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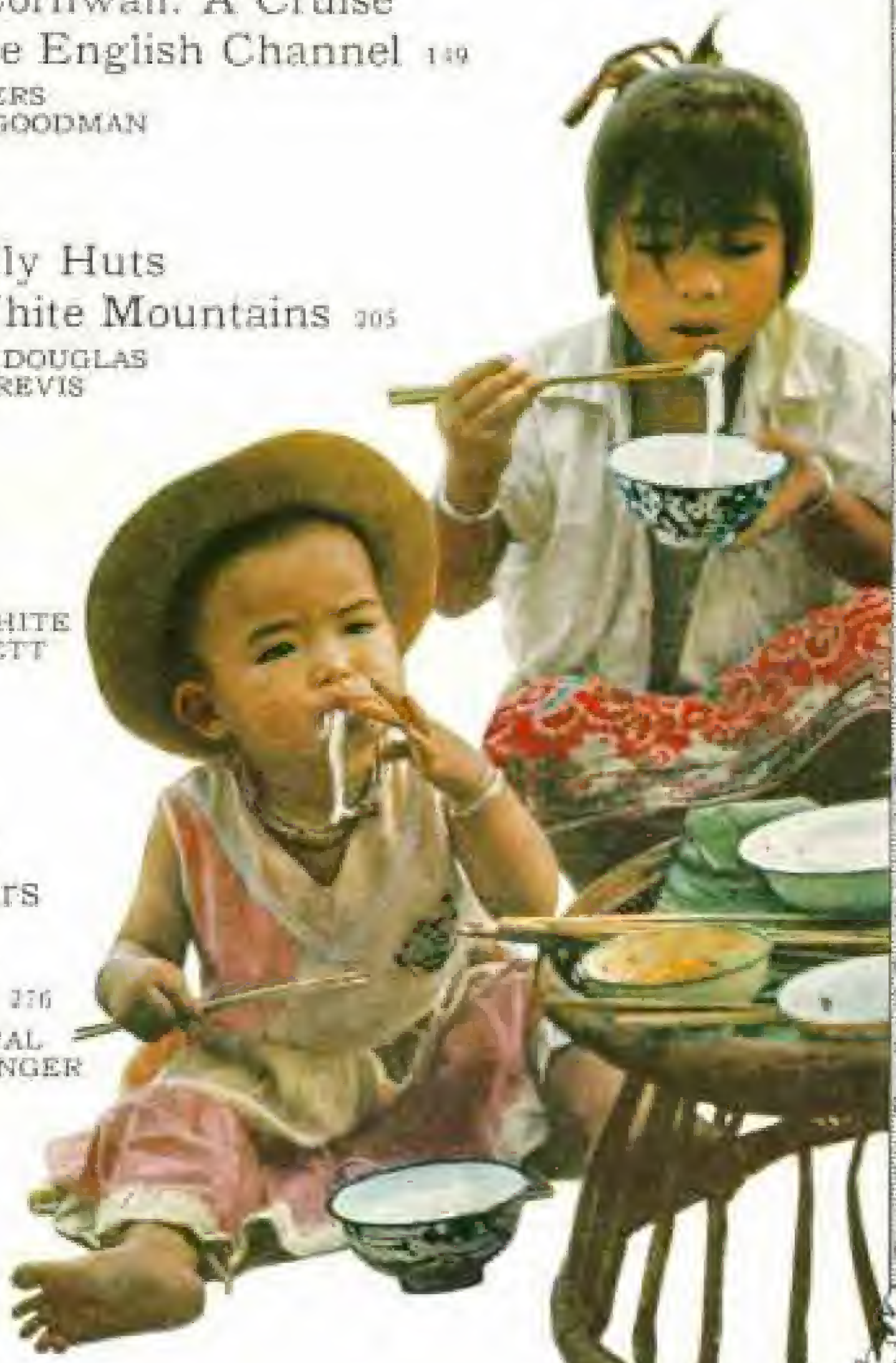
NATIONAL GEOGRAPHIC



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◀ COVER: *Fingers work better than chopsticks for a toddler in troubled Laos (page 262).*

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This kind of bird-watching is better done in your living room, through the pages of your GEOGRAPHIC—unless you have a particular liking for voracious insects and bushmaster snakes. But it's nothing new to Dr. Gilliard, Associate Curator of Birds at the American Museum of Natural History. Previous expeditions supported by the National Geographic Society have taken him to the islands of New Guinea, New Britain, and Little Tobago.

Let your friends share experiences such as these by sending us their names and addresses on the form below. If you wish to present their memberships as much-appreciated gifts, you need only enclose your nominees' dues with the form.

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It symbolizes the voyage to far shores. It symbolizes the quest that makes men dare the wrath of sea gods and other terrors of the unknown. Almost universal in meaning, this symbol has been understood through countless centuries—and by people speaking different tongues.

It was the emblem of Holland's Order of St. James. Of the Knights of St. Michael in France. Of medieval pilgrims in solemn processions to the shrine of Spain's patron saint. Of men rallying around England's King Richard in the Crusades. All knew the scallop to be the badge of the quest.

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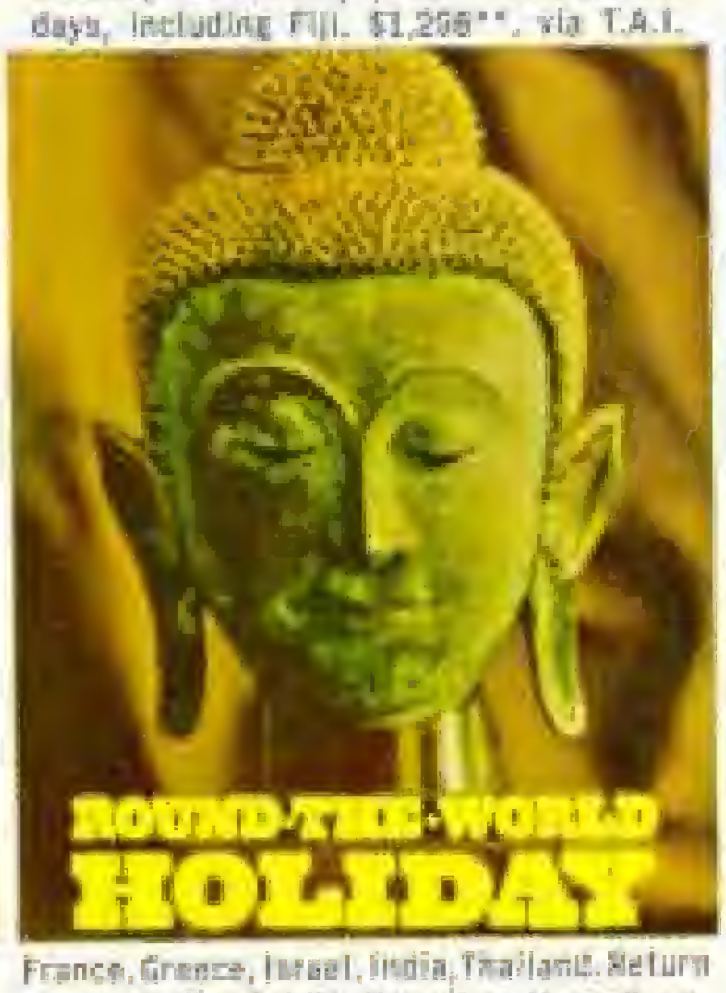

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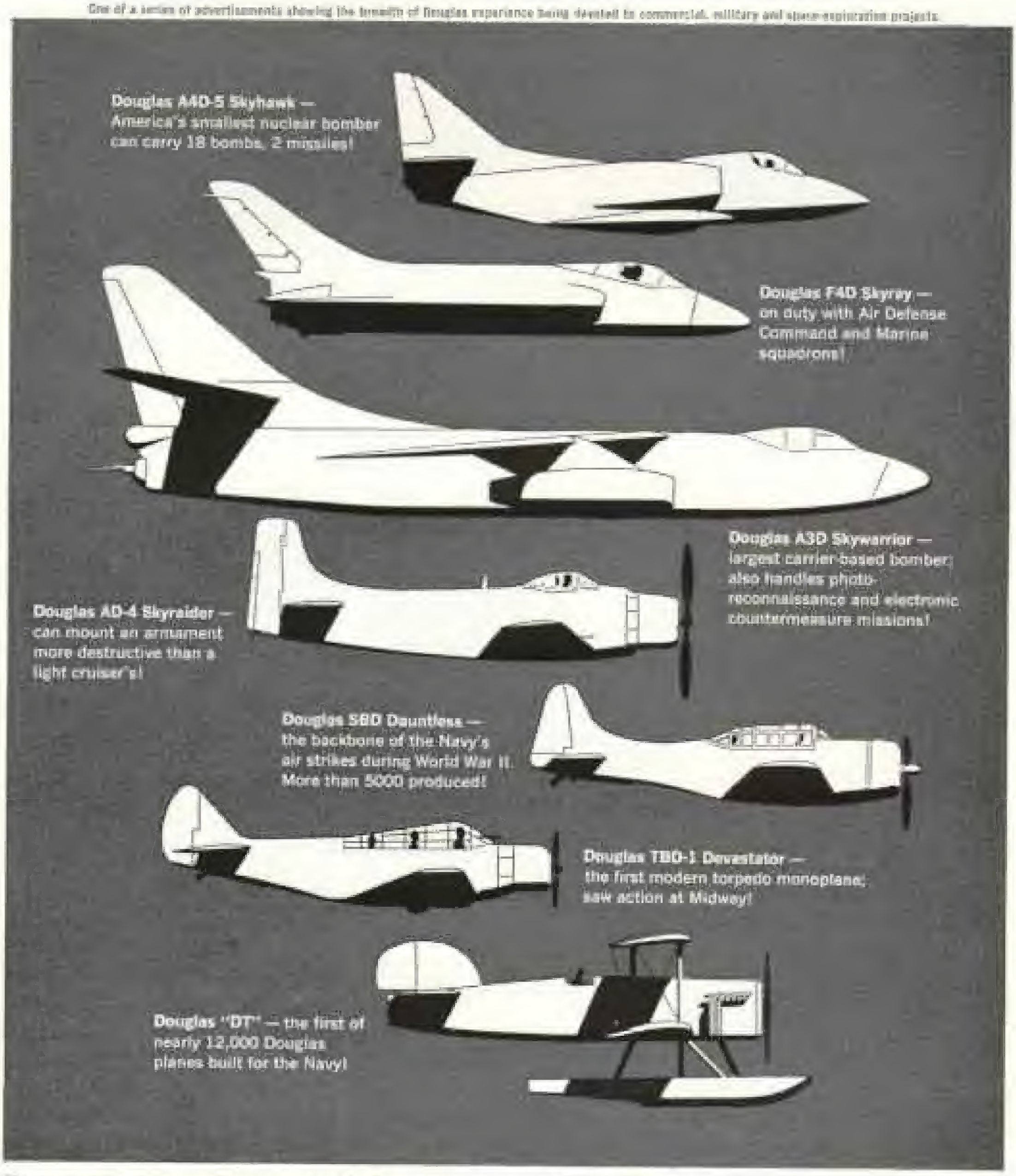

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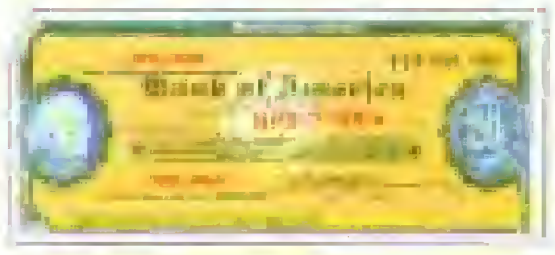

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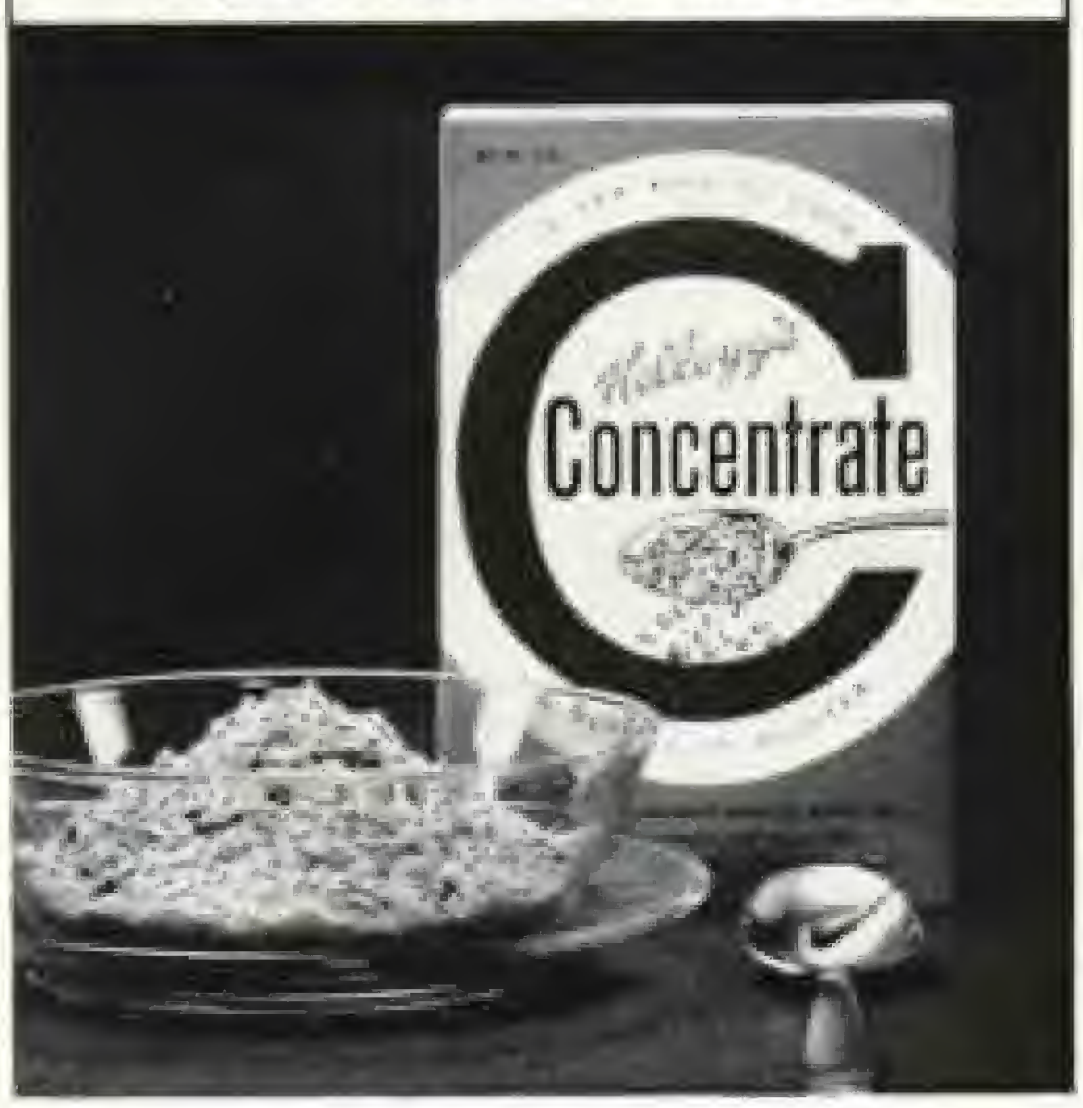

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How you use it: Served as a cereal or added to other cereals, Kellogg's Concentrate makes a delicious and substantial breakfast . . . a sustaining, low-calorie snack at any hour.

You can enjoy Concentrate many other ways, too. Sprinkle it on casseroles, soups, salads, fruits, vegetables and even desserts. Or use it as an ingredient in meat loaves or patties, stuffings and many other favorite dishes.

What it does: Concentrate is high in many of the essential nutrients—but low in things we usually get plenty of, such as fats. It's 40% high-quality protein, yet contains less than 1% fat. 99% free of the fat commonly found in other high-protein foods. (One ounce contains only 106 calories, no more than an average orange.)

Here's the nutritional "boost" that most of us need from time to time. So pick up a package of Kellogg's Concentrate—in your grocer's cereal section. Eat an ounce a day—as a cereal, on other cereals or with other foods.

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How much health did you buy today?

Family likes and dislikes often dictate food purchases. If good nutrition were the deciding factor, our meals would surely pay off in less fatigue, more energy and increased resistance to certain illnesses.

How can you provide good meals for good health? Usually all that's necessary is to serve a wide variety of foods—meat, milk, vegetables, fruits, bread and cereals. However, three things need watching.

1. At every meal serve a food rich in protein. Children need it for growth; adults for the body's upkeep. Best sources are meat, fish, poultry, eggs, milk, cheese and ice cream.

Pointers on protein: Less costly meats are as nourishing as higher priced cuts; some inexpensive foods—beans, peas, lentils and certain cereals—are also rich in protein.

Everyone needs milk in some form for both protein and calcium. Three to four glasses daily for children and teenagers. Two glasses or its equivalent in other foods for adults. Dry skim milk is excellent for soups, custards and milk drinks.

2. Serve a green or yellow vegetable every day. They supply some of the most essential vitamins and minerals.

3. Serve a vitamin C food every day. This vitamin can't be stored in the body. Your supply must be replenished daily. Citrus fruits—fresh, frozen or canned—and tomato juice, or fresh or canned tomatoes are good sources.

Most of us could improve our eating habits—especially teenagers. Many teenage health problems—poor teeth, blemished complexions, fatigue and overweight—might be avoided with more basic foods and less sweet and fatty foods.

Advice on planning varied, well-balanced meals is given in the Metropolitan Life booklet, *Food for the Family*.

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THE NATIONAL GEOGRAPHIC MAGAZINE

VOL. 120, NO. 2 AUGUST, 1961

Cowes to Cornwall

SAILOR'S LOG OF A CHANNEL CRUISE

By ALAN VILLIERS

Photographs by ROBERT B. GOODMAN, Black Star

I HAD NEVER BEFORE seen yachts look so interesting or so lovely. The Solent and Spithead were full of them. Red sails, blue sails, great brightly colored and wind-filled sails broke the seascape everywhere, with the rainbow spinnakers of running yachts distended in the fresh wind like half balloons.

Three hundred yachts were racing—big yachts, little yachts, dinghies of many shapes and sizes, ocean-racing ketches, cutters, yawls, catamarans, and just plain homely old yachts everywhere. They skim, race, almost fly along, listing heavily, shapely hulls creaming the shallow green water, winches singing when sheets are paid out or hauled in, canvas flapping briefly as the beautiful ships swing from tack to tack. Ashore, guns boom by the Royal Yacht Squadron steps. Squadron members, correctly uniformed, watch every move of every yacht. And the yachts beat, reach, run, with anybody at the helm from the Duke of Edinburgh to Farmer Giles (pages 152-3).

It was Cowes Week at the Isle of Wight in England, famed yachting center of the Western World, and the sun (for once) shone royally from a blue sky. I was there at anchor in Cowes Roads with the chartered ketch *Tectona*, 83 tons, Indian built, gaff-rigged and double-ended, with far from racing lines. Abeam of me, the royal yacht *Britannia* lay with huge standards flying bravely.

Aboard *Tectona* we had a grandstand view all day long. By night the social life was continuous, and the narrow streets of old Cowes were filled with sea-minded folk. Pretty girls in gay oilskins, London bank clerks dressed like French fishermen, shipowners in peaked caps and double-breasted blue serge, holiday-makers attired in anything at all jostled in the best of humor, while Cowes residents took the week off too. So many yachts jammed the harbor in the evenings that the masts seemed as closely packed as bristles on an upturned broom.

Down-Channel to the Coasts of Cornwall

Cowes Week was a setting-off point for us, for we were bound down-Channel on a cruise—to Cornwall, of course, that most fascinating of all the counties of old England, adventurous, romantic, different. Not for us the happy sailing crowds of Cowes. We had even better places to go—to Land's End, Mount's Bay and St. Michael's Mount, Fowey, and Falmouth (map, page 154).

The anchor came in handsomely; the brown

sails fluttered a moment before curving with the wind to their task. Owner Tom Blackwell, who comes with the ship when he charters her out, took the wheel in the narrow waters he knew so well, and we were off. The swift tide bore us seaward in the wake of a liner. Soon we were dipping and rolling in English Channel seas. Even out here, a crowd of racing yachts sailed by—15 or 20 of them, sturdy fellows, setting out on one of the many cross-Channel races, to Cherbourg perhaps, or Dinard.

I had sailed these turbulent waters before, many times. I'd led landing ships by the dozen across the Channel for D-Day in Normandy, mine-swept here in the dark days of 1940-41. I'd come up here by steam and sail and motor ship and gone down again from and to the ends of the earth, in peace and war.

Night Watch Sees Heavy Traffic

The night came slowly, for summer days are long in England. Friendly lights flashed from lighthouses ashore and lightships on shoals at sea. Out in mid-Channel a steady parade of steamers plowed by, for this is one of the busiest sea highways in the world. The crew were on watch-and-watch (the old sailing-ship system), one always at the wheel and one on lookout. They were all good seamen. There was a dish of boiling hot tea at the changes of the watch, at midnight and 4 a.m., and a mackerel line trailed hopefully from the stern.

The stout old ketch rolled gently through the starlit night and down the historic sea road where so many ships have passed and so much has happened. The very water lapping at the sides seemed to sing old stories—of how Spain's great Armada had once passed this way, never to return, of Julius Caesar with his legions invading England, and William the Conqueror in 1066, the last invader. Somehow 1066 didn't seem so long ago, and 1588 only the other day as we slipped on, silent and graceful in the night, under sail.

In the middle watch a huge Cunarder passed inbound, a fantastic blaze of lights from stem to stern, as if everybody was still up having fun, or maybe packing to land in Southampton with the tide in the morning.

The hours of the night watch slipped past rapidly, for this was a grand place to dream. The last time I'd sailed down-Channel had been in a full-rigged ship, my *Joseph Conrad*, outward bound to New York and round the world. It was the fall of the year and stormy then. I'd had to fight the southwest gales,

Capt. Alan Villiers, sailing the ketch *Tortoma*, captures the spirit of Cornwall in the accompanying article. From

Cowes on the Isle of Wight, he cruises England's southwest toe. Rounding Lizard Point for Land's End, he beats across a graveyard of ships and threads the rocky teeth that impaled them.

By car, he roams the cliff-walled north coast with its Celtic crosses, sweltering tin mines, mist-shrouded moors, and castles haunted by memories of King Arthur's time.

Lulworth Cove in Dorset shelters *Tortoma*, headed down the Channel to Cornwall. Its narrow entrance flanked by cliffs, the scallop-shaped cove seems a perfect smuggler's hideout. History records its use as a lair for revenue cutters that pounced out upon vessels running illicit perfume and spirits from France.


630

British-owned *Nantucket*, Spinnaker Ballooning, Runs Off the Wind at Cowes

For days before Cowes Week, in early August each year, ferries from Southampton transport capacity loads of automobiles and boat trailers to the Isle of Wight. Larger craft sail across the Solent to island moorings. Like a great ingathering of white birds, they come for Britain's premier yachting event. By day, regattas keep sailors on the water. Night finds them swarming High Street, watching fireworks, or dancing at yacht clubs.

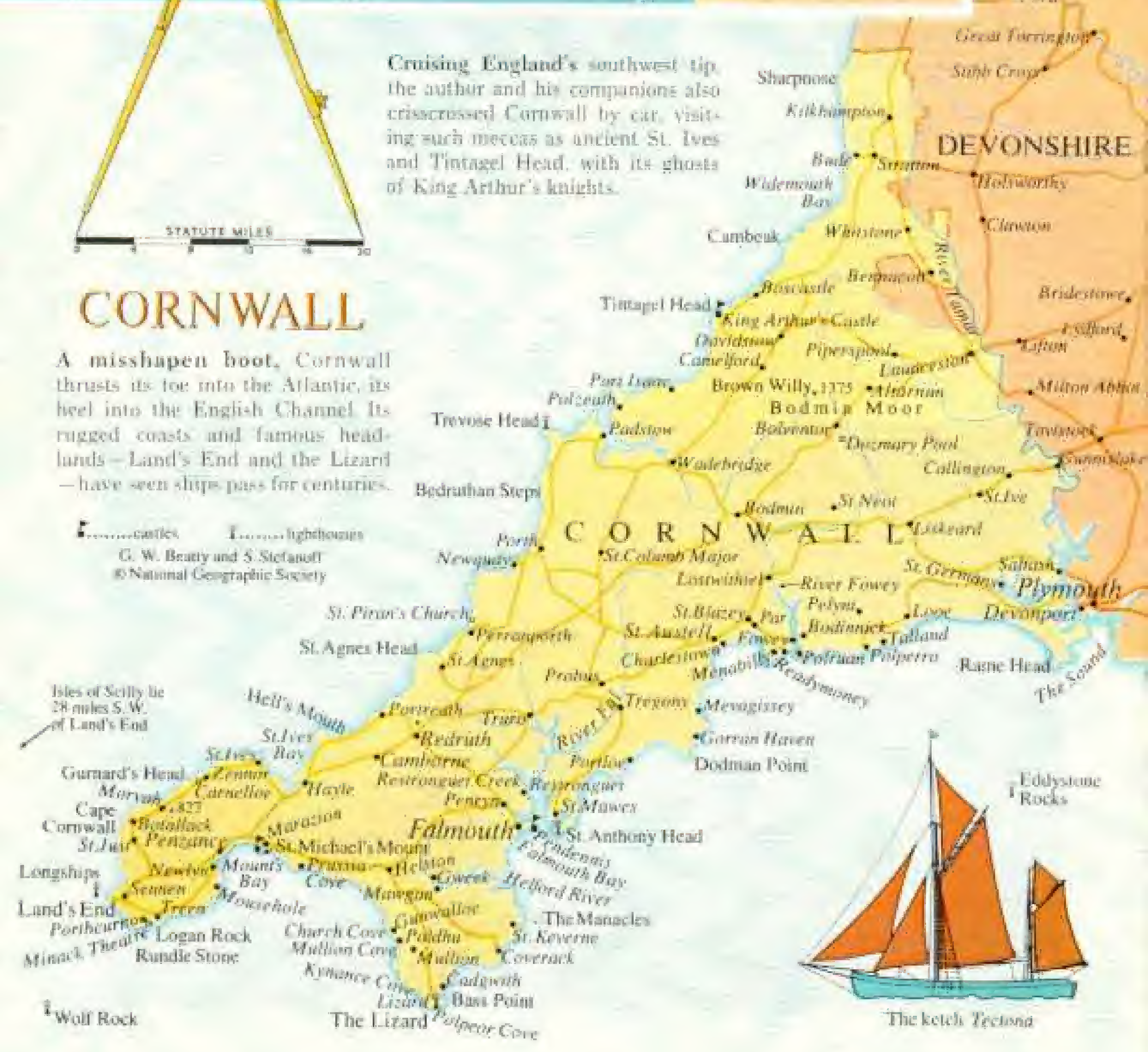
Driving to windward, a Hornet-class racer keeps her footing with human ballast. A girl daringly hangs on a hiking strap with one hand while leaning far out over the waves. With each tack, she changes sides. Such maneuvers enable the boat to take a hard rap of wind without capsizing. Another acrobat rides *Jamaica*, ahead by a few lengths.

His Royal Highness Prince Philip (left) sails *Coweslip*, a racing sloop given to him by the people of Cowes. Yachtsman Uffa Fox mans the jib.

Cruising England's southwest tip, the author and his companions also crisscrossed Cornwall by car, visiting such meccas as ancient St. Ives and Tintagel Head, with its ghosts of King Arthur's knights.

CORNWALL

A misshapen boot, Cornwall thrusts its toe into the Atlantic, its heel into the English Channel. Its rugged coasts and famous headlands—Land's End and the Lizard—have seen ships pass for centuries.



castles   lighthouses

G. W. Beatty and S. Stefanoff

The ketch *Tectona*

gale after gale, and those Channel seas ran high and cold and dangerous.

Here ten hundred thousand sailing ships had fought the same winds and seas all down the centuries. As the night watch passed and we rolled along, I thought that I could hear the thrash of their sails and the lash of the gales in their rigging.

Knobby Leg Means "Rise and Shine!"

"Eight bells!" shouted Ike Marsh, my bos'n on *Mayflower II*.* "Rise and shine for the Black Ball Line!" He was calling the other watch, down below. "Show a leg there, show a leg!"

This was the traditional call of the sailing-ship watch, from time immemorial. In the old days women were permitted in the jam-packed 'tween-decks of England's fighting ships when in port. Watch callers excused all hammocks from which a shapely, hairless leg was exhibited, very briefly, on demand.

None of ours was shapely—no excuses! Rise and shine!

The wind was southwest, fresh in the morning, and the sea got up with it. The *Tectona*, stout ship that she was, could take this in her stride, even with the wind blowing half a gale on her nose. She bounced along under her strong tanned sails, her big blue hull jumping and bucking and the sprays belting halfway up the jib.

It was exhilarating sailing, and the procession of Channel merchant shipping provided unfailing interest. Many merchantmen, bound west in ballast and flying light, were bashing into the short seas with the sprays driving over their bridges, making a great deal worse weather of it than we were. One little sea-walloper, belting the sea all over her with very bluff bows, came close enough for us to read her name—*Sand Baby*.

"What sort of a name is that for a ship?" asked bos'n Ike, as the jumping little steel box leapt and pitched by. "*Sand Baby* indeed! I bet that isn't what the cook is calling her right now!"

By this time we had a lively, high-running sea. The gauntness of Bolt Head loomed up, where that wonderful racing Cape Horner *Herzogin Cecilie* was lost some years ago. I had sailed in her once, in 1928. She was a splendid big ship.

The tide turned against the wind, and the sea increased with a nasty, petulant sort of

*Captain Villiers wrote of the *Foremost Command* in "North About," National Geographic, February, 1935, and of *Mayflower II* in November, 1957.

Foaming water swirls through lee scuppers as *Tectona* rolls in a nasty cross sea

Stone Walls Shelter a Fishing Fleet in Polperro's Bathtub Harbor

Exquisite miniature of a village, Polperro prefers the patina of age to the shine of the new. Cobbled streets no wider than paths lace the hillside.

Houses line the harbor and cling to wooded ledges. "It is a place no car should come, but every car does," wrote one observer of the throng of motorists drawn here each summer by Polperro's quaint old-world air. When the tide runs out, boats stay upright on props embedded in the harbor floor.

Blue-winged Water Skimmers Sweep Across Falmouth Harbor

Enterprise-class dinghies racing during Falmouth Week in mid-August follow the wake of a long parade of ships. Tradition speaks of Romans coming here for grain, Greeks for hides, Phoenicians and Bretons for tin. Henry VIII built a castle on Pendennis Point, and Sir Walter Raleigh laid plans for developing the port.

The golden age of sailing shed much of its glitter on this Cornish harbor. Out went packets carrying the mails to the West Indies; in came grain sailers and nitrate ships for orders that sent them to the ports of Europe. In World War I Falmouth harbored thousands of Allied ships.

No longer a major shipping center, Falmouth still keeps its harbor filled. Pleasure craft testify to its fame as a year-round resort.

Flower-lined lanes and pastel-painted shops enchant Mrs. Melville Bell Grosvenor, son Edwin, and the author on a tour of Polperro. Many shops and inns in Cornwall bear nautical names, such as this Captain's Cabin.

motion, as if it were in a bad temper that morning and did not want us to make westing at all.

Well, there were lots of places we could go into and put the anchor down if it got really bad. Brixham, Dartmouth, Salcombe were all good anchorages. So was Tor Bay. But mid-morning brought a real improvement, and we sailed on. I could look in at all these fascinating ports on the way back. The wind went to northwest and north, off the land, and the cliffs of Devon gave us shelter from its strength. We bowled along pleasantly under all plain sail. The sun shone and the decks dried. Ike gave the boys—Hank Hornblower, from Boston and Plymouth, Massachusetts; Peter Lisle-Taylor, cadet at Pangbourne Nautical College; and my 12-year-old son Peter—lessons in splices and sailors' knots, while seated round the chests on the little poop.

Ike mostly acted as cook, too. He was our best seaman, and he never tired of passing on sailing-ship knowledge.

"Soon there'll be nobody left who can do that at all," he said, which is sadly true.

Night fell, slowly and clear. Eddystone lighthouse, solid on its rocks out in the sea off Plymouth, flashed its warning message. It was twilight until nearly midnight. We sailed on steadily toward Falmouth Bay and the western tip of ancient England—incredible, romantic, crag-girt Cornwall.

Sailors Hear and Smell the Land

Morning brought fog and we lay becalmed, close enough in to hear farmyard dogs barking and to smell land quite strongly.

"Sailors round here in the old days knew the barks of all the dogs," said Ike, who had sailed out of Falmouth in his time. "That's one way they could tell where they were."

That may well be so, but for my part I was relieved when suddenly, as if impatient to reveal the craggy beauty all round us, the mist lifted. There was the distinctive lighthouse on St. Anthony Head, and beyond it Pendennis Castle at the entrance to Falmouth's inner bay. A sailing breeze came rippling across the sea with the morning sun.

Falmouth was our old "orders" port from

Dog leads and baby heels as a young couple explore the byways of Polperro. The little fishing village is best seen on foot.

EXPLORING BY MOTION PICTURE CAMERA

Sailing off the Lizard, Captain Villiers scans the sea for the reefs that have snagged so many ships. In the 1600's coal fires atop the cliffs warned of danger. Distant Lizard lighthouse, built in 1752, now throws a beam 20 miles.

In seeming tug of war, visitors at Mullion Cove pull a yacht-towing tractor out of sandy mire. The sailboat *Wingoes*, stranded by a storm, sits on greased planks awaiting a pull into the water.

Would-be sailors eye the struggle to float *Wingoes*.

windjammer days, for we always sailed from Australia with grain or from Chile with nitrates to Falmouth for orders—and how that port was longed for, over countless long voyages! The orders told us where to sail to discharge cargo. In such ships we saw Falmouth from the outside only, as briefly as possible, but it looked a green and pleasant haven to Cape Horn sailors. It still looked pretty good to us, this summer day in 1960.

Off the port lay some oil tankers, empty, enormous, high out of the water. Inside, the little port tucked around the corner was filled with similar empty big ships. Near them stood a group of salvage tugs, steam up and ready to pounce out into the North Atlantic to rescue ships in trouble. Huge cranes and 30,000-ton tankships dwarfed the old stone quays and the basin where fishermen and harbor launches lay.

With the breeze a sailing regatta began, for this was Falmouth Week, too—all the Channel is a fabulous place for these regattas. From the rivers round about, the yachts and the sailing oystermen came, while the breeze increased and lovely cumulus clouds of summer piled high in the blue sky.

Soon the whole estuary was splashed with the white, blue, red, and multicolored spinnakers of the yachts, oyster boats, dinghies, all sorts, like a huge boat show in glorious action on the perfect setting of this sheltered sea (page 158).

Oysterman Takes a Yachting Holiday

As we anchored, a picturesque oysterman rushed by under an enormous press of sail, a jerseyed Cornish seafarer holding the end of a tree-bough spinnaker boom with one great brown hand and half the sheet in

Sliding down her launching ramp on a practice run, the Lizard lifeboat smacks a placid sea. On call day and night, the rescue boat and its volunteer crews often face howling gales and mountainous seas that bring ships to grief.

Holed by rocks, *Cromdale* breaks up under the lash of pounding waves. The square-rigger, one of the last sailing ships in the Australian wool trade, ran aground in May, 1913, in fog off the Lizard. Cadgwith lifeboatmen rescued the crew.

F. E. STEVENS

On Cadgwith beach, lobsterman F. J. Stephens (left) yarns with the author and recalls his first rescue mission, the saving of *Cromdale's* crew. Quiet heroism distinguishes his long service with lifeboat crews.

Sunny skies and calm sea bring a day of rest to the coxswain of Coverack's lifeboat. He exchanges smiles with a young visitor.

Boats and crews of the Royal National Lifeboat Institution have saved more than 83,000 lives during 137 years of service. Voluntary donations support the work.

the other, while the sail tugged and the cutter swished along.

"Ahoy, Cap'n!" he shouted. "Like to come out tomorrow with us?"

I thought I recognized him as Jimmy Quintrell, a boatman who used to meet us well off Falmouth in his little ship when we came up in the big four-masters. Now here he was again.

I like those oyster vessels—shapely craft which are required by law to dredge for their oysters in Restronguet Creek and the Helford River entirely under sail, like the dredgers on Chesapeake Bay.

Oysters flourish by the million in the Helford, which is free from pollution. It is quiet and lovely water, really an arm of the sea reaching in among the tree-clad hills. Many creeks flow quietly down from wooded valleys, past peaceful little villages with queer names like Gweek and Mawgan.

"The oysters are pretty good around here," boatman Jimmy told me when we met him ashore. "We dredge for them in the winter. There's nothing doing now, and that's why we have the time to race."

Pandora Inn Recalls the *Bounty*

In the sailing dinghy, in the *Tectona* herself, and on foot we wandered these quiet waters and Cornish byroads. The Helford offered perfect yacht anchorage, and the whole area was magnificent for sailing. On near-by Restronguet Creek we dropped in at the Pandora Inn, named for that hellship which sailed to Tahiti to bring back the *Bounty* mutineers, only to drive ashore and wreck herself on Australia's Great Barrier Reef on the return voyage.

Her captain, blamed by many for excessive cruelty to his captured *Bounty* men, retired to this remote village and established the inn. Captain Edward Edwards of the *Pandora* chose a grand place. I envied him, living in those quietly beautiful surroundings, peacefully remote, with luscious oysters at his front doorstep and fish abundant everywhere, the hinterland rich with valley farms, where the steers produced succulent beef and the soft climate nourished fruits, flowers, and the best of vegetables.

The sea fishing was not so good just then, my boatman friend told me. Cornish waters have long been famed for pilchard, mackerel, herring, and other homely fish, as well as an abundance of the better-selling whitefish.

"I've seen shoals of pilchard that made the sea just one mass of fish from Land's End to past the Lizard," Jimmy declared. "Not now, though. They don't come like that now. Maybe it's as well, for they'd be wasted. People won't eat that kind of fish. They want 'em done up in cellophane, out of a deep freeze. There's very few of us go to the fishing now. A few long-liners, a bit of crabbing, maybe, and taking the tourists out for shark—that's about all it is now.

"You'll see some real work boats in Mevagissey and Polperro and Looe and round the corner in St. Ives Bay. But the boys are making a crust [a living] running skylarks—you know, river and harbor trips. Round the harbor, or the lighthouse, or the bar or whatever, for five bob. It pays good all summer."

Honest Smuggler Kept His Promise

Maybe the boys would have to take to smuggling again, or even wrecking, I suggested with a smile, if the tourist business ever failed them. These were branches of seafaring at which Cornishmen had—allegedly—once excelled.

"Our smugglers were all good men, honest in their own way," my boatman reminisced. "Like the Carters, there in Prussia Cove. They still tell down there of Honest John, who broke into the Customs House at Penzance to take back the contraband that customs men had seized when he was away from home. That was risky, and the King's men knew who did it too, because old Carter took only what they'd seized from him—nothing else. He needed it to deliver to his customers, he said. He'd promised 'em, and he had to keep his word!"

The old boy guffawed.

"As for wreckers and wrecking," he said more seriously, "if Cornishmen ever did that, they've more than made up for it, with the lives our lifeboats have saved from wrecks these past hundred years. Did you ever see the Lizard lifeboat? It takes nerve to go out in a thing like that. She's out a lot, come winter, and she never lacks for volunteers. Only the mechanic is paid regularly, you know."

One weekend of perfect weather, we sailed from Falmouth around the Lizard, across Mount's Bay and by its rugged coastline, off Penzance and tiny Mousehole (called by its inhabitants something like "Muzzle"), and to Land's End and Wolf Rock. We passed

(Continued on page 171)

Cottages of Stone and Thatch Shelter Cadgwith Fisherfolk

Roaming steps, narrow lanes, photographer Goodman found Cadgwith imbued with that rare kind of quiet possible only in a place where time seems to loiter. "With the fishing boats out for crab and lobster," he says, "villagers and visitors filled the hours with doorstep sitting, scene watching, and sunning in the cove."

Flowers grow before almost every Cornish cottage, if only in a pot hung by the door.

Stopping for tea, a girl motorcyclist finds a ship's companionway at the door of this Cadgwith cafe

In *Combe Valley*, Roger Venables evoked a mouth-watering picture of a Cornish tea:

The scones, still warm, are crisp and light.
Beside them are dark bramble jelly and bright
Red currant, and cream, with crust yellow-white;
And the thin bread and butter that manners decree,
And a choice of Indian or China tea. . . .

[illegible] (ABOVE AND BELOW) © N.G.S.

IKE MARSH

Life Aboard *Tectona*: a Rhythm of Work Set by Wind and Wave

Ghosting on a glassy sea off St. Anthony Head light (left), *Tectona* sails as free as a spirit, a small world unto herself. In the life of the ship, each man and boy knows his duty, and out of order comes a sense of mastery over a shared destiny.

Each day the decks are scrubbed, lines coiled, fittings checked, bunks made, and gear restowed. As watch follows watch, stars glide across the heavens, the sun describes its arc, fog rolls in and lifts, and sails match the mood of wind.

All hands keep busy on a tautly run ship. Edwin Grosvenor scampers up the ratlines (opposite page), while Captain Villiers eyes his progress. On another occasion the youngster learns the art of tying knots at a mastside class conducted by bos'n Ike Marsh. Other members of the crew, John Plewes and Henry Hornblower III, develop muscles furling sail. Sextant in hand, Tom Blackwell takes an altitude reading on a lighthouse to determine his position offshore.

Taking lobsters from the pot, Mr. Marsh anticipates work-sharpened appetites. At the dinner table, Captain Blackwell (left), the author, and Melville Grosvenor (right) spin sailing yarns for the younger crew members.

ARMY AERIAL OBSERVATION

Crazy Quilt of Stone-walled Fields Spreads Across Land's End Peninsula

For thousands of years man has walked this southwestern tip of England. Each age left its mark upon the land. On bleak uplands prehistoric man set massive stone atop stone to entomb his dead. Celtic farmers bordered the fields with enduring granite "hedges." Domesday Book recorded estates that were old even in William the Conqueror's time.

Photographer Goodman's aerial view sweeps from the cliff-hung north coast entirely across Cornwall to the English Channel. St. Michael's Mount, ancient trading point for Cornish tin, rises as a dim pyramid from Mount's Bay beyond the far shore.

Land's End, a rocky tip off the right edge of the picture, reaches southwest to meet the open ocean. There Wolf Rock and the Isles of Scilly lift sentry lights on England's sea approaches. These outcroppings, some say, are all that remain of the legendary lost land of Lyonnesse, Sir Tristram's home.

Open and shelterless, the northern Cornish coast has claimed countless ships, driven by gales or fog upon this perilous doorstep of Britain. Surf-hemmed swells from the Atlantic gnaw endlessly at the cliffs.

Wind whips sightseers at Land's End promontory. A commercial photographer inserts into the signpost the name of each customer's home town and its distance.

Men of the Cornish soil, father and son tend cows and sheep on moors overlooking Mount's Bay. With rich fields and mild climate, the area also grows flowers and vegetables for the London market. Here the sea is always within sight and hearing. "Light winds carry its throb and rumble over fields and moors as if some giant were at work, threshing corn," wrote novelist Ruth Manning-Sanders.

Traffic slows to a sheep's walk on a narrow lane near Tintagel. Clearing moors centuries ago, farmers piled rocks along the way. Today such roads, worn down by rain and travel, resemble roofless tunnels.

scarcely a point of land or a reef of rocks that day which hadn't claimed some famous wreck.

The whole run was fascinating. Though the day was quiet, we tossed and tumbled in turbulent seas off the Lizard, which is really only a cape and nothing like a lizard at all (page 160).

We ran in toward the beach by romantic St. Michael's Mount, as ships had done to beach and load Cornish tin 2,000 years and more before. The beautiful castle on the Mount, at once stronghold and sanctuary, fortress and priory, looked romantic and adventurous upon its perfect perch, where its guns could protect the bay. St. Michael's Mount seen from seaward is one of the finest sights in all England (page 175).

Land's End Gnashes Sharp Fangs

So is Land's End, that somber, sea-smashed headland of rock and cliff and dreadful breakers roaring in with all the fetch of the wild Atlantic behind them (page 168). We gave those rocks a good wide berth. One slight touch of the gnarled old fang-toothed stones would rip the *Tertona* to pieces, as they had done all along there to so many, many ships before.

The day was clear, the weather good, our sailing a profound delight. But it could well be otherwise; we all knew that. All who sail in ships around there are pleased to see the excellent navigation marks, lighthouses and buoys, and the coastguard and lifeboat stations, some of these in remarkably exposed places, but ready.

We went to the Lizard from the land side later, from Falmouth along the narrowest of lanes, past ivy-clad ruins of the hauling and pumping works of long-abandoned tin and copper mines, past fertile fields of rich brown corn [grain] ready for threshing.

The lanes ran incredibly narrow and twisting, as if they'd developed from farm-cart tracks as old as England. Rains of centuries had washed the track level down and down, until often the fields stood high on either side, and it was impossible to see over even a low hedge opposite. Those roads had literally worn themselves through the fields, up hill and down dale.

In the exceedingly narrow passing places (any spot where the lane widens three or four feet), often the hubs and door handles of the car scraped hard rock, close beneath the undergrowth, where some farmer a thousand years ago had stacked up the gathered stones from his field.

In such a place, when summer visitors arrive with cars and sometimes trailers as well, driving would be a nightmare if cheerful cooperation weren't the universal habit. We drove hundreds of miles in Cornwall, with countless road courtesies and never a snarl from anyone. Everybody backed up into passing places or the entrance to fields to help us along. Bus drivers were most courteous of all, backing for everybody, even up steep hills. We backed up often ourselves.

We found the Lizard lifeboat in its shed jammed under a cliff in Polpeor Cove. The only way it could be launched was by rushing down a steep runway straight into the turbulent rock-strewn sea. With an onshore wind, the place must be impossible. I saw it

Ruminating Cows Stare Back at the Camera

Photographer Goodman spent hours sitting in the field with the cows and moving closer from time to time. "My success in getting this shot," he says, "probably was due to having a mouthful of gum working all the time. After a while the only difference between the cows and myself was the fact that I had a camera in hand . . . and no visible horns."

Bards Marching at Camborne Keep Alive the Celtic Spirit of Cornwall

After forming a circle, blue-gowned men cry for peace, accept fruits of the earth, swear loyalty to Cornwall on the "Sword of King Arthur" (behind banner), and sing and pray in Celtic. The Gorsedd, or Gathering of the Bards, takes place in late summer.

on a quiet summer's day, and marveled at the lifeboatmen's courage (page 162).

Men to crew the boat come traditionally not only from the Lizard but from the small fishing villages in the coves near by. In emergency, any fisherman may go.

He takes a chance on getting back. In the dreadful seas that can get up on that rock-littered coast, even the most modern lifeboat may roll over, as the St Ives boat did years ago. There was one survivor.

Pretty coves like Kynance and Coverack, Cadgwith and Mullion, may look to the casual visitor like heaven's gift to the postcard industry. But here are seamen, in the finest sense of that long-honored word. Here the fishermen and lifeboatmen are to be found.

Coverack is a gem, with its small stone-walled harbor (dried out at low tide, like the rest) and pretty beach. In the post office, behind the counter, is a sailor's model of the famous Cape Horn ship *Bay of Panama* with, beside it, a framed photograph of the lost four-masted bark *Pamir*. I yarned with the postmaster awhile, for he'd been a seaman once.

The big sailing ships are all gone now, he said sadly. No longer do the great white-winged beauties thrash to windward out of Falmouth Bay under a press of sail, or come running in from a stormy sea at voyage end, shortening down.

Above the door of one cottage is a ship's name plate: *Gunver*. The plate looks as if it came from a ship's boat. I remember hearing about the wreck of the *Gunver*. She piled up right off that point. The hotel on the point is called the Paris, after the liner *City of Paris*, which drove up there years ago. Some of the timber in the hotel, they say, came from that wreck.

"Earth-grown fruits, plants bearing seed" symbolize God's bounty at the Gorsedd. Entering a circle, the young woman speaks to the Grand Bard: "Take this offering from me, as from the hearth of Cornwall."

Cars Stop for the Lifeboat

Cadgwith Cove has a lifeboat of its own. It provides only a rough stone beach to launch both the lifeboat and Cadgwith's small fishing fleet. The lifeboat house stands across the narrow road: traffic stops while the boat is hauled out on skids to be launched into the tiny rock-littered cove.

We found Cadgwith a minute village. A pleasant group of whitewashed cottages straggled up the steep street (page 165). They have warm, thatched roofs, quaintly attractive porches, and large chimneys to carry up the smoke from wood fires—driftwood, much of it, cast up from wrecks, or washed in on the Gulf Stream from anywhere on earth.

Jasmine, honeysuckle, myrtle, and sweet roses pile loveliness on loveliness all up the sides of many of these cottages, from rocky roadside to thick eaves. Near the village, a bubbling brook comes tumbling to the sea.

Here on the cobbled beach, I talked with lifeboatman-fisherman F. J. Stephens, aged 65, a stalwart character in jersey and peaked cap, working there on his lobstering boat. He'd been a member of the lifeboat crew more than 45 years (page 163).

"First wreck I was out to was a full-rigged ship called the *Cromdale*," said Mr. Stephens, in a quiet voice. (He wouldn't have said anything at all if he hadn't known I was also a seaman, and we had yarned a bit.)

I remembered talk of that *Cromdale*, even though she'd been lost in 1913 when I was 10, living 12,000 miles away in Melbourne. A colored picture of *Cromdale* hung beside my bed, for even then I was determined to serve in such ships when I grew up. She was the last of the famous wool clippers in the Australian trade—a steel skys'l-yarder, her

hull painted with gun ports in the fashion of an old East Indiaman, to make pirates believe she was armed.

"She still carried those painted ports when she was wrecked," said Mr. Stephens. "She wasn't wool-clippering then. Her crew told us they'd been more than four months coming up from Taltal in Chile with nitrates. Aye, I can see her on those rocks now—some sails run down like they'd been let go in a hurry, others still set.

"It was flat calm, and there'd been fog about for days. If a breeze of wind had come up, it'd have blown the fog away. She was on the rocks off Bass Point [page 162]. Calm didn't do her any good there! One tide finished her—she was all holed on those sharp rocks, and she broke up fast. We only just got her people off in time."

But it wasn't always so simple.

"It was bad, watching the men go," an old fisherman's wife told me. "They used to cry out through the village, 'Wreck! Wreck on the Manacles!' or wherever it was. The men rushed off at once, but a wild fear used to strike the women's hearts. Now they explode maroons—loud fireworks. We hate to hear them, too."

Aye, the men rushed off at once, as they still do whenever the need arises.

There has been a lighthouse of sorts at the Lizard since 1619, when a local resident named Sir John Killigrew erected the first primitive structure there. Other locals loudly complained that he was taking away God's grace from them, meaning there would be fewer wrecks for them to plunder!

We found a modern lighthouse, with its own small community established around it, and stalls selling models of the light, carved and polished, of the local serpentine rock—the same rock that provides the marvelous coloring in cliff and cove.

Cornish Air Is Kind to Flowers

The uplands here form a sort of plateau two or three hundred feet above sea level. In May and June the wild flowers are glorious, and the scent of the thick golden gorse blows far out to sea.

Cornish soil and the Cornish air are everywhere kind to flowers, wild and domestic. The mild warm air blowing in from the Gulf Stream Drift makes the peninsula climate balmy, almost like the Mediterranean, and the coast is called the Cornish Riviera. Early daffodils and other cut flowers are shipped by rail to London and the midland towns by the hundreds of thousands, and Cornish violets are famous.

Sweet narcissus and daffodils grow in sheltered valleys, and are ready weeks before they could be grown outdoors elsewhere in England. The Penzance Flower Show is famous, and so are the Morrab and the other gardens there. Subtropical plants and palm trees flourish. Hydrangeas and the like bloom year round, and the fuchsia thrives like a hedgerow bush.

Here at Penzance fierce Spanish seamen raided, pillaged, and burned, seven years after the defeat of their Armada. And the pirates of Penzance once had existence not only in Gilbert and Sullivan opera and song.

The only real way to see and appreciate the wonderful land of Cornwall is to walk. Everyone told us that. We met many such walkers, in shorts and stout boots. Some carried knapsacks adorned with small flags

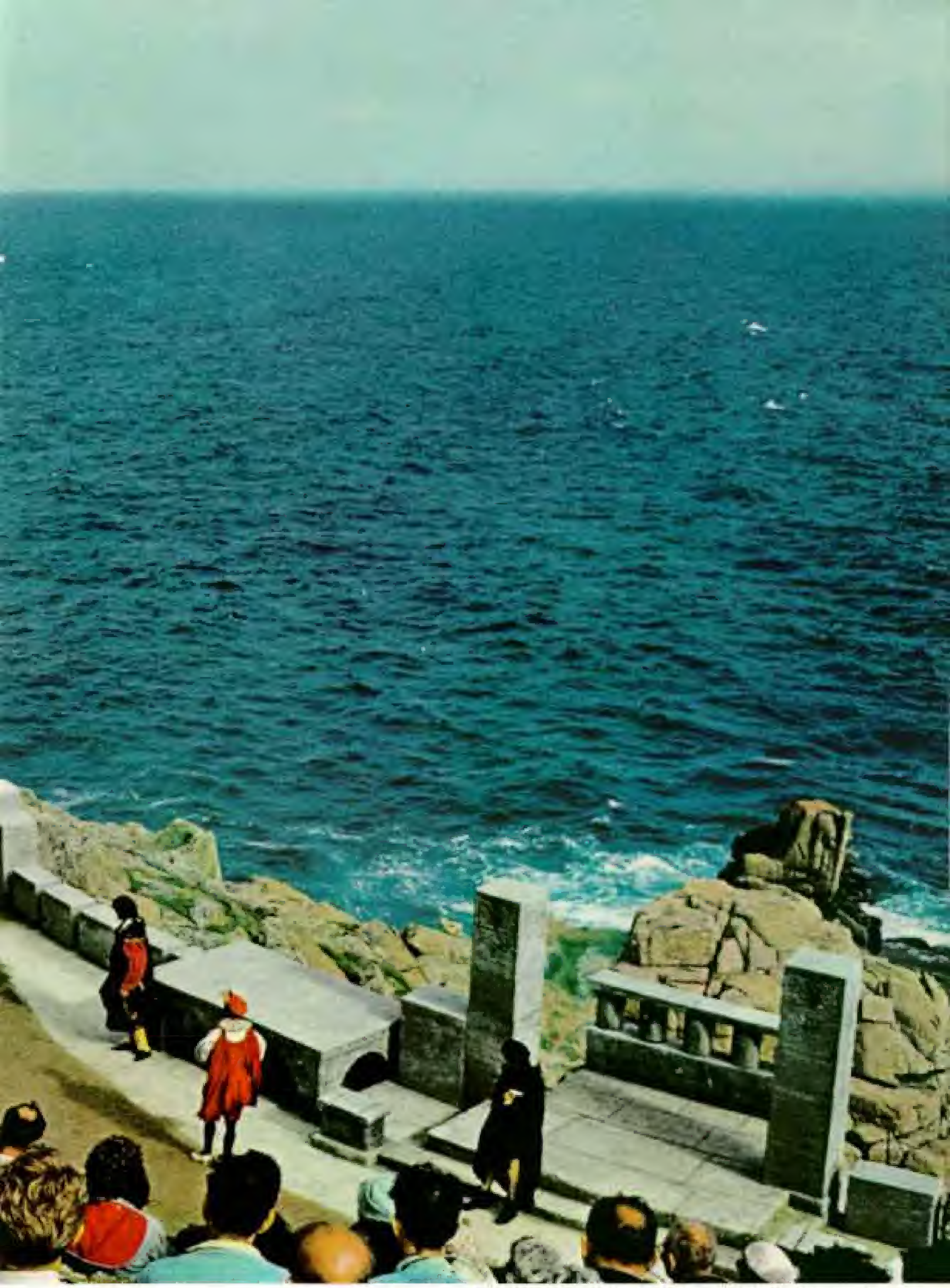
Teetona's Sails Frame St. Michael's Mount, a Sea-girt Crag Crowned by Castle and Church

Memories of a thousand years of peace and prayer, strife and suffering, haunt the pinnacle. St. Michael appeared on the Mount in a vision, it was said, and pilgrims acclaimed it as sacred. In the 11th century Edward the Confessor founded a priory on the heights, but its walls invited conquest. Enemies and adherents of successive English kings fortified the Mount, pirates attacked it, French and Spanish fleets sailed past it. For the past 300 years, the castle has served the St. Aubyn family as a home.

Deep-laden coaster outbound from Cornwall slops an angry sea over her bow in the Channel.

Petruchio Tames His Shrew to the Music of Wind and Wave at the Minack Theatre

Cambridge University Players develop the agility of mountain goats in making entrances and exits across the rocks of this natural amphitheater near Porthcurno. Here, near the end of *Act III* in



Shakespeare's *The Taming of the Shrew*, Petruchio brings his reluctant bride to her wedding feast, then refuses to allow her to stay, saying:

"Nay, look not big nor stamp nor stare nor fret! I will be master of what is mine own."

The cove beyond the actors served as a stage for another drama in 1895, when the *Granite State* piled up on hidden rocks (following pages)

indicating their nationality. We saw the French, German, Brazilian, Dutch, Danish, Australian flags, and once the English.

I walked down cliffsides, not too precipitous, into glorious coves like Kynance and Mullion and Church Cove, by Gunwalloe. Kynance rates as one of the loveliest little bays in all Europe, with fantastically broken cliffs, great caves, and incredible coloring in its serpentine rocks. Mullion has one of those tiny harbors which look big enough to shelter a couple of canoes, two brave little stone breakwaters reach out to hold back the tumult of the gale-tossed sea.

Poldhu Conquered Atlantic by Radio

Near Mullion Cove is Poldhu, where Guglielmo Marconi operated the first transatlantic radio station. From Poldhu to St. John's in Newfoundland flashed the very first radio signals ever to cross an ocean, away back in 1901. They were three dots, spelling out the Morse code "S," but they were dots that were to echo into history.

"Suddenly, at about 12:30 o'clock, unmistakably three scant little clicks in the telephone receiver, corresponding to three dots in the Morse code, sounded several times in my ear as I listened intently," wrote Marconi in recounting the day. (He was sitting anxiously at the time in the little station on Signal Hill in St. John's.)

"Electric waves which were being sent out from Poldhu had traversed the Atlantic serenely ignoring the curvature of the earth, which so many doubters considered would be a fatal obstacle. I knew then that the day on which I should be able to send full messages without wires or cables across the Atlantic was not very far away."

For years Poldhu's wireless telegraph station was of the first importance. Early broadcasting experiments were made here, and short wave developed. Then the great indus-

F. E. GIBSON

Weathered old marker in St. Keverne's graveyard honors emigrants to Quebec who were lost off the Cornish coast. Leaving Plymouth on the 3d of May, 1855, the *John* sailed past St. Anthony Head and found its doom on the rocks in the dark of night.

Landsmen watch the *Granite State*, driven ashore November 4, 1895, as she waits for lifeboats. From these same bluffs, spectators today view plays in the Minack Theatre, with the same distant rocky headland for a backdrop (preceding pages).

try moved away. Now Poldhu dozes on, its contribution to history made.

Near Gunwalloe, one legend says, King Arthur watched the sword Excalibur arise from a pool—the miraculous sword which "shone like fire" and prevented its owner from losing blood no matter how heavily he was wounded. Other versions say Excalibur rose in a woman's hand from a lake.

At Church Cove, southwesterly gales used to wash silver and gold coins up on the beach from some long-lost treasure in a wrecked ship near by. We looked along the shore, but our luck was out that day.

Officer Ordered to Restore Rock

All these beautiful places abound in romance and history. Walk those Cornish cliffs, sail into those Cornish coves (with a local fisherman aboard as a pilot, please!), and you never know what piece of romance or remnant of fable or strange reality you will find. Gray granite and serpentine cove, mystic moor, majestic coast are alike fruitful sources.

Near Treen Cliff, not far from Porthcurno, stands the Logan Rock, a balancing 60-ton boulder on the sea-cliff's edge, which a certain naval lieutenant named Goldsmith (nephew of the famous Oliver, the friend of Dr. Johnson and author of *The Vicar of Wakefield*) once deliberately toppled into the sea for a dare. There was such a popular outcry that the Lords of the Admiralty made young Goldsmith hoist the stone back and hang it properly again, at his own expense.

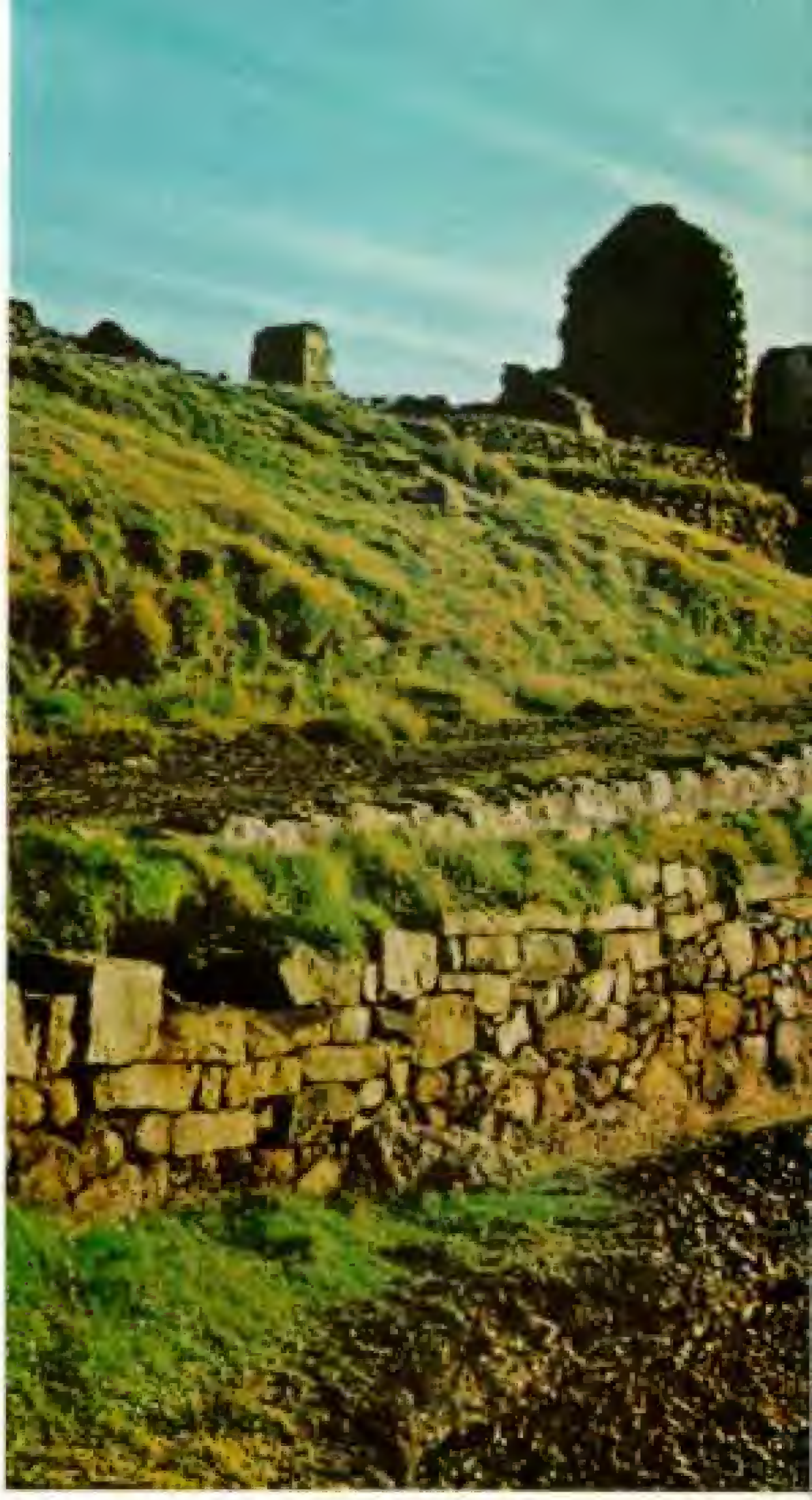
There is a sheltered spot by a coastguard station from which to look out over the wild coastline and ponder on the mystery of the lost land of Lyonnesse. Somewhere near here, in the dim ages, it is supposed to have sunk beneath the sea. Sir Tristram was Prince of Lyonnesse before he met King Mark and the two unhappy Iseults.

Peering over a cliffton near Porthcurno

Gaping Holes and Crumbling Walls Bespeak the Ruin of a Tin Mine

Producer of tin since ancient times, Cornwall once kept hundreds of pits working. Today most of the mines stand abandoned. Gorse and briar tug at roofless buildings, and wind moans through the holes of one-time windows. Miners scattered across the globe, many settling in the American West.

Here at Botallack one shaft reached out beneath the sea. When at work, miners could hear the water rolling massive boulders on the ocean bottom above them.



Tin-veined inferno 2,000 feet down tests the endurance of miners. Temperatures range above 100° F., and water oozing from rock is hot enough for tea. In this Camborne mine, one of two still active in Cornwall, photographer Goodman lost six pounds.

AUTOCHROMES / ARNOLD AND DE KATZENSTEIN © NATIONAL GEOGRAPHIC SOCIETY

that same bright day, by the beach of Porthcurno Bay, we suddenly saw beneath us, between the clifftop and sea, the most fascinating Greek theater I had ever seen. But it wasn't really Greek at all.

From the clifftop one can hear only the sound of the breakers roaring, smashing on the rocks, and the cry of the gulls. A pillbox, relic of the recent war, stands at a place of vantage, covering Porthcurno beach. A clifftop car park offers space but no shelter for a few cars. There is no sign of anything special.

Actors Compete With Ocean's Roar

Yet there below is this wonderful Cornish open-air theater in full swing, with a play in progress. Several hundred people sit upon dimpled earth seats, in semicircular rows cut in the steep slope. The play is obviously Shakespearean—a moment's listening identifies it as *The Taming of the Shrew*, a good gusty piece for that gusty setting (page 176).

The players are very young. Men and girls with stout lungs compete against the sea wind and threat of rain, scramble off stage upon craggy rocks, leap minor precipices with apparent imminent danger to life and limb to reach their cliffside dressing rooms, the girls holding billowing skirts against the freshening onshore wind. The sea beats on as it has been beating against that wild coast all through time, washing over the rocks, leaping high in anger, as if anxious to smash into the amphitheater, wash away the people, ready to drown any who get in the way.

Already the tide has swept swiftly up on Porthcurno beach and the bathers have all gone—children, shelters, chairs, picnic parties, everything. But the play goes on with a determined and admirable competence. Actors speak their lines with feeling and with vigor lest they go unheard—human voices

Color in stained glass intrigues painter Peter Lanyon of St. Ives. He spends hours roaming the seacoast and exploring abandoned mines, then translates what he sees into nonobjective works.

St. Ives lures Britain's artists with brilliant light, sparkling blue waters, and old-world charm. But the mystery of Cornwall plays a part, too, as these words of painter-sculptor Sven Berlin reveal. "The open coliseum of each little cove . . . the unending presence of the sea breathing ceaselessly over the shoulder of each hill, the rock charged with a thousand sunsets

A vase takes shape under the skilled hands of potter Bernard Leach, who considers his work "the counter-revolution, the refusal of the slavery of the machine."

lost in nothingness against the immensity of the cliffs, the sea, and the wind.

And such lines!

"Thy husband is thy lord, thy life, thy keeper,
Thy head, thy sovereign; one that cares for thee
And for thy maintenance. . . ."

So says the ex-shrew Kate, after her effective taming, and the gulls scream "encore!"

Known as the Minack Theatre, for a huge rock standing here, the auditorium was developed in 1932—a natural amphitheater of sloping cliff, with ridges cut to form rows of seats. ("It is advisable to bring rugs and cushions, also snacks and hot drinks for the main interval," says the small program we found later in the old pillbox.) Smooth, natural turf floors the stage. The only scenery is the ever-changing backdrop of lively sea and cloud-flecked sky.

The players we saw were from Cambridge University. Players from Oxford, members of

or carved by a hundred years of rain . . . the slow constructional flight of the seagull—these things in some way act as the charming of magicians and open up the deeper rooms of experience in man . . . awakening powers of perception which search beyond the frontiers of normal events."

the Cornwall Religious Drama Fellowship, and the West Cornwall Theatre Group—among others—put on good plays from late June to the end of August. Buses run playgoers the nine miles from Penzance, if they do not wish to brave the narrow roads by car.

The theater has a bit of a struggle to make ends meet, we learned, especially during a wet summer, for there is no shelter. Seats are reasonable—three and a half English shillings, or fifty cents. We thought this Minack Theatre wonderful and well worth supporting.

Not far from Portheurno is Land's End, a windy spot where not only Cornwall but the English mainland

Sculptor Barbara Hepworth works at St. Ives on a plaster model for her nine-foot "Figure for Landscape."

Cornish Pasty Makes Two Meals for Even a Hungry Youngster

Light, unsweetened crust may wrap a variety of fillings: meat and potatoes, chicken, pork, rabbit, or seafood. Written in Cornish dialect, the following recipe describes the making of Stargazing Pasty:

"Mawther used to get a herring, clean 'un, and put same stuffin' as what yow do have in mabiers [chicken], sew 'en up with niddle and cotton, put 'en in some daugh made of suet and flour; pinch the daugh up in the middle and lave the heid sticking out one end, and tail t'other."

The Cornish cook usually marks a pasty with initials of the consumer, so that he will know which is his during a day of nibbling.

Delectable concoctions of ice cream and fruit topped with thick, clotted Cornish cream bring a smile of achievement to a St. Ives waitress.

comes to a full stop and hands over to the Atlantic. To Land's End the trippers come by thousands, to buy postcards at a building proclaiming itself the "first and the last house in England," or to stand a swift moment by a contrived signpost put up by an enterprising wayside photographer who slides in signs reading "London 287 miles," or "Melbourne 12,000 miles," to suit the customers (page 169).

Shadowy Legend Beyond Land's End

Beyond the cliffs, out to sea, are the grim ship traps known as Wolf Rock and the Longships, well lighted now, but still dangerous. Far off are the Isles of Scilly, considered the mountaintop of that lost land of Lyonnesse, and sometimes in sight on a clear enough day.

As for the lost land of Lyonnesse, if there ever were such a place it was a long, long time ago. The sudden subsidence of some inhabited land off southwest Cornwall, known by this name, is factually described in at least one 12th-century English chronicle. Traces of a drowned forest exist in Mount's Bay, off St. Michael's Mount, and elsewhere off the coast of Cornwall. There are very old traditions that once the Isles of Scilly were part of the Cornish mainland. Stretching away to Atlantis, perhaps?

If you want to believe in lost Atlantic lands, Land's End is a good place to come to do it. Remains of early man abound in much of Cornwall—earthworks, relics of ancient forts, villages, burial places, places of pagan worship. Well-wrought flint arrowheads are to be found in the fields. Dolmens and cromlechs (which are large upright stones, sometimes capped like big tables and frequently in patterns) are commonplace.

Even the industries of Cornwall are of incredible age. Cornish tin, for example, was traded to the Mediterranean as early as Phoenician times. We were reminded of this connection as we hiked along the coastal road near Gurnard's Head and saw, by the beautiful village of Zennor, remains of the ancient tin mine of Carnelloe. There have been recent proposals to reopen this mine.

"Cornish tin mining is not dead yet—not by a long way. You mark my words, it will come again." The speaker was Mr. Leonard Thomas, the scene his office at the South Crofty Mine at Camborne—one of the few still worked in Cornwall.

I visited there with my colleague Bob Goodman on a bright September morning. We were entertained with coffee and cookies in the well-scrubbed office, while an energetic lady blacked three pairs of very heavy mining boots on a stand in the corridor outside. These were the mine manager's, I gathered. A mine isn't managed only from an office.

Mr. Thomas is a Cornish miner born and bred, from a family who have been miners for generations. He was educated, nonetheless, at Oxford's famed Dragon School; at Repton; and at the School of Mines.

He showed us over the works. Above ground, ore moved endlessly on conveyer belts into grinding machines and ended as dark-brown sludge in large vats. This was rich in tin, said Mr. Thomas—good tin, and lots of it.

The gaunt great wheels of the hauling machinery showed where the shafts were—a complicated system leading down 2,000 feet below, where most of the 200 miners toiled in fearsome temperatures (page 180). Cornishmen are famous miners (I remember them at Newcastle, far off in my own Australia, and in the island of Tasmania). Neither heat nor humidity nor any other unavoidable hardship of their trade means much to them.

Tin mining has gone on in Cornwall in one form or other for thousands of years, back to the Bronze Age. Not only tin, but copper, tungsten, arsenic, zinc, silver, and lead exist there too.

As early as the fourth century B.C., ships from the Mediterranean made voyages to Britain. A Greek traveler, Pytheas, described the Cornishmen of that time as "very fond of strangers, and, from their intercourse with foreign merchants . . . civilized in their manner of life."

Cornwall Guards Its Past

Everywhere in Cornwall is this vivid feeling of the long past, not pressing heavily as an incubus on present endeavor, but as a great tradition of living continuity, giving roots of strength and endurance to Cornishmen of today.

Cornwall is different—everyone told us that. "This isn't England, you know!" said a young man in the china clay business, near St. Austell. "This is Cornwall. We are Cornishmen, never forget."

These sentiments were echoed everywhere. There are growing efforts to revive the an-

Wild Seas Beat Jagged Cliffs in a Misty No Man's Land

Atlantic waters, surging 3,000 miles, wrench at boulders and hollow out coves at Hell's Mouth on Cornwall's north coast. Legend says that at twilight drowned sailors can be heard calling their names above the rhythmic ebb and flow of the surf. Purple heather carpets the slope.

Gulls ride the wind to a visitor's haunt at Hell's Mouth.

cient Cornish language, a sort of earlier cousin of Welsh, which has not been in general use since the 15th century. Many words have remained in daily use, however, and Cornish bards now discourse in the tongue at the Gorsedd, an annual assembly of scholars interested in the ancient sites and customs of Cornwall (page 172).

Secure in their hilly fastnesses, and out at the southwestern extremity of communication, the ancient Cornish people remained cut off from England. They liked it that way. The Roman occupation meant little to them, and the waves of later continental invasions less. Even the Norman Conquest in the 11th century took time to penetrate, and then not deeply. The Cornishman has remained a true son of his native land, far more than the people in most other parts of England.

This aloofness, this sense of long continuity, this difference, is a very real thing. You feel it in the leafy lanes, high-sided with the growth of ages, stones mossy and lichen covered. You feel it in the shadow of the ancient Christian crosses that abound. You feel it in the names of places and people, the lilt of Cornish voices, their folklore, their ceremonies, and their ways.

Few Harbors Break Savage North Coast

You feel it along the wild and dangerous north coast, and the balmy, more favored south. The north coast I found an extraordinary place, even for Cornwall. From a seaman's point of view, I had been warned about it long before, for it is notoriously exposed. The few so-called harbors require local knowledge and a good deal of luck, too, for the stranger sailing in under bad conditions.

From seaward or from landward, the brooding, gaunt cliffs seem savage, almost ferocious — miles of them, the sea edge littered and beset with the fang-toothed rocks of ages and shallow reefs extending far out (page 168).

Once caught in such places, no ship could live. Here countless good seamen have been bashed to death, bloody and bone-crushed and torn on that merciless coast. The cliffs rise to 700 feet, abrupt, often precipitous. The strong tides race over the few beaches. There is no shelter for a ship between Padstow in Cornwall and Bideford in Devon.

I did not sail here in the *Tectona*. She drew 10 feet of water, so she stayed in south coast ports where she was safe.

From the land side we found glorious places all around the north coast, no matter how forbidding the cliffs might be. I took a partic-

King Arthur Haunts Tintagel: Castle Ruins Crown a Headland Split by the Sea's Knife

Tintagel's tottering bastions once harbored King Arthur, says an old legend. Here for generations men have conjured visions of Knights of the Round Table. But the stones speak only of a 13th-century fortress built on the foundations of a Celtic monastery. Cliff-hung stairway (upper left) climbs to the site. Relentless waves have cut a deep gorge through the castle (upper right). Visitors in foreground stand on the seaward side; the castle's keep lies across the chasm. Tintagel Head's village lies beyond.

Crumbling walls overlook the cove (lower right) where a wave, bright with flame, swept a naked babe destined to be the legendary King Arthur into the arms of the magician Merlin.

ular liking to St. Ives (pages 182–3). The setting is striking, the old town around the ancient harbor most picturesque, the history romantic, the climate soft and equable, and the company good. The town is named for St. Ia, an Irish saint who, according to legend, came floating in from Ireland on a large leaf (probably a coracle, a sort of seagoing wicker basket some Irish fishermen still use).

The beautiful and varied scenery, the clear and lovely light, the splendor of cliffs and sand and sun and sea have long attracted artists to St. Ives. There were painters and

sculptors, the famous Whistler among them —James Abbott McNeill Whistler, the ex-West Point cadet from Lowell, Massachusetts, who became a great painter and etcher in 19th-century Europe.

Whistler died the year I was born, but famous names still walk the narrow, winding streets of old St. Ives. Here one day I met Mr. Bernard Leach, internationally known potter who has lived there since 1920. I found him at his pottery just outside town.

Mr. Leach is a lively septuagenarian. His kilns are downstairs, his workshop on the

AN EARLY-DAY (ABOVE) AND MODERN (LEFT) BY MELVILLE HALL ARCHERMAN, ADVALORUM (BELOW) BY ANNE ROSS ARCHERMAN © N.G.S.

Sun-tanned lifeguard at Bude wears a megaphone to call back careless swimmers who venture too far from the beach.

High breakers rolling onto Bude's beach offer thrilling sport. At times the water's roar can be heard 10 miles inland. Bude can be approached from the sea only by small boats that ride in with the tide.

floor above, and though it was late in the day, he was still there working. Gray-blue eyes twinkled in a fine face. A yellowish-white mustache, horn-rimmed spectacles, an air of great energy and competence completed the picture (page 182).

Mr. Leach told me that he was born in Hong Kong and studied the potter's art in Japan, where he spent his early childhood. He talked little about himself, but I knew of him also as an etcher and a painter.

What he *would* talk about was the potter's art, and it was quickly apparent that I was talking with an artist-philosopher with a real sense of humility, and serenity too.

"The machine takes the heart out of labor —it robs the worker of his imagination, feeling, directness of control," he said. "It seemed to me that the craftsman is almost the only worker left who has the privilege and the satisfaction of employing his hand, heart, and head in balance."

The famous sculptor Barbara Hepworth is another artist who has chosen St. Ives as a home. After a week or so there, I could follow their example—what a grand place to settle and write!

Despite countless visitors the summer long, the old fishing and waterfront town is pretty well immune to spoiling. Automobiles may choke the one main road some days, and

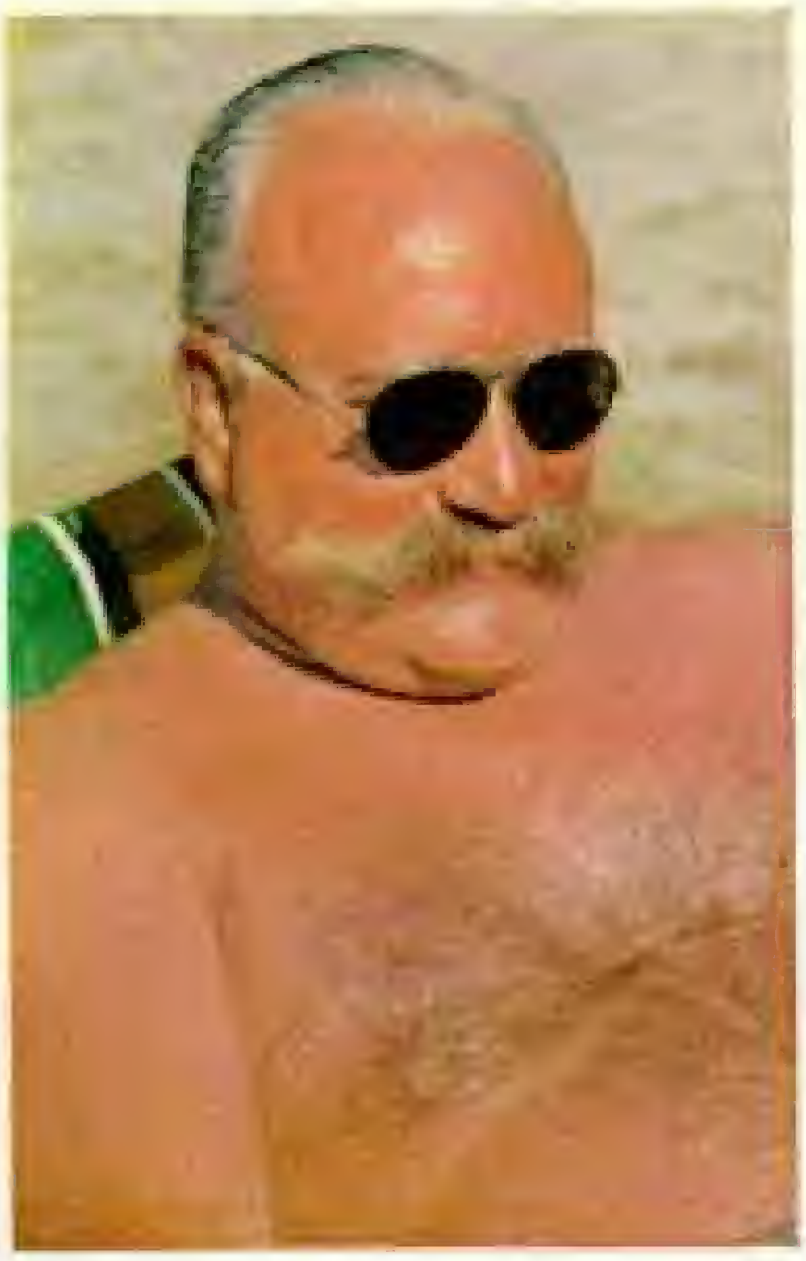
colorful bathing shelters rise by the hundred on the golden sands, but at the heart of all this the real old town, unspoilable and impregnable, goes on forever.

Tintagel: Did King Arthur Live Here?

If no monarch named King Arthur ever lived, then he should have, and Cornwall is the right place for him and his chivalrous Knights of the Round Table. Some scholars are skeptical about them, but even the most skeptical admit that once a great chieftain fought and won battles here among the Celts of Cornwall, keeping off the Saxons and probably other invaders.

What, no King Arthur? It cannot be!

There are many places that claim connection with King Arthur, but nowhere is belief in the legend stronger than on the headland called Tintagel, on the north coast of Cornwall, 20 miles from the Devon border. Beyond the rolling fields with the dark clouds racing in from sea, I found a venerable and romantic ruin upon a sea-torn cliff, a gaunt wraith of a castle, split in two where the sea, through a thousand years and more, has cut the whole



Mustachioed sun worshiper at Newquay wears the well-broiled stage.

Newquay's Surf-washed Sands Attract a Holiday Crowd

During Victorian times the town devoted all its energies to the fishing industry. Stationed high on the rocks in the foreground, where sun seekers now congregate, a lookout man, or "huer," kept watch for a purplish stain in the sea, evidence of a school of pilchard. When his trumpet sounded, villagers rushed to their boats.

Today the town makes its money from visitors. Some 25,000, arriving by train from London, crowd the resort each summer.

headland (page 189). This is that "time-eaten ruin of unknown date," as a friend described it to Lord Tennyson. A government treatise on ancient monuments calls Tintagel a "romantic site now in the guardianship of the Ministry of Works," and denies it "any authentic connection with Arthur." But who knows?

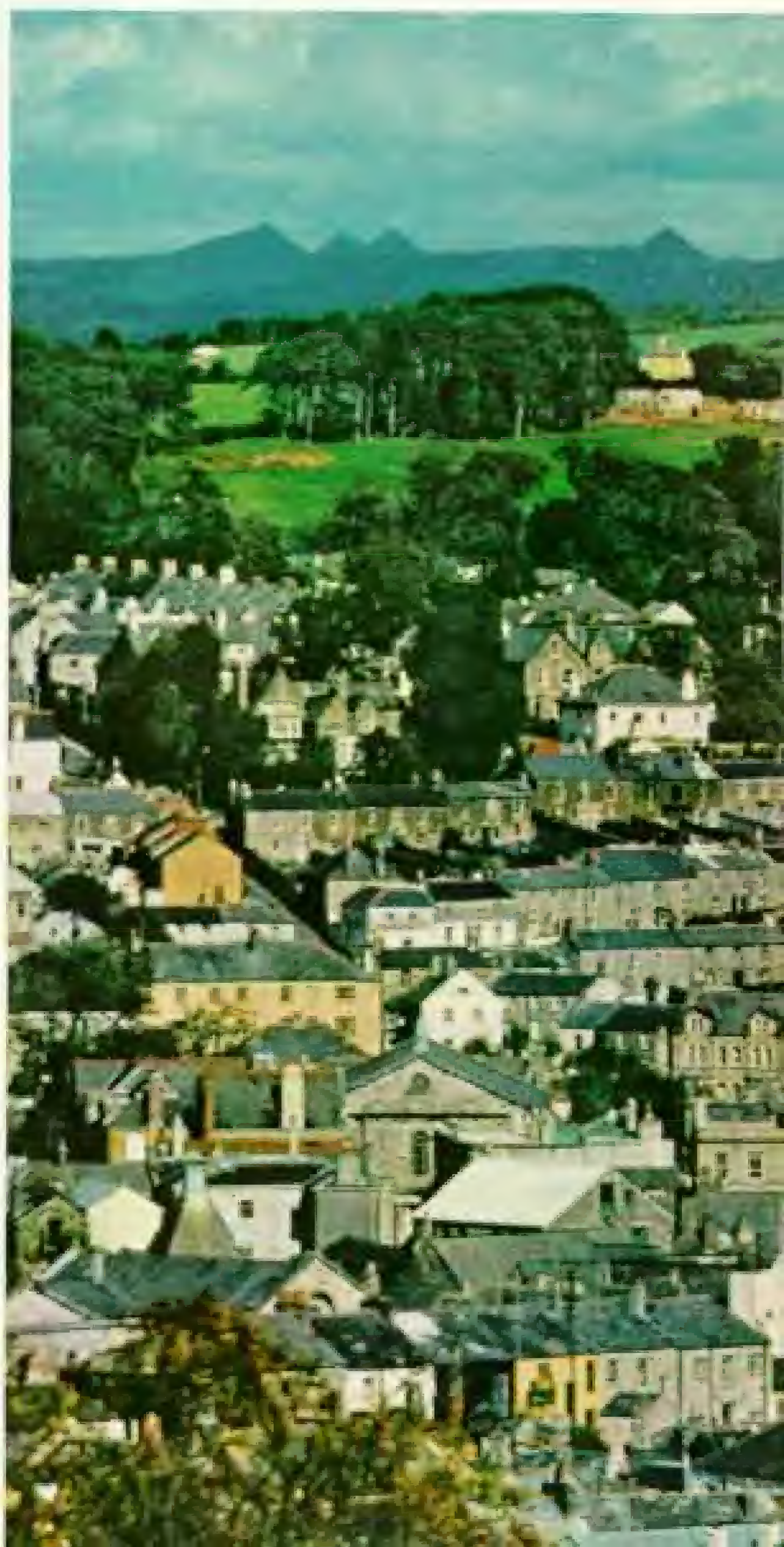
At Tintagel I forgot the scholars. I vote for Lord Tennyson and his *Idylls of the King*. I am prepared to go along with the shadowy, romantic Sir Thomas Malory when I look to seaward there. Sir Thomas was an English knight who lived when Columbus was a youth. His fame rests on his stories of the deeds of King Arthur—but even Sir Thomas's own identity was long disputed by scholars.

We scrambled up steep, winding steps (page 188) and looked upon a scene of wildness and beauty, a mystic, eerie scene in which all the myths of Cornwall could be at once accepted. King Arthur and his knights, the fair Guinevere, Lancelot and the rest *belong* here, and the mighty sword Excalibur.

But the castle "was, in fact, first built by Reginald, Earl of Cornwall," states the government, adding that the "visible remains were mostly built between 1236 and 1272." Under them, however, are traces of a Celtic monastery, very ancient, and of what else before that no man now can say.

Springy green turf floors the spot where once the famed Round Table may have stood. The crash of thundering seas, the crying of the gulls, and the sighing of the sea wind have long replaced the harp of Guinevere.

Dust of china clay whitens Fowey workers. Derived from decomposed feldspar mined in the moors, the clay is shipped to all parts of the world. For many years the fine paper on which the GEOGRAPHIC is printed wore a glossy coat of Cornish clay; now Georgia is the main source.



Cathedral spires dominate Truro. Pyramids of clay refuse, nicknamed the "Cornish Alps," rise on the horizon.

But in Cornwall the legends are real, and at Tintagel the ghosts remain.

From Tintagel I made toward castleless Boscastle and Bude. At Bude there was good surfing, under a beach guard's watchful eye, for some of these Cornish beaches can be dangerous, with undertows and fierce offshore sets that bear even strong swimmers out to sea (page 190).

Shifting Sand Reveals "Lost" Church

Port Isaac, like many small Cornish ports, I found to be a pretty place of narrow streets steep-pitched down the sides of a cleft in the cliffs, its harbor sheltering a few fishing craft and a yacht inside two stone breakwaters. By the beach sat a group of old mariners, attired in blues and jerseys, their eyes to seaward and their talk of Cape Horn and the big tramp steamers that sail from St. Ives.

I liked the looks of the beach of Perranporth, where the sands long hid the first church of St. Piran. Built there about A.D. 500 by a missionary from Ireland, the church was becoming yet another Cornish legend as the centuries passed and memories failed; but in the 19th century the sand moved again, and there it stood, lost no longer. I walked along the shore to see its crumbling stone walls, still standing after 1,400 years.

Near Portreath I braved the wind to stagger to the cliff edge, where a gaping hole is called, perhaps too appropriately, Hell's Mouth. Gulls hung within feet of the cliff, riding on the vertical draft, now and again darting to seize pieces of ice-cream cone held

Miniature lighthouse overlooks Mevagissey's harbor from a stout stone jetty. Skilled fishermen from here took so many pilchard that the village long ago acquired the nickname, "Fishygissey."

Ropes moor rowboats that have no place to go until the tide comes in; fishing smacks and yachts rest in shallow water. Windows of Mevagissey's hillside homes stare down at the stranded fleet.

up for them by generous visitors (page 187).

By this time I had some welcome additions to my crew. Melville Bell Grosvenor, President of the National Geographic Society, his wife Anne, and son Edwin had joined us from Washington, D. C. As we approached the ship, waiting in Falmouth Harbor, there was young Eddie, aged 8 and not an hour aboard, calmly seated at the masthead 60 feet above the deck, surveying the countryside as if he had been born there.

Seeing his mother, he hailed her with great delight, but this was not quite her sentiment when she took a horrified look aloft! There was precious little to hold to up there. Tom Blackwell said he had seen only one other person climb up there—and he was a veteran mountaineer.

There was still much more of Cornwall to be seen. One morning we hove up and moved off to sea again, bound up-Channel for the pleasant ports of Mevagissey, Par, Fowey, and Polperro. Anne drove along the shore to delight herself with the many hamlets and quaint little ports and villages there. Dr. Grosvenor and Eddie came with us, the latter scampering about the rigging thoroughly at home—no car rides for him, if he could help it (page 167). He had a couple of lines rigged over the counter, and he caught a bucketful of mackerel, which Ike fried forthwith for lunch—out of the sea into the frying-pan, literally, and they were *good*.

Armada Sailed Here to Its Fall

We wandered pleasantly along with a gentle west wind, staying close in by the land. Flags flew from the white lighthouse on St. Anthony Head, and the Cornish fields looked beautiful and parklike from seaward. Slow-moving rain squalls hung languidly about, but none caught up with us.

The wheel's kick was quiet for the moment, and the wind's song low. In my mind's eye I could see again the galleons of Spain's great Armada come rolling and creaking along this old sea road, guns run out tier upon tremendous tier, banners and pennants streaming in the wind, trumpets blaring, drums rolling on their troop-packed decks,

Cyclists Pedal Jauntily, Undaunted by the Rain

Passing this young couple on the road near Tintagel, Editor Grosvenor decided that their good spirits in the face of the deluge deserved recording. Getting out of his car, he waited for them to ride into focus, snapped the picture, and then shouted, "You're wonderful." Gaily the girl tossed back, "You're wonderful, too."

From beachside "caravans," vacationers at Fowey can hop out of bed and straight into the Channel. Increasingly popular, such trailer towns augment the strained hotel and rooming-house accommodations in Cornwall's most popular resorts.

Spanish grandees, bearded, magnificent, in command of them, square miles of the Channel water full of them. How splendid a sight this must have been!

I was bound next to Fowey, a beauty spot where a narrow river entrance broadens inside to a safe and spacious anchorage. Fowey was noteworthy in the 15th century as a hotbed of pirates. The "gallants of Fowey," they called themselves and, for a while, they bossed the whole Channel.

We looked about us for the Fowey gallants as we came sailing in on the modern leading marks, but Readymoney Cove was packed with bathing children, yachts lay moored thickly wherever they could fit around Polruan and in the harbor, and about the whole place was such an air of quiet and peaceful charm that it was difficult to believe there ever had been pirates there at all.

"Fowey children learn to pull a boat soon after they can walk," said Daphne du Maurier, the world-famed novelist, several of whose books had come vividly to life for us in Cornwall – at least in their local color and romantic background. Daphne du Maurier in private life is Lady Browning, wife of Lt. Gen. Sir Frederick Browning; her home is at Menabilly, close to Fowey (page 200).

There was, perhaps, local blood in those immortals of Kenneth Grahame's *The Wind in the Willows*, Mr. Rat and Mr. Mole, for two of Grahame's favorite haunts were Fowey and Falmouth. Fowey is the Sea Rat's "little grey sea town that clings along one side of the harbour." Grahame was married at Fowey church and came back again, year after year. He was a friend of another famous writer of those days, Sir Arthur Quiller-Couch, who wrote under the pen name of Q.

There is something about Cornwall, especially this section of the coast, that seems to suit writers. The novelist Leo Walmsley has lived and worked around Fowey for many years. A younger generation is making a name for itself near Mevagissey, not far away. This group is led by the writer Colin Wilson, whose *The Outsider* made a swift reputation when first published on both sides of the Atlantic in 1956. Today Colin Wilson works at Gorran Haven (page 201).

Clay Industry Builds Pyramids

Fowey is a china clay port, known the world over. Most of Cornwall's rich china clay goes abroad in ships from the river and the little port called Par, around the corner. The thrash of propellers from these two ports sends china clay by the 100,000 tons annually to the ends of the earth. As we sailed along the coast, we could see the giant heaps of sand which range the skyline everywhere like gray-white pyramids (page 197). This sand is the residue after the clay has been extracted, and the huge pyramids look as if the Egyptians had put them there.

China clay is a new Cornish industry, as time is measured in those parts.

"The use of these fine local clays wasn't discovered until the 18th century," said our friend Mr. L. P. Mendels, as he showed Bob Goodman and myself something of the industry. "A Plymouth chemist named William Cookworthy worked them first in 1755."

Cornish beauty recalls the lines of Thomas Hardy.

I have had dreams of that place in the West,
And a maiden abiding
There at an hiding,
Fair-eyed and white-shouldered, broad-browed and brown-tressed.

Water traffic at Fowey: Racing sailboats vie for position (opposite), and a ferry on daylong shuttle nudges its ramp (lower). Fowey's streets are steep and one way.

PAINTING (ABOVE) BY MELVILLE BELL GROSVENOR AND OIL DETAIL BELOW BY ROBERT F. SISSMAN © NATIONAL GEOGRAPHIC SOCIETY

The snow-white clay, called kaolin, is derived from the decomposed feldspar in granite. It can be dug up almost anywhere on the high moorland to the north of St. Austell. At that capital of the china clay industry I met Mr. A. N. G. Dalton, general manager of English Clays Lovering Pochin & Co. Ltd. He came forward smiling.

"I know you," was his pleasant greeting. "I'm glad to see you. We've shipped thousands of tons of china clay across the Atlantic for coating paper for the NATIONAL GEOGRAPHIC. It's one of the things that helps to make those color pictures look so beautiful. Would you like a cup of tea?"

I certainly did like a cup of tea and some Cornish cakes. We talked about kaolin. The wonderful stuff finds its way into all sorts of industries, from the making of fine china to rubber, plastics, paint, leather, drugs, textiles, and, of course, paper.

Beyond St. Austell, the coast between Charlestown and Par is Cornwall's most luxurious playground. Wide beaches offer good swimming, and there are fine clubs and expensive hotels. Huge beachside caravan [trailer] parks, well laid out and serviced, cater to holidaymakers by the thousand.

At Mevagissey we found the holidaymakers and their cars so numerous that the harassed harbormaster had turned the waterfront into a car park. His duties there kept him busy from daylight to dark.

Visitors Crowd Cornwall's Riviera

From Fowey I took the ferry—a small pontoon pushed by a smaller motor launch—across the river to Bodinnick and thence to the fishing ports of Polperro and Looe. I wound through narrow lanes, past harvest-ripe golden fields with high hedges full of ferns and with fuchsia forming hedgerows round the pretty cottage gardens. Every farmhouse, every cottage, every spot where man or woman dwells has its well-kept garden.

At Polperro there is scarcely room to walk

RESTLESS OF FLYN

in the crowded, winding, animated little streets—car parks full, cafes full, everything full but the harbor, where some half a dozen small, powered fishing vessels stand on props in the falling water. Artists sit at their easels along the quays and even on dockside roofs, for here every scene is a potential painting (page 156).

A pint-size stream washes merrily over its boulders through the town. Upon a seat with a sea-front view by the small fish market sits a row of genuine Cornish fishermen, their wind- and sea-tanned faces, their air of belonging there, so different from the sweeping tide of visitors who mill all round them.

"Bed and Breakfast" notices poke from almost every window in Polperro, and through the summer the locals are all but overwhelmed, for beds and breakfasts are in great demand, and lunches and dinners too. The little old fishing village with its gaily colored houses is as picturesque as it ever was, and three times as prosperous.

In winter, when the Channel gales rage, the fishermen may have it back. Not so long ago life for them at Polperro, Mevagissey, and all such ports could be tough indeed. They were plain fishing villages then, miles from anywhere, left to fend for themselves.

When we returned to the ship, the boys were sailing among the swans in the river, and a lively yachting race was going on. We sat on deck for a meal of nourishing Cornish pasties, a succulent mixture of spicy beef, rich gravy, and vegetables all baked together in individual casings of delicious pastry.

"I had your initials cut into them," Ike told the lads. "You won't be able to eat through a whole one at one sitting!"

He was wrong. He was following local custom, but underrating seagoing appetites of young sailors.

A family of swans, the little cygnets not yet pure white but their elders perfect, swam alongside. A trio of heeling dinghies raced by. A big tramp steamer flying the flag of Panama passed down with the tide, with a bustle of tugs and a hold full of china clay. From Readymoney Cove and the landing stage came the cries of happy children.

Famous author Daphne du Maurier (Lady Browning) finds the solitude she needs for writing at Menabilly, her Elizabethan home near Par.

In a writing cottage hung with her own paintings, she relaxes with her West Highland terrier, Pippin, after completing *Castle Dor*, a romantic Cornish novel begun by the late Sir Arthur Quiller-Couch.

"Every book is a purge," she says. "At the end of it one is empty . . . like a dry shell on the bench, waiting for the tide to come in."

Colin Wilson, 30-year-old author of *The Outsider*, dwells at Gurran Haven.

I gave the order to heave up the anchor with reluctance. Our cruise to Cornwall was all but over. We were bound now for the coast of Devon and home again.

To us all, young and old, the Cornish cruise had been just splendid, and we would carry with us memories of the romance, friendliness, and charm of this interesting, often beautiful, and always fascinating county in the far southwest of England.

Young Eddie loosed the jib, Tom took the wheel, the older of us stretched the main and mizzen. The sails filled nicely with the soft warm breeze, and we were off. As we passed serenely out to sea, we all looked back a long, long time.

Pliny Range

Jefferson

Highland

2020

U.S. 2

Meadows

Israel River

Boston and Maine Railroad

Pine Peak
2790

Mt. Millen
3050

Mt. Dartmouth
3721

Dartmouth Range

Mt. Deception
3604

Jefferson Notch Road

Ammonoosuc
Upper Falls

Base Road

Fabyan

Mt. Washington
Hotel

Ammonoosuc River

Bretton Woods

Edmands Path

U.S. 302

Mt. Clinton
(Mt. Pierce 4310)

Mt. Clinton Road

Crawford Brook

Mizpah Spring
Shelter

Maine Central Railroad

1776

Appalachian Trail

Crawford Path

Crawford House

Webster Cliff Trail

Avalon Trail

Saco Lake

Mt. Jackson
4057

Mt. Willard
2804

Saco River

Flume
Cascade

Silver Cascade

Mt. Clinton Trail

Crawford Notch

Mt. Webster
3910

Webster Cliff

MOUNT WASHINGTON

Lofty Crown of the White Mountains

Roads ——— Hut symbol
Trails ——— Shelter symbol

Elevations in feet

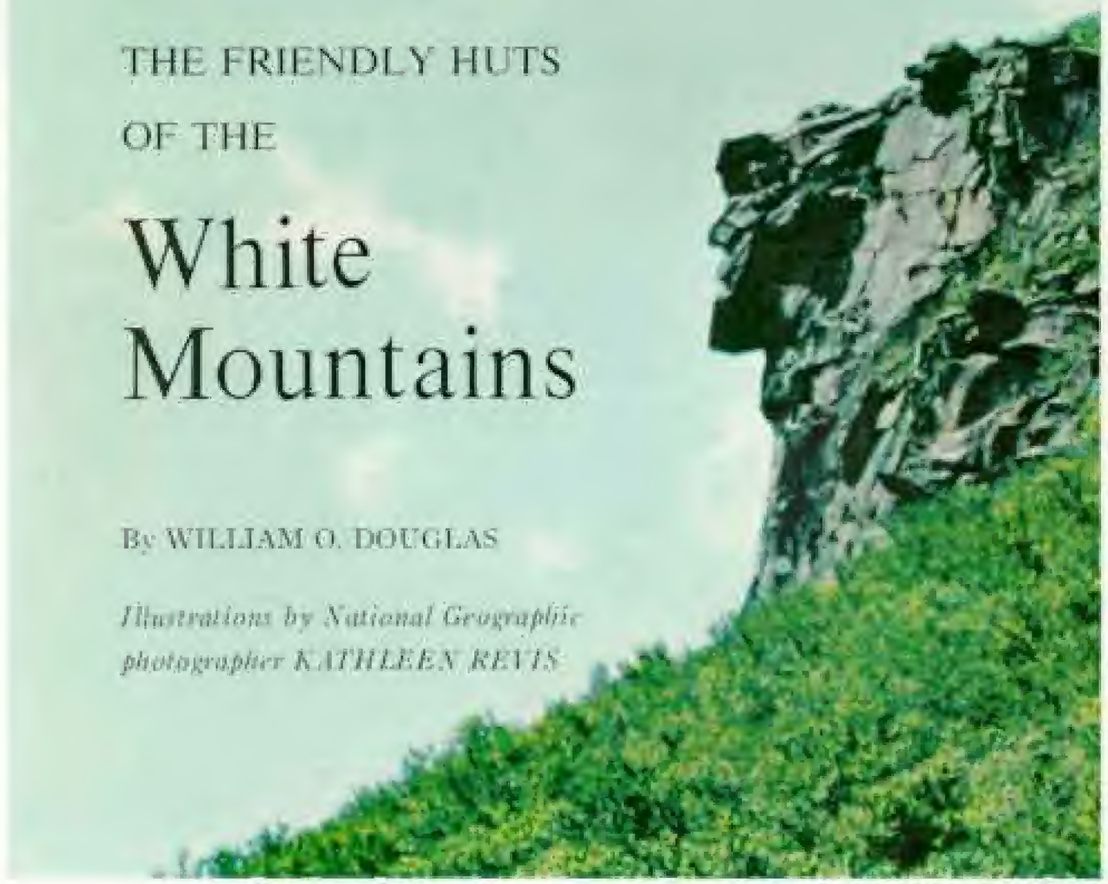
Research by H. Lee Peacock and art work by Robert W. Nicholson of the National Geographic Staff

Pond of Safety
Randolph Mt. 3070
2775
Crescent Range
Randolph Hill 1816
U.S. 2
Randolph Valley
Randolph
Air Line
Randolph Path
Crag Camp
King Ravine
Valley Way
Mt. Madison 5363
Madison Spring Hut
The Log Cabin
Gray Knob
Mt. Bowman 3450
The Perch
Mt. Adams 5798
PRESIDENTIAL RANGE
Edmands Col
Castellated Ridge
Mt. Jefferson 5712
Osgood Trail
Great Gulf Wild Area
Madison Gulf Trail
3840
Halfway House
Great Gulf Shelters
Caps Ridge Trail
Gulfside Trail
Mt. Clay 5532
Summit House
Mt. Washington 6288
Alpine Garden
Huntington Ravine
Jefferson Notch
Mt. Washington Cog Railway
Jewell Trail
Ammonoosuc Ravine Trail
Lakes of the Clouds Hut
Mt. Monroe 5385
2700
Base Station
Mt. Franklin 5004
Boott Spur 5500
Lion Head
Tuckerman Ravine
Raymond Path
Tuckerman Ski and Hermit Lake shelters
Tuckerman Ravine Trail
Crawford Path
Mt. Pleasant 4761
Gulf of Slides
Boott Spur Trail
Slide Peak 4807
Desolation Pond
Oakes Gulf
Montalban Ridge
Glen Boulder
Dry River Shelter No. 3
Isolation Shelter
Scars mark 1927 slide
Rocky Branch Ridge
3939
Mt. Isolation 4005
Dry River
Isolation Trail
Dry River Shelter No. 2
Isolation Trail
3660
Mt. Davis 3840
Dry River Trail
Davis Path
Rocky Branch Shelter No. 2
Rocky Branch Trail
Moose Brook State Park
N.H. 16
Grand Trunk Railway
Mahoosuc Range
Boston and Maine Railroad
Androscoggin River
1394
780
Moose River
Gorham
U.S. 2
Pine Mt. Fire Tower
N.H. 16
Pine Link
Pinkham "B" Road
Peabody River
Daniel Webster Scout Trail
Imp Mt. 3708
Imp Face 3175
Dolly Copp Campground
Middle Carter Mt. 4601
Carter Moriah Trail
Carter Moriah Range
Great Gulf Trail
Zeta Pass
Mt. Hight 4680
Glen House
Nineteen Mile Brook Trail
Mt. Washington Auto Road (toll)
Aqueduct Path
Glen House Reservoir
Carter Dome 4845
Emerald Pool
N.H. 16
Old Jackson Road
Wildcat Mt. 4397
Appalachian Trail
Carter Notch
Carter Lakes
Carter Notch Hut
Wildcat Mt. Recreation Area
Crystal Cascade
Pinkham Notch Camp
2032
Wildcat Ridge Trail
Pinkham Notch
Lost Pond
Glen Ellis Falls
1906
Wildcat River Trail
Wildcat Brook
Wildcat River
Ellis River
N.H. 16
1559
1416

THE FRIENDLY HUTS OF THE White Mountains

By WILLIAM O. DOUGLAS

Illustrations by National Geographic photographer KATHLEEN REVIS



THE MAP OF THE MOUNTAINS IS WAS...

IT HAD BEGUN on a sunny June day, our hike up the green-clad slopes of King Ravine. Now, an hour later and a thousand feet higher in the White Mountains of New Hampshire, the wind seemed to whip the calendar back to March.

A sudden storm whistled down the glacial cirque, drenching us; the temperature plummeted toward freezing. Mechanically I followed the spare figure of George Hamilton over tumbled rocks that lay everywhere along the steep trail.

Scrambling up one piano-size slab, I slipped on its greasy coat of lichens, skidded downward, and came to rest on my back, my rucksack caught in the top of a stunted birch. I laughed while George helped untangle me—then noted the 20-foot drop that awaited below the branches.

Cautioned now, and wearied by the climb, we slowed our pace. Fog moved in as we neared the tree line, cutting visibility to a few feet. I was dead tired and chilled to the marrow. Night was on us.

Abruptly the wind cleared a corridor through the mist, and there beyond a stand of dwarf spruce shone the lights of Madison Spring Huts—yellow beacons of cheer that promised hot food and warm bunks.

Hut Offers a Hearty Welcome

"Home at last!" George shouted. And so it seemed. In all my visits to the friendly huts of the Appalachian Mountain Club, I recall no heartier welcome.

Whenever I want a few days of wilderness hiking without carrying heavy camping gear, I head for the White Mountains

Crumpled mountainland of ridges and notches, trails and hikers' shelters, the Mount Washington area stands out in bold detail in this unusual relief map, made by photographing a plastic model. The model was produced to the National Geographic Society's specifications by the Aero Service Corporation of Philadelphia. To verify each detail, Geographic research cartographer H. Lee Peacock criss-crossed the actual peaks by plane. The area shown extends 12 miles from Bretton Woods on the extreme left to Carter Notch on the right (see map, page 210).

THIS PAGE FOLDS OUT

HE ATTACHMENT (RIGHT) AND FOREGROUND © NATIONAL GEOGRAPHIC SOCIETY

Hiking clothes replace judicial robes. Supreme Court Associate Justice William O. Douglas (center) arrives for a vacation in the White Mountains. New Hampshire's Gov. Wesley Powell (left) welcomes the distinguished visitor, who shortly set off on a wilderness hike with George T. Hamilton (right), manager of the Appalachian Mountain Club hut system. They climbed through wild flowers and forests, skirted precipitous ravines, and listened to the song of waterfalls. Higher trails led them across a skyscape of rock and wind, sometimes fog-hung, sometimes dazzling with sunlight, to boundless summit vistas. Stopping at AMC huts each night, they found food and fellowship.

Crystal Cascade: One of "a thousand waterfalls, making the dusk and silence of the woods glad with the laughter of the chasing floods, and luminous with blown spray and silver gleams." John Greenleaf Whittier wrote the description in *Mountain Pictures*.

and the huts of the AMC. If I select my route with care amid the miles of trails and logging roads that thread this region of New Hampshire, I need not pack a tent, sleeping bag, or food; yet I will sleep comfortably no matter how foul the weather, and be well fed.

These seven "huts" (perhaps a misleading term, for their bunkrooms hold from 30 to 90 guests in comfort) are unique in American mountaineering. Their doors are open to hikers between mid-June and mid-September. Under the direction of George T. Hamilton, manager of the AMC hut system (above), they are staffed by hand-picked high-school and college students who make hospitality their summer-vacation business. For a fee of $7.50 a hiker obtains lodging, supper, breakfast, a trail lunch for the next day's travel—and a companionship beyond price.

The Appalachian Mountain Club, which operates these huts, is not our largest—its membership of 7,500 is about half that of the West's Sierra Club—but it is our oldest mountain club, dating from 1876.*

Club Founded to Explore Mountains

Headed in its earliest days by a number of dedicated professors from New England colleges and universities, the AMC set out "to explore the mountains of New England and adjacent regions . . . and in general to cultivate an interest in geographical studies." Its members, of all ages and vocations, have since worked wonders in the recreational develop-

*With 55 other hiking clubs and hundreds of dedicated individuals, the Appalachian Mountain Club helps to maintain the 2,000-mile-long Appalachian Trail. See "Skyline Trail From Maine to Georgia," by Andrew H. Brown, NATIONAL GEOGRAPHIC, August, 1949.

Sunset's misty gold lights the trail for climbers approaching Lakes of the Clouds Hut

ment of the mountain country of Massachusetts, New Hampshire, and Maine.

In addition to the seven huts open during the summer and the base camp at Pinkham Notch, AMC* also operates a ski shelter in world-famous Tuckerman Ravine and unmanned lean-tos and cabins throughout the White Mountains. The club's magazine, *Appalachia*, has become a storehouse of information for climbers and nature lovers.

Hikers Roam a Mountain Playground

The White Mountains lie as though flung at random over some 1,300 square miles of northern New Hampshire, largely in the White Mountain National Forest. Actually they comprise several ranges, divided by gaps, or "notches"; dominating them are the treeless summits of the famous Presidential Range. Towering over all at 6,288 feet stands Mount Washington, loftiest in the Northeast (foldout, pages 202–4, and map, page 210).*

Modern highways snake through such famous notches as Pinkham, Crawford, and Franconia. Some 1,700 miles of footpaths, fire trails, and timber roads thread this cordial wilderness. A devoted band of AMC outdoorsmen and women has built and now maintains 354 miles of trail here.

Such accessibility has drawn millions of hikers, skiers, fishermen, campers, and climbers to the region, making it, all things considered, the most popular mountain playground in the United States.

It was not always so.

I first visited the White Mountains in the 1920's, when most of New Hampshire's roads were narrow and winding, many of them dirt.

*See "Mountain Top Of New England," by F. Barrows Colton, NATIONAL GEOGRAPHIC, May, 1951

Rousing chorus of "Dinah" sung by Justice Douglas and hutboys fills the kitchen of Carter Notch Hut, a night's stop on the author's trek. High-school or college students, the hutboys spend their summers cooking, cleaning, and packing in supplies.

Vacationists harmonize at Lakes of the Clouds Hut.

The mountains then seemed to me distant and remote, as they must have centuries ago to mariners who saw them from the Atlantic as "white hills" 70 miles away.

In those days I often went to Franconia Notch, where I liked to look at the Great Stone Face, made famous by Nathaniel Hawthorne (page 205). This natural wonder (now held in place by cables and bars) is known also as the Old Man of the Mountains.

Often, too, I would visit Crawford Notch, where one could rent a saddle horse and strike out into the forested slopes. The trail up Mount Willard, winding through spectacular hardwoods and flowering shrubs, made every ride an adventure.

Glen House Reservoir Mirrors Men and the Mountains They Seek

Bald heads of Mounts Adams (right) and Jefferson (left) rise above the Great Gulf Wild Area, 5,400 wooded acres set aside "for use and enjoyment by future generations." Glacial cirques, carved in the Ice Age, appear as dishlike hollows.

Seven friendly huts manned by the 85-year-old Appalachian Mountain Club dot the White Mountains of New Hampshire, offering food, bunks, and timely shelter from the area's sudden, fierce storms. Two of the seven—Madison and Lonesome—consist of several buildings and are referred to in the plural. Across the map slants an 80-mile section of the Appalachian Trail, the Maine-to-Georgia footpath that AMC helps maintain.

MAP BY VICTOR J. KELLER AND JOHN W. LEONARD

Since the 1950's, I have tried to hike these mountains each year, in either summer or fall. Last year I revisited this region for a week's hike with George Hamilton, Paul Doherty, State conservation officer, Lee Kelley of the U.S. Forest Service, and Kathleen Revis of the National Geographic staff, who made the photographs on these pages.

Before the five of us set out, George and I swung our legs on the porch rail at rustic Pinkham Notch Camp—headquarters for the AMC hut system—and discussed the visitor influx of recent years.

"These mountains are now within a day's drive for 40 million people," he said. "We have visitors every month of the year—nearly two and a half million a year altogether.

"November brings hunters as well as hikers," he continued. "From December to June, skiers and hardy winter climbers take over the slopes. Summer and fall, thousands of hikers take to the trails."

Since the first hut was built, on the shoulder of Mount Madison in 1888, the AMC's hut system has grown with the crowds.

"Today it's a chain-hotel business in miniature," said George. "We prepare between 40,000 and 45,000 meals each year."

Huts Spaced for Week-long Tour

The seven huts, together with the headquarters camp at Pinkham Notch, represent an investment of more than a quarter of a million dollars. The huts are so located along the ridges and cols that a hiker can plan a week-long itinerary, staying at a different one each night; or he can simply choose one as a destination and hike up in an afternoon

Picking a way up Mount Madison's Osgood Trail, girls from Camp Mudjekeewis meet "masses and fragments of naked rock heaped confusedly together, like a cairn reared by giants in memory of a giant chief," as Nathaniel Hawthorne described a slope in the Presidential Range. Campers from Mudjekeewis come to climb each summer

Gondola carries sightseers to the heights of Wildcat Mountain, which gives them a 70-mile view toward Canada to the north and the Atlantic to the east. Mount Washington rises on the horizon. In winter the 91-car Italian built lift serves skiers. Here, in summer, Stanley Judge (left), Wildcat's manager, welcomes a picnicking group.

Farthest east in the system lies a hut nestled in Carter Notch (see foldout, preceding page 208). We could have hiked up "The Slot," an easy 3.6-mile stretch of the Nineteen Mile Brook Trail, but we chose instead to ride the Wildcat gondola (above) and hike the more spectacular Wildcat Ridge Trail.

Purple finches were constant companions as the narrow trail repeatedly climbed and dropped sharply again. A breath-taking view awaited at every rise, but I found myself as enchanted by white banks of bunchberries growing thick along the path, and the delicate, greenish-white clintonia lily. Everywhere the ground was covered with oxalis—the low, shamrock-leafed plant which, when crushed, efficiently cleans hands of pitch.

Nowhere I could recall did the black spruce show to better advantage. On Wildcat Ridge it seldom grows higher than 10 or 12 feet, at this close range its cones shimmer with an iridescent purple hue.

At last on the edge of the notch, we gazed down 1,000 feet to Carter Lakes and the hut. The impulse to shout from this prominence proved irresistible. We took turns hailing the hut crew far below. But none of us got a response, not even an echo, for the deep spruce smothered our shouts.

Winter Ice Makes Summer Dessert

Slippery roots offered handholds as we half slid, half climbed down the steep slope to Carter. The hut, flanked by sheer cliffs, accommodates 50 guests and stands slightly higher than the level of Carter Lakes.

The larger of the two lakes is one of the few bodies of water in the Northeast that boast good fishing above 4,000 feet. Conservation officers, Paul Doherty explained, pack in brook-trout fingerlings every few years to restock it.

After dinner that evening a hutman spooned out generous helpings of fresh home-

Jogging up Mount Madison, student Gerry Whiting carries 85 pounds of food for the Madison Spring Huts. His Yukon pack, ten pounds of wood, rope, and canvas, puts most of the weight on his bare shoulders. Young, sturdy huthoys, all enthusiastic outdoorsmen, carry 90 percent of the supplies needed to serve thousands of meals each year in the seven AMC huts in the White Mountains.

Ringer! Dirt flies as a horseshoe finds its post. The midmorning break relieves a long day's work for Madison hutmaster Douglas Kirkwood. Rising at dawn, he and his assistants prepared breakfast and trail lunches for 50-odd hikers. Cleanup and packup followed. Afternoon will find them cooking for a new wave of guests.

To get the picture, photographer Kathleen Revis crouched behind the post for some 150 pitches. Dirt pelted her in the face, and each ringer sounded like "a shot from a gun." Fearful that she had missed her picture, she hiked seven miles for a return visit—only to discover later that she had caught this view on the first roll of film.

made ice cream—a long hike, I thought, from the nearest source of ice. Though three of the huts have generators for electricity, only Pinkham Notch Camp has a refrigerator. But ice, I learned, lingers far into the summer in the rocky crevices of Carter Notch.

When I awoke next day I folded my blankets, as hut guests are expected to do, and stepped out of the men's bunkroom into a morning that sparkled with a heavy dew.

George and I went to the lake's edge to wash up before taking to the trail. We stood in silence for a while in a stand of mountain ash, watching the "square tails"—brook trout—dimpling the surface. I turned away reluctantly, for this is a spot that invites, almost compels one to linger.

So, too, is Lonesome Lake, at the westernmost end of the chain of huts. Lonesome is a quiet mountain pond sitting above Franconia Notch, where the Old Man of the Mountains dominates the countryside.

Little sun reaches the trail into Lonesome even on a bright June day, I observed. Yellow and paper-bark birch, hemlock, and rock maple lock branches overhead, infusing the air with a soft emerald hue. White-throated sparrows kept us company along the broad path of crumbling rock and entertained us with their refrain: "Old Sam Peabody, Peabody, Peabody!"

Young Visitor Arrives on a Packboard

We exchanged greetings with a family group headed for the Lonesome Lake Huts. The youngest was a boy of five. I was not surprised, for one comes to expect all ages on these trails. George Hamilton's youngest son visited the huts when he was barely able to walk—carried papoose-style on a packboard. And fully 20 percent of the huts' guests are supervised groups from children's camps. Yet I have encountered more than a few hikers well into their seventies.

"I remember one old fellow who just wouldn't quit," Hamilton said. "I think he was 80 when we finally had to bar him from the huts for his own safety. Kept wandering off the trail, and finally got lost in the Pemigewasset Wilderness for three days. He lived on a couple of sandwiches until he was finally located."

Boys and Burros Stock the Huts

Linked by trails between Carter on the east and Lonesome on the west, four huts beckon the hiker along wind-blown ridges and forested defiles: Lakes of the Clouds, Zealand Falls, Galehead, and Greenleaf (map, page 210).

The last three lie in the broken, wooded country between Crawford Notch and Franconia. We took the easy way to Zealand Falls, driving to the end of a dirt road north of the hut, and hiking in 2.7 miles. Much of the way we followed the bed of a narrow-gauge logging railroad built in the 19th century. On the way we watched half a dozen protesting AMC burros being hauled aboard a truck with block and tackle.

"We use them mostly at the beginning of the season to stock the huts with case goods and heavy staples," George explained. "Even then we use them at only four of the huts. hutboys backpack 90 percent of our supplies."

Clouds hung low overhead like gray wool

late that afternoon when we reached Zealand Falls Hut—a restful, rustic cabin beside the falls of Whitewall Brook. Showers drumming on the roof lulled us to sleep, but sparkling sunshine greeted us next morning as we took the trail toward Galehead.

The route winds for about seven miles, up and down through black spruce, balsam fir, paper birch, mountain ash, and beech.

Timber line here varies with wind and soil. Trees creep higher on the eastern and southern slopes, sheltered from prevailing winds. But even there, in the 4,000-foot zone, the spruce, balsam, and birch are usually dwarfed.

Moss lies lush most of the way. I love this botanical matriarch, for it serves as seedbed for many flowers. It also germinates spruce, fir, and birch seeds, nourishing the seedlings among the wind-swept rocks until they can anchor their roots.

Galehead Hut, like Zealand and Greenleaf, accommodates 36 guests, but only two others occupied it the night we stayed there. Later in the hiking season its bunkrooms occasionally overflow, and hikers without advance reservations must sometimes settle

Bedtime Is Never Too Soon After a Long Day's Climb

Carter Notch Hut receives its early-to-bedders—children who hiked up Nineteen Mile Brook Trail. All but the two-year-old at lower left made the trip under their own steam: he rode on his father's back.

Three blankets on each bunk ensure comfort when temperatures drop to near-freezing in the unheated stone hut.

Pigtail swinging, a youngster climbs a ladder to her bunk in Zealand Falls Hut. White Mountain huts provide bunks for more than 15,000 hikers each year.

Camel-sized Load Arrives Atop Youth in a Zebra Vest

Back-straining bundle, 185 pounds of groceries, eases off the shoulders of William Belcher, assistant hutmaster at Lakes of the Clouds. Eighteen years old, he packed the load 1¾ grueling miles downhill from Mount Washington, where supplies are trucked in. Perhaps even harder than climbing, downhill packing requires steady footwork and balance. Slippery rocks invite spills.

"The boys sort of stagger down the mountain," photographer Revis observed.

Swells and peals of an organ enliven evenings at Zealand Falls Hut. Assistant hutmaster Henry A. Zoob plays; Navy chaplain Capt. A. R. Cook, his wife, sons, and daughter join in song. The organ, like all else, was packed in.

for cots or even sleep on dining-room tables.

Beyond Galehead Hut the trail jogs up and down through thick stands of timber, past rivulets and springs where I like to put my face to the cold, pure water.

We opened our trail lunches on Mount Garfield, where a fire tower once stood. We lay on smooth granite on the lee side, a bright sun warming the rock. The only sound was the whistling of the wind. The only movement was the scudding of white clouds and a hawk that soared gracefully high overhead.

"No traffic," I sighed.

"No exhaust fumes," Kathleen added.

"No people," said Paul.

"Not even a telephone," George murmured happily, eyes closed.

We pushed off down the trail to Garfield Pond, a small, shallow lake fringed with lily pads, and slaked our thirst at Elizabeth Spring, barely large enough for dipping, where the water stays at about 38° on the hottest summer day.

George and Paul paused to examine a sharp-clawed track, strange to me. They nodded in agreement: a fisher. This large and ferocious member of the weasel family flourishes in the White Mountains.

"They call him the 'forester's friend,'" Paul said. "For a good meal he'll wade right into a porcupine, which does a lot of timber damage up here. The fisher's as fast as he is tough, too—one of the few animals I know that can run down a red squirrel in his own tree."

Grouse Attacks Human Invaders

Game is more abundant in this area than in others served by the huts. This is a favorite haunt of the Virginia deer. Bobcat sign is frequent. And I always see snowshoe rabbits here.

Once, on an earlier hike with George Hamilton, I lagged behind while he disappeared around a bend. Suddenly I heard him laugh, shouting, "We're being attacked!"

When I caught up, I saw a hen spruce grouse, mottled with reddish, golden-brown feathers, charging him over and over again. Red marks above her eyes gave the illusion of genuine anger. Only when her brood of half a dozen chicks had reached cover did she retreat and leave the trail to us.

This area is abundant with birds—thrushes, juncos, black-capped chickadees, chestnut-sided warblers, hairy woodpeckers, ruffed grouse, winter wrens, robins, cedar waxwings—and, of course, the usual purple finches and white-throated sparrows. In summer when I sit quietly by a shaded pool or brook west of Galehead, I hear some of the finest orchestrations that the birds of the north woods produce.

As one leaves Garfield Pond for Greenleaf Hut, he climbs sharply toward the barren-looking mile-high summit of Mount Lafayette. From its crest the hut can be seen on open ground, nearly a mile to the west.

Greenleaf's three hutmen had seen us from a window as we worked our way, hot and weary, down the last scree slope. They welcomed us with a cooling soft drink. Shedding our rucksacks, we found dinner waiting on the rough wooden tables.

Hungry Camper Stokes Up

Already at the table was the only other human we had encountered that day—a burly camper carrying a heavy pack who had barreled past us with a cheery wave. From a hutman I learned that he had been camping out in the mountains for a week, eating mostly dried foods. Now he was making up for it.

Skyline Siding Eases Cogwheel Traffic Jam on Mount Washington

This sightseeing line, the Mount Washington Cog Railway, began operations in 1869. "Old Peppersass" trains, so called because the original locomotive resembled a pepper-sauce cruet, make the 6½-mile round trip in three hours. Each passenger car boasts its own locomotive, and both have brakes. Cars ride uncoupled ahead of engines on upgrades, behind them on downgrades. Boilers built for grades averaging 25 percent tilt oddly forward on level ground.

Billowing smoke, a "Puffin' Devil," as the trains are also dubbed, tackles the first rise near Base Station.

My own healthy appetite satisfied, I watched while he ate his way with silent singleness of purpose through three huge helpings of roast beef and vegetables. He glanced up inquiringly at the hutmaster, and the two exchanged knowing grins. A fourth plateload disappeared. I looked on in awe as the camper filled in a few remaining crevices with a large stack of fresh-baked brownies.

Family-style meals are served at all the huts. And it is always a joy to me to watch the hungry eyes of a camp group—perhaps 20 to 30 youngsters—following the motions of a hutman carving a turkey (page 227). The aroma of a crisp brown bird, bubbling soup, and hot biscuits seems magically to take the ache out of tired feet.

Every meal is a gay social event as well as a feast. Each hut seems to have at least one hutman who plays either the mouth organ or the guitar. I have joined them in after-dinner musicals from Carter Notch Hut to Lonesome (page 209).

Greenleaf Hut overlooks Franconia Notch (page 236), and from near by one can see the sheer cliffs of Cannon, or Profile, Mountain. From its heights the Old Man of the Mountains gazes serenely over the valley.

But as friendly as these mountains are, they can deal cruelly with those who underestimate them. Over the years 29 have died on Mount Washington alone. Paul Doherty, who has helped to carry out unfortunate victims, pointed out to me the scene of a tragedy less than a year earlier.

Youths Die Beneath Old Man's Face

When Sidney Crouch, age 21, and Alfred Whipple, Jr., 20, were seen one August afternoon stranded 500 feet up on the cliff below the Old Man of the Mountains, word was sent to AMC headquarters at Pinkham Notch. A crew of experienced mountain climbers quickly assembled, but driving rain, fierce gusts, and near-freezing temperatures made the rescuers' climb immensely difficult. Not until the next day did they reach the ledge.

"The two boys died of exposure soon after

Clouds Bonnet the Dome and Skytop Community of Mount Washington

In climate, flora, and fauna, this 6,288-foot peak is a bit of Labrador transplanted to New Hampshire. Winds here blow harder and more constantly than at any other spot under observation. Weather instruments in 1934 recorded the highest wind velocity known—231 miles an hour. With wind comes fog, shrouding the tree-bald peak 25 days in the average month.

In fall, winter, and spring, sometimes even in summer, the fog freezes into rime that coats rocks and buildings with ice. Hail and sleet hit like bird shot. Snow depth above timber line rarely exceeds a few inches except in sheltered pockets, but winter temperatures sometimes drop to 30° below zero and once hit −58°. "Misery Hill," as weathermen call the mountain, serves as a testing ground for arctic gear.

Darby Field, of Exeter, New Hampshire, first climbed the mountain in 1642, only 22 years after the Pilgrims landed. Since then, thousands have followed by horseback, car, railway, and foot.

In 1833 a guide wrote: "Wm. S. Gookin ascended . . . in a violent rain, got a thorough wetting, saw nothing but clouds and rocks, got nothing (except a cold)."

But P. T. Barnum had better luck. He labeled Mount Washington's spectacular view the "second greatest show on earth."

In this aerial picture, the mountain casts its shadow across an entire valley, and distant mountains roll away toward Maine.

A small but important weather observatory, anchored by 10-steel rods, and a television transmitter appear in foreground. Summit House and Tip Top House, summer hotels, rise at rear.

the first climber reached them," Paul said. "Their climbing equipment consisted of two lengths of rope, a carpenter's hammer, and a few short iron rods. They were inadequately clothed and lacked the experience for so dangerous a climb."

Rescue work in the national forest is in charge of the district ranger, who relies heavily on the AMC. George Hamilton keeps a list of 18 expert mountaineers according to their particular skills, such as ice climbing or rock work, together with their day and night telephone contacts.

Rescue equipment, ranging from windproof clothing to basketlike metal Stokes litters, is cached at key spots. Radio connects Mount Washington with Pinkham Notch, and a telephone with Lakes of the Clouds Hut, although the other huts can communicate only by "moccasin telegraph." Most rescue missions have happier endings than the one on Cannon Mountain. That same year AMC and Forest Service crews successfully answered 36 search and rescue calls.

Arctic Plants Thrive on Rocky Heights

Expert mountaineers find ample challenge in the White Mountains. A group within the AMC has formed the "4,000-Footer Club," open to anyone who has climbed 46 designated peaks above 4,000 feet.

Two friends of mine, Miriam Underhill, editor of the AMC magazine, *Appalachia*, and her husband Robert, now form an even more exclusive group: those who have climbed all 46 in both summer and winter. Making their last ascent of Mount Jefferson to achieve this unique record in December, 1960, the couple snowshoed to the summit in winds up to 35 miles an hour and temperatures ranging to 8° below zero.

The feat sounds impressive enough, but consider the fact that Mrs. Underhill is in her 60's and her husband is 72!*

Most hikers in the White Mountains are content to visit one or two of the huts, or to cover the entire circuit in a leisurely (in our case, even haphazard) way.

Of all the huts, Lakes of the Clouds—with a capacity of 90 guests—attracts the largest crowds, principally because it is so close to Mount Washington, which can be ascended by road, cog railway, and trail.

The Lakes hut has, however, another distinction: It rests near the base of Mount Monroe, and here the moist, rocky soil produces the most exotic wild flowers to be found in New England. Some I have found also in the Brooks Range of Alaska, 1,600 miles more northerly; others are akin to plants of Labrador and Greenland.

Cranberries with small, leathery leaves and tiny pink flowers grow here, as do delicate alpine saxifrage, lush cassiope, and Solomon's seal. A purplish mountain heath shows urn-shaped flowers, the Greenland sandwort makes beds of white.

Pale laurel displays tiny, star-shaped flowers of reddish pink. A tiny white sprite known as dwarf cinquefoil grows along the trails. Most profuse of all are creamy beds of arctic *Diapensia lapponica* that mantle the rocky surfaces (page 230).

Building Bolted to Windy Peak

It was at the Lakes that I learned how severe Mount Washington weather can be, even in late June. It had seemed warm as we hiked; indeed, I felt as if I had worn too much clothing. After dinner at the hut, when the sun was still high, I went out to explore some of the near-by botanical wonders. I wore no hat or jacket and felt comfortable enough.

Suddenly the wind came up. It arrived like a gunshot. In a few minutes it was blowing a gale. The temperature dropped fast, and before I could walk 100 yards I was blue with cold. There were moments on the half-mile hike back to the hut when I questioned whether I would be able to reach it. The experience taught me the awful threat Mount Washington holds for an incautious hiker.

The White Mountains are not high, even by United States standards. Yet they suffer some of the worst weather we have, for disturbances from the Great Lakes and the Gulf of Mexico often converge here, and the area lies close enough to the coast to feel severe storms from the Atlantic and Newfoundland.

As early as 1870 scientists spent long winter vigils atop Mount Washington. The present weather observatory there was established in 1932 (page 222). A staff of four to six mans it the year round.

They live and work in a small structure known as "the strongest frame building in the United States." Its framework of 10-inch railroad trestle timbers is bolted at least five feet deep into solid rock and concrete. Seven-

*A veteran mountaineer, Miriam O'Brien Underhill wrote "Manless Alpine Climbing" in the NATIONAL GEOGRAPHIC, August, 1954.

Striking Out Through Clouds on Mount Washington, Hikers Head Toward Tuckerman Ravine

Foul weather dictates that this party bypass Washington's summit. Such prudence saves lives. 29 climbers have perished on these slopes.

"Its accessibility and extremely violent and unpredictable weather make this one of the world's most dangerous peaks," says mountain expert Bradford Washburn.

Glacier-gouged Tuckerman Ravine (page 230) holds its snows for skiers into June.

"**Turn back now** if the weather is foul," says a sign beside the Ammonoosuc Ravine Trail near Lakes of the Clouds Hut. "The area ahead has the worst weather in America. Many have died there from exposure, even in the summer."

Satisfying appetites made ravenous by exercise and mountain air, a Lakes of the Clouds human fills bowl after bowl with salad. These enthusiastic young cooks can whip up dinners for 80 to 125 guests on any summer afternoon.

To break 90 eggs fast, a chef uses but one hand. He works at night to save time before breakfast.

layered walls ward off the summit's wintriest weather.

On all my climbs I drop in for a visit with these men, drink a cup of coffee with them, and watch their various instruments in operation. They make eight observations daily, sending five by radio to the U. S. Weather Bureau station at Portland, Maine.

I have spent hours perusing their records. The entries for April 12, 1934, show a wind of 231 miles an hour at the summit—the strongest ever measured anywhere in the world. Another reading, in wintertime, shows an unofficial low temperature of −58° F.

A 50-, 60-, or even an 80-mile wind is not unusual even in summer. Storms come up with incredible swiftness here, and a piercing cold wind can quickly reduce the body temperature of a lightly dressed, unprepared hiker below the safety point.

AMC Seminars Stress Safety

That is one reason the AMC hut system serves a special need in these barren, wind-blown regions. The three huts at or above tree line—Greenleaf, Madison, and Lakes of the Clouds—provide a comforting safety factor to hikers and climbers.

In addition, the AMC uses its huts early every season for the training of camp counselors in mountain leadership. Groups of boys and girls from more than 60 camps

(Continued on page 231)

Juicy breast of turkey vanishes under the knife of hutmaster Charles Kellogg, a Williams College track star. One hutman, something of a connoisseur, likes to try foreign dishes and imported ingredients. His manager regretfully has to limit his menus.

Lobster Pots Dot a Lake of the Clouds: a Hoax to Deceive Gullible Visitors

Hikers bound for Mount Washington thread trail-marking cairns overlooking one of the lakes. Although hutmen swim in the frigid waters, photog-

raphet Revis "never saw a day warm enough." Lakes of the Clouds Hut, largest in the AMC system, hugs a rocky shelf beneath Mount Monroe. Mount Washington Hotel, scene of the Bretton Woods Monetary Conference in 1944, appears as a long white smudge far below in the valley.

Wild-flower hunters find blooms on the rim of Tuckerman Ravine. Blanketed by snow until summer, flowers on the headwall of this glacial cirque abbreviate their blossoming time. Springtime violets often pop out with fall's goldenrod.

Large-flowered trillium (*Trillium grandiflorum*) glows starlike in moist woodlands.

Pale laurel (*Kalmia polifolia*) nods delicate blossoms in a trailside meadow flower left.

Diapensia (*Diapensia lapponica*) clings bravely to a rocky bed above timber line.

throughout the Northeast visit the hut system each season, and their leaders gather beforehand for several days of seminars, lectures, and familiarization with the maze of mountain trails.

At the Lakes hut I sat in with George Hamilton on one of these sessions, attended by 60 participants. Problems ranged from "Where should a group be taken to see the striae formed by glaciers?" to "How does one get help if a youngster breaks a leg or has an attack of appendicitis?"

"Discuss the pros and cons of the Huntington Ravine Trail and the Randolph Path, respectively, as escape routes during inclement weather," went one problem.

"The Huntington Ravine Trail is too steep to lead the average children's group either up or down in dry weather; in wet weather it is out of the question for descent by a camp hiking party," was the correct answer.

"On the other hand, the Randolph Path offers a gentle escape from Edmands Col down into the trees on the Randolph side of Mount Adams, and is the trail to take to escape severe weather on the ridge."

This is the kind of stuff around which these annual AMC seminars are built. They teach hikers what they must do to be safe when the mountains turn treacherous.

Club Members Tamed the Mountains

One cannot long wander through the White Mountain country without being impressed by the number and the excellence of its trails. A few of them were built before 1876, when the Appalachian Mountain Club was formed, but not many.

AMC members made nearly every high ridge accessible; they established a network of through trails which made possible cross-country travel from Carter Notch to Franconia Notch and even beyond. Other groups, notably the Randolph Mountain Club, added access trails. By the turn of the century the AMC had built and was maintaining 100 miles of trails.

Some of these were hacked out of thick

PHOTOGRAPH © NATIONAL GEOGRAPHIC SOCIETY

Shower of tiny pink blooms, alpine azalea (*Loiseleuria procumbens*) spreads across gray rocks rimming one of the Lakes of the Clouds. Ruler shows size of the flowers

forests, and trees along the way were marked by blazes. Above tree line, white stencil marks were painted on rocks, or cairns topped with white rocks were erected. In some places these cairns stand only a few feet apart to help keep hikers on the trail even in thick fog (page 228).

Trail Crews Keep Paths Open

AMC never neglects trails that it has built. At Hutton Lodge in Whitefield, during summer months, it maintains quarters for a trail crew of a dozen men or so, drawn from high schools and colleges. I have often met such crews clearing downed timber, repairing washouts, re-marking obliterated signs, or "brushing out" paths clogged with new growth.

Perhaps the most ambitious trail builder of all was J. Rayner Edmands of the Harvard Observatory, who spent 18 years at it until he died in 1910.

"He used to live in the Randolph Valley and hike up here every morning with a crew of workmen. They'd spend the whole day shifting rocks with a crowbar to lay them flat," said Hamilton as we walked along the Gulfside Trail, where Edmands had done his work more than half a century earlier. The trail, leading into Madison Spring Huts, looked in places almost as smooth as a garden walk, though it passed through tumbled masses of granite.

Hutmaster Doug Kirkwood, a student at Middlebury College, Vermont, greeted us with a broad grin at the door of Madison.

"Let's look busy—here come some more goofers!" he shouted to his four hutmen.

"Goofer" is not as derisive a term as it sounds, hutmen apply it to any visitor. Nor did the crew have to look busy. Their working day had begun before six that morning with the preparation of breakfast. It would end perhaps at nine in the evening, after trail lunches had been made up for the hikers to take with them next day.

The hutmaster, who has all the responsibility of managing a small hotel, prepares a roster for each day's work—dishes, cooking, cleaning, packing supplies. Most hutmen, ranging in age from 16 to 23, can cook surprisingly well, the younger ones learning

Shooting a waterfall in the Ammonoosuc River, a swimmer drops between rock walls into raging water. "Like a hand on your head, the current pushes you toward the bottom of the pool," one youth told the photographer. "When I am not cautious, whirling eddies spin me around and around on the surface."

Body rigid, Carol Gavin appears to stand in the midst of the race.

from their seniors. Many scorn modern mixes, turning out delicious hot breads, cookies, cakes, pies, and puddings the old-fashioned way.

At Madison one youth throws himself into the role of chef with rare dedication, beaming as hungry hikers wolf down such specialties as eggs Benedict.

"We have to hold him down once in a while," George confided with a chuckle. "He keeps asking for avocados and cooking wine, and spices I never heard of. We want the huts to put out good meals, of course, but we're not running Maxim's of Paris up here!"

From the base camp at Pinkham Notch, Hamilton looks over the orders and does the purchasing of supplies—from bacon to blankets. Twice a week AMC trucks take the orders to packhouses located below the huts, where hutmen pick them up.

Often I have paused on the trail to chat with these rugged, enthusiastic youths, their packboards impressively loaded with canned goods, 50-pound tanks of propane gas for cooking, even lumber and paint for hut repairs. Most wear faded packing shorts, cut down from dungarees, slit and laced up the sides for greater leg freedom (page 214).

Madison hutmen take about three hours to climb the 3.6 miles up the steep Valley Way trail with loads of 70 to 100 pounds or more—about the speed of an average hiker with a light knapsack. Each hutman commonly packs up more than a ton in a season.

A hutman filling a gasoline can accidentally set Madison afire in 1940, causing severe damage. AMC later hired dozens of packers to haul up building materials, weighing the loads at the top and paying the bearers 5 cents a pound. A French Canadian set a record that still stands when he packed up 224 pounds in one load.

Suspension bridge swings across Saco River at the start of the Davis Path from Notchland in Crawford Notch toward Mount Washington. The route forms part of a 354-mile trail system maintained by the Appalachian Club.

Truck Rides Trail on Hutmen's Backs

Over several cups of after-dinner coffee with George Hamilton and Doug Kirkwood, I learned that hutmen are paid from $16 to $50 a week, plus room and board. Yet Hamilton sorts through as many as 200 applicants each year to fill perhaps a dozen vacancies.

"Once a boy spends a summer in these mountains, they seem to get into his blood," said George. "Most of them come back year after year until they finish college."

And after all this packing-in, what does a hutman do on his days off? He goes hiking, of course. Most hutmen own a cherished map liberally "red lined": veined with red pencil marks tracing the trails they have covered in the complex White Mountain network.

And there is always time to perpetrate a hoax on goofers. The Madison crew one year dismantled a worn-out truck and packed it three and a half miles up to the hut. On a boulder-strewn slope they reassembled it, simply to savor the astonishment of weary climbers confronted by a motor vehicle 3,600

Mountain Visitors Dry Out After a Rainy Night at Sugarloaf Campground

Two Pennsylvania families, the Robert Sayres (above) and the Allan Ersleys, drove into the White Mountains to spend their vacations under canvas. Pitching camp, they endured a night-long rain that left their gear soaked.

Sometimes weather forces campers to seek permanent shelter. One night the howl of wind and lash of rain awoke Miss Revis in Madison Spring Huts. Alone in the dark bunkroom, she felt a shiver of fear when the door opened and someone slipped into the room. Her visitor turned out to be a woman whose tent had proved no protection against the elements.

Night discomforts forgotten, small campers wash blueberries they gathered themselves.

The world falls away from Greenleaf Hut lookout. Cannon Mountain's ski runs streak

the forested slope at left; Echo Lake adorns Franconia Notch. Vermont lies on the horizon


SERVICE

Hearty breakfast prepares Justice Douglas and his friends for a muscle-stretching day. George Hamilton and Mrs. Joseph Casey of Washington, D. C., flank the author.

Hikers Alone in a Granite Immensity Trudge Across New England's Roof

"New Hampshire mountains curl up in a coil," wrote poet Robert Frost. This view from Franconia Ridge pictures his words.

At the center of the coil lies Mount Garfield (foreground); the Twin Mountain Range swings behind and around it. On the outer arc stand the Presidential peaks, culminating in Mount Washington (far right).

feet above the highway. Last year lobster-pot buoys appeared incongruously in one of the Lakes of the Clouds (page 228).

"Another time," George recalled, "the Lakes crew slipped out in the middle of the night, hiked more than seven miles in the dark, and swapped places with the Madison boys. Sleepy breakfasters at both huts had a hard time figuring *that* one out."

But goofers have proved their resourcefulness, too. One couple turned up just in time for dinner at a hut miles from civilization, impeccably attired in evening clothes, down to patent-leather pumps and spiked heels (the result, it developed, of a quick change in the near-by brush).

Doug Kirkwood, who had served at Madison for four summers, went on to praise the spirit of most hikers who stop there to spend the night in rough, unheated bunkrooms and eat the plain, hearty fare.

He spoke of the new hutmen, and their need to get into condition quickly to pack heavy loads. He spoke with pride of their achievements in packing, in learning to accommodate themselves to all kinds of people, in developing the varied skills a hut job requires. As he talked, I caught from him the spirit of these men who work hard for small wages because they love the mountains and the outdoor life.

"Helicopters? Not on Your Life!"

Our talk finally turned to the future of the huts. Someone had mentioned to me on this trip that with helicopters the drudgery of backpacking would be eliminated.

"What would you think of that?" I asked.

Doug Kirkwood shook his head. "Helicopters? Not on your life!" he replied. "Then the romance would go out of the huts. Backpacking brings a sense of achievement."

I knew what he meant. Now it is the hutman versus the mountain. The man who carries a hundred pounds on his back as he climbs 3,000 feet has a feeling of fulfillment that makes even sweat and toil a joy. And often he rates the experience as the brightest in his life.

By the same token, the weary hiker who stays the night, dines heartily, makes small botanical, geological, or ornithological discoveries in the surrounding country, sees the sun set over distant ridges, and shares in the conviviality of an evening with the hutmen, feels somehow compelled to revisit the huts over and over again.

As I do.

Report on Laos

Hardship and peril become daily experiences when the 20th century explodes in a quiet land of rice farmers

By PETER T. WHITE
Photographs by W. E. GARRETT
National Geographic Staff

THE FIRST RATTLE of the machine guns, at 7:10 in the evening, roused around me the varied voices and faces of fear.

"Sounds exactly like last time." The young man spoke steadily enough, but all at once he looked grotesquely unshaven. The middle-aged man said over and over, "Why did I come here, why did I come here." Then he was sick. Amid the crackle of small arms and automatic weapons, I heard the thumping of mortars. Then the lights went out.

This was my second day in Vientiane, the administrative capital of Laos, and my thoughts were none too brave. Where was my flashlight? Where should I go? To my room? Better stay in the hotel lobby, where the walls looked good and thick.

Chinese and Indian merchants across the street were slamming their steel shutters. Hotel attendants pulled parked bicycles into the lobby. A woman with a small boy slipped in between them. "Please," she said, "please." She held out her hand to show that she had money.

The American newspaperman worried about getting to the cable office. But what was the story? Had the Communist-led Pathet Lao finally come this far? Or was it another revolt inside Vientiane?

"Let's play hero," I said. "Let's go to the roof and see."

Gunfire Saves the Moon

By 7:30 the answer was plain. There had been an eclipse of the moon. A traditional Lao explanation is that the moon was being swallowed by a toad, and the remedy was to make all possible noise, ideally with firearms.

The din was successful, too, for just before the moon disappeared, the frightened toad had begun to spit it out again, which meant good luck all around.

How quaint it all seemed the next day. A restaurant posted a reminder to patrons "who became excited and left without paying their checks." But everyone I met had sought cover first and asked questions later. And no wonder, for Vientiane, the old City of Sandalwood, had become the City of Bullet Holes.*

I saw holes in planes at the airport and in cars in the streets. Along the main thoroughfares hardly a house had not been peppered. In place of the police headquarters was a new square filled with rubble. Mortars had demolished the defense ministry and set fire to the American Embassy next door. What had been the ambassador's suite was now jagged walls of blackened brick.

This damage had been done in the battle of Vientiane, fought less than three months earlier when four successive governments had ruled here in three days (December 9-11, 1960). And now, in March, all Laos suffered a state of siege. The Pathet Lao forces held two northern provinces and openly took the offensive in three more. Throughout the land their hit-and-run terrorists spread fear of ambush and death.

*See "Little Laos, Next Door to Red China," by Elizabeth Pearse, NATIONAL GEOGRAPHIC, January, 1960.

Decked in her worldly wealth, a hill woman pauses outside a village market in Laos, Oregon-sized kingdom whose borders edge a militant China and Communist North Viet Nam. Her headdress marks her as an Akha, one of the country's many minority groups.

Author White tells in this perceptive article how Communist-inspired warfare has affected a simple land and its shy, peace-loving people.

"And it's all the more tragic because it's so little deserved," said Mr. J. J. A. Frans, a Belgian official of the United Nations Educational, Scientific, and Cultural Organization. We talked after I hailed his Jeep marked with the U. N. flag.

Practically all the people of Laos, he explained—about two million of them—are rice farmers, and the means and motives of modern war are as strange to them as clocks and steel plows. They look after their fields and children and water buffaloes in ten or eleven thousand villages, with an average of 200 souls. Nobody can tell more closely how many villages there are. They spread over an area no larger than Oregon, yet they include peoples as different from one another as Oregonians are from Patagonians.

Life Must be Kept in Harmony

"What matters here is family loyalty; faith in the Buddha and staying at peace with the *phis*, the spirits; and to live in harmony with nature."

Harmony in Laos? "Precisely," said Mr. Frans. He spoke of the season of dryness and dust, brought by the monsoon from the northeast, in harmony with the season of rain and mud, brought by the monsoon from the southwest. The slim pirogues in harmony with the majestically meandering Mekong River. Shy, slender-waisted girls at the loom in harmony with the frangipani by the wayside. Even life in harmony with death. For so long as death was not violent, it was natural and to be welcomed, making a funeral a feast.

To many a Frenchman—they came 95 years ago, colonized, and stayed until Laos became independent in 1953—the land had been even more delightfully tranquil than Tahiti. Yet Laos was now one of the most explosive headaches of statesmen around the globe. The Pathet Lao, stiffened by Communist veterans from neighboring North Viet Nam, were supplied by Soviet aircraft. The Royal Lao Army, on the other hand, was paid and equipped with American funds. In six years, U. S. aid had amounted to more than $1.60 for each American—a total of three hundred million dollars.

We were there at a moment when the situation in Laos threatened to ignite another war among the world's giants. Even if it did not, how would this little world of gentle people cope with its new reality of grenades and submachine guns?

To find out, we traveled throughout that part of Laos still nominally controlled, in the daytime at least, by the Royal Lao Army: from Attopeu, the City of Buffalo Dung in the southeast, to Muong Sing, the City of Lions in the northwest, close to Communist China (map, page 250). We rode over roads so rough that our Jeep came to rest atop the soil between ruts, all four wheels spinning uselessly. We flew in rickety planes so overloaded that we wondered why they didn't crash. In the end we ran into Communist artillery fire.

"We" were Bill Garrett of the NATIONAL GEOGRAPHIC Illustrations Staff, whose three cameras and eight lenses made him look as formidable as any fighting man we met; Boun My, our interpreter; and myself.

Boun My—the name means one who has a *boun*, a celebration, and is therefore lucky—was born in Savannakhet, the Border of Paradise. He had attended three universities in the United States. But he had never seen the mountainous half of his native land north of Vientiane, including the royal capital, Luang Prabang. Before the airplanes came, he said, travel in Laos was just about impossible.

Prime Minister Moves Fast

Alas, so it almost proved for us, too. To go outside the few cities required permits, and getting them seemed a life's work. Nobody wanted Americans to be hurt or captured, and few soldiers could be spared as escorts.

We were told that to the Pathet Lao, a kidnaped American was worth at least $750, a fortune in Laos. Everyone had heard of the American contractor who had spurned an escort. Now Pathet Lao propagandists were reported marching him barefoot from village to village, as evidence of evil American intervention.

Although we enjoyed our rounds of the government offices in Vientiane, with officials offering tea and pleasing conversation in French, we were getting nowhere. We had nearly decided that all the tales of Lao leth-

Wan Sunlight Paints a Wellside Puddle on a Battered Street in Vientiane

Administrative capital of Laos, Vientiane got these war scars in December, 1960, when royal troops ousted rebels who had seized the city in a coup. Here a smoky sky shrouds the afternoon sun as a girl draws water from a public well.

argy must be true, when we were invited to take a trip with the Prime Minister. Could we be ready in 15 minutes? His Highness had decided only two hours ago to go out of town, and he was eager to be off.

Prince Wears Ten-gallon Hat

And so, after a flight southeast to Savannakhet, we found ourselves bouncing along in a Jeep right behind the Land-Rover of Prince Boun Oum of Champassak, a tall man of Churchillian mien in a bush jacket and a ten-gallon hat from Texas. From his shoulder bag peeked the seven-inch barrel of a Luger.

The temperature rose to 105°. With our company of soldiers, we made one long column of reddish dust.

In Keng Kok, the City of Silkworms, the Prime Minister bought fried chickens and fried cicadas, and two notebooks for me. Then we drove on, until there was no more road and we traversed dry rice fields, bouncing across their squat earth walls.

It was a spleen-crushing day. An hour of bouncing, a brief stop in a village to inspect a new school or dispensary. More bouncing, another stop, a new house for teachers, a new well. Then off again, rushing to keep up. We were miserable.

But our two Jeep mates—Keo Viphakone from Luang Prabang and John Cool from Beaver, Pennsylvania—were beaming under their coatings of dust. Together they had probably done more than any other men to help push Laos toward the 20th century—constructively. Mr. Keo, once a diplomat in Paris and Washington, was Commissioner of Rural Affairs. John, an engineer and anthropologist with a doctorate from the London School of Economics, headed the rural development division of USOM, the United States Operations Mission administering U. S. aid.

"What you see are self-help projects," John said. "We ask the people what they want, and they supply the labor. We send shovels, cement, nails, and corrugated iron for roofs. That way they have an infirmary for $400. We have 2,500 such projects, and they add up to a lot more than just roads and wells and schools. Ask Mr. Keo."

Mr. Keo agreed. "Our people have been used to accepting things as they found them," he said. "Where there was no road, they lived without one. Now they learn that men can change their surroundings, through their traditional village elders, without violence. That's a big step toward a modern state. You might say we are in the nation-building business."

In the villages people lined up to give us flowers. Then came coconuts, eggs, and rice wine. The Prime Minister paid his respects to the Buddhist monks, strode rapidly among the houses, joked with the local soldiery, and made a speech. The soldiers are fighting and the Americans are helping, he said, but in the fight against the Pathet Lao the key factor is the villager himself.

Pedaling Cyclists and Sidewalk Games: The Routine of Life Continues in the Capital of an Embattled Nation

Repairs have erased much of the scattered damage Vientiane suffered in last December's fighting. Here cars and pedicabs roll along Pang Kham Road (left), passing shutter-fronted shops whose owners live on the balconied floors above. Children bat a shuttlecock in a netless badminton game.

Ice cream peddler does a thriving business with riders on a wooden bus; vacuum jugs on his bicycle cart keep his product cold. Mango and litchi-nut flavors are favorites.

Undulating Hands Tell an Age-old Story in a Sinuous Lao Dance

Wearing *sinhs*, traditional skirts, Lao beauties move rhythmically. Words and gestures convey such messages as "Say nothing bad of me or I of you, for we are all Lao."

Then we were off again. We did it for three days.

But our stumping tour of the south wasn't all misery. Crossing the 4,000-foot width of the Mekong at Champassak, on a raft with an outboard motor, we took off our dusty shirts and enjoyed a veritable ocean breeze. Then we hung overboard in the water.

Briefly we rolled over a paved road up to Pak Song, on the cool Bolovens Plateau. The Prince visited the hospital of Operation Brotherhood, supported by the Junior Chamber of Commerce of the Philippines, and fed rice to two pet elephants he kept at his residence at Pak Song.

Strings Keep Souls in Place

In the village of Soukhouma, which means "Peaceful," we had a *baci*. This is the most endearing of Lao ceremonies. It takes place in the household, a rite of well-wishing for myriad occasions—for the traveler, a wedding, a newborn child, the sick, the New Year, for any good purpose.

The preparations were elaborate: flowers, candles, incense sticks, rice wine, dozens of delicacies, and pieces of white cotton string. The strings were draped around flowers in tall silver bowls (page 261).

The candles were lighted, and we sat on split-bamboo mats among the village notables. I was careful to keep my feet, the seat of the least worthy spirits, from pointing at anyone's head, where the worthiest spirits reside. Now a distinguished old man called on nine divinities to come and join us.

Next he addressed himself to our souls. A man has 32 souls, one for each part of the body. Those souls like to wander off, and must be called back.

With the divinities present and our souls in place, we were wished health, happiness, and power. Then, one after another, the villagers tied the waiting cotton strings around our wrists. These were to be kept on, to hold in the 32 souls.

As we stepped out into the sunlight, a man came up to John Cool and silently showed him his hand. It had a festering hole as big as a silver dollar. We could see maggots moving.

John said: "I have some antiseptic salve with me, but it's too late for that." Through an interpreter he told the man to go home, rest, and soak his hand in hot water. Within three days a plane would stop near by, and antibiotics would be delivered to the male nurse. It had to be done that way, through the Lao authorities.

"I hope he'll be alive three days from now," John said. "The villagers have just built an infirmary, but there is nothing in it yet. Besides, there aren't enough trained medical helpers to go around."

Hospitals were fine, he said, but the real solution was fly control, sewage disposal, a changing of attitudes.

"That's what we're all aiming at—with roads, the schools, everything. Then someday there'll be an understanding of the germ theory and public health, and the people will live longer."

The man with the festering hand still squatted patiently before us.

"Chances are he won't do what I told him," said John, with a terrible sadness. "He believes he is sick because he has offended a spirit."

Spirits were everywhere. One could never be too careful. The Prime Minister himself explained that in carving a new field from the forest, burning the brush was not enough. The spirits had to be coaxed away.

"You post pictures of important people, perhaps a picture of the King," he said. "Then you must talk to the spirits, quietly and respectfully. Do you think this a silly belief? When people believe it, it becomes true."

Buddhist Monks Scorn Battle Shelter

Back in Vientiane I sought recuperation and peace in one of the many wats, the Buddhist temples with their houses for the monks, or bonzes.

"Do you know why we wear saffron robes?" asked the bonze who guided us. "Because we believe it is the most peaceful color."

We passed a crude underground shelter.

"For people who come to stay with us," said the bonze. "The Buddha himself was not afraid to die, and we try to act as he would have done. If shooting starts, we just stay in our house."

We heard a booming, and Boun My looked worried. But it was only a drum, calling people to bring food to the bonzes.

"In the morning we go out to beg our food," said our bonze. "At noon the people bring it. That's how the Buddha himself divided his time. In the morning he was not busy; so he went to beg. After that he was busy meditating; so people brought food to him."

In the great eating and teaching hall, wom-

en set out food and then squatted down. The bonzes ate at the other side of the hall; then they turned toward the women and chanted a prayer—for the people who had brought food, for their families, and for the fish they had eaten, wishing the fish a better life in the next incarnation.

In the evening I went to the movies—outdoors in Ban Mai, 10 miles west of Vientiane. That was as far as one might go with reasonable safety. A Lao Army officer drove me and Everet Bumgardner, of the U. S. Information Service.

"We have 100 portable projectors with generators for showing our films in the villages," Bumgardner said. "In the mountains we left projectors for use by the villagers, and the Army drops films by parachute."

Morning's Cold Tints a Thoroughfare Arched by Thick-boled Trees

Vientiane's Khoun Bouroum Road runs atop the remnants of a wall that once rimmed the city on its landward side and extended down to the banks of the broad Mekong. Now villagers, herding occasional oxen, trudge the well-worn roadway past homes clustered below the crest.

The typical Lao house perches on stilts from three to eight feet off the ground. Split bamboo forms the floor, woven mats the walls, thatch the roof. The family polishes rice, weaves on hand looms, and stables its animals in the open space beneath the house.

A land where bone-dry months alternate with the monsoon season, when rain falls steadily for days, Laos keys its houses and its ways to the weather. The wet spell, starting in May, turns roads to quagmires, and villages dotting the hills and valleys of the mountainous kingdom live in isolation.

We passed the roadblock at the airport, drove seven miles to the end of the road, and bounced along an ox trail. It was no worse than the traveling that still made my back ache. But this time it was night, and there were no soldiers around us. Only moonlight, chirping cicadas, and dense brush between the trees—a paradise for terrorists.

"Keep this handy," said the officer. He passed me a Thompson submachine gun. I hadn't held one since World War II and had to flick my cigarette lighter to see where the safety was.

The movies were a hit: President Eisenhower shaking the hand of the King of Thailand, a stylish Siamese lady singing "Que Sera, Sera," and Lao comedians joking about Communists. The villagers roared approval.


CHINA
YÜNNAN
NORTH VIET NAM
BURMA
THAILAND
LAOS
CAMBODIA
Gulf of Tonkin
Gulf of Siam
Mengtzu
Wenshan
Kochiu
Malipo
Makuan
Chinghsi
Tepao
Chenpien
Pingpien
Chinping
Hokou
Lao Cai
Pass of the Clouds
Ha Giang
Thanh Thuy
Bao Lac
Cao Bang
Bac Quang
Bao Ha
Bac Can
That Khe
Na Cham
Pinghsiang
Lang Son
Lai Chau
Tuan Giao
Nghia Lo
Phu Luong
Son La
Dien Bien Phu
Tuyen Quang
Thai Nguyen
Phu Tho
Vinh Yen
Phuc Yen
Phu Lang Thuong
Bac Ninh
Son Tay
Viet Tri
Hanoi
Ha Dong
Van Yen
Hoa Binh
Haiphong
Kien An
Hung Yen
Phu Ly
Thai Binh
Nam Dinh
Ninh Binh
Hoi Xuan
Thanh Hoa
Ha Trung
Sam Son
Qui Chau
Nghia Hung
Quynh Luu
Phu Dien Chau
Vinh
Ben Thuy
Linh Cam
Ha Tinh
Dong Hoi
Pungkuanshan
Mohei
Puerh
Szumao
Mengsao
Menghan
Lantsang
Chiangcheng
Menghai
Yunchinghung
Mong Yang
Talo
Bok Hsappam
Mengla
Keng Tung
Mang Yawang
Muong Ou Neua
Muong Ou Tay
Muong Va
PHONG SALY
Phong Saly
Boun Neua
Boun Tai
Muong Khoua
Muong Sing
Nam Tha
Na Mo
HOUA KHONG
Vien Pou Kha
Muong Sai
Muong Ngoi
Mong Lin
Hawng Luk
Ban Houei Sai
LUANG PRABANG
Chiang Saen
Chiang Rai
Muong Pak Tha
Muong Pak Beng
Pak Ou
Pak Seng
Luang Prabang
Hongsa
Xieng Ngeun
Phou Khoun
Xieng Kho
Sam Neua
Muong Son
Muong Soi
HOUA PHAN
Muong Peun
Sam Tao
Ban Ban
XIENG KHOUANG
Barthelemy Pass
Muong Sen
Plaine des Jarres
Phong Savan
Cua Rao
Con Cuong
Tha Thom
Muong Hiem
Muong Kassy
Sayaboury
SAYABOURY
Luang Range
Vang Vieng
Phou Bia
Borikhane
VIENTIANE
Ban Hin Heup
Ban Na Son
Muong Tourakom
Pak Lay
Pak Sane
Vientiane
Bung Kan
Phon Phisai
Nong Khai
Sanakham
Muong Chiang Khan
Loei
Khammouane
Lak Sao
Nape
Annamese Cordillera
Ban Phon Tiou
Muong Nhommarath
Mu Ghia Pass
Mahaxay
Thakhek
Nakhon Phanom
Pak Hin Boun
Sakon Nakhon
Udon Thani
That Phanom
Tchepone
Seno
Dong Hene
Savannakhet
SAVANNAKHET
Keng Kok
Mukdahan
Maha Sarakham
Roi Et
Muang Yasothon
Amnat Charoen
Khong Sedone
SARAVANE
Saravane
Bolovens Plateau
Pak Song
Pakse
Ubon Ratchathani
Champassak
CHAMPASSAK
Sisaket
Surin
Buriram
Khu Khan
Dang Raek Range
Preah Vihear
Moulapamok
Siem Pang
Khong
Khone
Samrong
Cheom Ksan
Kompong Sralao
Koulen
Melouprey
Chhep
Kralanh
Angkor Wat
Siem Reap
Prah Khan
Stung Treng
Rovieng
Mekong
Nan
Phrae
Lampang
Uttaradit
Chiang Kham
Phayao
Den Chai
Phichai
Sawankhalok
Bangkok (Krung Thep)
Samut Prakan
Samut Songkhram
Chachoengsao
Ban Aranyaprathet
Poipet
Sisophon
Ban Na Pa
MONGOLIAN REPUBLIC
Vladivostok
Mukden
Peking
Pyongyang
NORTH KOREA
SOUTH KOREA
Seoul
JAPAN
Tokyo
Lhasa
Chungking
Shanghai
Taipei
FORMOSA
Canton
HONG KONG
MACAU
Hanoi
NORTH VIET NAM
SOUTH VIET NAM
Saigon
Rangoon
BURMA
Bangkok
CAMBODIA
Phnom Penh
Manila
PHILIPPINES
Philippine Sea
Pacific Ocean
South China Sea
MALAYA
Kuala Lumpur
SINGAPORE
SARAWAK
BRUNEI
NORTH BORNEO
Sumatra
Borneo
INDONESIA
Djakarta
Java
New Guinea
Indian Ocean

Author White (left) and photographer Garrett dodged rebels to travel the length of Laos. Roads were poor and few. Rivers were made unsafe by guerrillas. Planes were scarce and none too safe. Garrett wrote home: "The ground crew pumped up the tires with a bicycle pump. They filtered gas from rusty jerry cans through a chamois. There weren't many seat belts." At press time, the newsman who took this picture, Grant Wolfkill of NBC-TV, was reported downed in a helicopter and in rebel hands.

Narrow, hill-strewn Laos lies athwart the traditional invasion route between China and Thailand. For centuries it has seen domination by conquerors. No railroads exist.

When the show was over, we wanted to stay a bit longer. "Better not," said Bumgardner. Driving back, he shone his flashlight at a tree.

"That's a fresh notch," he said. "A Vietnamese trick, to bring trees down across the road quickly, for an ambush." An army patrol was ambushed there two days later.

Eventually I learned to look past the bullet holes of Vientiane, and I found the life relaxing: big Frenchmen walking unhurriedly to little French cafes; bicycles, red and blue pedicabs, and black Mercedes limousines (page 244); girls serene in their *sinhs*, the long Lao skirts with intricately woven hems, and belts of silver and reddish gold.

At the public wells, men drew water to sell from pushcarts, 5 kip for two 20-liter cans.

110½ gallons). Five kip was only about six cents, but some families lived on 50 kip a day. Anyway, that water was for the Chinese and Vietnamese, who had the good stores and the good jobs. The poorer Lao went to the Mekong for his bath, and his wife would fetch the cooking water herself.

There was nothing frightening about being poor. Rice, vegetables, and bits of meat were cheap. And couldn't a young couple always find a bit of land to build a house of wood and bamboo, with the help of relatives? Brothers and uncles and countless cousins would help in any need, for family loyalty was the first loyalty. In town as in village, nobody was ever alone.

Bonzes were everywhere. At six in the morning women swept before their houses with short grass brooms. Then they knelt, and when the bonzes walked by, each woman put a bit of rice from her bamboo box into each bonze's black bowl (page 257). I wondered how a man got enough to eat that way. So I followed the long saffron line and saw that after 25 minutes each basketball-sized bowl was full.

Weedy Ruins at Wat Phu Mark a Pilgrimage Path up a Sacred Mountain

Soldiers of the Royal Lao Army walk beside the ancient stone ruins of a temple erected by a Khmer king on the slopes of Phu Cao, the sacred mountain. Its lofty peak juts out of sight to the left above the Mekong in southern Laos, near the town of Champassak. Men have revered the mountain as sacred for more than a millennium. Human sacrifices once were offered on its slopes. Near by the Khmers built a holy city that was the early capital of the civilization which created famed Angkor Wat in Cambodia.

Now roofless, the elaborately carved building shown here predates Angkor Wat's 12th-century beginnings. It stood as a wayside temple on the long climb up the hallowed mountainside. Carved guardians crouch on a column that overlooks an esplanade.

Today Buddhist monks live in a monastery on Phu Cao. And villagers also come to the mountain's rocky glades to watch a buffalo killed in an annual rite that conciliates age-old spirits and foretells the promise of a new year.

A kind woman had given me a donation, too. This was my introduction to the sticky rice of Laos. The kernels were distinct and almost crisp, to be kneaded together and eaten like bread. I liked it.

Children Shy With Sharp-nosed Foreigner

The children were unforgettable—charmingly childish children, not little grownups.

Many houses had open fronts, so that one could see in. Usually the children had no toys. They conjured up trains out of boxes or amused themselves with string or paper. When they noticed a *farang dang mo*—a sharp-nosed white foreigner—taking an interest in them, they were delighted at the attention, but too shy to come forward. This led to cheerful games of hide and seek. Eventually, with the approval of mother, the children approached, as happy as if they had received a treasure.

I gave a little boy a rubber ball. He measured 30 inches tall and wore nothing at all, and now he was the happiest boy I had ever seen. He jumped up and down, and then he ran back and forth, beside himself with joy.

I came by again two days later. He was wearing shorts, but he still hugged that ball.

The same night I visited a little house where something horrible had happened.

The father had been sitting on a swing in the big room, as Lao like to do. He was holding his two-year-old daughter on his lap. Six feet away his wife peeled cucumbers. Then a grenade went off under the swing. I saw the swing, pierced with two dozen holes. The father was dead. Wife and daughter were in the hospital.

The grandfather and what was left of the family ate quietly around the table. How did the grenade get there? Perhaps someone had planted it. Perhaps a dog had dragged it in. Did it matter? Did anything matter?

Next day we flew north at last. First the plain, then steep green hillsides and twisting rivers. Towers of weathered limestone rising a thousand feet straight up, like ruins of gigantic castles. Over hills and valleys, the road from Vientiane trailed us like an endless reddish snake. From it flickered the windshields of a military convoy.

We passed the road junction at Phou Khoun, where another snake went east to the Plaine des Jarres—Plain of the Jars. There, huge stones shaped like jars had made archeologists envision ancient burial grounds of a lost race. Now the Plain of the Jars was a Pathet Lao stronghold, with landing strips receiving Soviet supply planes daily.

Luang Prabang Prepares for Cremation

A lonely village perched on a hilltop, two dozen houses in a green sea. Farther on, a river wound in hairpin turns, the Khan coming to join the Mekong at Luang Prabang.

The royal capital dozed, at peace with the world. In the market, a stand six feet long and three feet wide displayed cigarettes from France and England, sardines from Morocco, beer from Germany, matches from Hong Kong, and detergents from the U. S. A. Fifty other stands seemed no less cosmopolitan.

A lady bathed in the Mekong, wrapped in a cloth. Then she washed her rice. "This water," she said, "makes my rice taste good." A foot-long lizard went "geck-o, geck-o."

Interest centered on King Sisavang Vong. After reigning 55 years, he had died more than a year before. Soon, the soothsayers said, the time would be propitious for his cremation. It would be one of the most important ceremonies in Laos in this century (page 274).

I encountered some impressive preparations a hundred steps above Luang Prabang, halfway up a hillside to a temple. Soldiers were melting down cartridge cases from rifles and machine guns. They used the brass to cast Buddhas (opposite).

Planes Trade Pamphlets for Ammunition

Below, Luang Prabang sprawled like a rambling suburb in Florida, with bungalows and two-story houses set apart in a sea of palms. Once I heard the sound of trumpets drifting up from the royal palace. A squad of khaki guards with red berets marched to their posts. They seemed souvenirs of colonial days that only dreamed of war.

The war was no farther than the Luang Prabang airstrip. When I went back there, a silvery twin-engine Dakota had just brought boxes from the U. S. Information Service in Vientiane—primers and booklets with health and farming information. Now soldiers loaded crates of rifle grenades and ammunition, and 50-gallon drums of water. Each piece of cargo had a parachute, ready to be dropped to the army under Pathet Lao attack near Phou Khoun.

We flew off again—as far north as we could go, to Houa Khong Province. More mountains, no more road, lonely villages of four and five houses. Fires ate away at the forest, for this was the time to "burn the mountain" before planting.

"We call this the smoky season, between the dry and the rainy," said Michel Lafrance, the pilot from Paris. "Soon it will be so hazy that you can't see ahead at all, only straight down. Then I follow the rivers and navigate by the shape of the fields. If I see a lopsided rectangle point a certain way, I know Nam Tha lies 10 minutes more in that direction."

Our single-engine plane hit a downdraft. A wooded slope raced by outside the window. We cleared the treetops by 40 feet. I caught a glimpse of shiny wreckage of a plane.

In Nam Tha, the provincial capital, we

Brass Buddhas Take Shape as Offerings for a King's Cremation

Lao revere the Pra Bang Buddha as the nation's protector. They believe the hands thrust back evil, including the kingdom's enemies. More than 3,000 such images were made for the funeral rites on April 29, 1961, of King Sisavang Vong, who died October 29, 1959.

unloaded a passenger but took on three more. Up front, where Bill had sat next to the pilot, there were now the pilot, Bill, and Boun My. The rest of us just squeezed amid cargo bags.

Would the plane ever get off the ground? It did, and 16 minutes and a 5,000-foot ridge later we landed at Muong Sing—19 miles from the Burmese border and less than a third as far from the gentle hills of Communist China.

Here stood a fort straight from a set for a Foreign Legion film. Except that it had a moat. Fish jumped in it, and soldiers were washing clothes and themselves. Others played volleyball.

Border Outpost Mourns Dr. Dooley

Two hundred feet away stood the hospital of Dr. Tom Dooley. A faded sign said, "Welcome Home, Dr. Dooley."

But Tom Dooley, the former U. S. Navy doctor from St. Louis, would never come again. His skill, his youthful energy and compassion, had been welcome in rural Laos, where a surgeon was a rarity. Two months before, he had died in New York, at 34, of cancer.

The story of this intrepid young doctor, who literally gave his life to help Laos, was on the front pages of every U. S. newspaper. What had become of his hospital?

We met the answer in the person of Say Sitha, a Lao of 24. He had started medical training two years before—handing instruments to Dr. Dooley. He had learned well, and now he was in charge of what Tom Dooley had left behind.

Say Sitha took us in. He showed us the doctor's king-sized coffee cup with a china frog inside, and a sheaf of Dr. Dooley's records. They listed about 30 patients a day, twice that on market days. One had been allergic to water buffaloes.

"We still have plenty of medicines and patients,"

Saffron-robed novices rule a slim pirogue across the Mekong at Luang Prabang. This city, home of Lao kings, serves also as a spiritual center of the nation. Its name, loosely meaning great, or golden, Buddha, stems from the gold Pra Bang Buddha enshrined there by a 14th-century ruler who made Buddhism the land's religion.

Kneeling women offer rice to a file of priests on their morning round for food. By feeding monks, Buddhists earn religious merit. Most Lao youths enter monastic life for at least a brief retreat.

Say Sitha said. But the operating room and its shiny instruments were idle. Dr. Dooley's successor in Laos, Dr. Ronald Winthrob from Toronto, was busy at Ban Houei Sai, 80 miles southwest, where Dr. Dooley had built another hospital. Say Sitha, with two male assistants and four girls, carried on as best he could (pages 266-7). The people loved them. And so, I thought, would Tom Dooley, for they were carrying out his dream: that somehow his hospitals would go on without him, without any doctor if necessary.

Students Face 36-hour Hike to Exams

The plane back to Nam Tha was supposed to come the next day, but it didn't. The day after that I waited at the airstrip again. Khamnouane Chayavong waited too. He was 22 and headed the district's 12 schools. "We're progressing," he said. "One school had 140 pupils last year. Now it has 230."

Khamnouane wore the dress of the Lao civil servant—khaki shirt with shoulder loops. He carried an American carbine. He wanted to catch the plane to take five students to Nam Tha, so that they might try for openings at the teachers' school in Vientiane. If the plane didn't come today, he would walk with them across the mountain—two nights and a day, instead of the 16-minute flight.

"If we don't get there in time, the boys will miss the examination. They'd have to wait another year. And we need teachers—and books, chalk, notebooks, and pencils."

If the plane didn't come, could we walk with him? No, he said, the lieutenant in charge of the fort would not permit it.

I trudged back on the dusty road, and at 10 o'clock I sat down at a food stand under a po tree. Meo tribesmen passed with packets of opium, for sale to middlemen. They expected payment in French silver piasters, to cast into silver bands and wear around their necks. A woman came with green bricks of river moss and sold them to the food-stand woman for ten kip each, to be fried and eaten.

"They are expensive," said the food-stand woman. "They come from three days away."

At 12 o'clock I bought rice, fish, moss, tea, and a cigarette the size of a cigar. Soldiers passed. Across the street, girls washed their hair and wound towels into turbans in two swift motions. I wondered what made them stay up. Women with babies visited one another. Children played everywhere.

At 5 the sun turned golden, and two girls

Hill Village Wrests Living Space From the Encroaching Forest

Thatched huts of a hill tribe huddle on the flank of a ridge in northern Laos. To create fields for growing rice, villagers burn forest plots before the monsoon rains. Smoke hangs in the humid, quiet air for weeks, blanketing the land. Tribesmen move their homes to another hill when soil fertility wears out.

brought out a badminton net. A cart came by with firewood, the driver deep in thought. His buffalo was his automatic pilot headed for home. The wooden axle made a wild music. I was getting chilly and had a vision: Me, sitting forever under the spreading po tree, watching girls play badminton, waiting for the buffaloes to come home.

A lady came and said, "You have waited for the airplane, but the airplane has not come."

I nodded. She said: "You are from another country and you are lonely. Please come and talk to us."

She led me to the house across the road, a typical Lao house on six-foot stilts. In the stilt space were a loom, a stone vessel for mashing rice, a chicken coop, a pony, and two pigs. We climbed the ladder. I saw split-

bamboo walls, five airy rooms, a charcoal fire on a clay hearth.

On the porch I was overwhelmed with food. As she served, the lady said her husband would be back soon. He was an elder, out to help settle a dispute.

A daughter and two grandchildren appeared, and more children, and then the husband. The dispute had been about a newly bereaved widow with a field but no children. Her husband's parents wanted the field back. She wanted it to support herself.

It was all settled, said the elder. The widow would keep half the field. After her death it would go to her husband's parents' heirs. "It wasn't hard," he smiled "After all, we are all related here."

Twenty-odd Tribes in One Province

Unhappily the same could not be said of all Laos. Back in Nam Tha I got an inkling of the diversity of the country's ethnic minorities. The market place seethed with varied types. I learned about some of them from the Reverend Richard Hall, a Seventh-day Adventist missionary from Washington State.

"There's a Thai Dam," he said. "They sacrifice dogs to the spirits. They beat them to death before they roast them, so that the meat will be tender.

"And here's a Kha Koui. They never wash. Only when their father or mother dies, then they take a ceremonial bath. If they wash at other times, they believe they'll get sick. The men let their hair grow. One told me his hair was 12 feet long, all coiled up. He said if he cut any of it he would die. Nobody can say how many tribes there are in Laos."

But the office of the *chao khoueng*, the chief of the province, displayed a chart with surprisingly precise information. First it listed the region's resources: salt, teak, tin, cotton, rice, and stick-lac—secreted by forest insects and exported to make shellac.

Then came the population—69,241 in 668 villages, including these minorities: seven kinds of Thai, specifically Thaikhein, Thai Vouane, Thai Lu, Thai Dam, Thai Neua, Thai Yang, and Thai Ngiou, eight kinds of Kha, namely Kha Ko, Kha Sida, Kha Koui,

Kha Hok, Kha Dam, Kha Mou, Khu Lameth, and Kha Samthao; also Lan Tene, Meo Khao, Meo Lay, Mouseudam, Mouseudeng, and Yao.

Twenty-one minorities in one province alone! Trying to memorize the list, I stumbled into a shop displaying bananas and a leopard skin. The proprietor smoked a huge water pipe. What ethnic group did he belong to?

"It is kind of you to ask," he said. "I am a Ho." I had found a twenty-second minority.

The longer I traveled in Laos, the more I realized that spirits and the supernatural were not simply the stuff of ancient legends, to be told to children with a smile. They were the facts of daily life.

In many villages people could scarcely believe that anyone would stay alone at night, or walk alone, for fear of phantoms. In Vientiane people said that the late King had

Fish net soars at sunset on the Mekong, whose fanning tributaries and 2,963-mile length make it one of the world's major rivers. In road-poor Laos, the branching waterway serves as a travel network. Mottled markings on the picture resulted from heat and humidity damage to the film.

Wrist strings seal a blessing at a Lao *baci*. This ceremony combines a feast with ritual hopes for the honoree's luck, long life, and many happy returns. Strings may be worn until they rot away to avoid any chance of spoiling the charm tied with them. Students give this baci as a farewell for Owen Loveless, a United States teacher in Vientiane.

Chopsticks Yield to Busy Fingers of a Hungry Lao Youngster

Lao living in the northern part of the kingdom eat with chopsticks, those in the southern part use spoons. This boy and his sister eat rice noodles at a roadside food stand near Muong Sing, seven miles from the border of Red China. Mainstay of the Lao diet is a glutinous rice, pressed into lumps and dipped in a fish sauce spiced with peppers. Chicken and vegetable dishes add variety.

walked across the flooded Mekong, and that this part of the river was now sacred. "If you swim there you will drown," I was told. A veterinarian said he had seen a man turn into a tiger. One of the leaders of Laos recalled escaping from many a tight spot by making himself invisible.

Then I heard a story so strange it would not let me rest. Two officers of the opposing forces met head on, each riding a tank. They fired the cannon at each other, to no effect. They collided their tanks; they dismounted and fought with submachine guns. No effect. They used bayonets, then their fists. Neither was scratched. So they gave up and went their separate ways.

"Of course it's true," I heard. "It happened near Vientiane, at Kilometer 18 on the Pak Sane road."

Khon Kongs Defy Death

There were, in short, men who could not be killed, who were invulnerable. They were called *khon kongs*—protected men—and they were rare, perhaps one in a thousand. Some could deflect bullets; others could stop guns from going off. Some could be hit without being hurt. Some of the best-known army commanders were kongs.

I heard of the many ways for men to become kongs. Through solemn training of the mind; through swallowing the rare yan root; through the help of a wise man in a cave who could reveal the right prayer, or supply a piece of metal which, put into the body, would circulate and bring invulnerability.

"It is a power seldom given," I was told, "because it could be misused."

Boun My agreed to take me to a friend who could settle my doubts. By then I had met many soldiers, from boyish privates and cocky sergeants of the parachutists to Maj Gen. Bounleut Sanichan, the barrel-chested commander in chief. But that stifling evening I learned more about the Lao Army than I had in weeks.

Boun My's friend was a French-trained captain, 38, tough, crew-cut, a professional soldier. We sat on his porch, with a Japanese fan and German beer. The modern upholstered chairs were a relief after reed mats.

"What you have heard is true," said the captain. "Some men can hold a grenade and pull the pin and the handle will fly off, but there will be no explosion."

Was he sure?

The captain said: "I have seen it myself. Can you disbelieve a thing when you have seen it? Let me show you something."

He brought a fist-sized bag of parachute silk in camouflage colors. Inside was a blue wool bag with a Buddha the size of a thumbnail, carved from an elephant's tusk, another Buddha, a woolen box holding powders, and a string of stones and animal teeth.

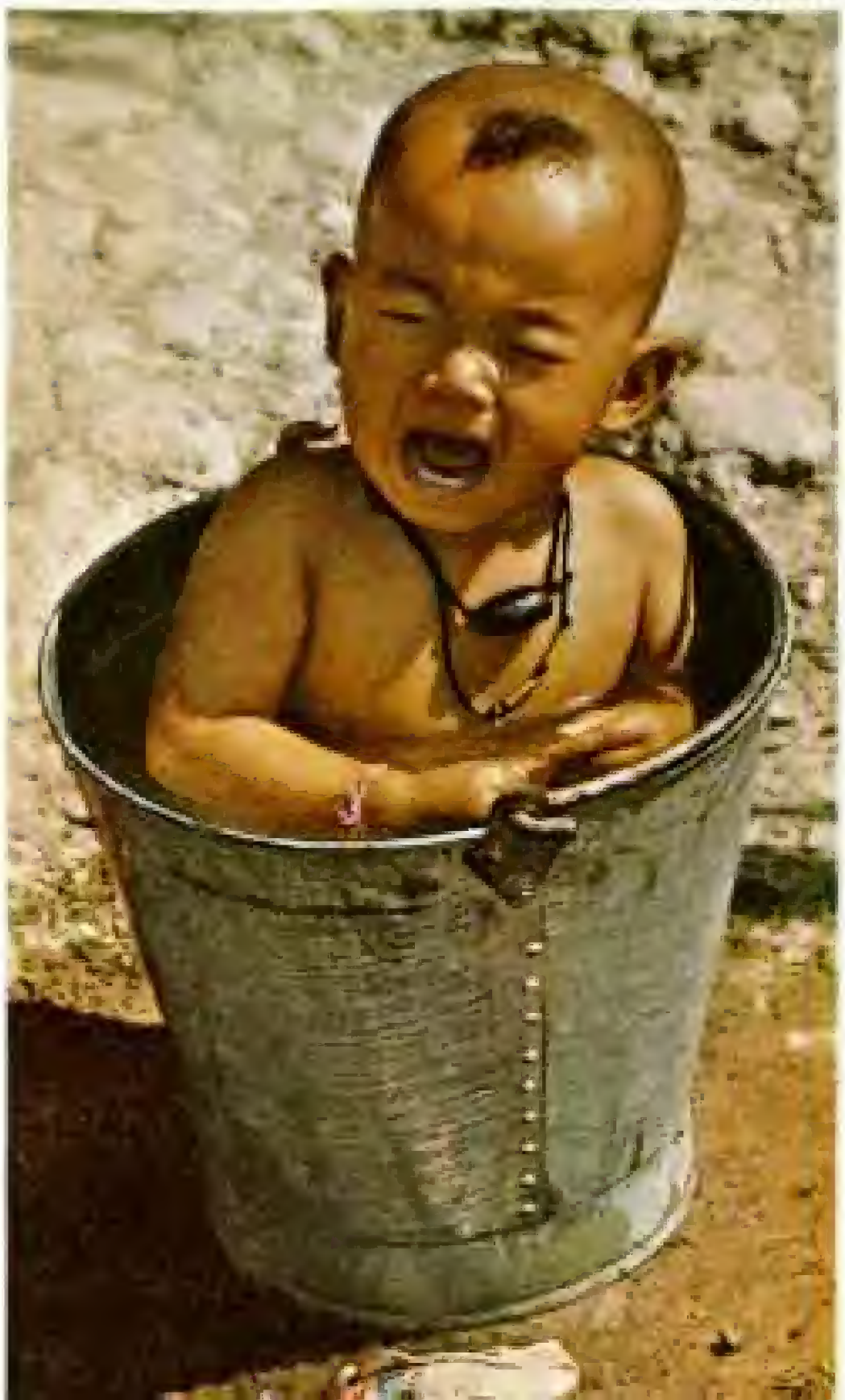
"A wise man prayed many years to put a spirit into the ivory Buddha," said the captain. He hoped that all these objects together would protect him against bullets, as long as he wore the bag around his neck. "Every soldier or general could show you such things."

On the wall hung the captain's diploma from a technical school. He held an important staff job, and his unit had an American adviser. Did the American know about the little wool bags?

"No, he wouldn't understand, and we wouldn't tell him."

(Later I talked to a senior American military man in Laos. He had heard all about

Bath in a bucket under a stranger's gaze draws loud howls. Necklace amulets and topknot tufts adorn many Lao youngsters. Chinese believe the topknot haircut protects the soft spot in an infant's skull.



Pack hung from a shoulder board, a Kha drives his pigs to market in Muong Sing.

Silver collar identifies this man as a Meo. Tough, independent warriors, the Meo dwell in hill villages. They refuse to live at altitudes below 3,000 feet, believing that to do so would cause them to sicken and die.

Western bath towel turbans the hair of a Thai Lu. Dozens of ethnic groups make up the estimated two million population.

those grenades. "They don't go off because somebody took out the detonators," he said. "As for demonstrations of invulnerability, what you believe has a lot to do with what you see. And we Americans don't interfere with a man's religion or his beliefs.")

"You know," the captain said, "the French didn't believe in these powers. A Frenchman asked a Lao for a bag once, and when he didn't get it, he became abusive. The Lao prayed, and the Frenchman's car blew up. He was dead."

The captain's son brought more ice from the refrigerator. "You might say that these beliefs belong to primitive times," said the captain. "I cannot tell what the future holds. But what you saw in this bag will go to my eldest son when I die. That is the custom. And no matter how modern our country may become, if these things continue to work, they will continue to be believed."

Gentle Music Amid Modern Violence

The longer I stayed, the more I liked Laos. I liked the way people gave parties, with food and music and dancing. I liked Lao music—the farmers' songs and the fishermen's songs; the songs in praise of the benevolent water snakes. I liked the Lao instruments, all of which had spirits of their own, surely good ones. Best of all, I thought, must be the spirit of the *khene*, the many-barreled Lao flute of bamboo. Its music sounded like a cross between an organ and bagpipes.

I liked the dancing of the Lao girls. Much of the movement was in the arms and hands, especially the fingers. I never saw any other dancers who could bend their fingers back so far. The girls moved gently and slowly, and it was all as graceful as the waving of sea anemones (page 246).

So much in Laos seemed as it should be that I almost agreed with a thoughtful American who questioned the wisdom of forcing modernity upon this land.

"Our only justification is that if we don't do it, the Communists will do worse," he said. "Still, it's a pity. Laos has no major industry, no bridges across the Mekong, no railroads. It has one public library, 18 post offices, and only 1,000 telephones, and those never did work very well. But what of it? Maybe a Lao can expect to live only 35 years. But who can say that in a way he hasn't lived longer than the average American, never having felt the pressure of time?"

Yes, the Communists would do worse. But how could the Pathet Lao hope to win over the people? Mainly through intimidation, through force. But they also tried propaganda, by word of mouth in the villages and in the towns by radio. I listened.

"The Americans want to make us a colony again," crackled the voice from the Plain of the Jars. "They are buying our country, and who gets the money? The fat cats with the Mercedes cars! The good things go to the few and the bad things come to all. The Americans drop their weapons here to test them out on us, and government men in Vientiane help them do it. If you see them, kill them!"

And what would the Pathet Lao tell in villages so remote that—in the words of one American—"They thought I dropped out of the sky, because I didn't look like a Lao, and wasn't Laos the only country in the world?" Could villagers be bamboozled with tales of cars, when they had never seen a wheel?

For Kha Mu consumption, for example, there was the legendary Kha King Chuong. Lao warriors had killed him 300 years ago, but some said he was still alive in a cave. The Pathet Lao said, "King Chuong wants you to rise against the enemy in Vientiane."

The propaganda's effectiveness was questionable, for the traditional wish of the villages was still simply to be left alone. As the saying had it, "When the buffaloes fight, it is the grass that suffers."

Vientiane Holds a Festival

But the Pathet Lao's military progress became more painfully plain every day. Villages and towns we had visited were now held by guerrillas, with more and more Vietnamese among them. Most of the countryside was unsafe. Roadblocks were boldly attacked. In the village where we had seen the movies, a patrol was shot up.

Yet Vientiane stirred festively. Buildings shone in fresh paint. Men had worked all night, under floodlights, to turn the square full of rubble into a park. Before it rose a grandstand with a raised platform for King Savang Vatthana and the Queen (page 274).

It was Army Day. Soldiers marched smartly, including girls with submachine guns.

The King, in the red-and-gold sash of the Order of a Million Elephants, gave out decorations and went to the stadium for track and soccer events. Night brought a torchlight parade with dozens of intricate floats.

Then the fun began. Along the Mekong stood hundreds of refreshment stands—upturned baskets holding trays of flowers, eggs, sugar cane, roast chickens, fruit, and candles. Young girls sat behind the trays, waiting for customers, preferably young men. Mothers sat not far behind. A love court at last! That's how Lao boys and girls meet to flirt poetically.

A girl smiled. I sat down on a low stool and, through Boun My, tried at once to rise to the occasion.

Me: The candle shines brightly, but the beauty of the flower of Laos before me outshines all the candles flickering in Vientiane tonight.

Girl: I am a poor girl and not beautiful, and I fear you are only trifling with me.

Me: Trifling is as far from my nature as the moon is from the Mekong. . . .

Girl: A man like you must marry a rich and beautiful girl, not some one poor and ugly like me. . . .

Me: Wealth and beauty of the face, are they not passing things, and as nothing compared to beauty of the spirit?

Girl: Have an orange!

Dr. Tom Dooley's Hospital Still Serves Muong Sing

Established by the young United States doctor who died recently of cancer, the clinic brings a touch of modern medicine to an isolated area. Lao youths taught by Dr. Dooley give shots and medical aid short of surgery (above, right).

Says Dr. John M. Keshishian of MEDICO, the organization that sponsored Dr. Dooley's pioneering: "We don't know how much longer they can carry on at Muong Sing. But Dooley's work was not in vain. The tribesmen won't forget. And from Laos have sprung other MEDICO projects in Asia, Africa, and Central and South America."

Akha woman with an abdominal complaint is examined by an *infirmier*, a Lao medical assistant in Dr. Dooley's hospital.

I did, and strolled on to the brightly lit boxing ring. Two Lao Army men, scarcely 100 pounds each, put on enormous gloves, knelt for prayers, listened to the referee's instructions, touched gloves, and wham! A kick to the chin, rabbit punches, wrestling grips, fierce employment of elbows, knees, toes, heels, and occasionally fists, all to cheerful music of drum and flute.

Near by on an outdoor screen a Japanese film showed a ghost in armor throwing a victim into a well. And farther on, on a flag-draped stage, cavorted a *molam-ku*, a pair of minstrels, doing a leisurely dance while improvising in rapid singsong to the music of a khene. Their topic tonight was marriage.

Another stage was devoted to debating. The audience sat in the street, while men with opposite views alternated at the microphone. Is it better to have one wife or five? The one-wife side won, because the judges felt that fewer wives mean less trouble. There was weak applause, and I asked a young soldier how he felt.

"It's one wife for me," he said, "because that's all I can afford. If I had the money, I'd want five or ten. But why set a limit?"

The next topic was: Is it better to be fat or slender? The fat side claimed better health and higher intelligence, and contended that "important people tend to be fat, like the Prime Minister." The slender side cited ability in sports, less money spent at the tailor, and better chances when running from battle.

Then the fat side said that the Buddha had pronounced in its favor. The slender side submitted that the Buddha had said no such thing, but to no avail. The final score: fat, 227 points; slender, 216. Rather a slim victory.

Helicopter Ride to the Front

We were packing to go home when permission came to go to the front. In 15 minutes we were in a helicopter, and 50 minutes after that we landed in the rain at Vang Vieng, a little market town 1,000 feet above sea level, ringed by steep green mountains. One rose 2,000 feet straight up. Here was the head-

quarters of Col. Kouprasith Abhay, commander of Mobile Group 12. He had halted the southward drive of the Pathet Lao nine days before, and now he was pushing north.

The daily airdrop began, but the children did not stop playing soccer to watch. Sending boxes down by parachute was to them a natural way to unload an airplane. The field was wet and soft, and with the chutes the plane could deliver three times the load it could have landed safely. Convoys from Vientiane were slow and ambushed daily, and so Mobile Group 12 depended on airdrops.

The Dakota passed over every three minutes, leaving six chutes behind (page 270). Then came six double thuds as the boxes hit, bouncing once. One chute didn't open. The box shot downward and flew apart.

Death in Wooden Boxes

Our companion Boun My had gone to work at the Education Ministry, but we found another interpreter on the colonel's staff. He liked to be called Johnny.

In a Jeep we slithered north on the muddy Luang Prabang road, following the colonel. We crossed a river at Ban Pha Tang, retaken five days before, and stopped at a thatched-roof shelter where soldiers huddled in blankets. Malaria.

A Jeep brought back a man bandaged from feet to hips. Blood soaked through in three places.

"Chinese mines," the colonel said. Half a mile farther he showed me one, freshly dug up: a wooden box a foot square. "No metal except for the detonator," he said. "The mine detector won't react to it. You've got to see where the ground has been disturbed."

Off the road four 105-mm. howitzers went into position, the heaviest weapons then in Laos. "The enemy has Russian

Breakfast Time in the Market at Nam Tha Mirrors the Kingdom's Mixture of Tribes

Vendors set up open-air restaurants wherever space can be found. Buyers eat *bánh phở*—rice vermicelli, vegetables, and pungent sauce. Author White counted 23 tribal minorities living in the area. Legend says the tribes emerged from huge gourds punctured with a poker by a demigod.

85-mm. field guns with longer range, but they don't have the same wallop." Infantry dug in around the guns, while pigs and chickens rummaged among them.

As we drove back to Vang Vieng after dark, the villages we passed looked deserted. Not a light, not a stir. At dinner by candlelight the colonel received word from the tough Meo warriors holding the ridges on our right. Two old Yao tribesmen from the highest region reported a Vietminh patrol passing their village.

The colonel exploded. "You are Yao, but you are Lao, too! Why didn't you kill them?"

The old men squatted silently. The colonel sighed. "Our people are very tolerant," he said. "Life is like a string, and you follow the line of your life because it is guided by the Buddha. We say *kan khat*," if it must be like that, it must be. If I must die today, I die; it is ordained."

"Be a Fatalist, but Move Your Feet"

The colonel ate sticky rice and some preserved fish his wife had sent. "But fatalism isn't everything," he went on. "The Lao father also tells his son, 'If you fall into the water you must move your feet.' Do what you can to make sure that your life is long—be a fatalist, but move your feet!"

Next morning we drove north again, past the howitzers, past armored cars, past a tank,

Inquisitive Yao Watch Supplies Drop Through Vang Vieng's Clouds

Only a week before photographer Garrett took these pictures, this airstrip on the road between Vientiane and Luang Prabang had been under rebel fire (map, page 258). Two days after he left, rebel troops launched a drive that eventually overran the area.

Airdrops offer the surest means of moving supplies to the front in mountainous Laos. Limestone peaks tower sheer above the plains—breathtaking in their beauty but formidable barriers to ground travel.

Eyes glued aloft, Yao men survey parachuting cases. "These friendly people have the curiosity of complete honesty," Mr. Garrett says. "They appear for every landing, touch our cameras, laugh and talk. They said they thought they could build planes but not tires that would hold air."

Skilled craftsmen, the Yao use scrap brass to decorate the knives worn at their belts. One man clutches a shiny, newly bought pot and kettle.

Army Trucks Cross a Flimsy Bridge Near the Front in a Strange War

When NATIONAL GEOGRAPHIC staff members White and Garrett visited the Vang Vieng area, the front lay less than a mile beyond this little village of Pha Tang. Trucks returning from the lines roll over a bridge laid on pilings of rock and dirt in a wickerwork frame. Most bridges in Laos disappear when rivers flood during the heavy monsoon rains.

Soldiers in civvies turn an ammunition case into a cook-pot; duck blood enriches the stew. Fat, hand-rolled cigarettes are smoked throughout Laos.

Faces of war: a helmeted youth and a hardened veteran. Government units often wear kerchiefs of various colors for identification.

King Savang Vatthana and the Queen of Laos watch Army Day events in Vientiane. He became monarch of the "Land of the Million Elephants and the White Parasol" in 1939 upon the death of his father, King Sisavang Vong.

Royal cremation: On a serpent-bodied carriage, an urn carrying remains of the King nears the gilded pyre at Luang Prabang last April. The new King (above) applied the torch; other officials added sticks of burning sandalwood. The cremation had been delayed for 15 months while the royal soothsayers awaited a propitious time.

At the battalion command post, next to the radio telephone, I noticed little clumps of rice. The commander hesitated. Then he said, yes, the rice was an offering to the local spirits. "And if a soldier is killed, we bury him with a little rice, to ease his way."

We walked on, past infantry foxholes. Ahead lay a narrow, bending gorge blocked by enemy demolitions. Our scouts were feeling their way along the ridges.

Over a mound of earth at the left of the road, I stepped into a field where two men were sighting a 4.2-inch mortar. Their map showed an enemy position three miles ahead. Another crew roasted a pig over a fire.

I joked with a private with a scraggly but fierce mustache and fierce twin knives in a single scabbard. "The big one is for cow and fish," he said. "The little one is for bananas and vegetables." He glanced toward the fire. "Both are fine for pig."

Back on the road, I looked ahead to the hill gorge. How wonderful it would have been to drive between those walls of green, with the valley ringing with the song of birds.

A black puff appeared over the gorge.

Another. The valley shook with a crackling explosion. The Russian 85's were seeking the range with aerial bursts.

Two more rounds hit the ground, to my left and comfortably far ahead. Then a roar right next to me, a push of heat against my forehead. My insides tightened and I stood still. My mind said clearly, I am alone.

The next instant brought a second close blast, but I was already in a mudhole.

With the third blast, I laughed out loud. The enemy shells were hitting as far away as ever. Those near-by explosions came from the friendly mortar in the field, the one I had just watched being sighted in. It was a heavy mortar, and its muzzle blast was correspondingly strong.

I had never been happier in my life.

Johnny looked glad, too. "Before I left home," he said, "I prayed to the spirits I respect most. I prayed, 'Please help me, don't let anything bad happen to me or my comrades. If I come back, I will give you a present, the best thing I can.'" He slung his submachine gun over his shoulder jauntily.

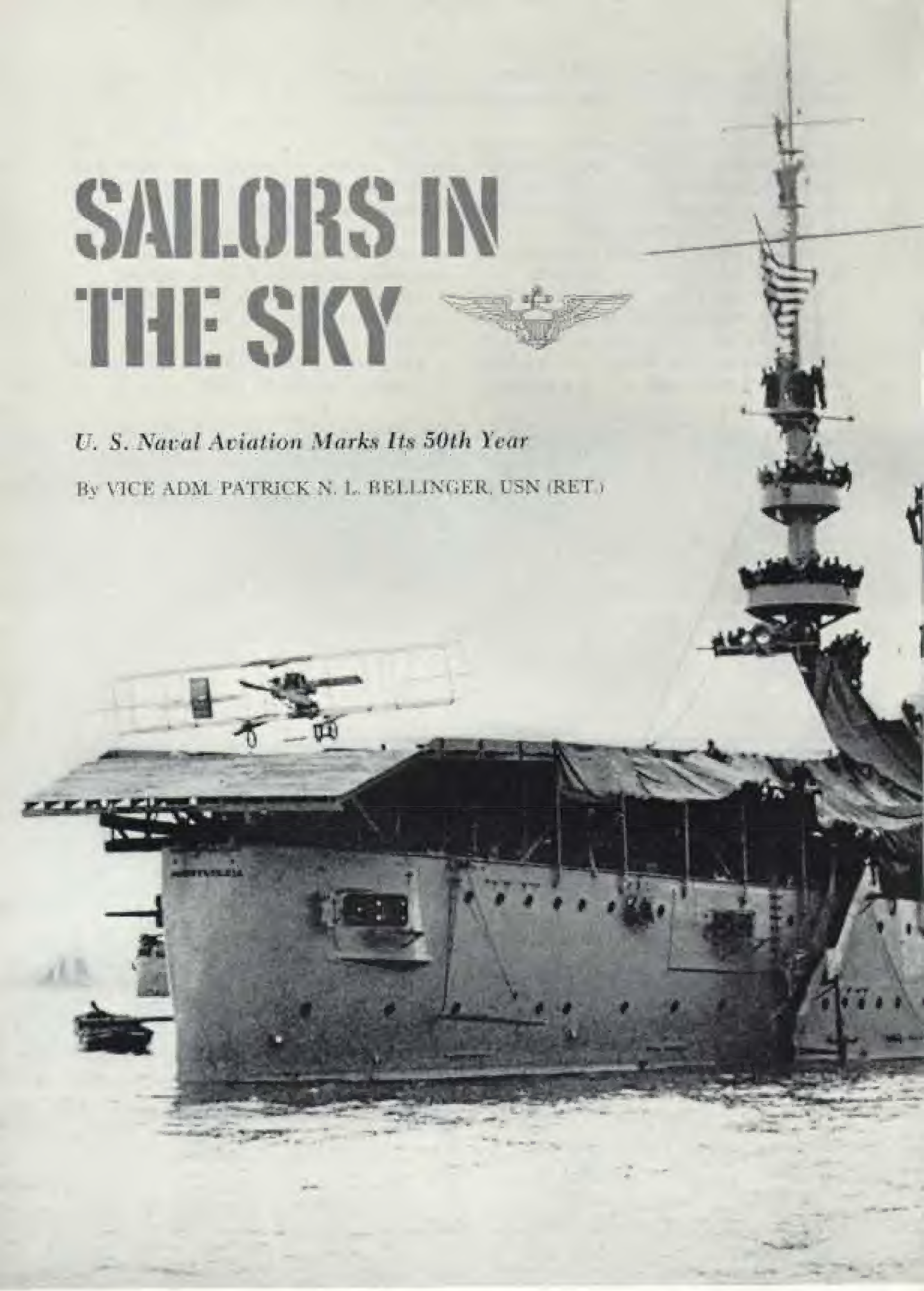
"When we get back to Vientiane, my parents will have a baci for me, and we will all be happy."

Yes, Johnny, I thought, I hope that you will be happy — you and all Laos.

SAILORS IN THE SKY

U. S. Naval Aviation Marks Its 50th Year

By VICE ADM. PATRICK N. L. BELLINGER, USN (RET.)



First shipboard landing, January 18, 1911: Eugene Ely gingerly brings his biplane down on the

cruiser U.S.S. *Pennsylvania* in San Francisco Bay

MANY YEARS AGO at Midway, 1,300 miles northwest of Pearl Harbor in the Pacific, I came to know the gooney bird, a kind of awkward albatross.

Gooneys are stern parents. They abandon their youngsters to fend for themselves, to learn to fly or starve. I watched young gooneys flop on their faces and felt vaguely uneasy. Suddenly I knew why: They reminded me of naval aviation.

Fledglings Reshaped Sea Power

The Navy got its first plane in 1911 — a single-engine pusher, the Curtiss A-1. The first Navy pilot to master it was Lt. T. G. Ellyson (page 280). By the time I had learned to fly in 1913, we had five planes. I became pilot No. 8.

Of course we were successful gooneys; we survived hard times and did not starve. At the peak of World War II, there were 60,747 of us. In fact, we did more than survive; we practically took over the nest. Aviation revolutionized the art of making war at sea.

This year naval aviation celebrates its 50th anniversary. Some of those years have been lean, others fat. I've been around for 49 of them. I've set down here some of the things I remember and some of the thoughts I have

Football helmet and bicycle tubes serve as crash helmet and life preserver for Ely, a civilian test pilot for Glenn H. Curtiss. Admirers swarm about him aboard the *Pennsylvania*.

THOMAS J. ABERNATHY

The author today: At 75 the senior surviving U. S. naval aviator, Vice Adm. P. N. L. Bellinger served through four vital decades. A South Carolinian, he graduated from the Naval Academy in 1907. He was assigned to battleship and submarine duty during 1911 and 1912, when the Navy was taking its first tentative steps into aviation, but in 1913 he qualified as Naval Aviator No. 8.

Always an outspoken advocate of naval aviation, he helped it grow from humble beginnings to a mighty offensive force. In World War I he commanded the U. S. Naval Air Station at Hampton Roads, Virginia. He received the Navy Cross for his part in the historic NC transatlantic seaplane flight of 1919. Later he served in many staff and command capacities—including tours as assistant naval attaché in Italy and as commander of the carriers *Langley* and *Ranger*.

For World War II service as Commander, Air Force, Atlantic Fleet, Admiral Bellinger received the Distinguished Service Medal. He has also been decorated by the Portuguese, French, and Italian Governments. He retired in 1947.

A split second after the photograph on page 276 was made, Eugene Ely touches down at 40 miles an hour on the *Pennsylvania*'s improvised flight deck. His wings barely clear crouched onlookers. Three hooks on the undercarriage catch ropes stretched between sandbags, foretelling modern arresting gear.

The author 46 years ago: Lt. (jg) Pat Bellinger braces for take-off in 1915 in the Curtiss AH-3 hydroaeroplane, rigged for testing a control system.

about this wonderful adventure I've shared with so many dedicated, talented people. I can't tell the whole story, but perhaps my small part will give you a better understanding of how the Navy found and used its wings.

When I was a midshipman at the United States Naval Academy between 1903 and 1907, we learned to maneuver fleets so that battleships could chew the enemy to pieces with their big guns, tossing 800-pound shells three miles or more. Thirty-five years later, ships fought decisive battles in the Pacific and never saw, much less shot at, each other. Carriers sent their planes hundreds of miles, far beyond the horizon, to do the job.

But whether you sail it or fly it, the Navy

is still the Navy. The training and traditions that produced Farragut and Dewey gave us great carrier admirals like Marc Mitscher and Bull Halsey, and I will take any odds that the breed is not extinct.

Exhilaration, Strangeness—and Fear

A man feels good when history slaps him on the back and says, "You were right." Flying was a new art 50 years ago, and like all things new, it had to prove itself. Although those of us who flew were only tolerated in the Navy during aviation's early years, when the chips were down during World War II our theories were gratefully adopted. A good thing, for naval aviation played a decisive role in winning the war at sea.

However, I shouldn't begin my story at the end. Let's go back to 1911 and 1912, when the Navy got its first planes. I will try to recapture for you something of what we felt—exhilaration, danger, strangeness, and certainly fear—when we perched on the edge of a wing, dangled our feet down to a bar on a pontoon, and hunched and prayed our wobbly little seaplanes up off the water.

Like the few pilots before me and the millions since, I'll never forget my first solo flight. Early in 1913 the Navy packed its planes and their crews off to Guantánamo Bay, Cuba, to operate near the fleet. I was taught to fly by a young lieutenant, Jack Towers (who, as vice admiral, commanded naval air in the Pacific during World War II,

Navy's first aviator, Lt. T. G. Ellyson, rides beside Glenn H. Curtiss, builder of this early hydroaeroplane. They prepare for take-off in 1911 from Keuka Lake, Hammondsport, New York. Ellyson's career was tragically cut short in 1928 when he crashed in Chesapeake Bay.

Naval Aviator No. 3, Lt. (jg) John H. Towers (right) and Glenn Curtiss man dual controls at Hammondsport in 1911.

AB-3 Curtiss flying boat shoots from a permanent catapult installed on the stern of the U.S.S. *North Carolina* in 1916. The armored cruiser thus became the first naval ship equipped to carry and launch aircraft at sea.

Marine parachutist plummets from a de Havilland DH-4 of the Leathernecks' famed Ace of Spades Squadron of the early 1920's. Marine Corps aviation began as early as 1912.

Rear Adm. W. A. Moffett headed the Bureau of Aeronautics, 1921-33. He died in the airship *Akron's* crash in 1933.

Twin-float bomber and torpedo plane of the early 1920's, the SC-1, releases its charge. The Navy test-dropped a torpedo in 1917 and commissioned its first torpedo squadron in 1920. A quarter-century later Navy and Marine aircraft sank more than 600 Japanese ships.

Naval Aviator No. 11, Lt. Comdr Henry C. Mustin commanded the first naval air station at Pensacola, Florida.

Tent hangars on the beach housed the seven flying boats and hydroaeroplanes moved from Annapolis to Pensacola in 1914. The first aviation unit numbered only nine officers and 23 men. During World War II the Pensacola flying school trained thousands of Navy pilots.

Navy's first airship, the DN-1, approaches its floating hangar on Pensacola Bay, where the twin-propeller gasbag made three successful test flights in April, 1917. Blimps won high praise for their performance during both World Wars. Navy blimp squadrons still operate (page 287).

Pioneer parachutist leaps from a balloon. The Navy ordered chutes carried on lighter-than-air craft in 1919.

Novel experiment in 1926 saw the submarine S-1 launch a Cox-Klemin XS-2 seaplane off New London, Connecticut. Disassembled, the plane rode in a waterproof tank amidships. Within 12 minutes after the sub surfaced, crewmen could assemble the plane, put it in the water, and watch it take off. To retrieve the plane and submerge again required but 15 minutes.

and, after the war, became Commander in Chief, Pacific. On February 1, 1913, he told me I could go up alone.

"Bellinger is doing fine in the air," Towers had reported, "but he is very erratic in landing. I still have hope of teaching him to fly. After he learns how to do something, he never forgets."

You can be sure I tried to remember everything that morning. I bubbled all over with excitement, and the plane —which had its engine and propeller behind the seat— didn't let me down.

It was a wonderful feeling. I was nervous and fascinated, all at the same time. The plane soared and flew like a balloon, light and responsive to every touch of the controls.

"You're sitting on top of the world, Pat," I told myself, "but how much do you really know about flying? Not much." None of us did. We learned our lessons and made up our rules as we went along.

For instance, as we flew, we always figured the wind's force and direction, for rough air could toss you out of the sky like a flipped playing card. Motors were primitive, and they often quit in mid-air; so we flew with an eye on the surface, picking out the nearest open space in case of a forced landing. The most important rule was: "When something goes wrong, point her nose down."

All these were more than just useful habits. They were the difference between survival and disaster.

First War Missions in Mexico

Some pilots who flew in those days will tell you they were never scared. They are either liars or were too stupid to know what they were doing. Of course, we never realized we were scared when we were in serious trouble—we were too busy trying to save our necks. But sometimes anticipating danger could squeeze your stomach and parch your mouth so that you thought it was stuffed with cotton.

It happened to me at Veracruz, on the east coast of Mexico, in April, 1914, when I flew the Navy's first observation missions under war conditions. Our fleet was trying to extinguish a smoldering revolution, and occupied the port to keep shipments of foreign arms from coming in. I flew scouting missions, spotting revolutionaries fighting U. S. Navy forces in outposts around the city.

I took an observer up every day for a month, and then I began to have trouble sleeping, because I was worrying about my seaplane being forced down in hostile territory. The chance was more than imaginary. Once a piece of the carburetor snapped off and bounced into the propeller. Another time the crankshaft broke, and again the gasoline line. Fortunately, I always limped to the coast and landed on open water.

By accident, I set a record of sorts at Veracruz. The engine faltered one day, and before it caught again, we dropped low over a village. After I landed at our beach airbase, my mechanic found bullet holes in the wings. Mine was the first U. S. plane hit in action.

Our orders were not to fire back (all we carried were pistols), but on the last flight before we packed up to leave, I decided I'd drop some small change for the punishment

A. C. Read skippered the NC-4 on its transatlantic crossing in 1919. Then a lieutenant commander, he retired as a rear admiral.

Churning Lisbon harbor, the Curtiss flying boat NC-4 (opposite, lower) taxies triumphantly toward shore after completing the first flight across an ocean. She took off from Newfoundland on May 16, 1919, and spanned the Atlantic, via the Azores, in 11 days. Two sister planes accompanying her failed to complete the historic flight.

Crewmen board the luckless NC-1 at Rockaway Beach, New York. Author Bellinger stands in the nose at left. Lumbering toward Lisbon from Newfoundland, the big flying boat became lost and landed off the Azores. A Greek ship rescued the crew, but waves demolished the plane. The NC-3, third plane in the 1919 transatlantic attempt, also came down at sea, but was able to taxi and drift to the Azores.

we'd taken. I couldn't find a handy stone or brick, so the Navy's first bombardment mission armed itself with a big bar of yellow laundry soap. Let's score it as a clean hit—target unknown.

World War I Navy Made 22,000 Flights

The world plunged into war in August, 1914, and aviation developed elsewhere at a frantic rate. We tried but didn't keep pace in this country. I visited France that summer and reported sadly that Europeans were far ahead of us. Time confirmed what I said.

In 1917 we entered the war, and the muscle in the Navy's air arm consisted of 48 officers, 239 enlisted men, 54 rickety airplanes, and one airship. Naval aviation had little to do with the outcome of essentially a land war, but Navy pilots made a good record in 22,000 flights. Mostly we flew antisubmarine patrols, but there were also bombing raids and instances of brisk aerial combat.

Fortunately, those years were not wasted. We did not build an air fleet, but we did innovate on a small, experimental scale, and many of the techniques that gave naval airpower its World War II wallop were developed during those otherwise frustrating times. For instance:

In 1915 one of the early launching catapults shot me and my seaplane from a floating barge at Pensacola, Florida. I'd been to a party the night before, and I can testify that the jolt of a catapult launching clears one's head.

Later, off Guantánamo, I spotted the fall of shells from battleships firing at towed targets, and Albert C. Read, my observer (now a retired rear admiral), signaled hits, misses, and corrections, so that gunners could improve their aim. The eyes of the fleet quit blinking and opened.

Fighting Ships Acquire Slingshots

By the end of the war, we had learned to drop bombs from airplanes and were experimenting with torpedoes. We could fly higher, farther, and faster than we ever dreamed possible. But at heart, we were still a bunch of missionaries, and we knew naval aviation would be a heathen forever unless it could go to sea with the fleet.

Catapults, developed from the one I tested, were partly the answer, although frankly I never thought they were much good. Planes were made available to equip all battleships and cruisers, and soon cumbersome catapults—they threw planes aloft like monster slingshots—sprouted on the fleet's fighting ships. They annoyed spit-and-polish officers, who complained they cluttered up their ships and introduced unnecessary hazards.

But the war showed the importance of masses of planes, not just lone flyers popped off a deck; so the Navy cast about for a way to take its airbases to sea. The answer, obviously, was the aircraft carrier.

Of course, there were many practical problems. My good friend the late Capt. Henry C. Mustin (page 281)—he loved aviation with more dedication than any man I have ever known—helped find some of the answers in 1919. He built a sledlike speedboat that tore across the water at 55 miles an hour, the take-off speed of the plane it carried, and actually managed to launch it.

Years later, huge carriers would head into the wind and steam full speed to help their planes soar off the deck.

The Airfield Goes to Sea

The British went ahead and built a carrier, while we scratched our heads. We had experimented in 1911 with landing a plane on a platform built atop the old armored cruiser U.S.S. *Pennsylvania* (pages 276 and 279). But not until 1922 did the Navy put a flight deck on a collier, renaming it the U.S.S. *Langley*. We had our sea-borne airport. I'm still convinced one reason we got it was so we'd take our planes off to ourselves and not bother the rest of the fleet.

I commanded *Langley* ten years later, when the mighty *Saratoga* and *Lexington*, designed from lessons she taught, had made her obsolete (page 289). A slow and in many ways a lubberly ship, still she trained a generation of Navy pilots to find a flight deck—a chip of home in the wide blue sea—fly their pattern, and come in straight.

Now I have gotten ahead of my story. Naval aviation developed in several directions at once; so I must go back and pick up another thread.

One of our jobs—the most important, some people thought—was to fly long observation and bombing patrols with seaplanes. These missions were essential to antisubmarine warfare in World War II, and provided yeoman reconnaissance service to the fleet until radar gave it second sight.

So necessity bred generations of lumbering

Trail Blazers Byrd and Bennett Head for the North Pole

One of America's most famous airmen, Lt. Comdr. Richard E. Byrd electrified the world in 1926 with the first flight over the North Pole. Beside him in the trimotored Fokker monoplane rode Naval Aviation Pilot Floyd Bennett, the enlisted flyer for whom New York City named Floyd Bennett Field.

Here, wearing reindeer-skin parkas and polar-bear trousers, Byrd (left) and Bennett board their plane at Spitsbergen.

Naval scouting planes soar over icebound Smith Sound, off Greenland, during the 1925 MacMillan Arctic Expedition sponsored by the National Geographic Society. Byrd led the naval detachment, whose Loening amphibians flew more than 6,000 miles in the first extensive use of aircraft in Arctic exploration.

Macon, Last of the Navy's Rigid Airships, Cruises Over Lower Manhattan in 1933

For a decade, beginning in 1923, mammoth airships roamed U S skies. The Navy built three giants—the *Shenandoah*, *Akron*, and the latter's $6,000,000 sister ship, the *Macon*. A German-made Zeppelin acquired by the Navy and renamed *Los Angeles* logged more than 5,000 hours before being decommissioned at Lakehurst, New Jersey, in 1932. *Macon* went down off California in 1935, ending the era of Navy airships with rigid metal skeletons. But the smaller blimp, a gasbag without internal supports, continued to be developed.

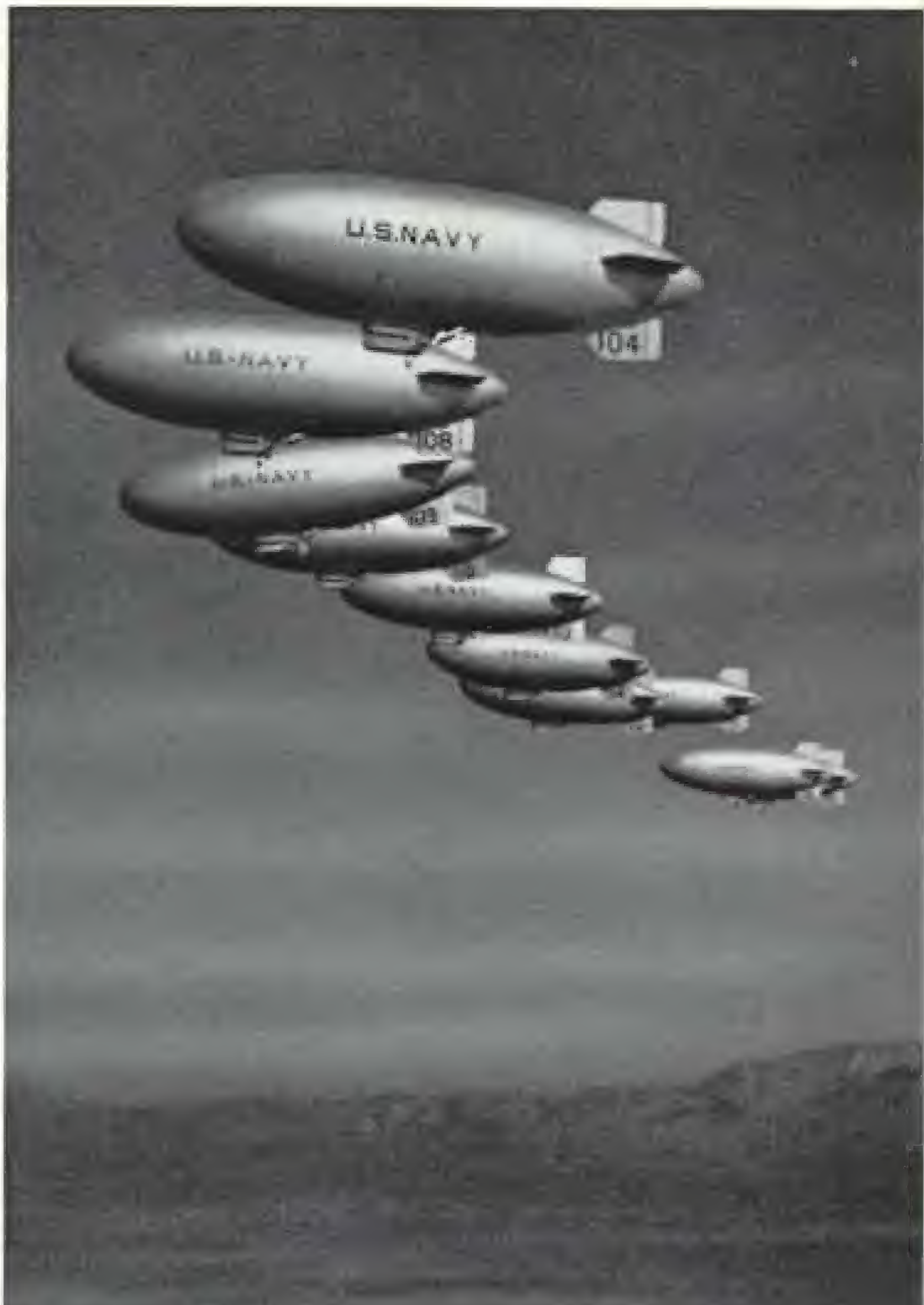
Trapeze bar beneath the belly of the leviathan enabled her to launch and recover in flight the F9C-2. The 785-foot *Macon*, powered by eight engines, carried five fighter planes in her hull.

flying boats, such as the early NC's (Navy-Curtiss). The first were finished too late for World War I, so the Navy decided to dramatize their tremendous range by making the first transatlantic flight with four of them.

On May 16, 1919, after weeks of tests and mishaps, three NC's with five- and six-man crews finally lifted off the waters of Trepassey Bay, Newfoundland, and headed southeast for the Azores and Portugal. My old friend and instructor Jack Towers commanded the NC-3, Lt. Comdr. Albert C. Read had the NC-4, and the NC-1 was mine.

Of course we knew where Europe was, but finding it meant trusting new navigation instruments never used on a long-distance flight before. Ships spaced along the route flashed guiding signals, but NC-1 lost its bearings in a fog. We groped and circled, sometimes skimming the tops of waves, and finally gave up. Our pilots, Lt. Louis T. Barin and Lt. Comdr. Marc A. Mitscher, later a hero of the war in the Pacific, brought us down safely, despite heavy seas.

I've never been as seasick, tired, and discouraged in my life. We scrambled around, desperately trying to bal-



Ten Blimps Parade Like a Flotilla of Submarines

Gleaming gasbags on practice maneuvers sail above the Naval Air Station at Moffett Field, California. More than 120,000 cubic feet of helium inflates each rubberized envelope, half as long as a football field.

World War II blimps escorted hundreds of convoys without losing a single vessel to submarine attack. Earlier this year only 10 airships remained on active duty, and further reductions appeared likely.

ance the plane so it wouldn't founder, but the waves slowly pounded it to pieces. In the nick of time, a Greek ship loomed out of the fog and picked us up. We were 70 miles from Horta, in the Azores. A towrope to the NC-1 became its noose, and it died in the crashing Atlantic swell.

However, numbers spelled success: one plane, the NC-4, made it to Horta and then to Portugal and England (page 285). NC-3 landed at sea as we had, but a fair wind and a jury-rigged sail helped her get to the Azores.

The Big Carrier Comes of Age

In the years that followed, we built bigger and better flying boats. They were sturdy, awkward, and serviceable, but by the end of the second World War, I decided they had just about seen their day. Good work-horse planes, they lacked fighting ability.

After the first World War, the fresh wind of change blew through military aviation. Sometimes it blew quite hard: the Army Air Corps' Brig. Gen. Billy Mitchell attracted a great deal of attention when he charged that the Army and Navy high commands were blind in refusing to admit that aviation made fleets and old-style armies obsolete.

There was no unified naval aviation command. "Everybody's business is nobody's business," I used to say—and it is true that we lacked purposeful direction. The Bureau of Aeronautics had more real authority than any other office, although in the Navy's chain of command it had no control over operations.

I make no bones about my bias. I did all I could to keep aviation from being pushed aside as a mere auxiliary, but with mixed success. "The eyes of the fleet," they used to call us, and when they did, my collar would heat up. I felt we were being patted on the head, as you might pat a toothless, faithful, not-too-bright seeing-eye dog.

Still, we learned to build and operate big, modern carriers. At the beginning of World War II we had only eight. But with their crews and flying squadrons honed to a keen edge by ceaseless drill and maneuvers, they saved our necks in the Pacific.*

(Continued on page 294)

*See "The New Queen of the Seas," by Melville Bell Grosvenor, NATIONAL GEOGRAPHIC, July, 1942.

Dubbed "Old Covered Wagon" by airmen, the converted collier U.S.S. *Langley* joined the fleet in 1922 as the Navy's first carrier. She trained a generation of pilots and, reconverted to a seaplane tender, served valiantly until sunk in February, 1942, off Java.

Fast, lethal carriers, their decks crowded with planes, anchor off Ulithi Atoll in December, 1944, demonstrating the tremendous, far-ranging power of naval aviation. In line lie *Wasp*, *Yorktown*, *Hornet* (each the second carrier of that name), *Hancock*, and *Tranderoga*. Two other flattops ride astern amid supporting ships of all sizes (opposite page)

U.S.S. *Hornet*, Rolling in Heavy Swells, Launches the First Air Strike at Japan

Early in World War II, American morale sagged as Japanese forces stormed the Pacific. But in April, 1942, a joint Army-Navy strike gave spirits a boost. The carrier *Hornet*, commanded by Capt. (later Adm.) Marc Mitscher, launched 16 bombers a mere 668 miles off Tokyo. Led by Lt. Col. (later Lt. Gen.) James H. Doolittle, the planes hit five Japanese cities. Of the 80 flyers, 73 survived by crash-landing or parachuting into China.

This *Hornet*, seventh Navy ship to bear the name, was sunk in October, 1942. A new carrier took the name again in 1943 (preceding page).

"Go!" signals a flight officer on the U.S.S. *Philippine Sea*, and a rocket-toting F4U-4 roars off to blast a Korean target in August, 1950. First Navy-Marine plane to surpass the Japanese Zero in performance, the rugged, gull-winged Chance Vought Corsair fighter flew with the Navy for 14 years.

Carrier Gunners Throw Up a Deadly Barrage; Japanese Planes Press a Brave but Costly Attack

In April, 1944, an American task force struck at Truk, a Japanese bastion in the eastern Caroline Islands. Working under fire aboard the carrier *Yorktown*, Navy artist William F. Draper captures on canvas a ship's grim fight for life. Antiaircraft fire rakes the sky and takes a heavy toll, but still one plane in the center of the picture comes on. Skimming the water through geysers of spray, it heads straight for the carrier. Eyewitnesses recall that at the last moment it veered over the bow and crashed into the sea. Torpedo plane at upper left, spewing flames and with one wheel dangling, banks away in a death plunge.

NAVAL AVIATION 1911-1961

Sleek, swift jets herald a new age in naval aviation. Powerful A3J Vigilante (upper left), a North American bomber, can fly thousands of miles and at more than twice the speed of sound. Rakish F4H Phantom II (top of page), made by McDonnell, is a superb all-weather fighter. Thirty 500-pound bombs ride with the fast A2F Intruder, a Grumman attack plane (above).

Carrier Crews Letter the Deck to Spell Out a Salute to the Skies

Carriers like the *Independence*, *Saratoga*, and *Intrepid* (front to rear, shown here during Mediterranean duty), provide the sinews of the Sixth Fleet.

Ships of the *Forrestal* class, which includes the *Saratoga* and *Independence*, boast four-acre flight decks more than 1,000 feet long. Four steam catapults propel jet fighters and bombers into the air. In addition to a take-off runway at the bow, each of the carriers shown here has an angled runway slicing diagonally across the deck, allowing planes to land while others take off. More than 3,500 crewmen man a large carrier.

Sometimes an idle remark by an old friend, or a cluster of eager faces around a gangling plane in an old photograph washes my memory clear, and I can feel again what was wonderful about those years. Ours was a small Navy. Officers all knew each other, and a ship's crew loved her like a mother.

Lady Lex—the carrier *Lexington*—was sunk by U. S. torpedoes in the Coral Sea in 1942, after her planes had bloodied the Japs and she had been battered so grievously in return that she had to be abandoned. Many of the crew had served on her for years. They carefully saved the captain's dog, slipped their rafts into the warm sea, and ducked their tear-stained faces so they would not see their happy ship explode and die.

Pearl Harbor Teaches a Lesson

The Navy that took such a disastrous licking at Pearl Harbor on December 7, 1941, was a good Navy, willing to take on the terrible task of war. I know, for I was there. But years of lean appropriations had sapped its strength, and those of us who preached airpower had to grit our teeth and take it when the Japanese swooped in that Sunday and read us the litany of air superiority—a text we had written and then ignored.

I commanded the Pacific Fleet's Patrol Wings One and Two—81 seaplanes, many of them obsolete, spread across the Pacific at Pearl Harbor, Midway, Wake, Johnston, and Palmyra. Despite urgent pleas, we lacked crews, spare parts, and equipment to operate efficiently.

Everyone did his best with what he had. My headquarters at Ford Island radioed, "Air raid Pearl Harbor—this is no drill!" when the first bomb fell. Moored ships blew up and sank all around us. I watched the battleship *Nevada* head for the open sea, shudder when bombs hit her, and then run aground.

Then I ran out on the field, as planes swooped in low.

"Get in the corner of the hangar, Admiral," a crewman shouted.

I started to dive and suddenly thought, "This is a stupid thing for me to be doing." Instead I ran to a machine gun wrenched from a damaged plane. Fortunately it jammed, for the planes turned out to be ours—typical of the confusion of that terrible day.

I will say one thing for Pearl Harbor—it removed once and for all any lingering doubts the Navy may have had about the usefulness of airpower. I'm sorry we had to learn in defeat, but learn we did. Shortly afterward I heard that an old friend of mine, the late Vice Adm. Herbert F. Leary—determined advocate of the big gun—had said, "This is an airpower war. There's no place for an old battleship horse like me."

We used no battleships in the Battle of Midway in June, 1942; we didn't have any available. But we did have three carriers—*Enterprise*, *Hornet*, and *Yorktown*. *Enterprise* alone was there of three that had been in the Pacific when the war began—luckily none at Pearl Harbor. *Saratoga* took a Japanese submarine's torpedo in January near Hawaii; refitting on the West Coast, she was too late for the battle. *Lexington* went down in the Coral Sea in May.

At Pearl Harbor I scraped together every suitable land-based plane I could and shot them off to Midway. They joined Marine and Army planes already there, and the combined force tore into the enemy bravely. But they suffered heavy losses in closing with the enemy ships, and they scored little damage.

Adm. Chester Nimitz, then in over-all command, gambled the battle and perhaps the war on carrier squadrons. His last chips were his dive bombers, and with them he raked in the pot—four out of four Japanese carriers sunk.

Airmen Take On the Submarine

The tide turned slowly after Midway, and in the end it ebbed all the way to Tokyo Bay, where the Japanese surrendered in September, 1945.

I was not there. This was the two-ocean war Navy strategists had foreseen, and beginning in March, 1943, my ocean was the Atlantic. As Commander, Air Force, Atlantic Fleet, one of my jobs was to provide the planes that went fishing for the German subs prowling and snapping at convoys.

This was precise and technical warfare—almost like a ballet. We had a unit of scientists and other specialists at Quonset Point, Rhode Island, who developed devices for finding and sinking submarines, and I am sure the Germans had a unit of their own trying to keep ahead of us. I insisted that careful reports be made of each attack on a submarine—whether successful or not—so that we might continually improve our tactics.

Our score rose as the war went on, despite faster subs that ran submerged for days with

Task Group Alpha, Patrolling the Atlantic, Perfects Its "Hunter-Killer" Technique

Planes canopy the U.S.S. *Randolph*, submarines, helicopters, and destroyers ring her protectively. This ocean parade shows vividly the diversity and complexity of antisubmarine groups, whose teamwork must be instant and precise. They roam the Nation's sea approaches, ever alert against sneak attack.

snorkels. I'm convinced the Germans lost their best crews early and felt sorely our attacks from the air. Ship-borne and land-based planes sank 83 U-boats during the war in the Atlantic, driving home the lesson.

Few people realize, I am sure, the vast amount of training and support it takes to put a ship, a plane, or a man in the battle area during a war. Take carriers, for instance. We soon realized that big ones would win the war in the Pacific for us, and that small escort carriers were a convoy's best protection. But an operating carrier is an incredibly complicated mating of ship, planes, and crew; each must work perfectly with the others.

Then, too, we continually learned lessons the hard way—in combat. A communications or fire-control system failed at a crucial time in a battle? Then we needed a better one, and it had to go immediately into all carriers.

All new carriers built on the East Coast came to my command soon after they were commissioned. It was our job to fit them out, train their crews and air squadrons, and send them off ready to fight. Rear Adm. A. C. Read —whose NC–4 made it across the Atlantic in 1919—headed a special unit that did this.

We won World War II for many reasons, not the least of them, certainly, the intelligent use of airpower. I said before that history slapped naval aviation's missionaries on the back and said, "You were right"; now I'd like to add: "Thank God there were so many of us."

"Alumni List" Includes Famous Names

I'll name a few alumni; perhaps the list will surprise you.

There was James Forrestal, for instance, who served as Secretary of the Navy and later as first Secretary of Defense. When I saw him in Washington during the war, he said: "Pat, I was an ensign under you at Hampton Roads during World War I, and you chewed me out for stunting a plane." I smiled, but frankly, I couldn't remember. After all, I have chewed out a lot of ensigns in my time.

Franklin D. Roosevelt himself, though never an aviator, helped naval aviation try its wings when he was Assistant Secretary of the Navy during World War I.

The whole world remembers Richard E. Byrd, who retired as rear admiral. He pioneered in the use of airplanes as a tool of exploration, and under his leadership, aviation left its mark at both ends of the earth (page 285).

Robert A. Lovett, another Secretary of Defense, won his Navy wings in World War I. So did Artemus L. Gates, who served as Assistant Secretary of the Navy for Air and later as Under Secretary of the Navy. He pulled off a daring air-sea rescue in the English Channel during World War I, one of the first such rescues ever made.

Then there was David Ingalls, later Assistant Secretary of the Navy for Air. He shot down five German planes and became the Navy's first air ace. And there are many more.

I'm proudest, of course, of "our own"—men in aviation who rose up the ladder of command and led our forces in World War II. I've mentioned Marc Mitscher and William Halsey (I don't know how he got the nickname "Bull," but it stuck.) Another was Fleet Adm. Ernest J. King, a curious combination of martinet and sagacious leader. My immediate superior many times, he ran the Navy during the war with more absolute authority than anyone before or since—and the Navy responded magnificently.

Gooney Birds Reach the Rocket Age

Since I retired in 1947, I've watched naval aviation grow with the fond admiration—tinged perhaps with envy—of a parent whose child succeeds beyond even his expectations. A profusion of new weapons—missiles, jet planes, huge carriers—has given our task forces a new dimension (pages 292-3). They shifted without missing a step to the essentially ground-support mission they had in Korea, and today they stand ready to move—and strike—anywhere in the world.

It's difficult to get back in step. I visited the carrier U.S.S. *Forrestal* last year—its planes *land* twice as fast as we used to fly—and said I'd like to take a ride in a jet. There was a quick silence, then a lot of embarrassed hemming and hawing.

I suppose an old man like me belongs on deck. I couldn't get any takers.

Over the past half century the NATIONAL GEOGRAPHIC has published many articles marking milestones in the history and development of flight. Among the more recent: "Aviation Looks Ahead on Its 50th Birthday," by Vice Adm. Emory S. Land; "Fact Finding for Tomorrow's Planes," by Hugh L. Dryden; and "Fifty Years of Flight," a photographic history, all in December, 1953; "Fledgling Wings of the Air Force," by Thomas W. McKnew, and "History Written in the Skies," a pictorial record of the U. S. Air Force, both in August, 1957.

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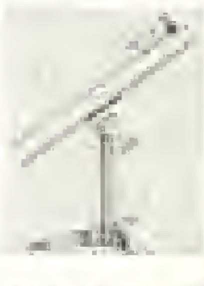

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SHILOH

the battle fought at a "place of peace"

When the Methodists of Pittsburg Landing in Tennessee built their church, they named it "Shiloh" —a place of peace. But on Sunday morning, April 6, 1862, Federals under U. S. Grant and Confederates under Albert Sidney Johnston turned that peaceful churchyard into a shell-torn battlefield.

Shiloh is again peaceful, *and a visit will make you proud that our National Park Service has made it a national shrine.* Mockingbirds sing over the silent guns near the beautiful river bank. The Peach Orchard is heavy with fruit. Bloody Pond, where both Blue and Gray came to share water and bind their wounds, reflects a placid sky. But as you drive through the battlefield, or follow the backwoods lanes Gen. Lew Wallace marched along to Grant's relief (and to later fame as author of "Ben Hur"), you see a thousand reminders of war, and the courage war demands.

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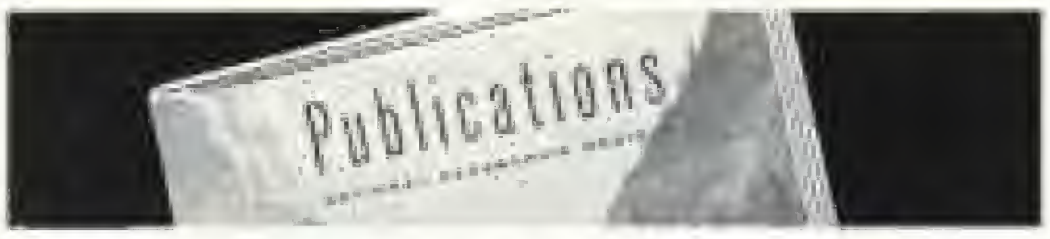

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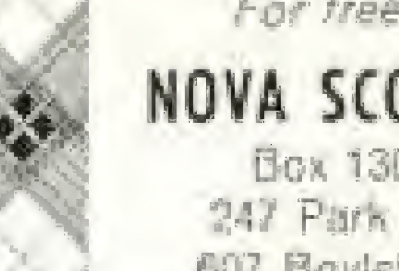

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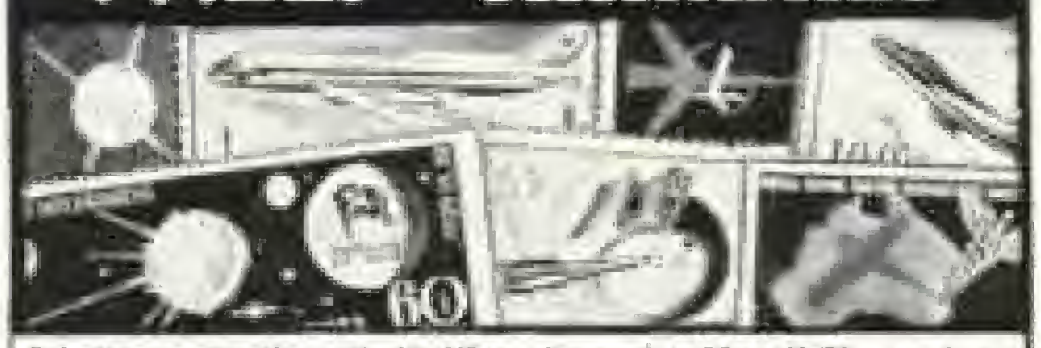

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