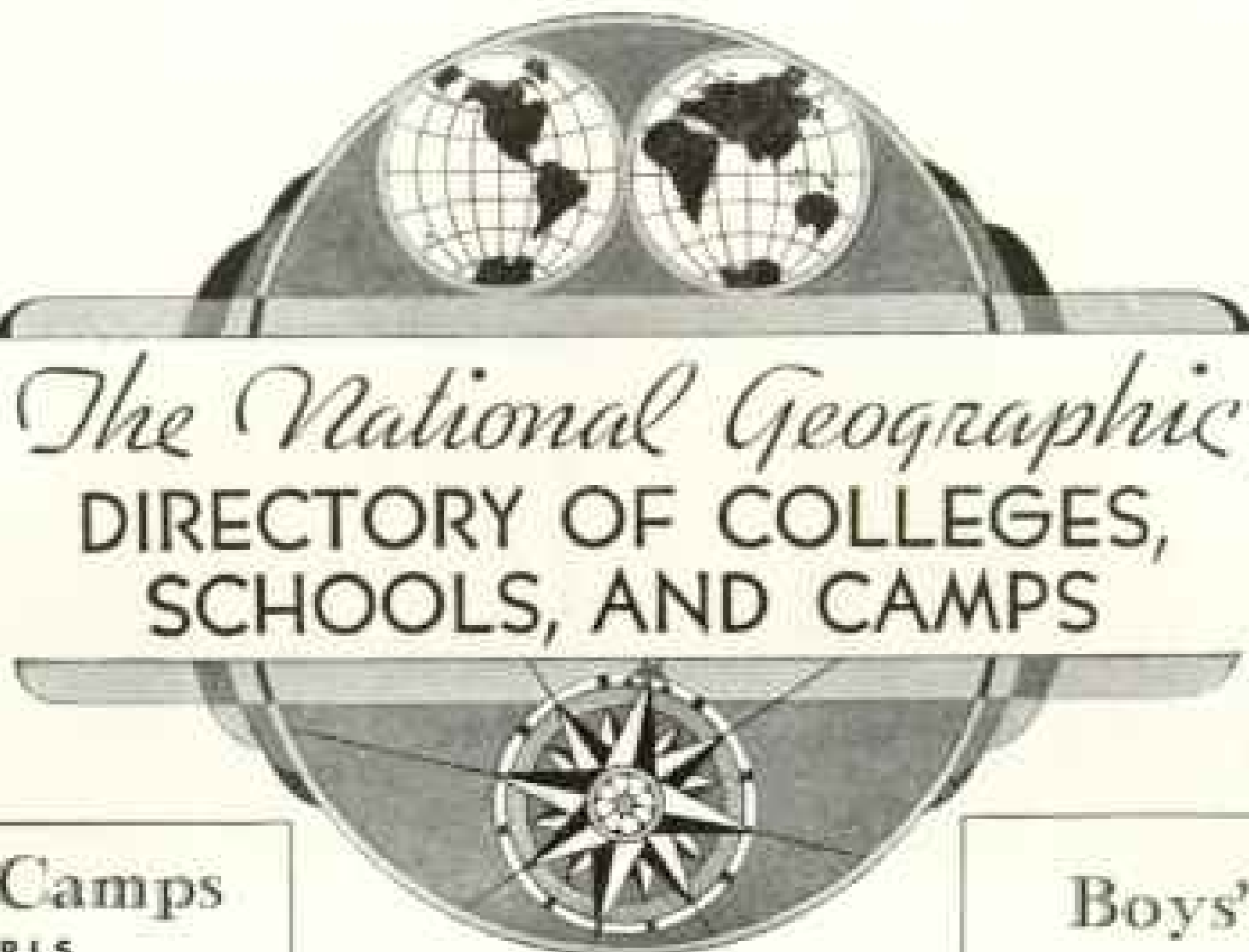
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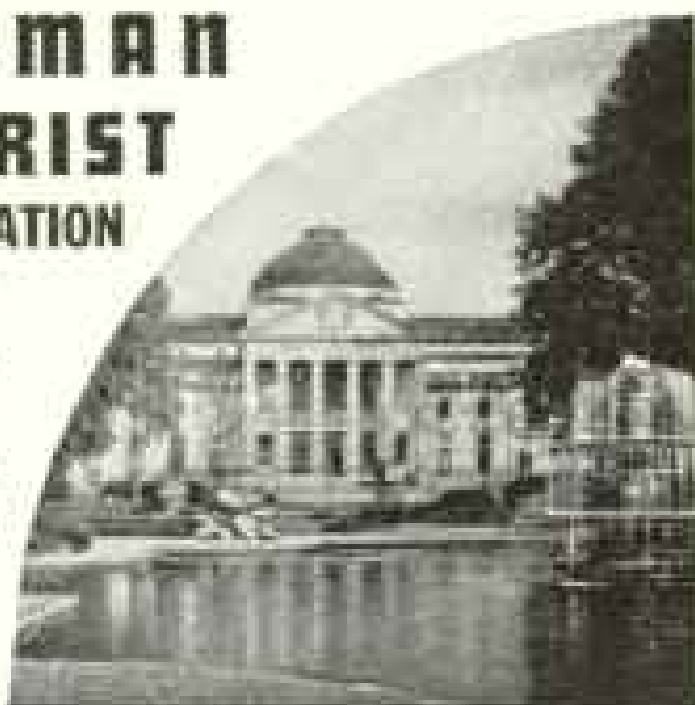
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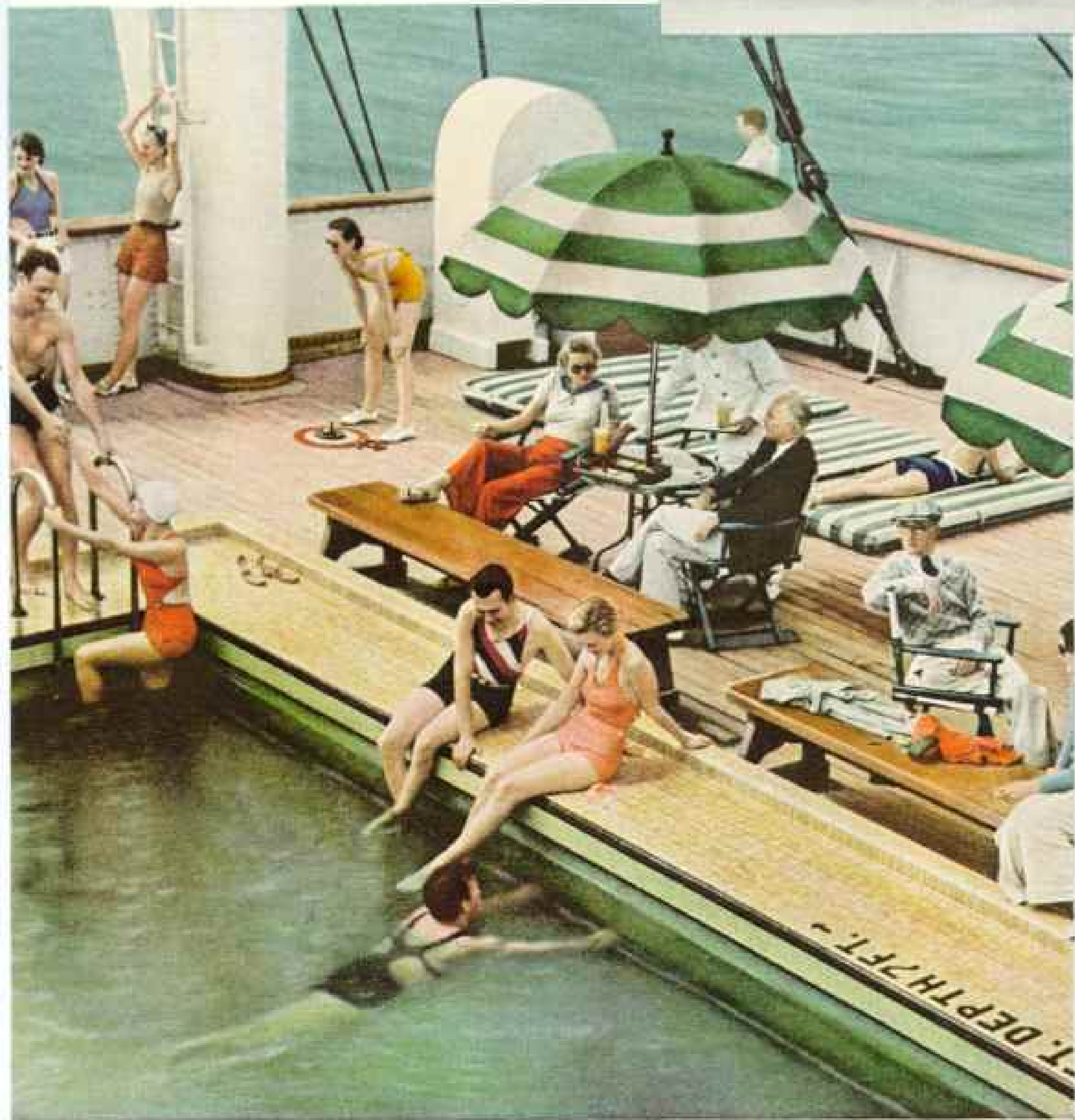
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Please send me the new publication on Exercise prepared by your Bureau of Physical Education.

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WHEN boys and girls play hard they use practically every muscle in their bodies. They run, jump, bend, twist and turn. It is the exercise they need to strengthen their muscles, straighten their backs, deepen their chests and square their shoulders.

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There are some persons to whom vigorous exercise might be harmful. But unless your doctor has advised against your taking reasonable amounts of physical exercise, the



booklet prepared by the Metropolitan's Bureau of Physical Education will be helpful in supplementing your normal outdoor activity. You will not begrudge the few minutes a day given to exercise when you begin to get the benefit from it.

The Metropolitan has sent to policyholders and their neighbors more than 1,500,000 illustrated Exercise Charts. Send the coupon for the 1935 revised edition of the publication on Exercise.



METROPOLITAN LIFE INSURANCE COMPANY

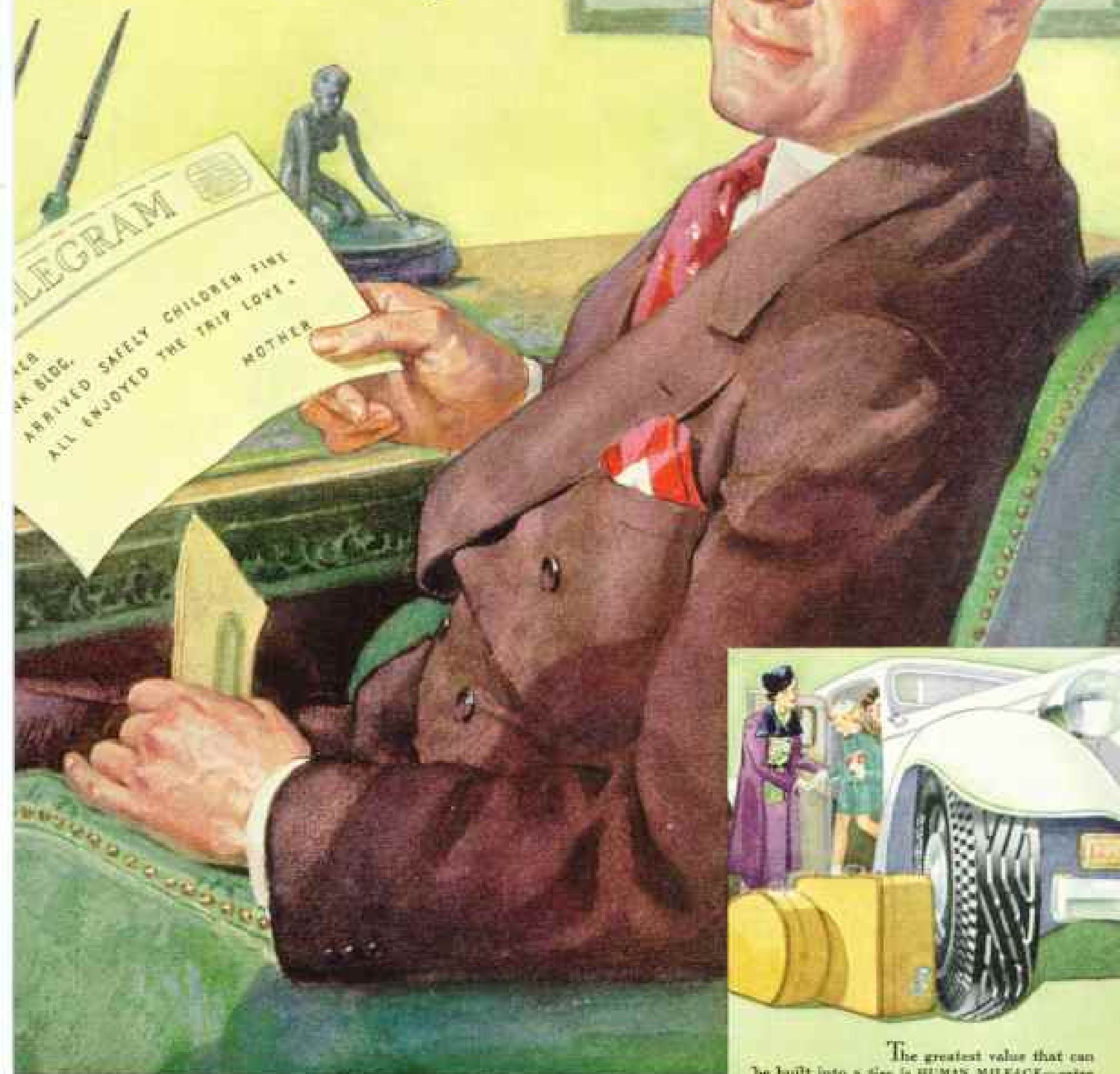
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in these bright new red and white cans which faithfully guard its refinery-quality against dirt, water . . . anything or anybody.



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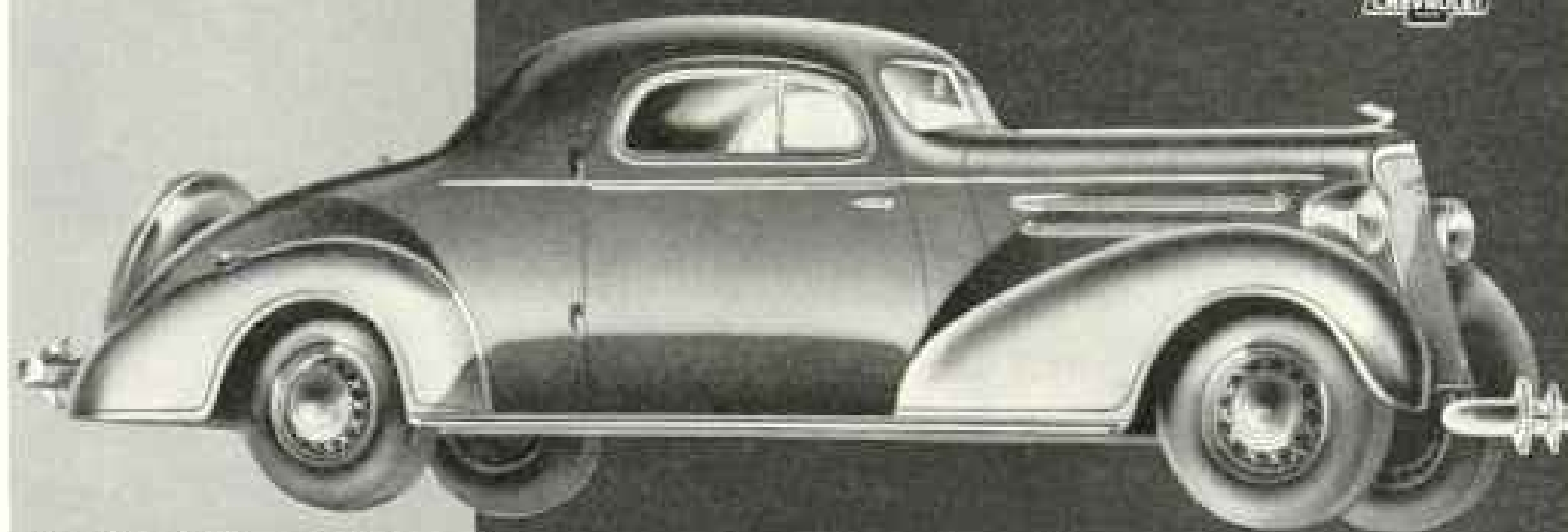
and comfort and
performance
combine to
give fine car
quality

Beauty, comfort and performance will be yours in *full* measure when you buy your new Master De Luxe Chevrolet for 1935. It is beautiful in *every* detail of its Fisher bodies. It is comfortable, too, for it has every modern improvement to make your ride smooth—safe—pleasant. And in performance it will be a revelation to you. All these advantages combine to give fine car quality—the *highest* quality Chevrolet has ever offered . . . yet Chevrolet prices are low and Chevrolet operating economy is greater than ever before. May we suggest that you *prove* these facts by your own tests, and choose *Chevrolet* for quality at low cost.

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1935

CHEVROLET

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Why not leave the monotony of heavy winter meals behind? Enjoy the delicious crispness of Kellogg's Corn Flakes.

For breakfast tomorrow give your family this springtime thrill. Fill the bowls with crunchy golden flakes of corn and red-ripe strawberries. Pour on milk or cream. Then taste that matchless Kellogg flavor! See how much keener, fitter everybody feels after such a meal. Kellogg's Corn Flakes are nourishing. Rich in energy and easy to digest. Splendid for lunch or the children's supper. Ready to serve.

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when you buy*

There's just one reason why Kellogg's Corn Flakes lead the world in sales. *Outstanding value!* No imitation can equal their delicious flavor. No other corn flakes have that extra Kellogg crispness, kept oven-fresh by the patented WAXTITE inner bag. And no other corn flakes are made in the great, spotless Kellogg factory in Battle Creek, where quality and purity have been guaranteed for 29 years.

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Million People
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THE BELL SYSTEM**

THE Bell System furnishes a nation-wide telephone service to a great and populous country—a service used for 59,000,000 talks a day. Telephone conversations per capita in this country are more than nine times as many as in Europe.

It takes 275,000 trained people to build and operate the switchboards, wires, cables, and other apparatus that make this service possible. It has taken the savings of 850,000 people to pay for the plant and equipment of the Bell System. Six hundred and seventy-five thousand own stock in the American Telephone and Telegraph Company, and in many instances other Bell securities. Another 175,000 own Bell System bonds or stock in the operating telephone companies.

No other business organization is so widely owned by so many people.

It is owned by the people, and it is run by wage-earning men and women. Their incentive is pride in performance; in doing a good job come recognition and promotion.

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BELL TELEPHONE SYSTEM

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"Freeze onto
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Macgregor PACE-MAKER
DRY ICE CENTER Golf Balls

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AUSTRALIA

NEW ZEALAND

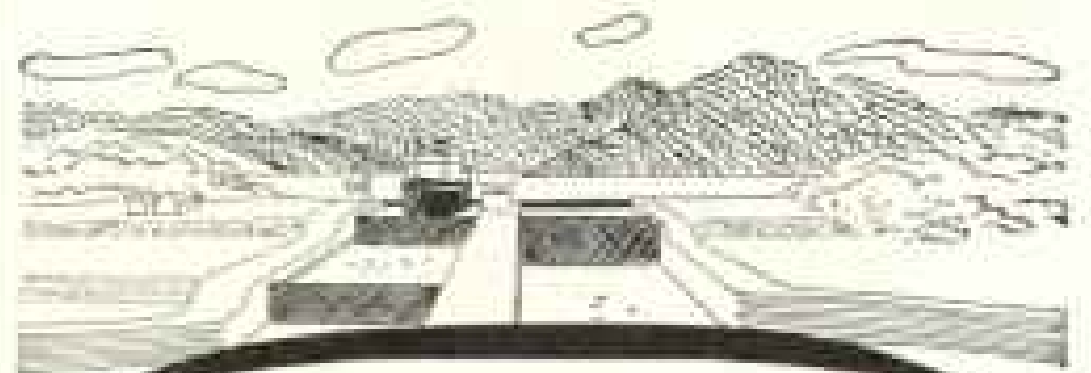
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Wouldn't you pay a dime for a movie of it?



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WITH Ciné-Kodak Eight, movies now cost less than ever before. This little camera uses a new type of film which gives you *four times as many movies per foot*.

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*Ciné-Kodak Eight makes 20 to 30 movie scenes—each as long as the average scene in the news reels—on a roll of film costing \$2.25, finished, ready to show.

Ciné-Kodak **EIGHT**

Yellowstone . . .



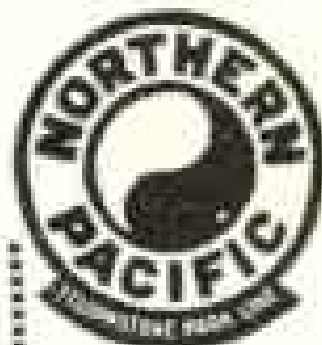
"The Grandest Spectacle I Ever Beheld"

"What is the greatest sight in Yellowstone National Park?" was asked of an Iowa educator, back from America's Wonderland. To which she replied: "I cannot say, for it is the grandest array of spectacles I ever beheld."

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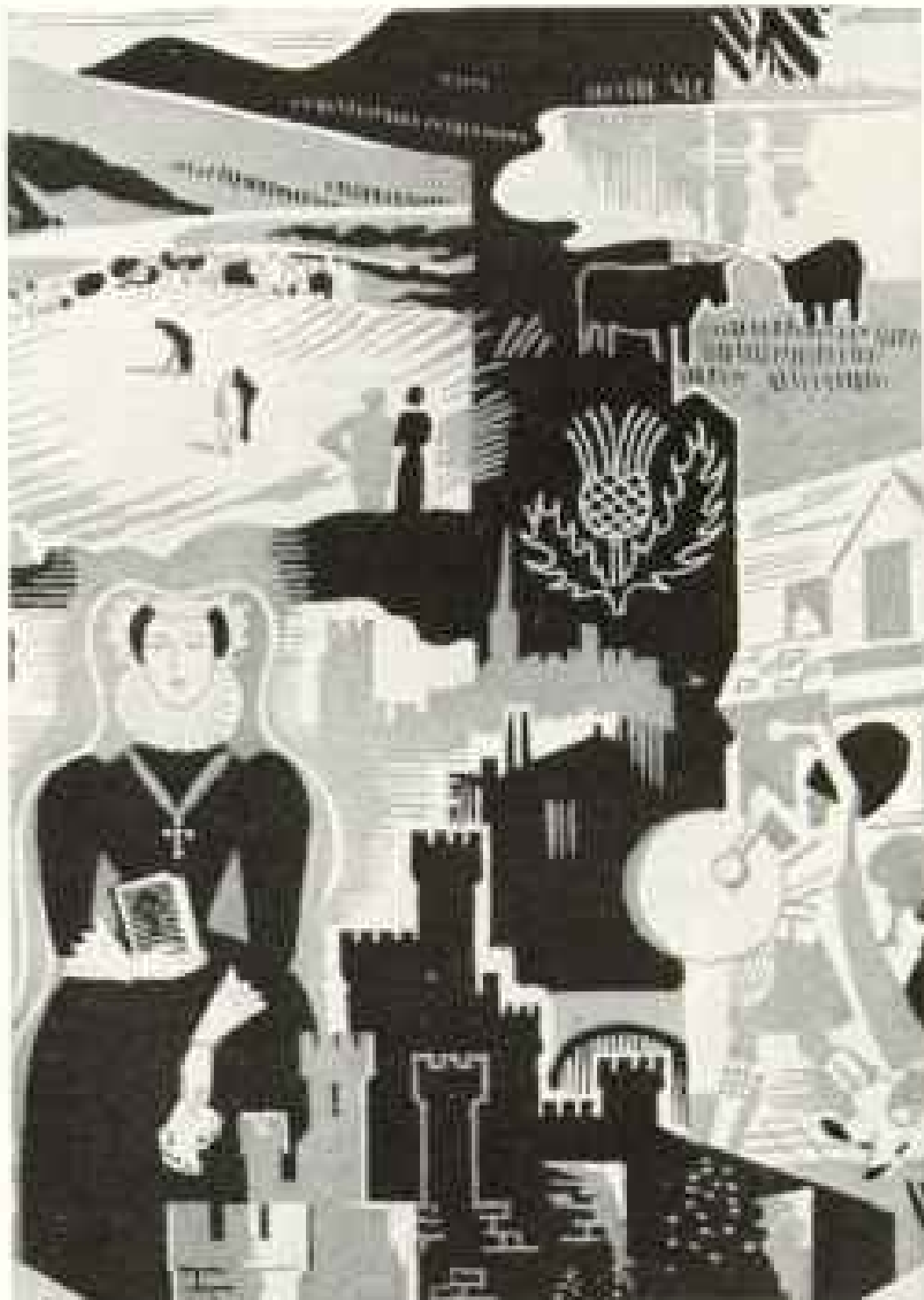
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"I Want to Take a Sea Trip"



CRUISES IN AMERICAN WATERS, MAY 10 TO JUNE 9

This Sailing List is published by the Advertising Department of The National Geographic Magazine as an aid to readers contemplating a sea voyage. Routes as well as sailing dates are subject to change and can not be guaranteed. Before plans are concluded a travel agent should be consulted for latest authentic information. Consult the agent also for booklets and tickets. The National Geographic can NOT supply them.

* The star denotes a steamship line whose advertising appears in this issue of THE GEOGRAPHER. † Leave Boston. All others leave New York.

LEAVE NEW YORK	DATE	STEAMSHIP LINE	ROUTE (See list below)	SHIP	LEAVE NEW YORK	DATE	STEAMSHIP LINE	ROUTE (See list below)	SHIP
May 11	17	*Grace	18	Santa Elena	May 25	13	Standard Fruit	17	Amundsen
12	20	*Grace	19	Santa Maria	Mar 28	5	Holland American	1	Watautan
13	12-41	Munson	10	Western World	20	4 1/2	Hamburg American	1	Resolute
14	7	New York and Cuba Mail	4	Oriente	20	4	Swedish American	1	Sunshine
15	13	Standard Fruit	17	Asanula	20	14	Southern Pacific	25	Utaie
16	12	United Fruit	9	Musa	20	22	Red 'D'	8	Carabobo
17	18	United Fruit	9	Talia	Mar 28	11-13	Colombian	13	Halls
Mar 15	21	Red 'D'	8	Fulton	20	17	New York & Cuba Mail	21	Algonquin
Mar 16	11-19	Colombian	12	Panama	20	17	New York & Porto Rico	12	Bartholomew
16	11	New York & Porto Rico	12	Horizon	18-17	1	*Dollar	2	President Polk
16	17	New York & Cuba Mail	11	Orinoco	18	17	United Fruit	2	Peter
16	17	United Fruit	7	Vergara	Mar 11	25	American Caribbean	23	Scammell
16	17	United Fruit	7	President Garfield	21	20	*Grace	19	Santa Inez
Mar 17	25	American Caribbean	23	Scamper	21	12	Munson	5	Munson
17	12	Munson	5	Munargo	June 1	20	Canadian National	24	Lady Seward
May 18	28	Furness Prince	14	Southern Prince	1	8	*Panama Pacific	4	California
18	20	Canadian National	24	Lady Rodney	1	20	Furness Prince	14	Victoria Prince
18	0	*Panama Pacific	4	Pennsylvania	1	7	New York & Cuba Mail	4	Oriente
18	28	*Grace	3	Santa Barbara	1	13	Standard Fruit	25	Guine
18	7	New York & Cuba Mail	4	Orinoco	1	12	United Fruit	10	Platano
18	12	Standard Fruit	25	Guine	1	18	United Fruit	8	Tonia
18	12	United Fruit	10	Platano	June 12	16-18	Canadian National	21	Lady Drake
18	18	United Fruit	8	Tonia	June 3	21	Red 'D'	8	Caracas
Mar 21	18-20	Canadian National	24	Lady Hawkins	June 6	11-18	Colombian	12	Pastora
Mar 22	21	Red 'D'	8	Lora	6	19-17	*Dollar	2	President Wilson
May 22	25	Furness West Indies	14	Norlana	6	17	New York & Cuba Mail	13	Orinoco
22	11-18	Colombian	12	Columbia	6	11	New York & Porto Rico	12	Guano
22	10-17	*Dollar	2	President Lincoln	6	17	United Fruit	7	Vergara
22	17	New York & Cuba Mail	11	Shaner	6	25	Furness West Indies	24	Port St. George
22	11	New York & Porto Rico	12	Guano	June 8	17	*Grace	18	Santa Rosa
22	17	United Fruit	7	Quiteria	8	29	*Grace	19	Santa Clara
May 24	21	Royal Dutch	10	Grande Naarun	8	12-41	Munson	24	Pan America
May 25	17	*Grace	18	Santa Paula	8	7	New York & Cuba Mail	4	Oriente
25	20	*Grace	18	Santa Lucia	8	21	*Panama Pacific	20	Columbia
25	12-41	Munson	20	Southern Cross	8	12	Standard Fruit	17	Amundsen
25	7	New York & Cuba Mail	4	Orinoco	8	12	United Fruit	8	Musa
25	12	United Fruit	8	Musa	June 8	18	United Fruit	8	Utaie
25	18	United Fruit	8	Calamaya	June 9	15	Hamburg American	27	Resolute

ROUTES

- Bermuda.
- Havana, Panama.
- Panama, Callao, Valparaiso, Guayaquil.
- Havana.
- Nassau, Miami, Havana.
- San Juan, La Guaira, Puerto Cabello, Curacao.
- Havana, Kingston, Cristobal, Port Limon.
- Kingston, Cristobal, Cartagena, Puerto Colombia, Santa Maria.
- Puerto Castilla, Yela, Puerto Barrios, Puerto Cortes.
- Santiago, Puerto Barrios, Puerto Cortes.
- Havana, Progress, Vera Cruz, Mexico City.
- San Juan and Santo Domingo.
- Haiti, Jamaica, Colombia, Panama.
- St. Thomas, St. Croix, St. Martin, St.

- 15 Port au Prince, Curacao, Puerto Cabello, La Guaira, Guanta, Puerto Sucre, Pampatar, Curacao, Trinidad, Demerara, Paramaribo.
- 16 Rio de Janeiro, Santos, Montevideo, Buenos Aires, Trinidad.
- 17 Santiago, Kingston, La Ceiba.
- 18 Cartagena, Puerto Colombia, Panama Canal, La Libertad, San Jose, Marajon, Los Angeles, San Francisco.
- 19 Kingston, Panama Canal, Buenaventura, Guayaquil, Salaverry, Callao, Valparaiso, Havana.

- 20 Bermuda, Rio de Janeiro, Santos, Montevideo, Buenos Aires.
- 21 Bermuda, St. Kitts, Nevis, Antigua, Montserrat, Dominica, St. Lucia, Barbados, St. Vincent, Grenada, Trinidad, Demerara.
- 22 New Orleans.
- 23 St. Thomas, St. Croix, St. Kitts, Antigua, Guadeloupe, Martinique, St. Lucia, Barbados, Trinidad, Paramaribo, Demerara, Grenada, St. Vincent, Dominica.
- 24 Bermuda, Nassau, Kingston.
- 25 Kingston, La Ceiba.
- 26 Havana, Vera Cruz, Progress, Kingston, Nassau.
- 27 Nassau, Havana, Vera Cruz.

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- *Dollar Line
- French Line
- Furness Bermuda Line
- *Grace Line
- Hamburg American Line
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- Holland America Line
- Italian Line
- *Matson Line
- *Nippon Yusen Kaisha
- *Panama Pacific Line
- States Steamship Line
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To Bermuda.
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To England, Ireland and Germany.
To England, France and Holland.
New York and Boston to Azores, Lisbon, Gibraltar and Mediterranean ports.
From San Francisco and Los Angeles to Hawaii, Samoa, Fiji, New Zealand and Australia.
From Seattle and Vancouver to Japan and China.
From San Francisco and Los Angeles via Hawaii to Japan and China.
Via Panama to San Diego, Los Angeles and San Francisco.
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SUMMER
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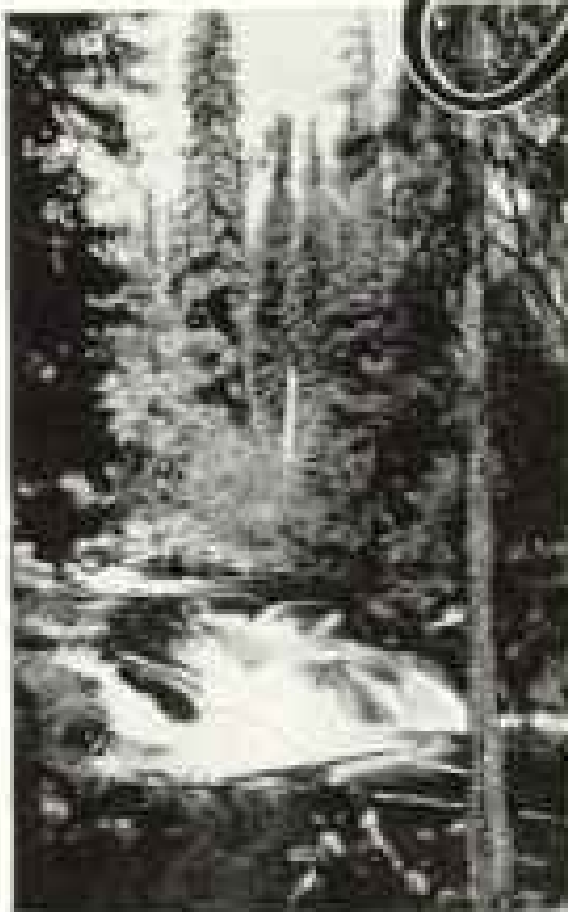
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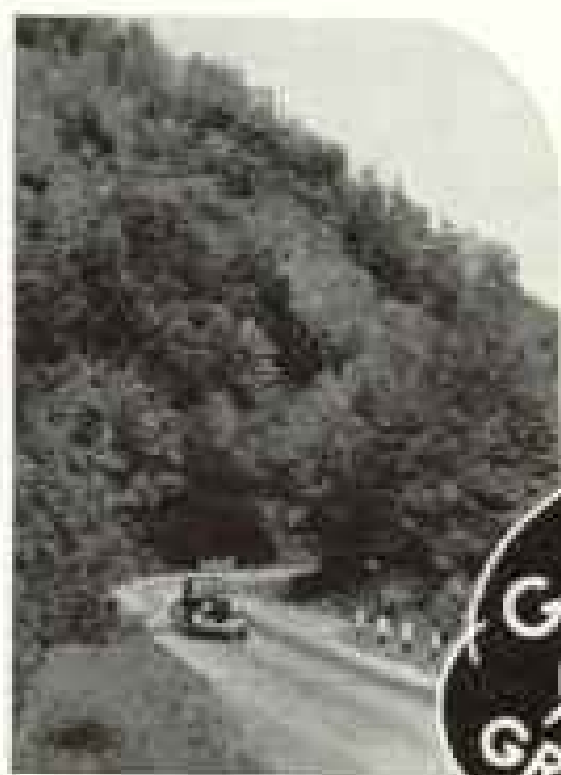
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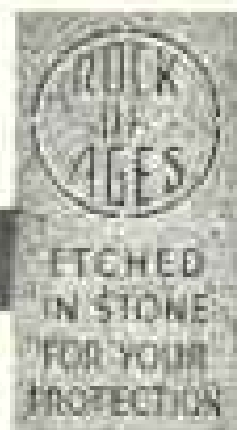
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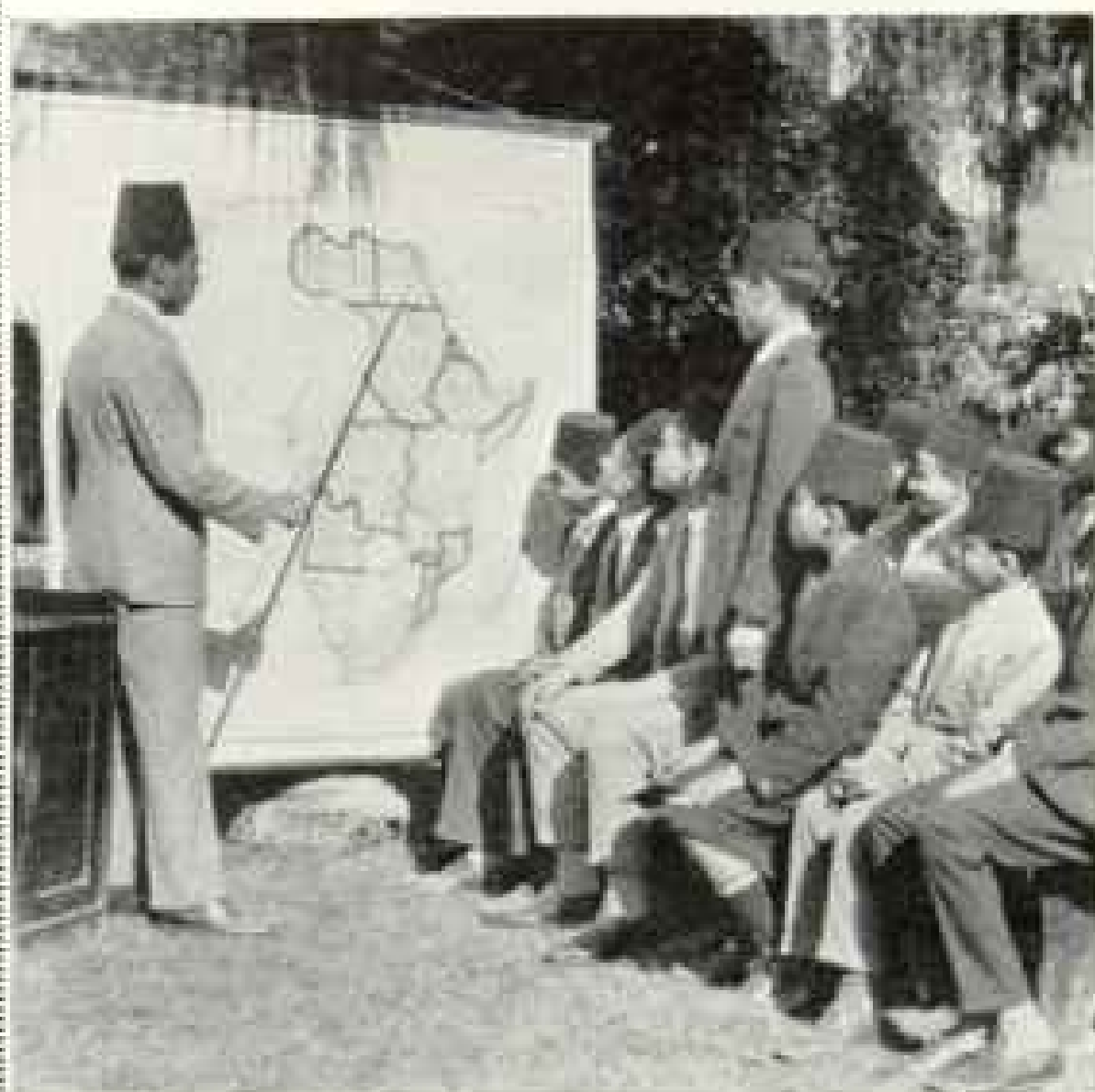
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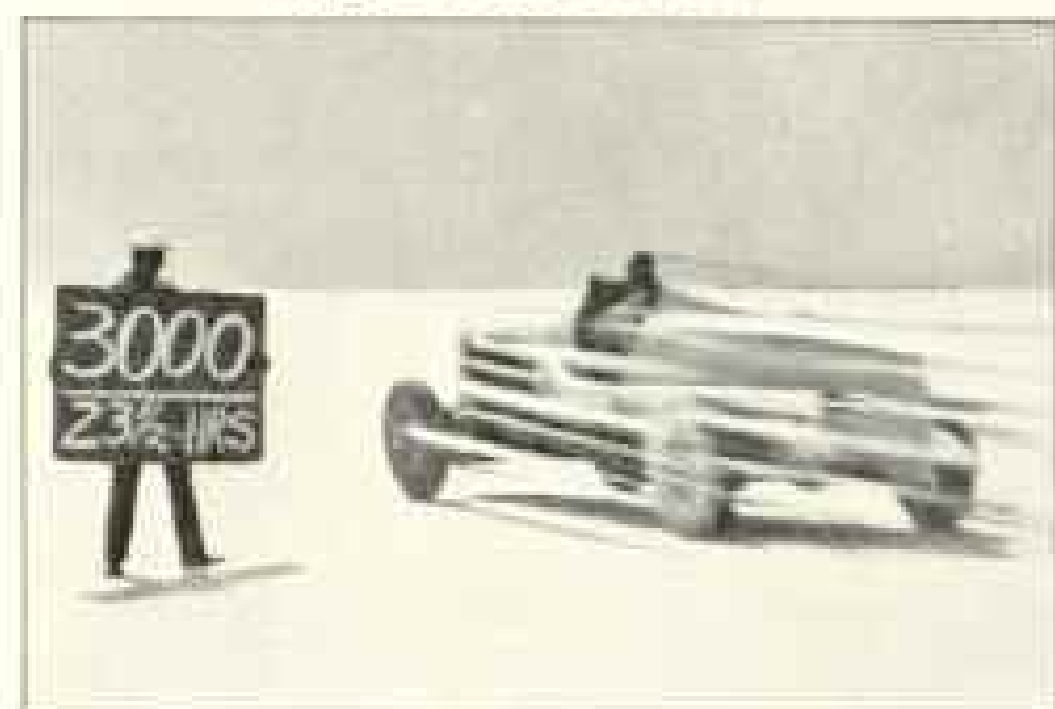
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