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OCTOBER, 1944

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the Indies and the Philippines to the Solomons

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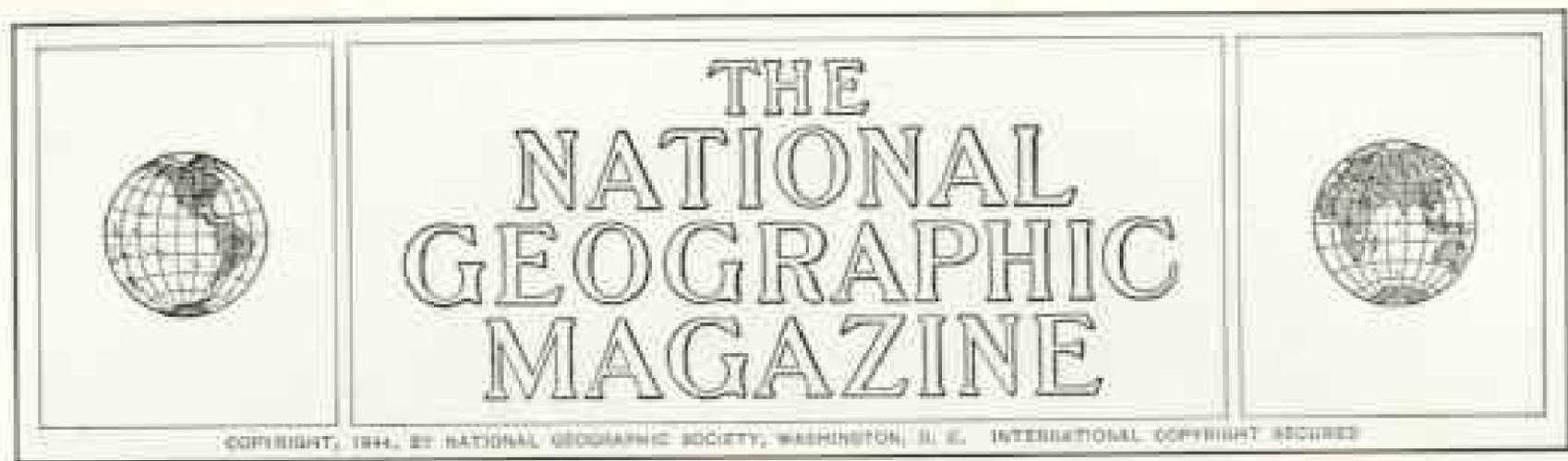
HARLAN MAJOR

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Springboards to Tokyo

BY WILLARD PRICE

WHAT was our chief handicap in the Pacific has become our chief advantage.

Japan's southern islands, the Bonins, Marianas, Carolines, and Marshalls, were a barricade blocking our path. Now they have become our steppingstones to Japan.*

It is perhaps hard to visualize this spread of islands and its significance.

Suppose that California, which is about the size of Japan proper, possessed a chain of islands extending to the Equator and planted so thickly that no invader from across the Pacific could approach any part of Mexico, Central America, or South America this side of Ecuador without California's consent!

Or, unthinkable as it sounds, suppose New York State plotted aggression against lands south to the Equator behind a rampart of islands reaching from New York Harbor to Brazil!

Island Sea Wall Defended Japan

Just so, Japan, thanks to her mighty sea wall of islands stretching from Tokyo Bay to latitude zero, was able to carry out her conquests in China, French Indochina, Thailand, Burma, the Malay Peninsula, the Netherlands Indies, and the Philippines, safe for a while from American interference.†

Confronted by this entanglement, we had to make our start toward Asia by way of Australia—much like proceeding from New York to London by way of Buenos Aires.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Mysterious Micronesia," April, 1936, and "Hidden Key to the Pacific," June, 1942, both by Willard Price; "Japan and the Pacific," by Joseph C. Grew, April, 1944.

† See map supplement of "Southeast Asia and Pacific Islands" in this issue of the NATIONAL GEOGRAPHIC MAGAZINE, and "The Society's New Map of Southeast Asia," page 449.

The calculating Japanese figured this all out many years ago. The island barricade then belonged to Germany. World War I gave Japan her opportunity. She had no love for either side. It was largely the chance to seize the Marianas, Carolines, and Marshalls from Germany that brought her into the war with the Allies.

That was 1914. In 1915 I chanced to be in Japan as a cub reporter and interviewed Count Shigenobu Okuma, then premier. The imaginative old man explained to me in his graphic way the importance of Japan's new acquisition.

"As you came into this house," he said, "the first thing you saw was the spirit screen. It stands in the middle of the vestibule. It barred your path; you had to go around it, either on the left or on the right, to get into the house. Its original purpose was to keep out devils. Well, these islands—they are like a spirit screen."

"You mean that they will keep the foreign devils out of Asia?"

Count Okuma smiled. "I am speaking quite frankly. It is my habit. It is really not good manners for us to call outsiders foreign devils. We should stop it. But it is true that we and our brothers in China have suffered a great deal at the hands of Western powers. It is my hope that these islands will protect us from such interference in the future."

"You mention China. Do you feel responsible for China's troubles?"

Very diplomatically, but unmistakably, Count Okuma outlined Japan's policy, a policy that had been plainly stated by many other Japanese but that we of the West long refused to take seriously.

"Japan is the leader of Asia," he said. "A leader is responsible for those who follow him.



Richard B. Goldsmith

Blood of Three Races Mingles in the Descendants of Nathaniel Savory

In 1830 five white men from Hawaii settled on Peel Island (Chichi Jima). Nathaniel Savory of Essex County, Massachusetts, became head of the mixed colony, which intermarried with Polynesian women from Hawaii, Guam, and Ponape. Two sons of Nathaniel Savory, Horace (left) and Benjamin, are shown here with the latter's daughter (right), grandson, and another descendant of Nathaniel (center). They represent a mixture of white, Polynesian, and Negro blood. Descendants of original settlers, always few in comparison with the Japanese, are dying out. This photograph was made in 1926 in the island's old settlement (p. 387).

I believe that all Asia is to be bound together in one heart and one mind. And I believe that Japan has a mission in helping to bring this about."

Japan's "mission" to dominate Asia has been fulfilled, at least temporarily. And it is hardly likely that it could have been accomplished without the "spirit screen" of islands which barred the way of the "foreign devils."

For more than two years the United States has been trying to go around the screen, on the left by way of New Zealand, on the right by way of the Aleutians.

Only with the taking of Saipan did we actually break straight through the barrier. And at this writing attacks upon the Bonins, Tinian, Guam, and Palau presage new rents through the spirit screen.

The most vital of these islands, because they are nearest to Japan, are the Bonins and Marianas. With their capture will begin a decisive phase of the Pacific war.

Their great importance is fully realized by the Japanese, who put up more bitter resistance on Saipan than on any other mandated island. Even the bloody record of Tarawa

was eclipsed. There were about $2\frac{1}{2}$ times as many American casualties in the first two weeks on Saipan as Marine casualties on Guadalcanal. And Japanese deaths in the same period were about four times the American. A Tokyo spokesman called the Battle of Saipan "the most critical since the outbreak of the war."

It was the most important because it was on Japan's doorstep.

From the Marianas and Bonin Islands (Ogasawara Gunto), American attack may dart out like a two-pronged fork.

One prong may be expected to plunge into Luzon, at the north end of the Philippines, synchronizing perhaps with an attack by MacArthur upon Mindanao, at the south end. Or it may strike for the China coast.

The other prong can very effectively jab deep into the Nipponese homeland itself. Airfields in the Marianas and Bonins would put us within bombing range of every important city of Japan!

Even the most remote of the Marianas, Guam, is only 1,565 miles from Tokyo, an easy trip for the Superfortress. Saipan is but



U. S. Marine Corps, Official

Marines Team Up with a Carabao to Move Supplies on Saipan

Saipan has alternating deep gulleys and steep hills that even jeeps and bulldozers could not push through. The island's few beasts were put to work. But United States Marines and soldiers often lugged heavy equipment and supplies by hand.

1,460 miles distant. Not only the B-29 but some of our medium bombers can manage that. The northern Marianas are closer and the Bonins would cut the distance down to 615 miles, which might mean a run of only a few hours.

The Bonins therefore take on a significance far out of proportion to their size. There are about 15 islands in the group if one counts only the large ones; nearly 100 if all the islets are included. But the entire land area of the archipelago is only 30 square miles.

"Foreign Devils" Settled Bonins

It will be a sort of poetic justice if the forked tail of the Western "foreign devil" strikes at the Japanese from the Bonins, for this was the first territory wrested by Japan from British and Americans.

Like the *Bounty* mutineers landing at uninhabited Pitcairn, or the Pilgrims at Plymouth Rock, the Bonin pioneers faced a new and strange life when they stepped ashore on palm-shaded Peel Island (Chichi Jima) one day in 1830 (page 388).

The island seemed a land of the dead, or an island on which life had never begun. It had long ago been called by the Japanese

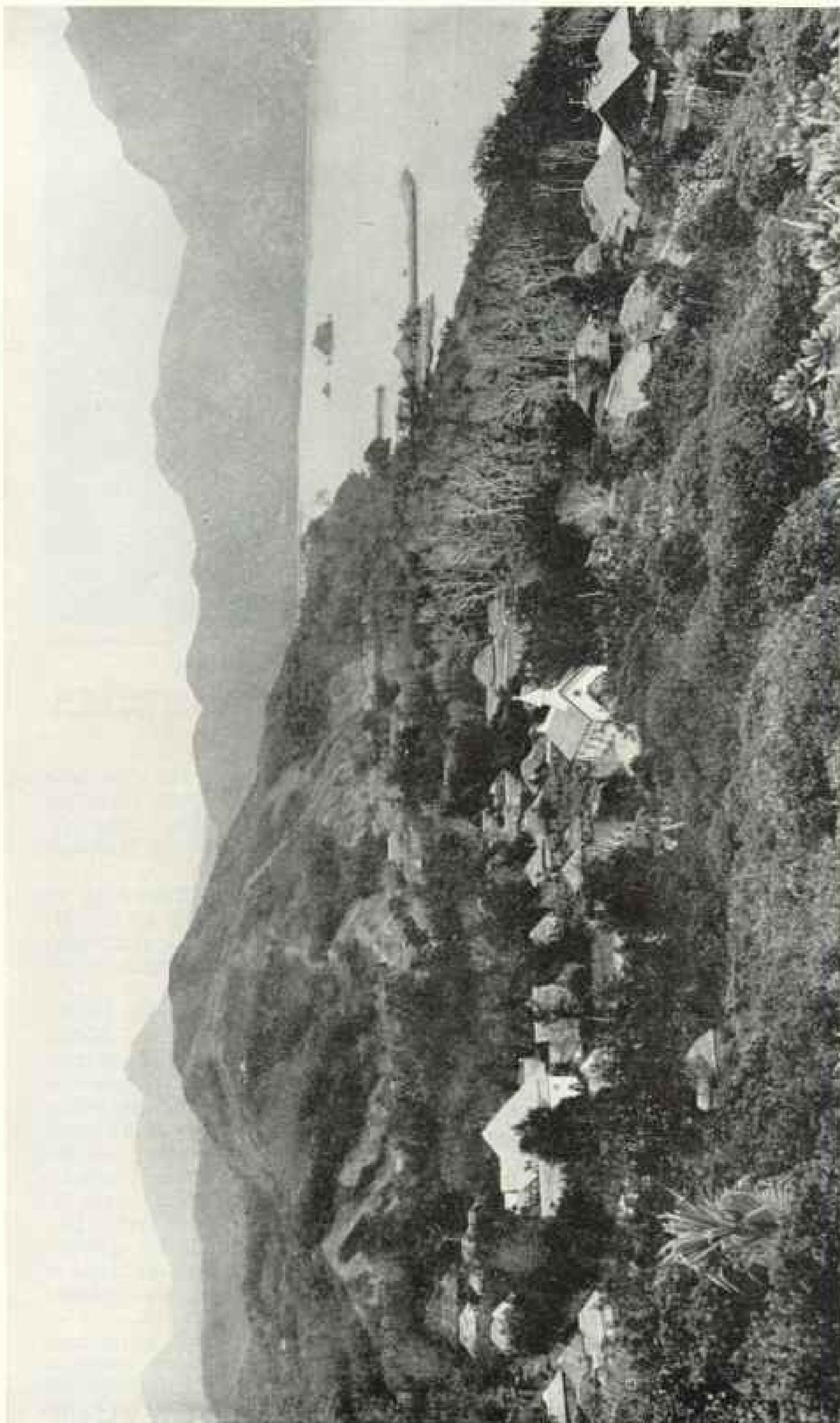
"Empty of Men," *Munin*, of which the later "Bonin" is probably a corruption. And yet "Empty of Men" seemed waiting for men, for its soil was fertile, its vegetation luxuriant, and its climate good.

Those first colonists were headed by an American, Nathaniel Savory of Essex County, Massachusetts (page 386). The others were British, Italian, Danish, and Hawaiian—about thirty in all.

Although their guiding genius was Savory, their nominal chief was an Italian, Matteo Mazarro. He had been appointed governor by the British consul in Honolulu, who had sent the little colony forth to hold the Bonins for the British Crown. Three years previously Capt. Frederick William Beechey of His Majesty's Ship *Blossom* had taken possession of the islands in the name of King George IV.

So the British colony, with an Italian governor (who would rather drink than govern), an American leader, and an assortment of other races soon augmented by marooned men from whalers, started from scratch.

They put up huts, some of palm leaves, some of logs, apportioned off the brown women to the men in rough-and-ready marriages, caught wild pigs and goats in the hills, snared turtles



Arnold Arboretum, E. H. Whittier

Thatched Houses of Japanese Nestle on the Slopes of Port Lloyd, Where Savory's Colonists First Settled in the Bonins in 1830

Taken on the Arnold Arboretum Expedition to the Bonins in 1917, this photograph is one of the few in existence showing Chichi Jima, or Peed Island. Here landed Nathaniel Savory, a resourceful New Englander, with a small group of Europeans and Hawaiians to colonize the uninhabited islands. Commodore Perry on his historic trip to Japan in 1853 stopped at Port Lloyd. Seeing its strategic value, he bought water-front property (page 396). Later the Japanese annexed the Bonins and swallowed the little colony of English-speaking islanders. Bombing and shelling by United States carrier task forces have destroyed many houses and fortifications of this town, which the Japanese call Omura (pages 387, 404, 405). The main town lies beyond the hill.



Arnold, Johnston, E. H. Wilson

A Toy Japanese Village Overlooks the Shallow Open Roadstead of Okimura, Haha Jima's Chief Port

As in Japan, every available inch of land in the Bonins is cultivated. Strong winds sweep across the islands, so windbreaks of trees and shrubs border the sugar cane and garden patches. Only on sheltered slopes do tall trees grow. An American diplomat and two friends, among the few foreigners allowed to visit Haha Jima, landed here by barge and hiked across the island, spending the night in a Japanese inn (page 193).

in Port Lloyd, found wild pineapples, beans, and taro as well as occasional coconuts, piped water in bamboo tubes from the mountain spring, and put up a liquor still.

"Governor" Mazarro hung a ship's bell on a stump and struck it whenever he wished to assemble the settlers to hear his drunken edicts. The colonists paid little attention to him and took their directions from the industrious Savory.

Mazarro raised the British flag. Savory raised the American. He refused to quarrel over the question of sovereignty, but he quietly hoped that some day the United States would dispute the British claim, which he regarded as very thin.

Nantucket Whaler Discovered Bonins

True, Captain Beechey's copper plate affixed to a tree stump claimed the islands for Britain, but Britain had never formally endorsed the claim and did nothing for the colonists. And Beechey had been by no means the first to visit the islands. In 1823, four years before the British ship arrived, an American whaling ship from Nantucket, the *Transit*, with Capt. Reuben Coffin in command, discovered the group.*

His was the first recorded visit in modern times, and Savory believed it gave the United States prior right. He chose to disregard visitors who had come two centuries before. The Japanese claimed that they had found the islands in 1593. The Spanish explorer, Don Ruy López de Villalobos, almost certainly had sighted them in 1543. Such discoveries were too far outdated to deserve attention.

For more than twenty years Savory waited in vain. Then, in 1853, his hopes seemed about to be realized. Commodore Matthew Calbraith Perry's black ships sailed into Port Lloyd.

Savory, thrilled by the appearance of the American flag, rowed out to Perry's flagship, the *Susquehanna*. It was a monster that signaled the transition from sail to steam; it had both masts and paddle wheels.

Perry received Savory personally. How moved Savory must have been when he was told that it was the Commodore's intention to urge Washington to consider establishing an American coaling station in the Bonins!

The Commodore felt that an American foothold here would have a salutary influence upon Japan.

Perry, on his own initiative and with his own money, purchased land for a naval station, later to be turned over to his Government if it should approve his idea.

This land, according to the title deed, was

bought from Nathaniel Savory and consisted of that "piece of ground fronting on what is called the Ten Fathom Hole, the same being a part of the Bay or Harbour of Port Lloyd."

Savory had no thought of making money on the transaction, as indicated by the provision that "the said sale is made for and in consideration of the sum of Fifty Dollars and other benefits."

"Governor" Mazarro having died, Perry arranged to have the colonists elect Savory chief magistrate. On his own authority he made him agent for the United States Squadron and "attached to the Navy of the United States," a peculiar position indeed for the governor of a British colony.

When news of this got around the world there was reaction from three quarters: Britain protested the apparent attempt to expropriate her islands, the United States refused to dispute their ownership, and Japan made a note on her kimono sleeve.

Coming of the Japanese

In 1861 Japan quietly sent a group of about 100 Japanese colonists to Port Lloyd.

The islanders watched them land on the beach one morning, and stared in bewilderment as their ship hastily sailed away. There was no way to deport them. They could not be allowed to starve. Besides, they seemed mild enough, asking only for a place to live and work—and there was plenty of room. Savory gave them without charge a rich tract of land and they set to.

They were good workers and made no trouble. They were all peasants except six soldiers and their leader, a Japanese government agent. One day he said to Savory, in effect:

"Mr. Savory, we are very happy to have you here."

"Have *we* here?"

"Yes. You see, there has been a slight mistake—these are Japanese islands. They were discovered by a Japanese, Ogasawara Sadayori, in 1593. From now on they will be called the Ogasawara Gunto."

Appeals to both Britain and the United States brought no action. Soon wearying of their enterprise, the Japanese colonists withdrew, only to be replaced in 1875 by another group. Savory had died in 1874 and the next leader was Japanese. Two years later the islands were formally annexed by Japan.

The foreigners remaining were protected by extraterritorial rights. When Western powers

* See "Nantucket—Little Gray Lady," by William H. Nicholas, in the NATIONAL GEOGRAPHIC MAGAZINE, April, 1944.



U. S. Marine Corps, Official

Marines of the Second Wave Scratch for Cover while Their Buddies Move Inland

The first wave drove their amphibious tractors up the beach on Saipan and speeded for objectives a half mile inland. The second wave, here pinned down by heavy enemy fire, must liquidate the Jap beach defenses and cover the rear. As at Tarawa, the tanklike treads of the "Alligators" carried them safely over reefs, shoals, and other obstructions.

surrendered such rights in 1894, some of the foreigners refused to be subject to Japanese law and departed. Others found that their roots were too deep in Bonin soil and remained, intermarrying with the Japanese.

This pageant of history came vividly to our minds as my wife and I stood on the deck of a Japanese ship in the harbor of Port Lloyd, named by Captain Beechey for the then Bishop of Oxford, and called by the Japanese Futami Ko. It is believed to be the crater of an extinct volcano. It is a mile or more in diameter and some twenty fathoms deep. Its attractions as a small naval base, so evident to Perry, have not been overlooked by the Japanese. The docks and installations are much more substantial than necessary to serve the commercial needs of a small island five miles by three with perhaps 6,000 inhabitants.

This main island of the Bonin group was formerly called Peel, is now Chichi Jima

(Father Island), and tomorrow will probably be Peel again.

We could see at the sheltered apex of the bay the spot where Savory had established his little settlement. Behind the gently sloping beach the hills rose slowly and kindly, terminating finally in craggy peaks. Some of those peaks now looked strangely flattened, as if topped with gun mounts.

Log Cabins Still Survive

The lower slopes were covered with palm groves, screw pines, tree ferns, vegetable plots, and small fields of grain under dry cultivation. In the hollows were a few poor rice fields. Along the shore was what seemed an almost continuous Japanese town, but the concentration at intervals of business buildings and Shinto and Buddhist shrines showed that it was really a series of villages. Most of the houses were of airy Japanese construction, but



U. S. Navy, Official

Such "Hell's Pocket" Terrain Made Saipan the Toughest Pacific Battle to Date

Marines advance at the ready against holed-up Jap stragglers in caves and behind big rocks (page 397). On the beach at foot of cliff lies enemy plane wreckage, planted as a booby trap. Most of Saipan's coastline is low, sandy beach. The island as a whole is not mountainous; only Tapotchau (1,554 feet) and its slopes reaching to the sea presented such rugged land.

here and there were palm-log cabins probably dating from Savory's day.

"That village is Susaki," said the mate beside me, pointing south, "and that is Ogi Ura. And those on the north side are Okumura and Omura." Omura, the capital, was destroyed by our Navy early this August (pp. 404-5).

But I mildly resented the Japanese names and recalled some of the names of the past: Savory's Rock, Stiver's Beach, Down the Bay, Gold Heart, Joe Kanaka Beach, Ugly Gulch, Bull Beach, Blossom Village, The Other Side, Hump Back, Hog Island Strait, Dick's Store Hole, Charlie's Little Island, Merry Wilson.

Those were salty characters who colonized the Bonins, and the whalers who came in later to steal women and rum were no less so. Somewhere up in those hills was the cave where the colonists stood siege for days while drunken whalers burned and looted their village.

I wanted to see the modern Bonin islanders. Was anything left of the pioneer stock?

We Identify Black Widow Spiders

The vice-governor, hearing that I was a naturalist (which I am not, but in poking about among Japan's Pacific islands I had found it wise to show more interest in fauna and flora than in fortifications), asked that we come ashore to identify certain creatures that he believed had caused some deaths among the islanders.

We went, glad of the chance to get ashore but quaking lest our ignorance be exposed.

However, the "creatures" were easily identified. They were black widow spiders, perhaps brought to the island by some Japanese cargo ship from a California port.

Improving the opportunity, we kept our Japanese guides fretfully waiting while we talked with some of the people in front of the

little houses and stores along the narrow fish-smelling streets.

It seemed to me that in many faces I saw something better than the Nipponese cast of features. The girls particularly were lovely. I commented on this to one of my companions. He gave me a sly, sneering smile.

"We like them in Tokyo," he said.

Later I learned the significance of this cryptic remark. The Bonins for years have been the foraging grounds of agents for Japan's yoshiwaras.

Girls whose faces held some trace of American or European ancestry were preferred. These girls had definite features, not the broad flattened nose, shallow eye pits, and general vacuity of many Japanese girls' faces.

It may seem strange that the Japanese would prefer something a little non-Japanese. But it must be remembered that the Japanese ideal of beauty, as illustrated in the old prints, is the long, narrow, definitely featured face. Such faces may still be found among aristocrats, contrasting sharply with the round, flat, expressionless faces of the lower classes.

Girls of Western Blood Abducted

Another reason for choosing girls of Western ancestry was that it seemed a delightful way to humiliate the West. The Government connived. Girls of pure Japanese blood could not be taken without the consent of their parents. Girls "tainted" with Western blood might be abducted, with no questions asked.

Agents who could make the trip to the Bonins liked to get girls there, since no expense was involved except payment to the toughs who seized the girl on her way to the fields and the cost of a steamship ticket.

This traffic alone is good reason for ending Japanese rule in the Bonins.

If I had expected the villagers to tell me proudly of their American or European ancestry, I was disappointed. Those who were most obviously of Western origin most stoutly denied it. Foreign blood was not popular.

But they did seem to have a curious if disdainful interest in the past history of the Bonins. An old log-and-frame hut said to have been the home of one of the first settlers was used as a small museum.

There one might examine articles of clothing of the pioneers, a pair of Congress gaiters, a corn-cob pipe, a lithograph of Queen Victoria, pictures of whaling ships, a belaying pin, a harpoon, and a ship's bell.

About 20 miles south of Chichi Jima is Haha Jima (Mother Island). So secretive were the Japanese that, when an American

diplomat and two friends made a visit to the island in 1931, they were escorted all the way from Tokyo by a Japanese gendarme, or *kempei*. They might not have been allowed ashore at all had Haha Jima not then been outside the military zone that included Chichi Jima.

The gendarme, in civilian clothes, was ostensibly a "guide." Everyone knew the real reason for his presence, and of course no cameras were allowed.

Haha Jima is a rugged island eight miles long by one mile wide, with green hills rising to 1,515 feet above the coast. The Americans landed at Okimura from a little passenger-cargo steamer which brought supplies to the Bonins from Japan (page 389).

The hill-girt harbor was too shallow for ocean-going vessels to dock, so the visitors were brought ashore sitting on piles of cargo on a lighter sculled by husky Japanese.

They then set out to walk the six miles to Kitamura, on the northern end of the island, where the steamer would pick them up the next morning. The narrow footpath, too rough for wheeled vehicles, led through hilly country on the west side of the island, overlooking the sea.

The hikers passed an occasional patch of sugar cane and here and there a small sugar mill, in which the juice was squeezed out of the cane in a primitive press powered by a single ox walking round and round. The juice then was boiled down into sugar over a fire fed by cane stalks. No rice is raised on Haha Jima, and the inhabitants depend chiefly upon food imported from Japan.

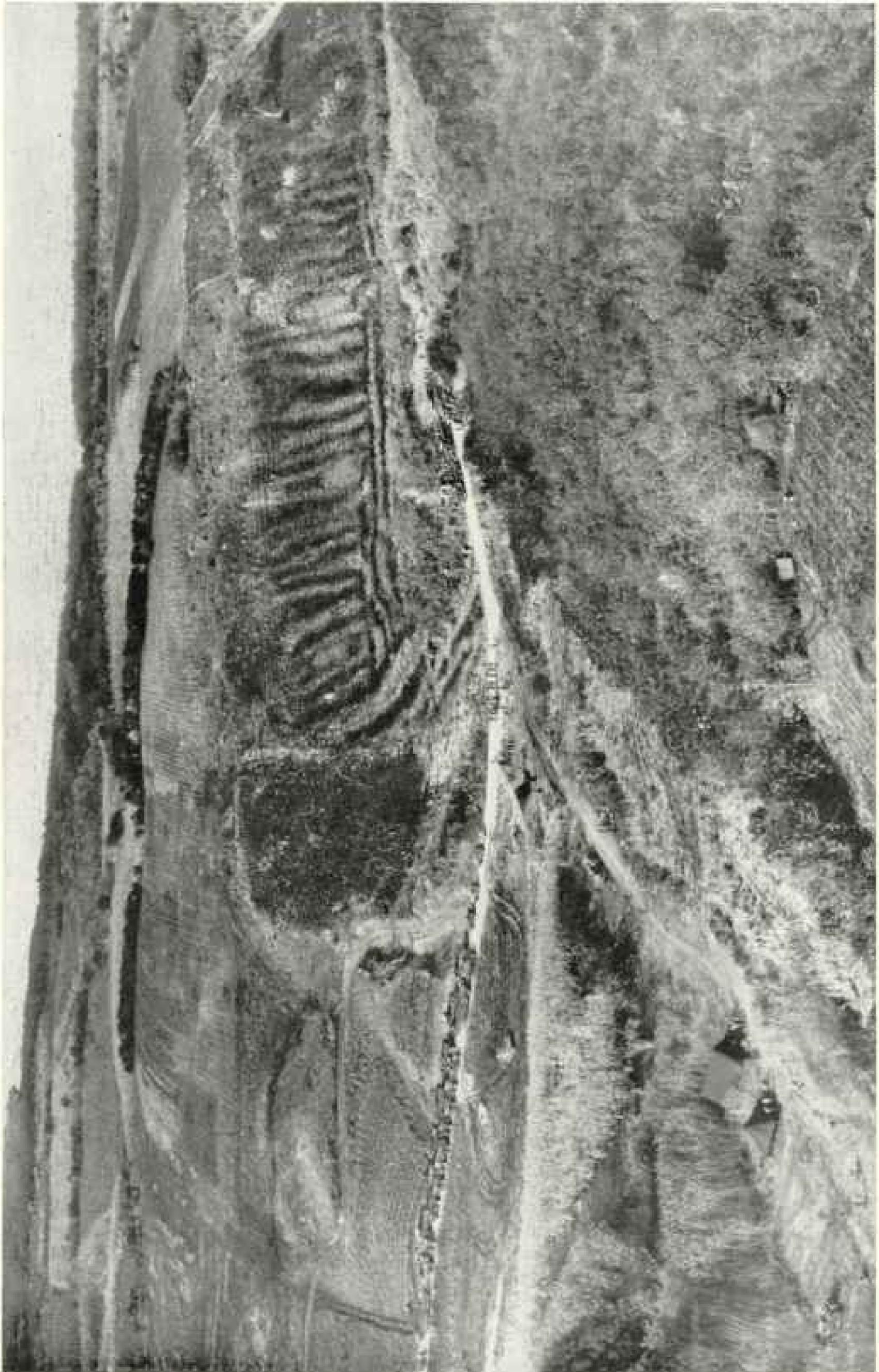
Haha Jima, a Toy Japan

Here and there the visitors saw poverty-stricken one-story farmhouses with thatched roofs. Japanese farmers in the fields were clothed in shirts and shorts with large straw hats, while the women wore kimonos. Foot-gear consisted of wooden clogs, straw sandals, and *tabi*, cotton socks with a heavy sole and separate sections for the big toes.

Save for the palm trees and other semi-tropical vegetation, the whole appearance of Haha Jima was that of a miniature Japan.

Late in the afternoon the Americans arrived at a small inn at Kitamura where, thanks to the island "grapevine," they were expected. The proprietor's wife met them at the door, politely kneeling.

The inn itself was a larger version of the Japanese bungalow, with unpainted wooden outside walls and the interior divided into rooms by sliding partitions—wooden frames covered with paper.



U. S. Marine Corps. Official

In a Mobilized Push toward the Saipan Battle Line, Marines Move on Trenches, Wheels, Wings, and Shoe Leather

Hodgehopping above them, a "grasshopper" plane dromes toward the enemy, looking for artillery targets. Cultivated patches are cane fields, the island's biggest single crop. Saipan, one-fourth the size of American Guam, produced 70 times as many exports (pages 397, 407). The hillside field in background is pocked by battle.



U. S. Marine Corps, (Official)

Homeless Japanese Civilians Are Rounded Up and Segregated

After being doctored, fed, and clothed, these harassed women and bewildered children became happy and carefree. At first, all claimed to be Koreans or Chamorro (natives). Pamphlets dropped from planes mapped safe corridors for civilians to reach safety behind the American lines. Garapan, an almost all-Japanese town of 10,000, was completely demolished by the pre-invasion bombing, the house-to-house fighting, and the subsequent shelling by the Japs (page 405).



C. E. NORT, Official

A Navy Dentist Sets Up His Outdoor Office on Saipan

His portable drill is foot-powered. A box labeled soybean sauce serves as footrest, and a Japanese shrine decorates his waiting room. The combat photographer wrote: "To keep the dentistry really 'painless,' a Marine patrol near by kept on the alert for Jap snipers." A bandaged Marine walks past at right.

On the floor were the usual straw mats of standard size, six feet by three.

When a guest registers in a Japanese hotel, his name is at once turned in to the police. That evening, when the Americans climbed to the top of a hill overlooking the town, a local policeman with black uniform and sword followed them to see what they were doing.

"Our room in the inn was about 12 feet by 12," the diplomat said, "and we slept, as is the Japanese custom, on mattresses placed directly on the floor, with blankets to cover us. Rather than rest my head on the hard little sack filled with rice husks which served the Japanese as a pillow, I folded up my coat and used it. Only the more well-to-do Japanese use sheets. Mattresses and blankets are put away in a closet during the day.

"Our evening meal was served in our room, for Japanese inns of this sort have no dining rooms. We ate at a low table, the height of an American coffee table, and sat on the floor.

"The menu included poor-quality rice, a rather tough chicken with soybean sauce, some eggs which tasted as though they had come from a badly undernourished hen, and tea and beer, which were good.

"To summon the waitress we clapped our hands, Japanese style. The sound carried easily through the thin paper walls. In fact, any sound made in one room of a Japanese inn can be heard in those adjoining, so there is little privacy.

"Going for a stroll in the evening through the village, we were followed by the children and stared at by everyone, for we were probably the first white people many of the islanders had ever seen.

"When we retired, a large mosquito net was draped in our room so as to cover all three beds. We had a hard time dissuading the proprietor from closing our window with a heavy wooden shutter, as is the custom, shutting out all fresh air at night.

"Japanese inns provide a kimono-like garment to wear in bed if desired, but the guest must supply his own towels and soap. The bath, in a separate room, is a huge wooden tub filled with hot water. The guest strips, dips out water in a smaller bucket, washes himself, and then soaks for a while in the large tub, chatting amiably with anyone else who may be in the tub at the same time.

"Breakfast was the usual one of hot tea, hot bean paste soup, or *miso*, rice, and pickles. Japanese hotel bills are very low, and it is customary for the guest to leave 'tea money,' a sort of tip, which may be equal to the amount of the bill if he has received considerable extra service.

"The harbor at Kitamura, like that at Okimura, was too shallow for ocean-going vessels, so again we were sculled out on a lighter to our steamer."

Jap Airbases Dot the Bonins

How useful will the Bonins be in the attack upon Japan?

If we can imagine American anxiety along the Atlantic coast from Miami to New York, should an enemy establish himself in Bermuda, we can realize the wave of worry that must today pass along Japan's eastern coast where all her chief cities lie exposed as our Navy blasts the Bonins.

That the Bonins, though small, have sizeable airfields is indicated by the heavy toll of Japanese aircraft we are now taking over these islands. In American attacks on July 3, 1944, upon the Bonins and the near-by Volcano (Kazan Retto) group, a large number of Japanese planes were reported destroyed and damaged. In Chichi Jima and Haha Jima alone many planes were caught on the ground; 32 of them were smashed and 96 damaged.

This means adequate runways—adequate at least for medium bombers. And these are all that will be necessary for the short flight of some 600 miles to the cities of Japan.

In so brief a trip, fuel load can be small, bomb load large. The round trip can be completed in four or five hours. This means that the same plane could make more than one sortie a day if necessary.

The chief harbor, Port Lloyd, would be valuable as a supply depot and staging base for both surface ships and submarines. It has been called Japan's Pearl Harbor. It hardly deserves the name, yet it would be an invaluable arm of our own Pearl Harbor now stretched across the sea to within easy striking distance of the Japanese homeland.

Twice as far from Japan, but even more valuable than the Bonins, are the Marianas.

These fifteen principal islands, forming a chain 550 miles long, include the active volcano Uracas (Farallon de Pajaros), the volcanic isles Maug, Asuncion, Agrihan, Pagan (recently bombed), Alamagan, Guguan and others, and, finally, five islands of a quite different character.

These last and largest islands are not volcanic but coralline, and fairly flat—the best islands in this part of the Pacific for airbases. That they should also be within bombing range of Japan is our great good luck.

The Five "Fateful Isles"

The five fateful isles are Saipan, Tinian, Agiguan (Aguigan), Rota, and Guam.

Their chief superiority over the Bonins lies in the fact that they are more nearly level and much larger. Saipan is roughly fifteen miles by six, Tinian thirteen by six, Rota twelve by four, Agiguan three by one. Guam is the largest of all the Marianas, some thirty miles long and seven wide.

These islands are characterized by flat coastal plains, or flat tablelands, or both. There are some hills, but the only mountains worth mentioning are Rota's 1,613-foot peak, 1,554-foot Tapotchau in Saipan, and a range in the southern end of Guam.

Even the two smallest of the five, Rota and Agiguan, are more than adequate for the runways needed by our great B-29's. And on the magnificent 10-mile tableland in northern Guam, airstrips many times the necessary length will be possible.

Vice-Admiral John H. Hoover, after inspecting Saipan, captured by American forces in July, 1944, declared that it offers the best possibilities for airfield development of any of the islands captured from the Japanese in the Central Pacific campaign.

"Its main airstrip," he said, "is far the best that we have taken, and the island's size offers additional advantages of wide dispersal."

During the Saipan battle, the toughest to date in the Pacific war, we heard little about the level areas, much about "Hell's Pocket."

This was a ravine 1,500 yards long and 500 wide on the southeast side of Tapotchau. Its walls were limestone cliffs rising straight for hundreds of feet, and these were honeycombed with caves concealed behind foliage (page 392).

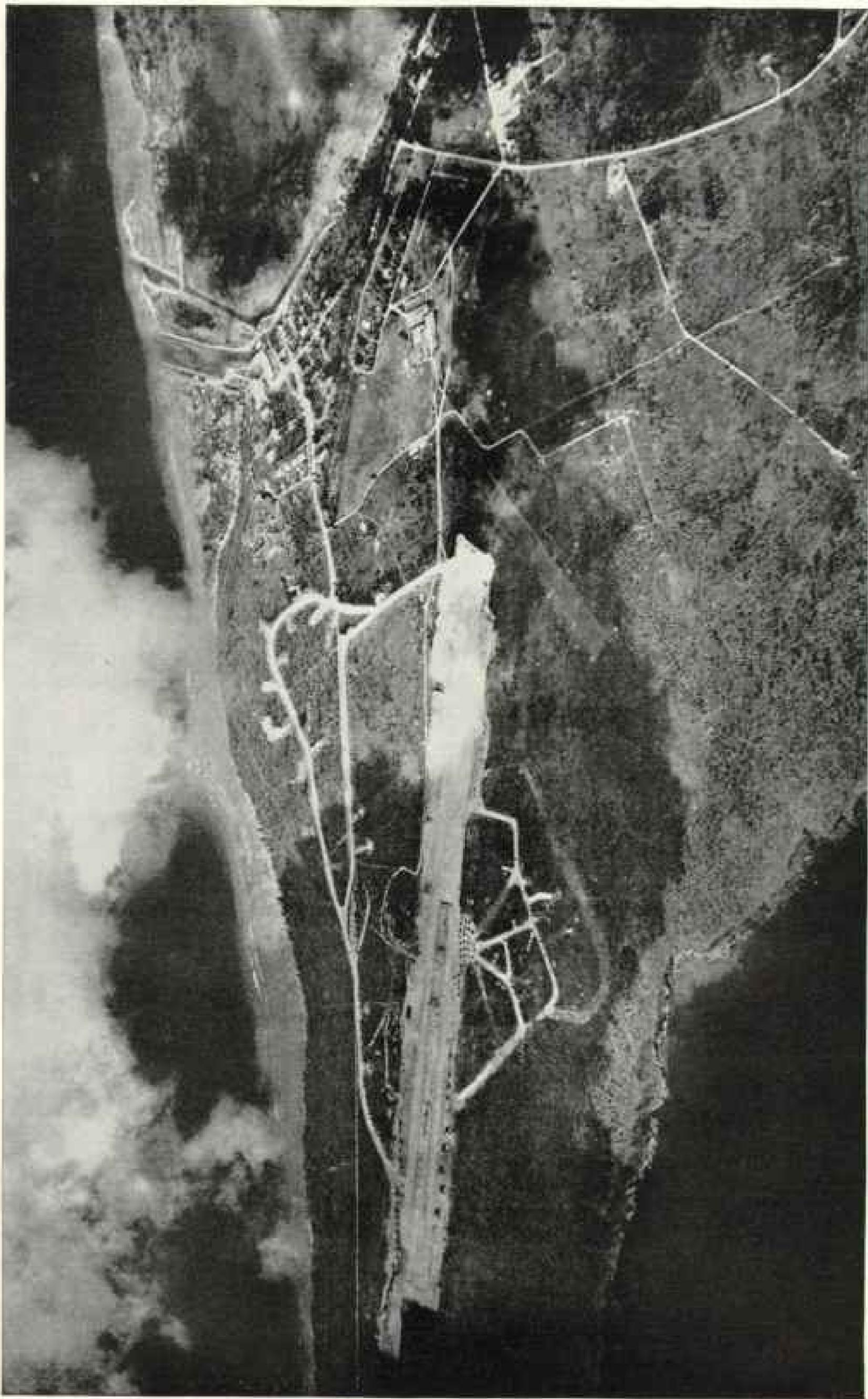
Some of the caves were hundreds of feet deep, with rear exits. In these retreats thousands of Japanese waited behind mortars and machine guns. Neither airpower nor heavy artillery could solve such a problem. The slogging Yank foot soldier had to go in with machine gun and flame thrower and clean out



U. S. Marine Corps, official.

Marines Machine-gunned Japs Breaking across This Open Field toward Escape Boats in Tanapag Harbor

This Saipan port in the mandated Marianas became a graveyard for Jap ships caught like ducks on a pond by United States planes. Just offshore, Jap dredging for a small boat basin was halted by the invasion. Beyond is Maningama Island, lying in the reef that encloses the harbor (page 405).



U. S. Navy, official

Some Seventy Jap Planes Are Dispersed on Orote Airfield, Our Chief Objective on Guam

Yet the enemy offered slight air resistance to American bombers and invaders. Lying along the Orote Peninsula, the field was cut off and made useless on the fourth day of fighting. Under the clouds lies part of Port Apra, almost completely protected from the open sea by reefs, but its waters are obstructed by coral heads and shoals. Town to right is Sumay, prewar Pan American Airways' headquarters. American-built roads run the length of the peninsula, connecting with the mainland.

the caves. Small wonder if Tapotchau and Hell's Pocket go down in history as representing Saipan.

But the rest of Saipan is different from this dinosaurlike hump of cliffs in its middle. Saipan has been producing six million dollars' worth of sugar a year. Sugar cane does not grow on cliffs (page 394).

Looking down from the razored ridges of Tapotchau, one sees extensive plains waving with sugar cane. Below on the west are the town of Garapan and Tanapag Harbor (page 398). Today the town is demolished and the harbor is full of American supplies to fit Saipan for its key role in future action.

South of the mountain is a fairly level plateau which already accommodates two airfields. One of them is that mentioned by Vice-Admiral Hoover as the best yet taken.

East of the mountain are rolling hillocks, which will not stump our engineers any more than they would the Japanese who at Truk leveled an island 300 feet high to make an airfield. And to the north, toward Marpi Point, there is already one field and room for others.

Marianas Noted for Their Beauty

Now for the first time reports come that our men are beginning to enjoy Saipan. The numerous troops that will be maintained on the island will find it not at all bad. The same goes for most of the Marianas. The Spaniards called Tinian an island paradise. Guam contends for the honor of being the most beautiful island north of the Equator.

Before landing on Saipan, a medical officer warned Marines of a hundred terrors: in the surf, sharks, barracuda, sharp coral; on shore, snakes, giant lizards, saw grass, and villainous insects; in villages, yaws, leprosy, typhus, elephantiasis, and a dozen other insidious horrors.

At the close of his talk, a private piped up, "Why don't we let the Japs keep the island?"

But it isn't that bad. Compared with the New Guinea jungle, the Marianas are city parks. The Japanese clean up places where they choose to live—and in 1938 the Japanese population of the Marianas was about 44,000, which was several times the number of Japanese in any other section of the mandate.

Americans billeted in the little houses will find them comfortable—except that the ceilings are low! Capt. John N. Popham, Marine Corps public relations officer, writes from Saipan to the *New York Times*:

"The houses are built to scale for a small-statured people, and the average American Marine has a bad time with the low ceilings,

door tops, and cross-beams. Consequently, those of average height and taller now wear their helmets all the time, indoors and out, so that when they bang their heads on the low rafters there is just a metallic ring and no injuries. It sounds like a series of muted dinner bells around here most of the time."

But such troubles will be counted small by the lads who have been in the foxholes. In Saipan tropical diseases are few, malarial mosquitoes nonexistent, so far as we know now, drinking water safe, breezes soft, extreme heat and cold unknown.

There are, however, a few suggestions that may be made to the thousands of American airmen and Navy men on Saipan, Tinian, Guam, and the other Marianas.

Sea Snakes Menace Swimmers

Don't look on shore for snakes—but watch out when you bathe, for sea snakes are poisonous. Eels and sea snakes are often confused. Eels are fish, and harmless. Incidentally, they are very good food. A sea snake has scales; an eel has none, or none that are apparent. The snake usually swims with his head out, the eel under water.

Watch where you step on the lagoon floor. The erect spine of the sting ray lying on the bottom can inflict a serious wound.

Don't walk into the open jaws of a giant clam. If they close, you will be detained until help comes, and may lose a foot.

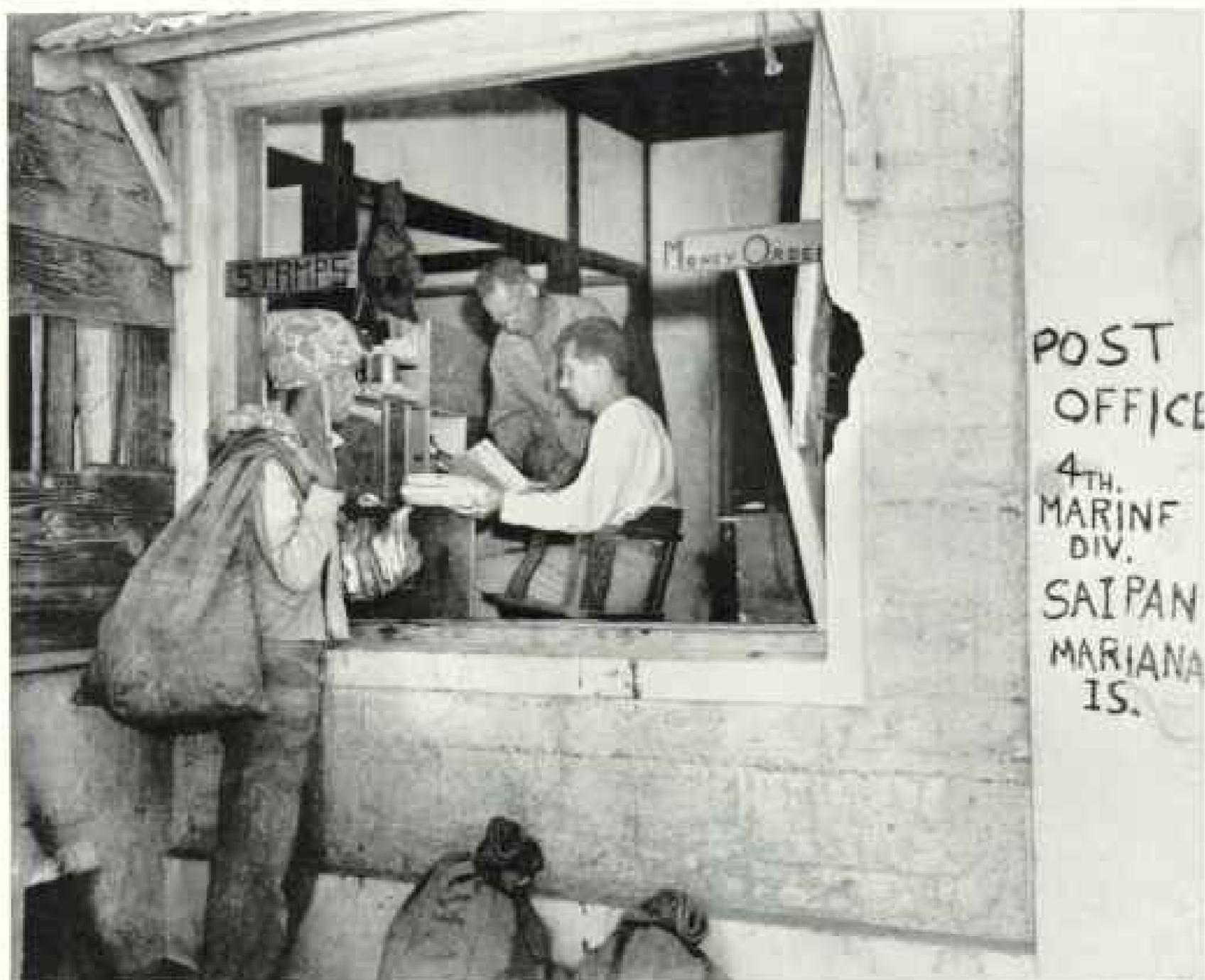
Don't share a bathing beach with sharks. They are not there just to enjoy the bathing. Splashing *may* keep them off. A shark's Achilles' heel is his nose. Forcibly struck there, he usually thinks of an errand elsewhere. He is also sensitive about the gills.

To learn what to do and what not to do, ask the Chamorros. They will be found friendly—unless imposed upon. The Chamorros are the light-brown natives of Indonesian stock mixed with Philippine Tagalog and Spanish blood (page 404).

On Guam, where there are some 22,000 of them, they have been treated fairly by the American naval administration which governed that island from 1898 to December 12, 1941. There they are enthusiastic about anything that is "states-side" (from or of the United States). Many of the Chamorros on the other Marianas have been in Guam or have relatives there; hence they share the goodwill toward Americans.*

As we seize the islands in this area and propose to hold them, many Asiatics will ac-

* See "Guam—Perch of the China Clippers," by Margaret M. Higgins, NATIONAL GEOGRAPHIC MAGAZINE, July, 1938.



U. S. Marine Corps, Official

Mail Has Priority Next to Chow—It Was Delivered on Saipan before Smoke Cleared

In this Fourth Marine Division post office, set up in a shell-splintered house in Charan Kanoa, mail is being sorted for the front-line unit of the man at the "counter." The family of a sugar-factory worker probably lived in this flimsy miniature house with sliding panels between closetlike rooms.

cuse us of imperialism. Staunch support and eager loyalty of the native population will do much to show that Uncle Sam is imposing upon no one.

Where there are none of the wise and friendly Chamorros to consult, the Yank's problem will be more difficult. Some of the smaller northern Marianas and Volcano Islands are uninhabited. When the southern Marianas become a great airbase, it is likely that more than one American airman will drop into the sea and get ashore on one of the northern desert isles.

These northern islands are volcanic. Uracas is a sputtering, lava-spewing volcano down whose steep slopes internal convulsions send showers of cinders and ash. There is hardly a blade of vegetation, and probably no water. Some of the other islands are little better.

Islands That Vanish Overnight

Worst, perhaps, are the temporary islands. There is no vegetation, except of the sub-

marine variety, on an island that has just come up out of the sea. Such islands are sometimes little better than barren reefs, pushed up by explosive forces beneath, only to sink again later.

The largest of these upstarts on record had a shoreline of two and a half miles. It appeared in November, 1904, three miles to the northeast of San Augustino (Minami Iwo). It was a bare, rocky picture of desolation with only one gracious feature, a pumice-stone beach.

At the end of two years, when about enough vegetation had come up on the island to support one goat, and the Japanese Government was considering formal inclusion of this bit of earth in the Empire, it disappeared.

This region has been a geological riddle. One man who has helped to solve it is Prof. William Herbert Hobbs, former head of the Department of Geology at the University of Michigan, an authority on volcanic action.

In 1921-23 he visited the Japanese mandated



U. S. Navy, Official

Chow for the Crew of a Carrier Attacking Saipan

During battle, only sandwiches and coffee are available for the men. This flight-deck crewman wears special headgear and goggles for working in the slipstreams of planes. He must carry his sheath knife at all times. From the key ring dangles a locket containing a picture of himself and best girl; a letter protrudes from his hip pocket.

islands. That was before the ban on foreign visitors had become very severe; even so, an evident attempt was made by the Japanese harbor authorities at Palau to run the small American ship on which he traveled on a reef by displacing the channel buoy (Plate IV).

Professor Hobbs identified the three Volcano Islands as "newly born," geologically speaking, one of them still smoking after the eruption that had pushed it above the waves.

The entire Volcano and northern Marianas area is a region of birth. While some of the new islands may sink again, the general trend is upward—and the nation possessing these groups may find its territory gratuitously in-

creased several hundredfold in the distant future by the forces of Nature.

The birth pangs of a rising mountain range are felt in the remarkable submarine volcanoes which shoot masses of mud and ashes out of the sea, accompanied by noisy and sometimes disastrous earthquakes. The stench of sulphur drifts through the air.

And as these sea bottoms heave upward, others farther east subside, and may eventually form troughs miles deep. Whenever these troughs sink, the water above them necessarily drops, only to be replaced by inflowing water. This inflow creates a vast rolling bulk, commonly called a "tidal wave," or, better, earthquake wave or sea wave. It inundates the shores of the islands and may sweep on to do damage on the coast of Japan.

It was such a wave, Professor Hobbs points out, that in 1891 drowned some seven thousand Japanese. Lesser waves of this character suck boats down in the Bonin and

Volcano harbors until they scrape on the rocks, then suddenly toss them high on the land.

As we sailed past Uracas, I could not help reflecting on the fate of any airman cast into the sea near this forbidding heap of lava and cinders. If he should make his way through the sulphurous, ash-streaked water to this uninhabited and almost uninhabitable junk-pile, his immediate problems would surpass those of Robinson Crusoe.

There would probably be no animal food, no edible vegetation, and no water. Nothing but fire and desolation.

Some of the other islands are no better. They are as cheerless as the twisted remains

of a fire-gutted house. But gradually there is a change. Each island shows a little more vegetation. They still seem hardly fit for human habitation, though a few fishing boats visit them.

It is a relief to look at last upon the billowing sugar cane, coconut plantations, and groves of huge breadfruit trees on the island of Saipan. Villages here and there show that man has found the island hospitable.

Unwelcome Guests on Saipan

We slipped into a shore-going lighter without permission and were met at the dock by a baleful Japanese police officer, who promptly conducted us to the office of the Japanese governor.

"Very bad," the police officer kept repeating, shaking his head, as we walked through the streets of Garapan. "Very bad. So sorry for you."

We had visions of detention in a Saipan jail and of "questioning," the polite word for torture. As carried out by the *Kempeitai*, the Japanese Gestapo, it is an art in itself. Conducted with the aid of needles, cigarette butts, and the "water cure," it is designed to make the victim confess having done what he never did.

Following the confession comes a prison term without benefit of trial—or complete disappearance. Several foreigners who had entered the mandate, including Col. Earl Ellis of the U. S. Marines, had not been heard of again.

But Governor Fushida, nearsighted, florid, with a portly bay window, had had just enough liquor that day not to take life too seriously.

Saved by a Bicycle!

He squinted at us for a few moments, then reached into a drawer, drew out a clipping, looked at it, looked again at us, and burst into a roar of laughter.

"You are the foreigners who ride bicycles! Ha, ha, ha! I have your picture here. So funny!"

We laughed, too, much to the distress of the police officer, who had been standing as straight and stern as a Nazi, hoping to hear sentence pronounced upon us.

An enterprising reporter in Japan had snapped us on our bicycles and printed the result in the Tokyo *Asahi*. Of course it was not news that two people were riding bicycles—the bicycle was common enough in Japan. But that was just the point—it was so common that it was ridden only by common people.

Farmers, laborers, and shop clerks rode

bicycles. Professional men or big business executives did not ride bicycles, or, if they did, they were considered very democratic and a little peculiar. And as for the foreign visitor or the Embassy attaché, he was to be seen only in the shiniest of imported cars.

But living in a little fishing village, we had not felt compelled to keep up with the Joneses. So, happily, we had ridden.

The picture was our salvation. Preceding us to the South Seas, it lay in desk drawers or was tacked up on government office walls and assured us of an amused welcome on many an island. We were considered ordinary folk. People who rode bicycles could hardly be arch spies.

"Let me know what I can do for you," insisted Governor Fushida. "You want to study the natural history of the island? A most interesting subject. I hope you can stay many days. I will take you around myself."

Escorted by a Jap Governor

He was as good as his word. Of course, it was one way of keeping us from seeing what we should not see. And yet, any policeman could have done that. We saw a great deal—storing in our memories anything that hinted of the war that was even then plainly visible on the horizon, but putting into our notebooks only items of harmless interest.

The town of Garapan is, or was before it was reduced to blackened ruins, rather like a California town where an old Spanish mission rubs elbows with brisk real-estate offices.

In Garapan, too, was an old Spanish mission, still frequented by the Spanish Chamorros. Its bell tower rose through dense neglected foliage near pillars left by a prehistoric race.

Over these relics of the past flowed the staccato sounds of Japanese speech and Japanese *geta*, wooden clogs, from a neighboring business street. While the mission moldered, a fresh new Shinto shrine received hundreds of visitors, and the geisha house near by did as well. A loud-speaker in front of a radio store blared news of war in China.

Over the doors of the movie theater were lurid paintings illustrating two features: one a samurai story of medieval Japan, the other a war story of today. Thus Japan contrives to make the past live in the present.

Exploited Races on Saipan

Garapan swarmed with Japanese—or were they Japanese? Governor Fushida stopped to speak to one, a laboring man just in from the cane fields. The man looked blank. When he spoke, it was the governor's turn to look blank.



James H. Wood.

Torii, Shrine, and Gong Identify This Scene as Japanese: It Is Omura on Chichi Jima. The fire bell has often rung the alarm recently, announcing U. S. raids which have been frequent in the Bonins since June 14, 1944.

"These Okinawas!" he shrugged, and walked away.

Seventy percent of the Japanese on Saipan were Okinawas. The name applies to the people of Okinawa in the Nansei Islands (Ryukyu Retto). These islands were once claimed by China.

The present inhabitants are a mixture of Chinese and Japanese and speak a dialect of Japanese unintelligible to the people of Japan proper. The rather plodding Okinawas have been ruthlessly exploited by the smart mainland Japanese.

The Chamorros have fared even worse. The lands of these charming people of mixed ancestry (page 400) have been expropriated by the Japanese, their labor has been impressed at starvation pay, their extermination has been hastened by an alien civilization. Yet they carried themselves with an air and lived clean, cheerful lives in Spanish-style balconied houses.

We were lodged in the home of their headman. His house was run down, but spacious, cool, and always clean. Guitars were hung on the walls. In the evening they were taken down and twanged for dancing on the polished floor of the main room. Relatives and neighbors flocked in.

Also on the wall were colored pictures of saints, for the Chamorros became ardent Catholics during the days when Spain ruled the Marianas. They have found it hard to swallow the claim of the Japanese that their Emperor is superior to the Christian God.

Our host's 14-year-old boy with whom I shared a room began to talk after the lights were turned out.

"It's very hard here," he said. "Someday I'm going to escape to Guam. I could get there in a sailboat. My father used to live there. He liked it, but there was no work. He came here to get work. Wherever the Japanese are, there is work—you've got to say that for them. But now he's sorry he ever came. They try to turn us into Japanese."

Did U. S. Shells Wreck Imperial Pictures?

I had seen the vault outside the school this boy attended. Every Japanese school has a special vault containing the pictures of the Emperor and Empress.

"Do they make you worship the imperial pictures?"

"Of course. They put them up in the assembly room and we must worship. But I have a cross on a string around my neck. It's under my shirt and they can't see it.



Julius D. Wood

From a Hand Well a Japanese Dips Water in the Village

In such crude houses as these of Omura, with thatched roofs, weather-beaten unpainted sides, paper partitions and windows live the Japanese in the Bonins. In 1917 only some 60 or 70 English-speaking descendants of the original white settlers were left. But recent visitors, including the author, found no Bonin people who would acknowledge descent from the early colonists (pages 387, 388, 404).

I put my hand on it when I bow."

Extraordinary care is taken of the imperial pictures. More than one school principal has been burned to death trying to rescue them during a fire, or has committed suicide after failing to save them. It would be interesting to know what happened when the sacred vaults of Saipan with their portraits were set aflame by American bombs.

The governor took us to the village of Tanapag to see some megapodes (mound birds, or brush turkeys), comical creatures that waddle up to you if you strike two stones together. We saw several flying foxes, or fruit bats (pages 461-2), three feet from tip to tip; and fruit doves, gorgeously decked out in rose, green, yellow, orange, and purple.

A Channel "Just for Sugar"

The country was beautiful, a riot of coconut palms, flame trees, tree ferns, oleander, scarlet hibiscus, and crape myrtle. "Sleeping plants" lay with leaves closed, to open them at sunset. On a tree that science knows as *Barringtonia asiatica* hung the poisonous fruit that is used by Pacific islanders to narcotize fish so that they are easily caught with a net.

We tried to show little interest in Tanapag

Harbor, then being dredged and docked for service as a naval base (page 398). A channel had been cut through the reef near the islet which the Japanese rather significantly called Gunkan Jima, Battleship Island.

"Just for sugar shipments," said the governor of this man-made harbor, the cost of which had disturbed the League of Nations Mandates Commission. However, it did not greatly disturb our boys when they arrived, because its limited space and single outlet made it a trap for the few ships it contained.

The real fighting of Saipan was not in either Tanapag Harbor or Magicienne Bay, but in the hills.

We crossed the three-mile strait to Tinian. Across that strait later American artillery based on Saipan softened up Tinian and our landing craft went with invading Marines.*

Tinian was a great cane field interspersed with groves of fine trees. Its chief village was made up of rows of dapper little Japanese houses, each set in its own miniature garden and each equipped with a tank into which rain water flowed from the roof.

* See "Landing Craft for Invasion," by Melville Bell Grosvenor, NATIONAL GEOGRAPHIC MAGAZINE, July, 1944.



U. S. Marine Corps, Official

Like a Cornered Tigress Guarding Her Young, a Saipan Woman Eyes Her Rescuer

Marine and Army patrols rounded up civilians—Japanese, Koreans, and native Chamorros—and moved them to safety in the beach area (page 395). This family of mother, four children, and a dog was holed up in a hillside cave near the fiercest fighting. The woman obviously expected nothing less than death from the "foreign devils."

Our guide, the young local superintendent of the sugar company, was thinking about importing a bride from Japan.

"Somebody you know?" I asked. "Or will your family pick her out?"

"Oh, no. I would get her from the Brides' School."

The government has for some years conducted a Brides' School to train girls for life in the South Seas or Manchuria. A young man making application for a bride must give his own history and state his characteristics and habits. A girl of corresponding nature is selected by the faculty and packed off.

The applicant meets his mate at the dock, accepts her with as good grace as possible whether she suits his fancy or not, and takes her to the town office where they write their names in the marriage book. That's all.

"How do such marriages work out?" I asked.

"Well," as we stopped before a tiny house where a young fellow was working in the garden, "Chigoro will tell you. He got one a year ago. How's the Honorable Back-of-the-House, Chigoro?"

Chigoro didn't tell us. He was too embarrassed. But we got the impression that the blind mating in his case had not turned out too badly. If the wife is a willing drudge and gives both love and loyalty without demanding either, she is apt to suit the Japanese male.

Contrasting with the light modern houses of the village were the age-old monuments just outside it, mammoth square pillars topped with stone hemispheres. Many had fallen in the earthquakes. Twelve still stood, and we may hope they continue to stand, mute reminders of past skills unknown to the present natives of Pacific islands.

In Spanish times the ruins were called the

Houses of the Ancients. The pillars may have supported large buildings, perhaps temples. But that is speculation. There are no inscriptions to throw light upon the puzzle.

Yearning for Guam!

On shipboard once more, we passed the "anchored aircraft carriers," Agiguan and Rota, and then the blue cliffs of Guam. Our ship was of course Japanese and would not be welcome at the American naval base. But that did not prevent Japanese passengers from lining the rail and yearning.

"What we could do with that!" one said to me plaintively. "The U. S. Navy is not interested in developing the island. Guam is four times the size of Saipan. Yet you get only \$100,000 worth of exports from the island in a year. We get \$7,000,000 worth out of Saipan."

It is true that Guam's possibilities are almost untouched. Guam, together with the neighboring Marianas Islands and the Bonins, will be a rich heritage for future proprietors if they care to develop them (page 399).

One of the greatest bonito fishing fields of the world is here. Bonin waters are famous for tuna. Sharks, once neglected but now much sought-after for their vitamin-rich livers, abound everywhere.

Except on the inhospitable volcanic islets already mentioned, there are useful and valuable trees, including the coconut, the areca, pandanus, sago, sandalwood, rosewood, boxwood, and ironwood. Also there are large groves of splendid breadfruit trees, and scattered cacao trees.

The great ilang-ilang tree is the source of a perfume as exquisite as attar of roses. Indigo, still prized by cloth dyers, grows in the form of a tall plant of the pea family. Tobacco likes the climate so well that it grows wild. Flame trees and tree ferns beautify the landscape.

As for fruits, in a single meal on Saipan we sampled papaya, mango, sweetsop, cherimoya, pineapple, banana, and watermelon, and declined half a dozen others.

The chief product of the islands is sugar cane.

* For additional material on Japan in the NATIONAL GEOGRAPHIC MAGAZINE, see: "Unknown Japan," August, 1942, and "Japan Faces Russia in Manchuria," November, 1942, both by Willard Price; "Tokyo Today," by William R. Castle, Jr., February, 1932; "Japan, Child of the World's Old Age," March, 1933, and "Empire of the Risen Sun," October, 1923, both by William Elliot Griffis; "Geography of Japan," by Walter Weston, July, 1921; "Motor Trails in Japan," by W. Robert Moore, March, 1933; "Women's Work in Japan," by Mary A. Nourse, January, 1938.

We saw trainloads of cut cane coming in to the great Saipan sugar mill (now demolished), where it was pulled off by automatic claws onto a moving belt which conveyed it to the shredders and rollers. These squeezed out its juice, which was then boiled to brown crystals to be sent to Japan for refining.

On Tinian, too, there was a quarter-mile-long sugar mill, a most inviting target and now nothing but a heap of cement blocks and twisted machinery. Twelve tracks served the plant.

However, the real value of the islands today, and in years to come, is strategic.

Chiang Kai-shek has called Saipan "the gateway to Japan." This is particularly interesting coming from the Chinese Generalissimo, who might naturally and reasonably think of China as the gateway to Japan. Admiral Nimitz has announced his intention of driving through to the China coast and bombing Japan from there. The China coast, if freed of Japanese, would be much more useful than Pacific islands because vast dispersal areas would be available. The great and final attack upon Japan may come from China.

Two Hazards to Victory

But both Admiral Nimitz and the Generalissimo realize that they will not meet on the China coast tomorrow. Two great hazards, greater than anything yet encountered, lie in the way of Nimitz and MacArthur. These are the Philippines and Formosa (Taiwan).

On both, as well as on the coast of China, we shall encounter Japan's real strength—her Army. The Japanese Army is intact. In such spots as Saipan and Guam it could do little because it had to depend upon the Japanese Navy to carry reinforcements to the islands. In China it will not be dependent upon a weak and timid Navy.

It may be a year or even two years before we are able to establish firm bases on the China coast and launch an invasion of Japan from that quarter. But it may be only a few months before systematic bombardment of Japan begins from the Marianas and Bonins.

Therefore they may truly be thought of as "the gateway to Japan" through Japan's great island wall; and the ultimate invasion from China will come only after the wall itself has been entirely broken down.

Secretary of the Navy James Forrestal has said that the occupation of Saipan enables American planes to select targets at will in the enemy's homeland, and that the campaign in the Marianas marks the start of the final thrust toward the Japanese islands.*

Painting History in the Pacific

PAINTING the Japanese torpedo that missed him was the task of Lt. William F. Draper, USNR, a Navy on-the-spot artist. Airborne, the torpedo was intended for a newly commissioned American aircraft carrier, a unit of mighty Task Force 58. Draper was aboard to paint the Navy's record of an air strike against Japan's Palau Islands. The NATIONAL GEOGRAPHIC MAGAZINE presents the results (Plates I to XVI).

Draper was working under fire when he saw the torpedo. An enemy plane, having made a long straight run for the carrier through a funnel of converging antiaircraft fire, veered up and over just as it reached the carrier's bow. There in its belly was exposed the sinister weapon it did not deliver (Plate X). A moment later it crashed flaming into the sea.

So close was the pilot that gunners swore they could see his face. They could not understand why he failed to drop his charge or make a suicide crash on deck. Perhaps he was dead or stunned.

A Black Pencil Gets Every Color

"Though night action is nerve-racking enough, because you never can tell when you will be hit," says the combat artist, "a daylight attack can sometimes be more hair-raising, because you can see what's aimed directly at you."

During night action, when the deck was too dark for painting, memory and pencil served as the artist's tools. A rough map locating each object and describing its color was sketched on paper. Thus a mark for a plane shot down in flames was penciled "red" (Plate III). A shell's explosion above a carrier was labeled "yellow-green." Fire's glare against carrier-borne wings was indicated as "cadmium orange." Later these impressions were transferred to canvas.

To one officer, Plate III appeared incredible. "Your tracer bullets don't follow a true trajectory," he told the artist. Draper, confident his eyes had not deceived him, took the picture to a carrier veteran.

Tracers Shot as from a Waving Hose

"Exactly correct," affirmed the latter. "When the gunners grope for diving planes, their tracers resemble the twisting pattern of water shot from a waving garden hose."

Dawn tests the artist's ability as does nothing else. In Plate II Draper caught the sunken deck lights, the firefly glow of planes aloft, and night's gloom mingled with day's first rays. Ironically, shafts of the rising sun light the way for American planes. Draper

disclaims any striving for irony—"it just happened that way." Actually the sun rose in the direction of the United States, and, facing it, the carrier turned her back on Palau to launch her planes into the wind.

Brilliant sunshine bathed the task force on the day it was detected by enemy planes. Everyone dashed to his battle station (Plate I). Draper's post was in the ship's island structure, a good observatory for action, color, and perspective. He left his kitelike canvas below deck, for a 30-mile wind made painting impossible.

An Air-conditioned Seagoing Studio

Pilots of Torpedo Squadron 5 invited Draper to use their ready room as his studio, an invitation he readily accepted, as the room was air-conditioned. There he transferred his sketches to canvas, and there he painted his hosts (Plate XVI).

A crash on deck presented unusual action (Plate XII). A Hellcat, its wing torn by Palau's flak, struck a gun turret and lost its fuselage. Fire fighters in red jerseys and plane spotters in yellow quenched the fire with clouds of white chemicals. Ghostly white figures, men in asbestos suits braved the burning cockpit. One may be seen under the left wing. Miraculously, the pilot escaped without a scratch.

As opportunity offered, Draper worked on land. Captured Munda interested him because its palms still bore the scars of American shells (Plates VII and XV). While waiting for the task force, he painted *Espíritu Santo* (Plates VI and XIV).

Task Force 58 an Eye-filler

"Rendezvous at sea was a sight never to be forgotten," he says. "Ships of all descriptions stretched as far as the eye could see."

The artist in Draper likes a carrier. "She offers many activities, a variety of color, and bulky masses for composition," he asserts. "There is one drawback: you can't find a quiet place to work." It is difficult to mix colors as five-inch guns roar at wing-borne machine guns diving your way.

For history's purposes, paint and brush are ideal chroniclers. "Artist's license" permits the telescoping into a single panorama of events separated by minutes.

This generation's readers will prize Draper's work as skillful and informative. To their great-grandchildren, treasured copies of THE GEOGRAPHIC will be history indeed! Too bad the world cannot thus see Nelson's and Drake's destiny-shaping naval battles portrayed by a combat artist!

Painting History in the Pacific

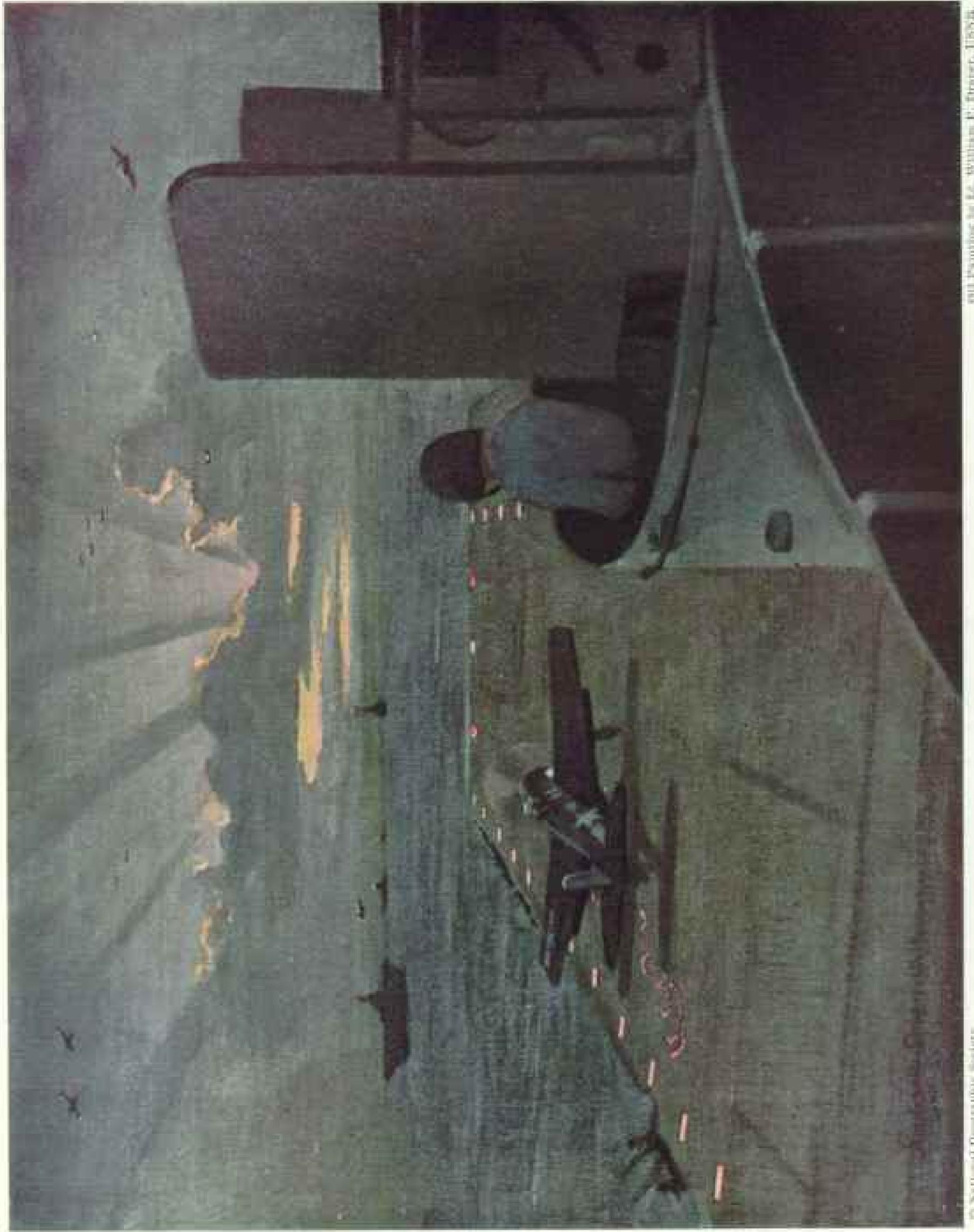


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Oil Painting by Lt. William F. Draper, USNR

"Man Your Battle Stations!" Galvanizes a Carrier Sailing under Enemy Skies

An American task force striking at the Palau Islands, Japan's Gibraltar of the western Carolines, carried a canvas-and-oils witness. He was Lt. William F. Draper, USNR, who made these 19 paintings for the Navy's records. His "Navy Artist Paints the Aleutians" appeared in the August, 1943, NATIONAL GEOGRAPHIC MAGAZINE and his "Jungle War" in April, 1944. Here he shows General Quarters on the day before the strike. Some 600 miles east of the Philippines, the task force has just been detected by enemy planes. As sirens shriek the alarm, 5-inch and 40-mm. guns probe the sky. Their eyes, a range finder, are in operation. Avenger torpedoplanes are spotted for quick take-off. Zigzagging, the carrier churns a bright wake. An Independence-class carrier follows.



Oil Painting by Lt. William F. Draper, USNVA

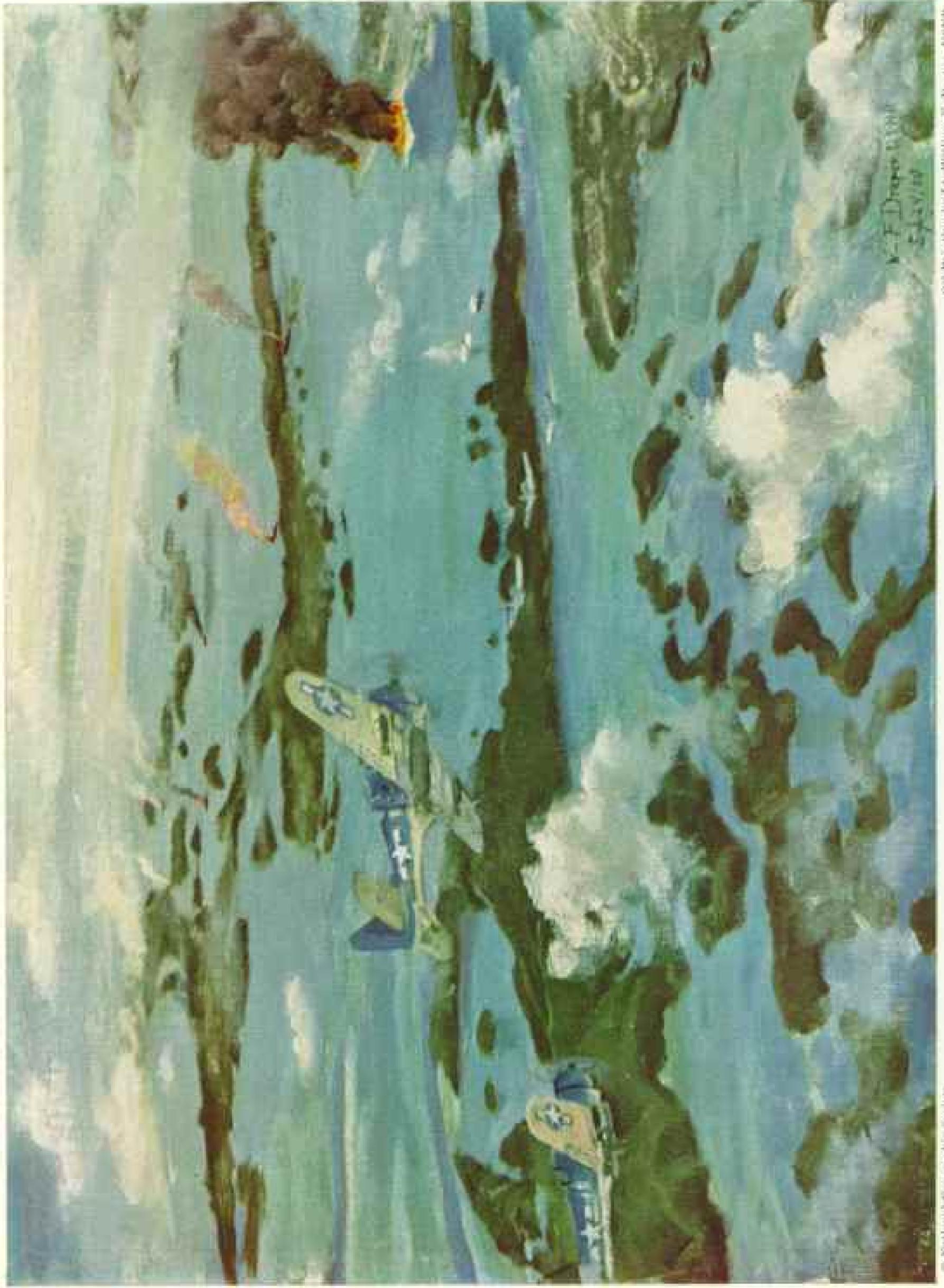
Carriers Cast Their Challenge into Palau's Rising Sun—Sunken Deck Lights Guide a Helicat's Take-off

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The Bombing of U.S. Warships by Japanese Bombers, 1942

As Tracers and Shells Stab the Night above an Independence Carrier, a Japanese Bomber Makes a Bonfire at Sea



© National Geographic Society

Oil Painting by Lt. William F. Draper, USMC

Dauntless Dive Bombers, Peeling Off over Malakal Harbor, Light a Funeral Pyre for Palau's Ships and Docks



© National Geographic Society

Oil Painting by Lt. William F. Draper, USNR

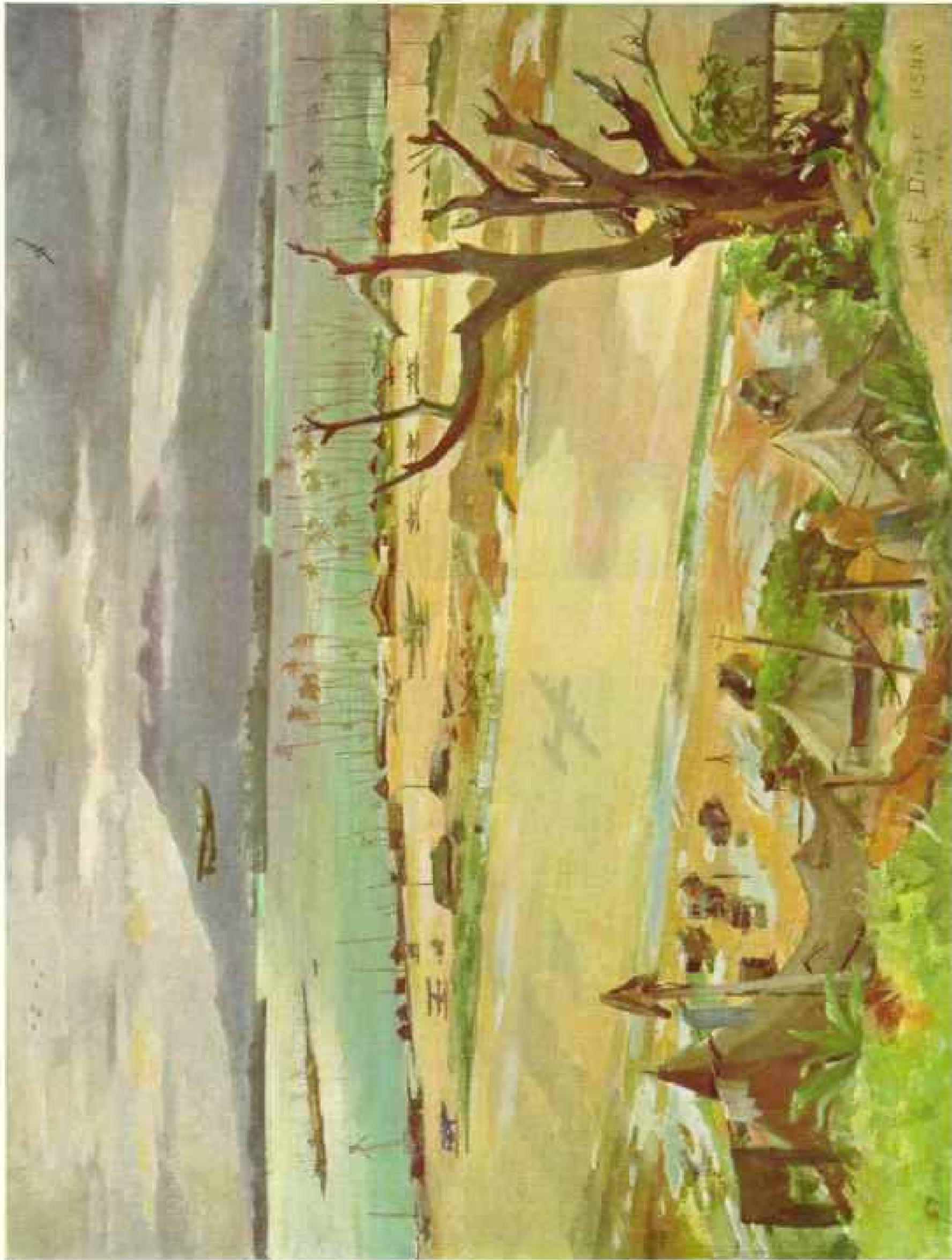
"Todd City," a Secret Hideout between Munda and Rendova, Loads PT Boats for Night Patrols against Enemy Prowlers



© National Geographic Society

Oil Painting by Dr. William F. Hooley, F.R.S.B.

War Wakes the Lazy New Hebrides—Liberty Ships Crowd an Espirito Santo Harbor, Depots Line "U. S. Highway 1"



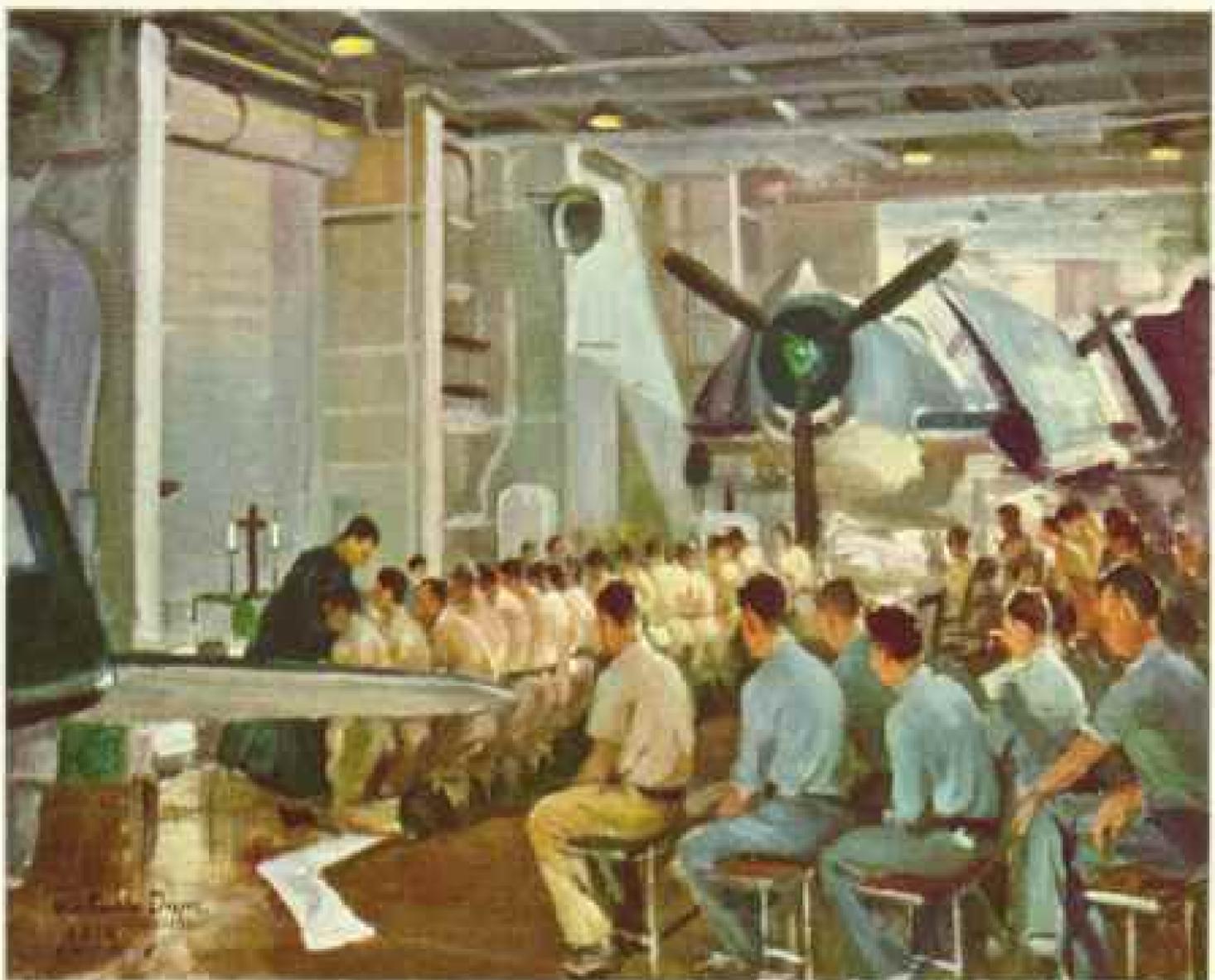
© National Geographic Society

Oil Painting by Le. William F. Deaper, USNH

Home from a Raid on Rabaul, a Liberator Races Its Shadow over Conquered Munda Airstrip, Made by Japan for USA



At an Advance Base, a Carrier Loads Shells for Her 5-inch Guns



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Oil Paintings by Lt. William F. Draper, USNR

Amid Parked Planes Men Make Their Peace Before Battle

Painting History in the Pacific



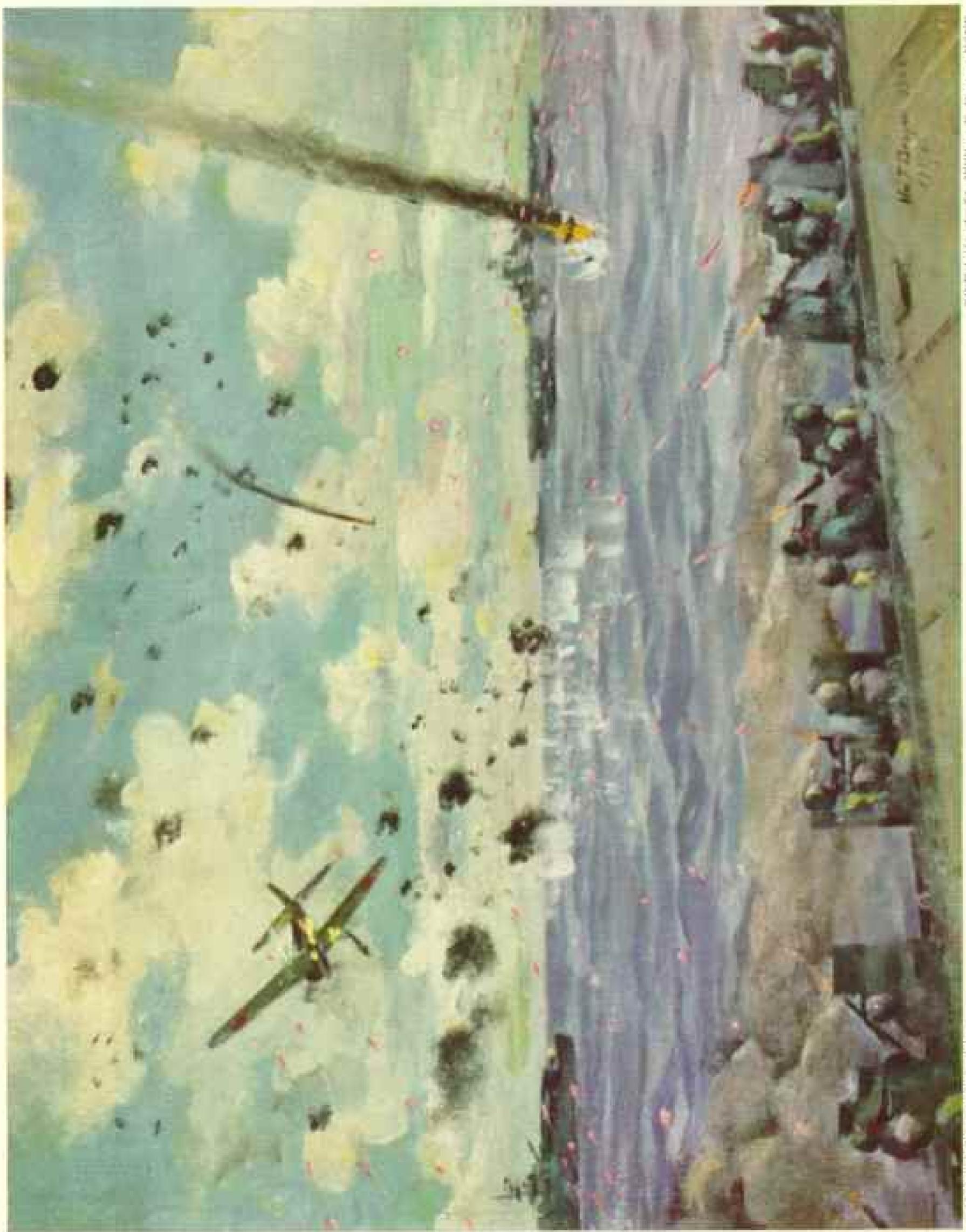
A Carrier's Service Crews "Do It Now"—Lives May Depend on It



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Oil Paintings by Lt. William F. Brown, USNCR

To Stretch Folded Wings, an Avenger Takes an Elevator to Flight Deck



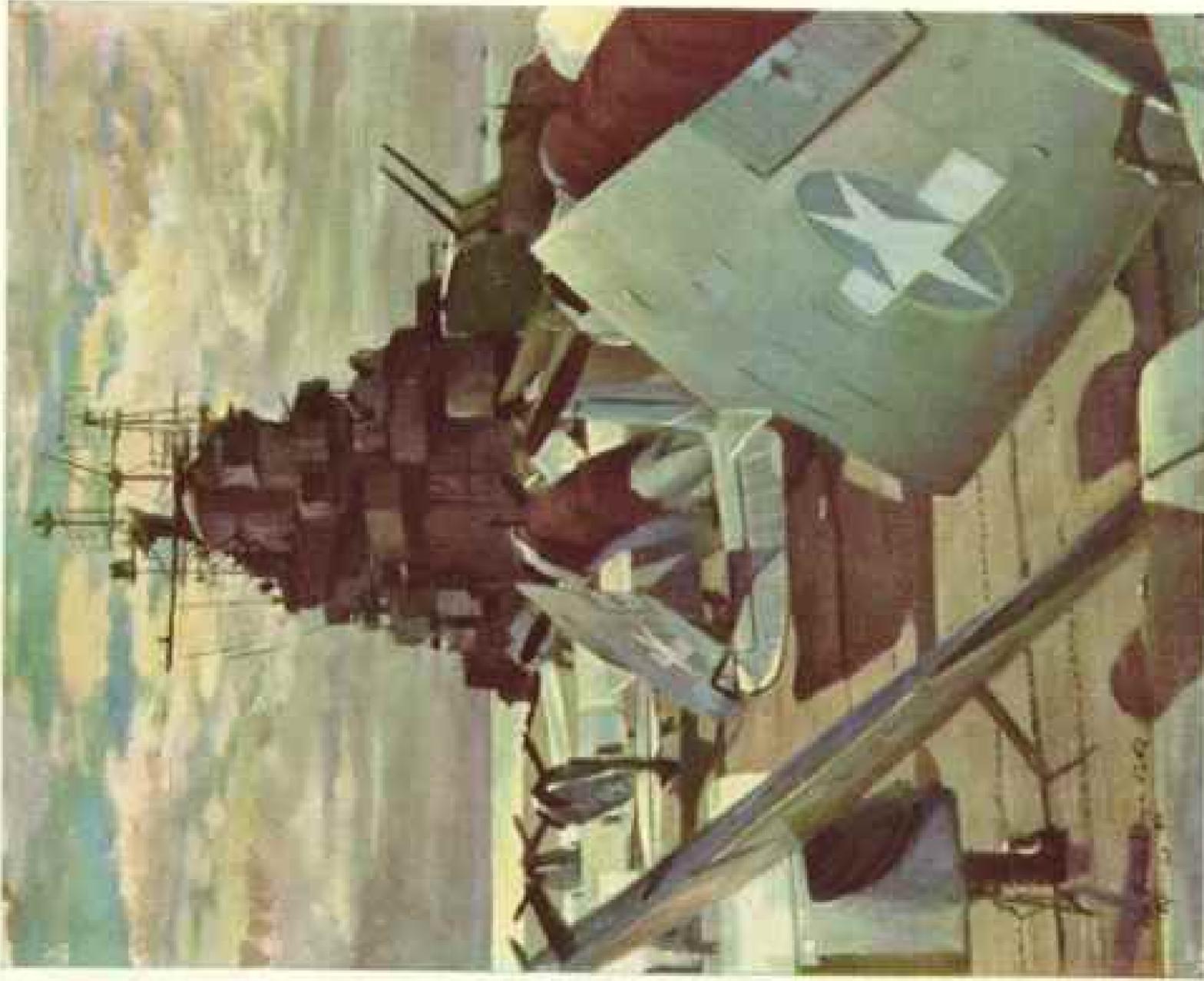
© National Geographic Society
Off Trunk, Tracers Lay a Roman-candle Broadside and Japanese "Jills" Dive Like Exhausted Skyrockets
Oil Painting by Col. William F. Draper, USMC



© National Geographic Society

Planes Away, Service Crews Sleep on an Empty Deck by Day

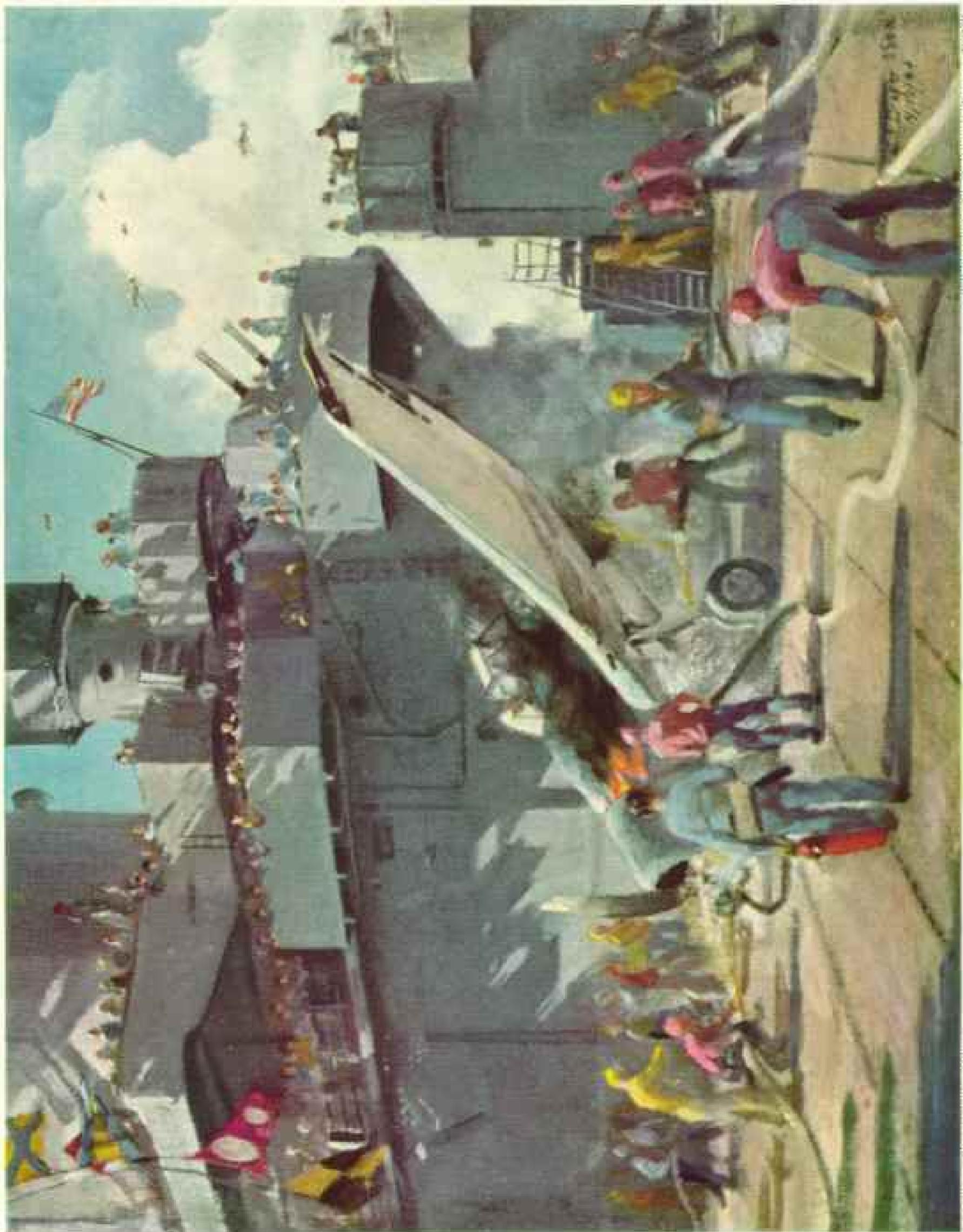
Bomb and torpedo loading and night's alarms have exhausted these men. In the shade of a gun turret they snatch 40 winks while awaiting the flyers' return from Palau. Those in yellow jerseys are plane spotters and directors. Red jerseys denote fire fighters and gasoling crews. "E" stands for the turret crew's efficiency and the oblique "hash mark" for a second award.



Oil Painting by Lt. William F. Dwyer, USN

Chips on Her Shoulder, a Carrier's Brood Sleeps at Sunset

Wide awake, however, are all eyes in the island structure. At this hour the enemy knew the task force was headed his way. At Palau his fleet answered our challenge by fleeing. At Manila, 1,200 miles away, the Japanese grew panicky and ordered an air-raid alarm. Our targets, however, were Palau, Yap, Woleai, and Ulithi, all in the Caroline Islands.



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Fire Fighters, Some in Asbestos, Save the Pilot of a Flak-torn, Tailless Cruck-up and Earn the Gallery's Cheers



Old Palauite by Lt. William F. Draper, USMC

© National Geographic Society
Dive Bombers Refuel for a Second Blow at Palau—Others, Coming in One by One, Circle the Ship Like Gulls



© National Geographic Society

Old Pictures by Lt. William F. Draper, USN

Ship's Store on Espiritu Santo Is Ice-cream Parlor and Social Headquarters for Service Men at Leisure



© National Geographic Society

Oil Painting by Lt. William F. Draper, USMC

Below Munda's Battle-torn Palms, Army Mechanics Race an Approaching Rainstorm to Repair a P-38 Lightning

to J. D. ...
Jan 1945



© National Geographic Society

Oil Painting by Lt. William F. Dooper, USN

Shock Troops of the Air, These Are the Men Who "Dish It Out" to the Nips

In the three-day attack on Palau and its neighbors, American carrier pilots destroyed 28 ships and 214 planes. We lost 25 planes, but not one of our surface ships was scratched. Vice Admiral Marc A. Mitscher, who commanded the task force, proved that Japanese land-based planes could not stop our carrier-borne craft. Here five Avenger pilots relax in their air-conditioned ready room. In a baseball cap their skipper, Lt. Comdr. Richard Upson (since lost over Truk), plays cards with Lt. (jg) William Laliberte (foreground). Ensigns L. E. Benson and T. D. Quinn are onlookers. Lt. Joe Kristufek, preparing for antisubmarine patrol, writes on his plotting board.

Marseille, Battle Port of Centuries

BY A STAFF CORRESPONDENT

With Illustrations from Photographs by W. Robert Moore

A QUARTER-CENTURY after a large segment of the American Expeditionary Force sailed home from Marseille a new generation of American soldiers again fights in France, driving on that tough old seaport, liberated by the Allies, August 23.

On August 15, 1944, one day after the enemy ordered Frenchmen to evacuate Marseille, invasion struck the French Mediterranean coast (map, page 428). Parachutes, gliders, and a huge fleet poured Yanks, Tommies, and pollus ashore.

Between two world wars Marseille was the chief sea gateway of France. In the whole Mediterranean area no other port was so big or so busy (page 439).

Every day an average of more than fifty passenger liners and cargo boats steamed in and out of its harbor. They flew the flags of virtually every maritime nation. In their vast maws were stacked products of infinite variety from all over the world.

Within miles of sea walls and jetties and beside huge warehouses was a maze of bristling masts, smoking funnels, and gaunt cranes.

Then Came the Nazis

Germany requisitioned, dismantled, and shipped away much of the harbor equipment, a vigilant Free France reported. At the same time the Nazis constructed submarine pens, and behind the jetties they organized convoys to the Italian front. To cripple these enterprises, the United States Army Air Forces and the RAF bombed Marseille from North Africa, southern Italy, and Britain (page 427).

Before the Nazis came, Marseille's airport, too, swarmed with commercial planes.

Huge sky birds of Imperial Airways splashed down and took off on their swift flights to and from the Far East and Australia. Here was the terminal for the southern transatlantic hop of Pan American Clippers.

French, German, Italian, and Dutch planes that winged the air lanes to Africa, Spain, Italy, to faraway Indochina and Java, and also to northern Europe, roared off its runways.

Marseille derives its name from its predecessor, the Greek city of Massalia. Into its Vieux Port (Old Port) Greek colonists from Phocaea (Foça), Asia Minor, sailed in 600 B.C. They settled on the northern bank.

Ancient Massalia's limits were roughly those of modern Marseille's Old Town. It founded

its own trading posts. In Roman times it outlived Carthage, its rival; finally submitted to Julius Caesar. During the Crusades knights and pilgrims set out from its harbor for the Holy Land.

Expanding Marseille allowed the Old Town to become a rabbit warren of timeworn structures threaded with a maze of narrow, twisting alleys. The area was tough, rowdy, and raffish. It contained some criminals whom the police were never able to root out. But for every outlaw it housed half a hundred honest fisherfolk.

Massalia—the City That Was

Old Town lived through centuries of siege, capture, sack, and pestilence. Neither enemy nor disease succeeded in doing what Germany did.

On a January morning in 1943, two months after the Allied invasion of North Africa and the German occupation of southern France, the Nazis and their Vichy satellites threw a police cordon around the Old Town, blocking every exit. Loud-speakers in the streets ordered all inhabitants to assemble on the quay.

Some 40,000 were rounded up. Half of them were singled out for a concentration camp 60 miles away. Though it was mid-winter, little or no baggage was permitted. To some, especially to children and invalids, the journey proved fatal.

Homes were pillaged for lead pipes and other fixtures. Then dynamite charges were laid. Demolitions began February 1. The following evening a Swiss reporter toured the ruins.

"In the growing darkness," he wrote, "the scene assumes the hallucinating grandeur of a modern Pompeii. The silence is complete."

After 25 centuries "Massalia" shared the fate of Carthage.

Germans Explain Old Port's Destruction

Berlin said the deed had been done to "clear the city of an ugly stain and build a clean district where once hung a false halo of apache romanticism."

A more plausible explanation pictured the Germans as killing two birds with one stone. First, they obtained room for harbor defense guns; second, the labyrinthine Old Town offered search-proof sanctuary to patriots of the Underground.



In Peace or War, Old Town's Pallid Dead End Kids Never Had Much of a Chance

Coaxed from a dark alley, children of Italian immigrants line up for their portrait. Many boys who escaped the Nazi eviction became waifs. Rickets and tuberculosis took heavy toll.

I remember the old district well. Shortly before the war I spent many an hour there tracking down with a camera some of its unforgettable characters. Amid their piles of cabbages, garlic, eggplants, and sea food, the market wives were a jolly lot (pages 441, 445, 447). With many who were as buxom as Tugboat Annies, I laughed and lied gloriously, assuring them my camera would make them Hollywood queens.

"I don't know why so many painters and photographers come up here," said one talkative middle-aged woman.

To her the hillside steps of worn flagstones were only the passageway up and down which she had to carry her baskets of vegetables each morning. The ten-foot-wide canyon, patterned with fantastic lights and shadows, was her home.

"Window-shopping" with Baskets

As in old Naples, windows and doorways throughout the district flaunted intimacies of the family laundry. Perpetually, they formed a banner display (pages 437, 438).

While some thoroughfares were accessible to delivery vans, which crept up them in low gear, others were so steeply tilted that they were stair-stepped all the way to the top.

Knife grinders and venders plied up and down these steep alleys, catering to doorway customers and to those who let baskets down by strings from the upper windows.

Every day was market day along some of the narrow lanes. Refuse piled high; even walking space was sometimes hard to find.

Down along the water front of the inner harbor the denim-clad menfolk gathered about their boats to mend their nets, bait their hooks for the next trip out to sea, or paused to eat their pots of *bouillabaisse*, wine, and hard rolls.

The Old Town had an Italian appearance; much of it was inhabited by families of Italian ancestry (page 445). They comprised a large percentage of the city's prewar population of more than 914,000 persons.

Marseille drew a strange assortment of nationalities and races. On its streets and at cafés mingled Spaniards, Algerians, Moroccans, Senegalese, Greeks and other numerous groups of the Levant. From black men of Martinique to pale-yellow Annamites from far-off French Indochina all shades and colors were represented.

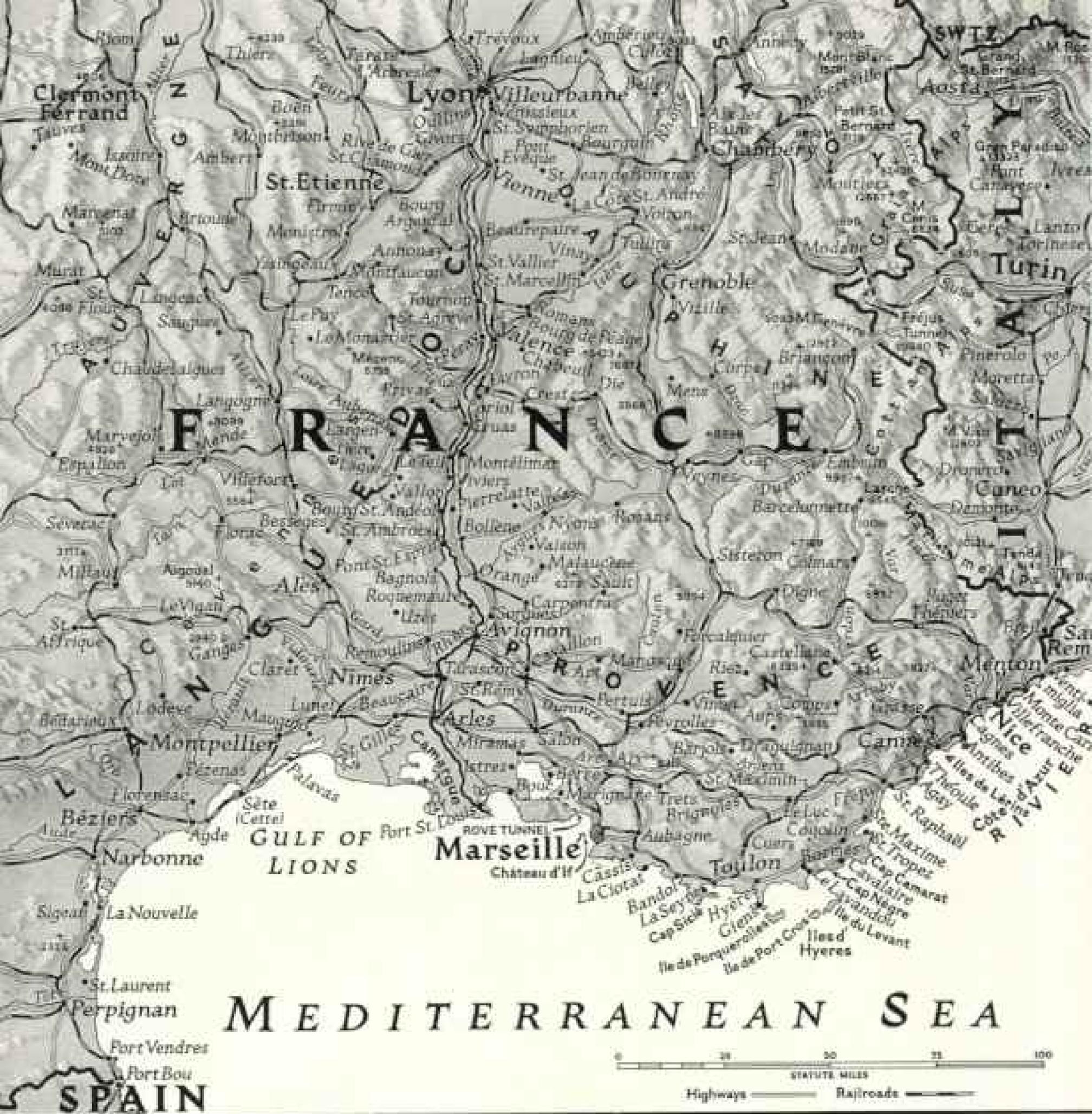
Traditionally the city has had a reputation for independence. The people's laughter was a little louder, their talk more boastful, and their pronunciation of the language terrible—



U. S. Army Air Force, Official

Dust on Land, Bubbles on Water, American Bombs Burst on Marseille U-boat Pens

Submarines and German shipping to the Italian front were marshaled here. Brushing off Messerschmitts, the 15th Army Air Force blasted them, first from Africa, later from Italy. A suburban aircraft plant was an RAF target. Just before the invasion of southern France, its coast took an intensive four-day bombing.



Drawn by E. E. Eastwood and Irvin E. Allman

Marseille Dominates the Mouth of the Rhône, Mediterranean Gateway to Southern France

at least so said their fellow countrymen from other localities.

Because it was sung by the Marseillais soldiers when they marched into Paris to take part in the attack on the Tuileries in 1792, Rouget de Lisle's battle song henceforth has been known as the *Marseillaise*.

Old Port in Heart of Modern City

The Old Port where Marseille had its beginning is now only a little lakelike rectangle in the heart of the city.

Across the channel at its lower end, engineers had erected a huge Transporter Bridge. Though not a bridge in the accepted sense, it afforded cross-harbor transport with

little interference to the passage of ships.

Passengers and vehicles were borne across the harbor entrance a few feet above the water on a moving platform suspended by long cables from a carrier rolling along a lofty track (pages 434-5).

The giant steel pylons, which supported the 870-foot-long cross span about two-thirds of the way to the top, soared to about 280 feet.

The fate of the bridge is uncertain at this writing. An Underground source said Germany had ordered it dismantled for scrap iron.

Seaward from the bridge site the narrow channel to the Old Port is guarded on either side by time-mellowed fortifications.

Right on the northern side stand the quaint



In Old Town One Street Rambles Downhill; Its Intersection Takes Steps and Soars

Here ended a daylong search for a reputed *Champs Élysées*, namesake of the famous Paris thoroughfare. A friend who had "seen" such a street took the photographer on a wild-goose chase. He apparently had mistaken the Buster Keaton poster, *Le Roi des Champs Élysés*, for a street sign.



Imagination Pictures Allied Troops Marching through Marseille's Triumphal Arch

This memorial in the Place d'Aix reflects changing sympathies for Empire and Republic. It was erected in 1825-31 in memory of the Duke of Angoulême's victory near Cádiz. After 1848 it was decorated with Napoleonic reliefs. Now it is dedicated "To the Republic (from) Grateful Marseille."

square towers of Fort St. Jean, or Fort Grasse-Tilly (page 439). Here, until it was razed in the 1660's to make way for the present structure, stood a 12th-century Crusader castle that housed persons awaiting departure for the Holy Land.

But this fort, like its predecessor, outlived its usefulness, except to serve as a picturesque relic and, when colonial troops moved back and forth, as their headquarters while they paused in the city. The red- and blue-uniformed Tunisian or Algerian troops who usually lounged about its gateway and strolled on its parapets heightened the Moorish appearance of its architecture.

The angular fortifications of Fort St. Nicolas, or Fort d'Entrecasteaux, on the opposite side seem more formidable and still are used by the military.

Church Is a Seaman's Shrine

Rising abruptly on this southern side of the Old Port back of the fort is a high conical hill. Shops and houses extend only a little way up its sides, beyond the gray and time-worn crenelated towers of the historic Abbey of St. Victor (page 432). The rest of the rocky eminence is barren except for the impressive church of Notre Dame de la Garde which crowns its summit.

The tall belfry, surmounted by a colossal gilded statue of the Virgin, dominates the city and forms a monumental landmark for sailors far out at sea. To seamen the church is a celebrated shrine. Numerous votive offerings and ship models decorate its interior.

Out in the open roadstead, beyond the promontory occupied by a château that once belonged to Empress Eugénie and where medical students have since studied, are clustered a group of sun-bleached islands. France fortified the outer ones to guard Marseille against sea attack.

On one of the nearer islets, above the indigo-blue sea, rear the white stone battlements and towers of Château d'If.

Prison of the Count of Monte Cristo

Francis I constructed it in 1524 as a defense for Marseille against the Spaniards. The State converted it into a prison and in its gloomy dungeons incarcerated Mirabeau, Louis-Philippe-Égalité, and many others. But it remained for Alexandre Dumas the elder to endow it with immortal fame when he used its rugged walls and grim recesses as the setting for part of his classic *Le Comte de Monte Cristo* (page 444).

Every day, when the sea was fair, hundreds of people normally journeyed there to roam about the keep and explore the cells. Often they paid scant attention to some of the rooms where noted prisoners had been held, preferring to linger longest in the dungeons that Dumas's heroes, the Abbot Faria and Edmond Dantès, supposedly had occupied.

Focus of Marseille is the Canebière (Cannebière). The Greeks had a word for it, *canabis*: hemp—referring either to a field of that plant which once may have covered the site, or to a ropewalk. Little does this avenue now suggest the humble origin of its name.

Its sidewalks were built as wide as the vehicular lane itself, and onto them usually overflowed chairs and tables of open-air cafes and the bargain counters of large department stores.

Even by counting the short intersections where narrow streets cut in at sharp angles, this wide arterial thoroughfare is only about 14 blocks long. Masts of fishing boats in the Old Port are at one end; the soaring Gothic towers of St. Vincent de Paul stand at the other.

While driving down this famous thoroughfare, King Alexander of Yugoslavia met his death on October 9, 1934, at the hands of Macedonian terrorists.

To the Marseillais there is no other street in the world quite like it.

"If Paris had a Canebière, then it would be a little Marseille," so say the Marseillais. Actually Paris does possess a street by that name out near the Place de la Nation, but it resembles the Marseillais Canebière as little as the Capital does the port.

Modern Marseille spreads far on either side of the Canebière and back from the ancient harbor. Spacious radiating boulevards and sycamore-lined avenues extend for miles.

South of the Canebière, centering on the Rue de Rome, St. Ferréol, Paradis, and adjoining streets, is the chief shopping district.

Here again was a baffling confusion of traffic. In some places you had to park on the odd-numbered side of the street on odd days and on the even side on even days.

I lived once on a steep street where, without even looking out the window, I sensed the magnitude of the industry of the city. Ponderous trucks roared up the hill in low gear and backfired as they descended.

On all of the main routes throughout the city and on the highways that lead up from the port, these juggernauts moved unceasingly to and fro, carrying goods and raw materials between the ships and outlying factories. Big passenger buses, taxis, and delivery carts had multitudinous comings and goings.

Out along the promenade of the Prado, life assumed a more even tempo. Especially in late afternoon and on Sundays, many people went to sit on its shaded benches or to stroll beneath the leafy canopies formed by triple rows of stately sycamores on either side of the spacious boulevard.

Some two miles long, this attractive street reached refreshing park areas and then bent sharply to join the Corniche at the sea. The unshaded Corniche twists and turns along the coast, its route hewn in places from solid rock.

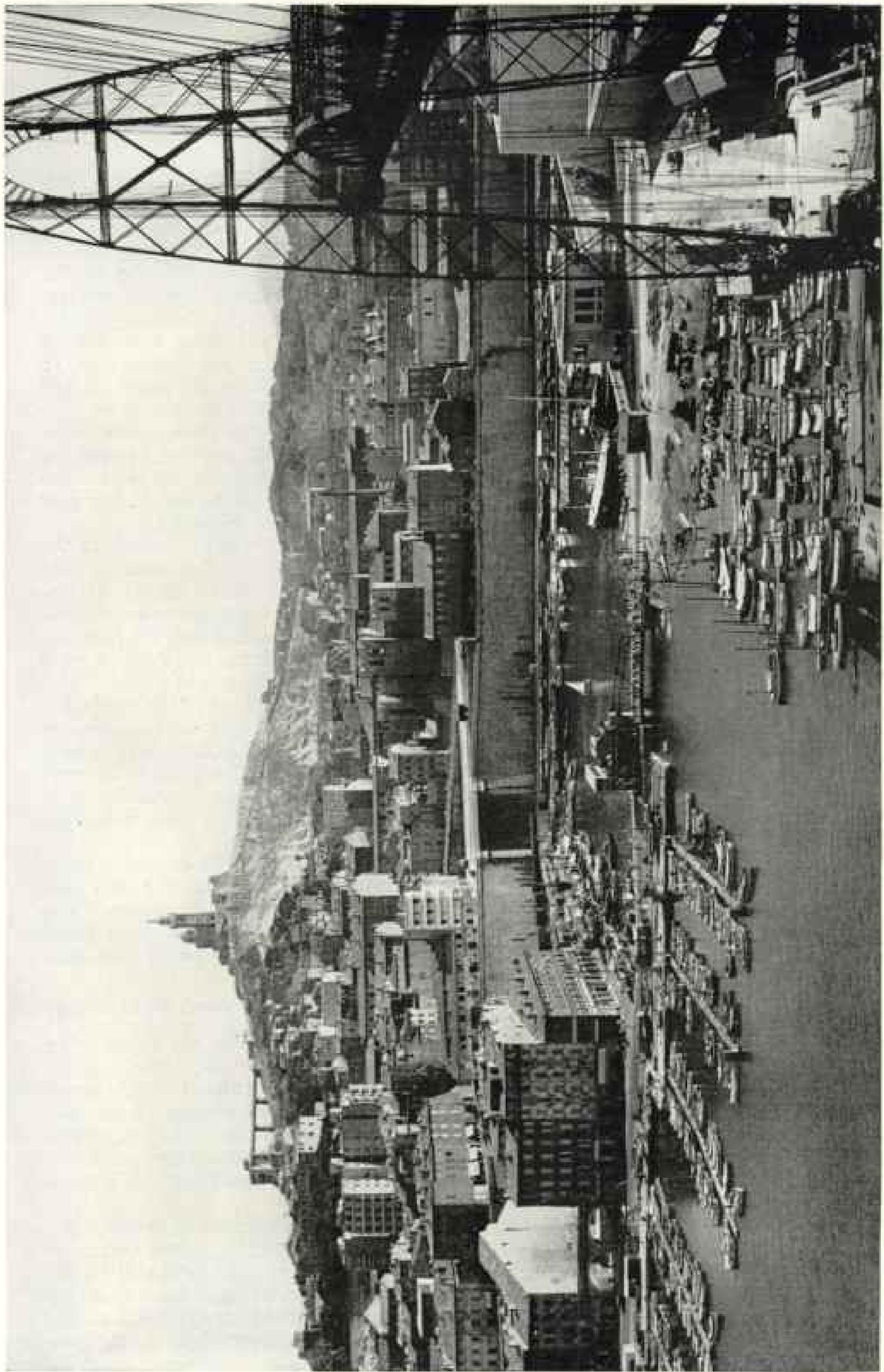
A Bullfight in French Style

One Sunday afternoon on the Prado, when Marseille was still new to me, I saw outward-bound tramcars crowded almost beyond standing room. An unusual number of taxicabs, private cars, and pedestrians also was moving in the same direction. I asked the reason.

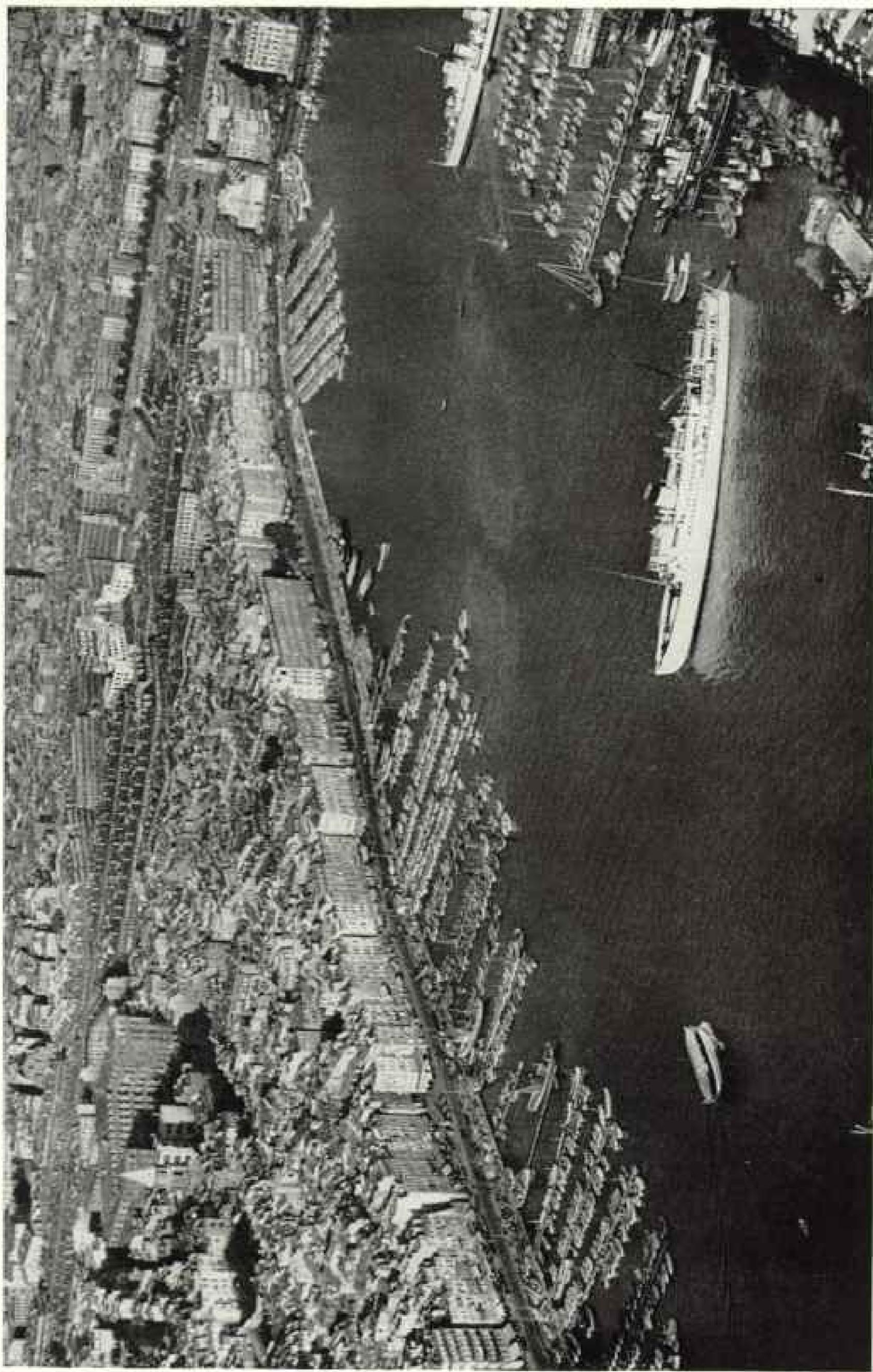
They were going to a bullfight! So I joined the procession.

Bullfighting was forbidden in France. But the people, while believing in the dignity of State statutes, liked also the thrill of the sport. So its devotees, law-abiding citizens that they were, paid in their entrance fees the fines that the court regularly exacted from the promoters (page 437).

The gay, noisy throng applauded or booed



On a Bare Hill above the Old Port, Notre Dame de la Garde Stands below Its Colossal Virgin, a Gilded Beacon to Sailors
A footbridge terminating at an elevator tower (upper left) leads to the basilica. In the harbor, a drawbridge separates anchorage from repair basin. Just beyond the sea wall, the battlemented towers belong to an abbey named for Saint Victor. The south side is seen from Transporter Bridge (right).



© E. M. Hubbard

Greek Settlers' Massalia (Born 600 B.C.—Died A.D. 1943) Stood on Marseille's North Shore until German Dynamite Levelled It

Patriots' refuge, Old Town first surrendered its 40,000 residents. On a February morning blasting began. Next evening a Swiss reporter found "no one on my walk across the desolation except the cats." Fishing craft and pleasure boats thronged the Old Port. Liners and freighters used the modern harbor (page 427).



Colossus of Marseille, Transporter Bridge Straddles the Old Port on 280-foot Steel Legs

Seemingly a steamer outward bound, the cable ferry glides in air from bank to bank (opposite). Perched like counterbalances on either end of the span, domed structures house cafes and observatories for sight-seers. Queen of the city's streets, the Canebière begins at the gap just to the right of Fort St. Jean (left).



Photo World by E. M. Newman

Moving as on Air, a Cable Ferry Carries Horses, Carts, and Passengers across the Old Port

Dispensing with draw and lengthy approaches, the Transporter Bridge gives ample clearance to shipping. Its cable-hung platform moves on wheels in the lofty track (page 428). Any falling parts land in the safety net. Spired with masts, a channel (center) connects old and new ports.



Step by Step, Ancient Streets Are Swept

In the Nazi-demolished Old Town, kitchen waste was dumped into open drains and sluiced away to disposal trucks. Weary climbers found handrails convenient, but running water was a hazard. As indicated by its sign, the store sold "a little of everything."

the Spanish toreadors who had been brought to Marseille for the fight. Ice-cream-cone and sweetmeat venders did a thriving business.

Judged by any standard, the performance of one toreador was poor. Time and again there was a loud unison of noes and prolonged boos. One man in front of me kept jumping up and down and shouting, "Why don't you get a gun?"

Marseille lacked the historic Roman arenas of Nimes and Arles to give its bullfights a proper setting. Unlike the other historic towns of Provence, the city has few monuments or relics of the days when it was controlled by ancient Rome. Like those of its earlier Greek

culture, they have been swept away.

Its oldest structure is the blackened stone Abbey of St. Victor, with its fortified towers. It dates only from the early 13th century; yet it rises above catacombs where early Christians found refuge, and its traditions reach back to the beginning of the fifth century when its foundations were laid by the monks of the Order of Saint Cassianus.

New Buildings on Ancient Sites

The sumptuous Roman-Byzantine Cathedral of Sainte-Marie-Majeure (La Major), which stands on a wide terrace overlooking the new harbor, and other churches are comparatively new. All were constructed between the thirties and seventies of the last century, when the city had its big building boom.

The Longchamp Palace, since converted to house the art and natural-history museums, the Prefecture, Palace of Justice, Stock Exchange, and many of the other chief build-

ings date from the same time.

So, too, does the Triumphal Arch, or Porte d'Aix, which was erected in memory of the Duke of Angoulême's victory of 1823 at Trocadero, near Cádiz, but was later decorated with reliefs portraying the struggles of France under the First Republic and under Napoleon (page 430).

"There are," wrote a Marseillais poet, Méry, "only two monuments here, but they are magnificent: the sea and the sky."

Beside the sea, and from the prodigious trade it has borne, grew the monument that is Marseille itself. Its jetties here are among the largest that man has ever reared against the waves. Its docks, warehouses, and port



At a Scrub-it-yourself Laundry, Wagging Tongues Air Neighborhood Affairs
Marseille's Old Town afforded little privacy. Many household duties were performed in the open. From washing to drying, the laundry was public. Gossip made the chore less arduous.



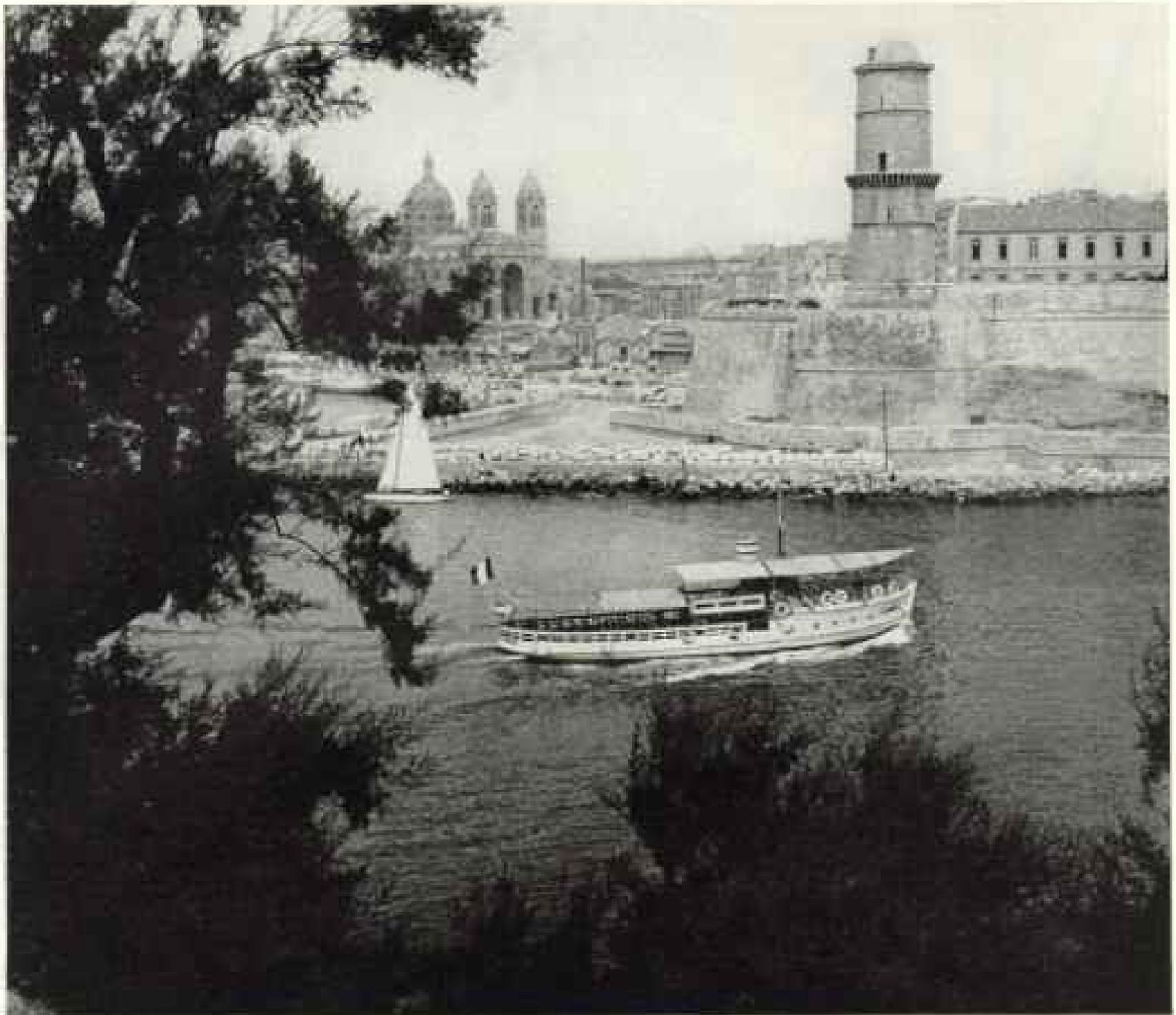
Peeping at a Spectacle, They Unwittingly Make One

A bullfight, outlawed but tolerated, was the attraction beyond the crack. Marseille's cash customers salvaged their consciences by paying at admission gates the fines sure to be collected from promoters (page 431).



House Fronts Reveal the Condition of Papa's Underwear, the Size of Mama's Nightgown

Like festival banners, drying sheets cascade from laundry racks. "Bar . . . meublée" advertises tavern and rooming house. Travelers wisely avoided it. Even native police felt uneasy among these dark shuttered canyons. Here patriots hid until Nazis dynamited their retreats (page 425).



No More Do Pleasure Craft Sail Past New Cathedral and Old Fort St. Jean

Overlooking a between-harbors channel, the fort's round tower houses an inscription recalling the 1899 celebration of Marseille's 2,500th birthday. A temple to Diana once stood at the Cathedral's site.

highways have been built on land redeemed from the ocean.

Since the Old Port became too small, the basins of Joliette, Lazaret, Arenc, Gare Maritime, National, Pinède, Président Wilson, and others were constructed along the rocky shore. Marseille had built more than 14 miles of available quay space, and, before war came, men were working to erect even more.

The Geography of Marseille's Trade

Floors of the warehouses were heaped with bags of peanuts and other oil products; with rice, potatoes, sugar, and spices. Paunchy casks of wine lined the quays. Everywhere there was the pungent smell of copra or the mingled odors of fruits, fertilizers, and farm products.

Half of Marseille's import labors were centered about the handling of grains, vegetable-oil products, and crude oils. Sugar, rice,

fruits, wine, and fresh or dried vegetables made up another fourth.

Crude rubber came in from the plantations of French Indochina and Malaya. Steamers in turn carried tons of new automobile and truck tires out to Singapore and Saigon.

Freighters from Brazil discharged castor oil beans to be sent to the local factories for oil extraction. Ships from Algeria brought over many potatoes; quantities were sent back to be used for seed. Most of the stevedores were Algerians.

One day I fell into talk with a port foreman as I watched the Algerian stevedores unloading a Greek ship. As we talked, one of the bags in the descending sling split open, sending a shower of rice over the pier. Immediately I was interested in learning where a Greek steamer would be getting rice.

The foreman quickly provided the answer. "Java. We get the bulk of our rice from



Spice Isles' Commerce on Marseille's Docks Bears the Aroma of Far-off Places

Within range of eye and nose were peacetime's tea from China, coffee from Red Sea ports, licorice from Turkey, palm oil from West Africa, jute from India, grain from Odessa, rice from French Indochina and the United States. These men are weighing copra from New Caledonia.

French Indochina, but we also have some from Madagascar, Egypt, Spain, Italy, and other places. As an American, you of course know that we get some from your country, too."

I knew well the rice fields of Indochina and Java, but I had never seen a rice field in my own homeland. Yet in recent years the United States shipped more rice to Marseille than any other country save Indochina.

In other warehouses I saw huge bags and piles of licorice roots from Turkey.

Such was the long arm of Marseille's trade.

Of the wealth of merchandise brought to Marseille, a fourth was produced by France's own possessions in Africa and Asia. Algeria, by its extensive output of wheat and other cereals, its fruits, vegetables, wines, and livestock, ranked as the outstanding contributor.

The port's exports were the reverse of the imports, as the possessions absorbed two-

thirds of its goods. Again, Algeria was its largest market, taking a third of the outgoing trade. Of the many foreign vessels entering Marseille's harbor in peacetime, most came from Britain, Italy, and Spain.

Down here at the docks, where boats shuttled back and forth, where boxes, bags, and bales piled high, and where passengers hurried down gangplanks, the Chamber of Commerce gathered reams of statistics.

Under normal conditions there was a movement of some 19,000 ships entering or clearing the harbor during the year, representing a gross tonnage of 33,500,000 tons. Marseille and its subsidiary ports handled some 8,000,000 to 9,000,000 tons of merchandise, and 750,000 passengers came and went.

The Chamber of Commerce itself has had a remarkable history. It was founded almost 350 years ago. This wealthy society founded



German Occupation Taught the Old Town's Market Wives Not To Be Jolly

Though prices were fabulous, sea-food dealers had little to offer during the occupation. A few shellfish could be scraped off piers, but Nazi naval regulations often compelled the fishing fleet to remain idle.

the African Company, sent forces to help clear the seas of the Barbary pirates, maintained consulates, and once communicated directly with the kings of France.

In more recent years it built the imposing Stock Exchange on the Canebière to house its offices. Much of the new harbor was constructed under its supervision.

In 1927 the Chamber also saw brought to completion a project that had long been its dream—the opening of the 4½-mile Rove Tunnel (page 443). This passage through the rocky hill of L'Estaque, northwest of the city, gave direct entrance to the inland sea of Berre.

By a more recently completed canal linking the Berre to the Rhône River at Arles, the whole vast interlinking system of rivers and canals throughout the heart of France became accessible to barges and small craft from Marseille, thus obviating the 25-mile journey in open sea to get to the Rhône.

Underground reports seeping out of France have told of attempts at sabotaging the Rove

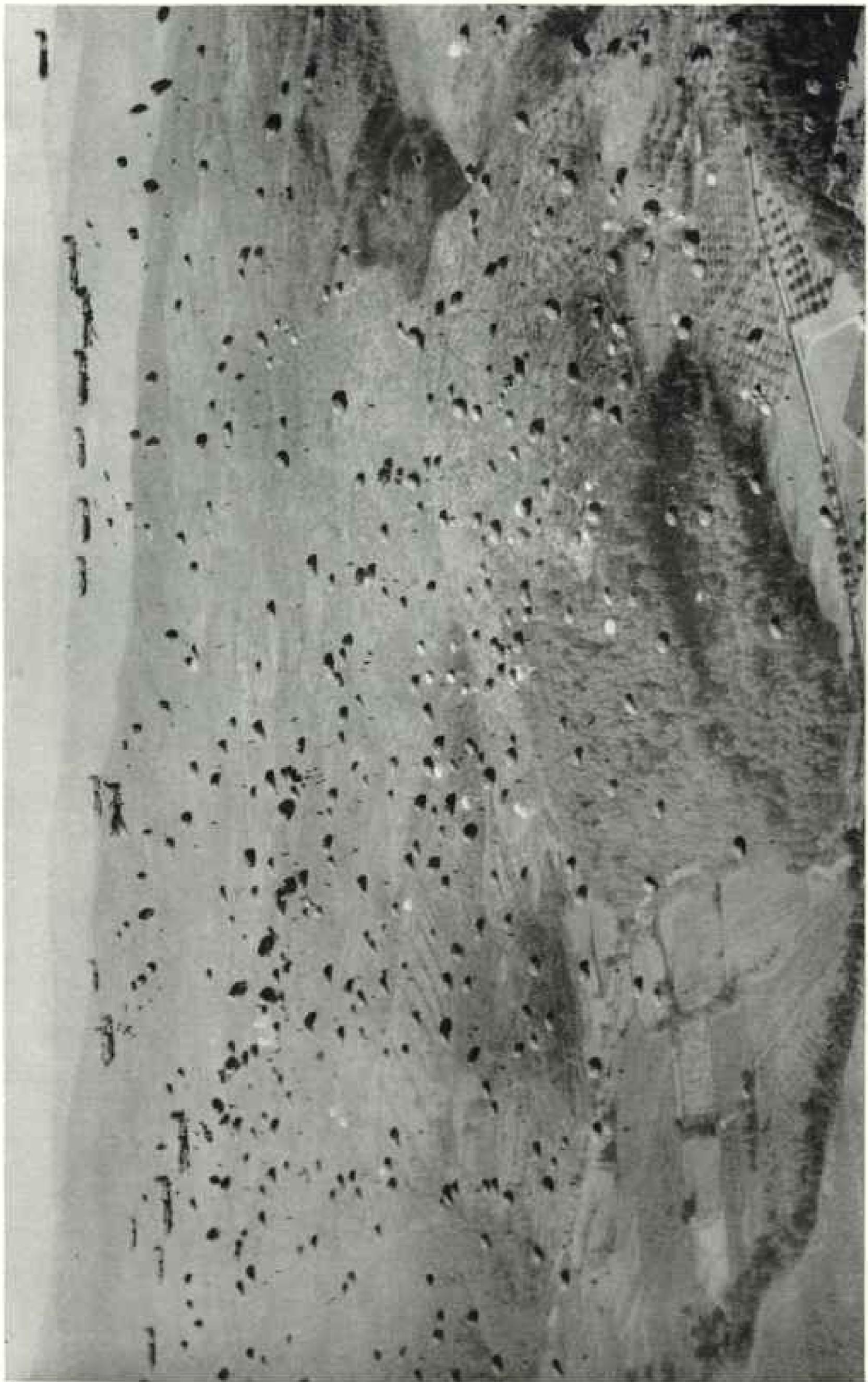
Tunnel, in order to deny the Germans the use of this canal system.

The Chamber of Commerce also supervised the huge airbase at Marignane, located beside the Berre. The industrial life of Marseille was largely centered about its three chief imports: grain, vegetable-oil products, and crude oil. For here were numerous large milling establishments, oil distilleries, soap factories, and refineries. There also were cement and chemical works and many other smaller concerns. Transit companies and exporting and importing houses were legion.

Of the climate and health of Marseille someone once wrote: "The sunshine and the mistral set everything in order!"

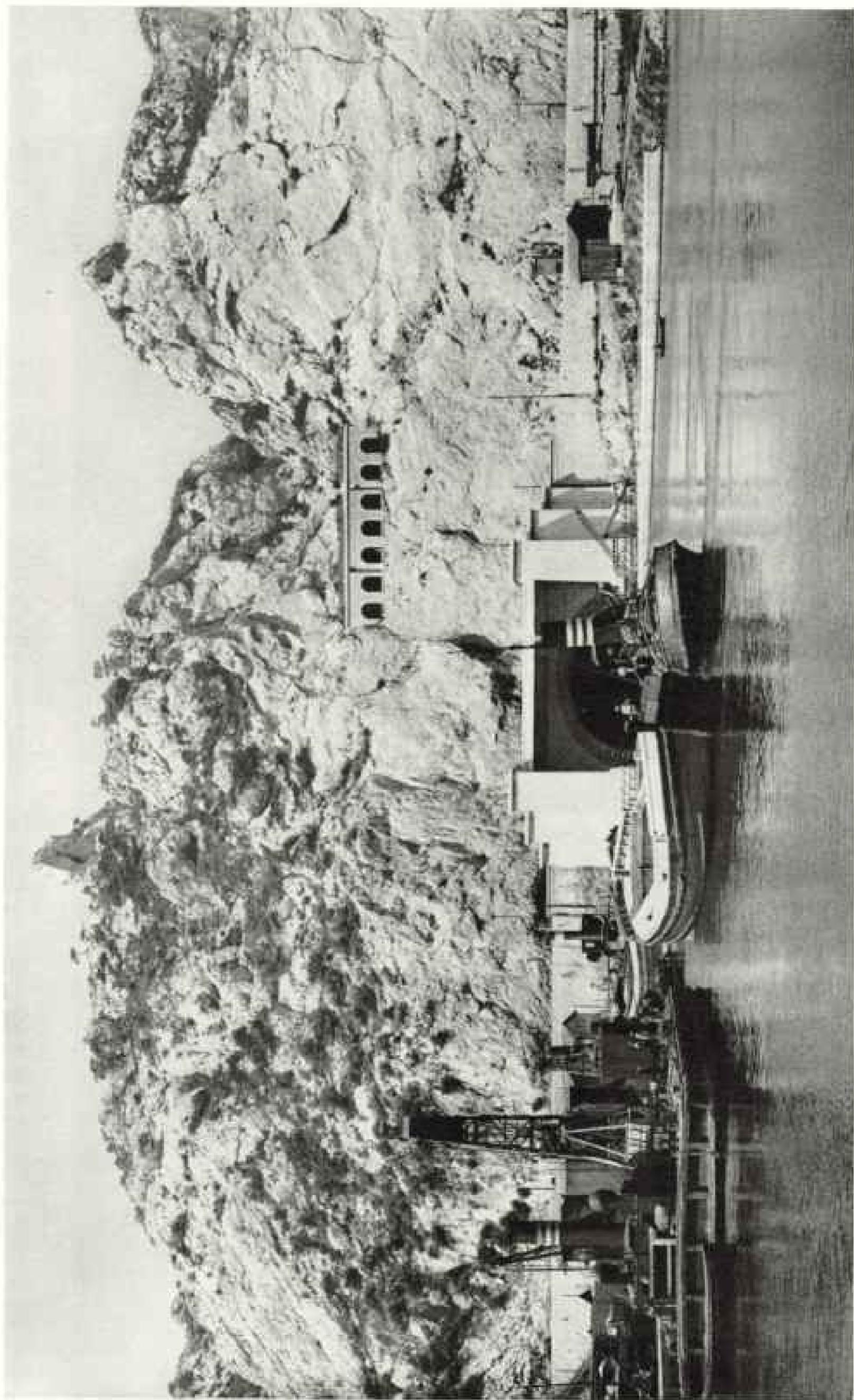
Throughout most of the year the sun shines from unclouded skies, working wonders with its penetrating rays.

And the mistral, that remarkable dry, cold blast which bears down the Rhône Valley from the mountains with hurricane velocity, sweeps the areas that lie in its path,



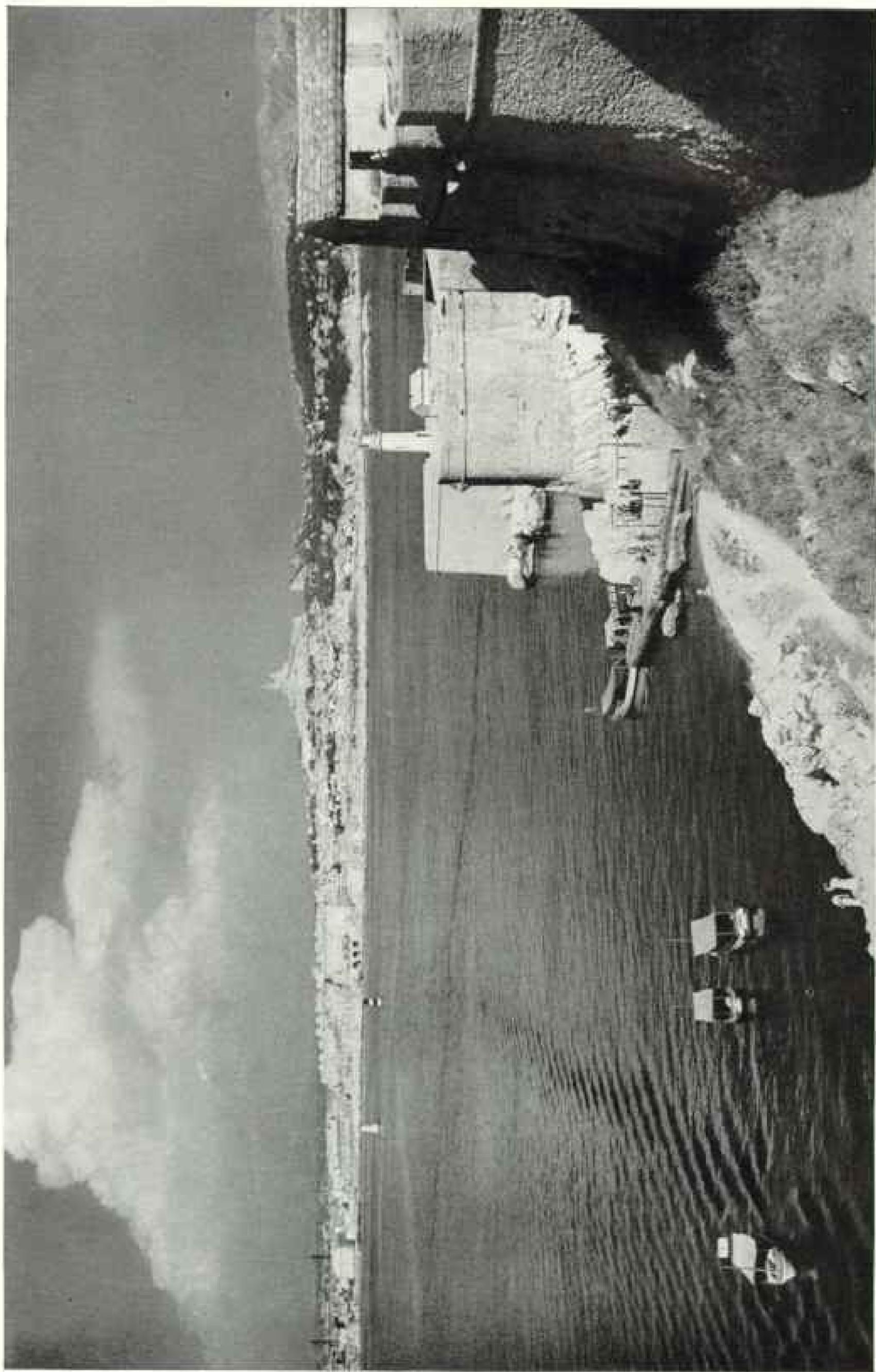
Dropped by C-47's, a U. S. Army Beachhead Floats between Marseille and Nice, Catching the Enemy without Antiaircraft Defense
At dawn August 15, 1944, hours before ship-borne forces struck, thousands of Allied paratroopers seized strategic points inland. Lost in fog, one American group dropped on the coast by mistake and took St. Tropez (map, page 428). Another unit, landing two weeks in advance of the Mediterranean D Day, joined French patriot forces for 20 days in the interior operations against the Nazis.

U. S. Army Air Forces, Official



Through Rove Tunnel Marseille's Small Boats Take Protected Passage to France's Network of Inland Waterways

By sailing under the rocky hill of L'Éstaque, vessels by-pass Gulf of Lions storms and Rhône delta silt. Four and a half miles long, the tunnel leads to the inland sea of Bervo, and thence to the Rhône at Arles. Here a break in the cliff reveals a railroad tunnel, marked by a series of arches, running above the underground canal (page 441).



Château d'If, Once Marseille's Alcatraz Island, Lure's Boatloads to the Dungeon of an Imaginary Character

Gravely a door plaque announces, "Cell B, Edmond Dantès," hero of Dumas's *Count of Monte Cristo*. A flesh-and-blood prisoner was Mirabeau (page 431). Two miles away, the Church of Notre Dame de la Garde towers over the city. Rugged, waterless Massif de Marseillevoyre rises to the right.



Old Town's Eggplant Queen Says It with a Gesture

Five years ago food was displayed without fear. Under Germany, life became a dreary struggle for survival. Rationing, black markets, and Nazi requisitions afflicted French cities. For a morsel, men robbed and killed.



Crisp and Oven-fresh, the Daily Bread Goes Home

This Italian girl represents a people composing a large percentage of Marseille's prewar population. Some were refugees from Italy; the majority were anti-Fascist. Littered streets were typical of the Old Town.



"Violets" on the Dealer's Signs Refer to Ascidians, or Sea Squirts, Not to Bouquets.

A Marseillais eats his sea food raw from an open-air stall. Sea squirts are found on Mediterranean piles and rocks. Because of their tough coat—they have no shell—they are not widely relished.



French Zouaves, Algeria-bound, Inspect an Algerian Peddler's Trinkets.

At Marseille France's overseas troops stopped for a last fling. There they met Arabs, Senegalese, Chinese, Greeks, and Annamites, some in uniform, some in native dress, speaking a babel of three continents.



Fish Market: One of the Sights and Smells That Gave Old Town Its Flavor

These fishwives, wrapping sales in old newspapers, were sensitive about their wares. Audacious Marseillais who held their noses while passing such a stand risked a bombardment of fish.

In winter and spring, and occasionally at other times, it comes, blowing always, say the Marseillais, for three, six, or nine days at a time.

When the rains come, borne on the southeast winds, they usually fall with the energy of a tropical downpour.

Few visitors to Marseille explored the realms of its commerce, but they learned its specialties in foods. Marseille was the home of *bouillabaisse*. It is a good thing that the Marseillais coined a single comprehensive word for it, as its ingredients are as many and varied as would be a trade circular of the port.

Fish and crustaceans are its basis. My chef's cookbook, after listing 10 or 15 different kinds, adds the footnote: "In a word, all of the rockfish of the Mediterranean!"

To this are added tomatoes, onions, garlic, leeks, celery, and oil, as well as a little laurel, fennel, and thyme. Then comes the seasoning: a little salt, pepper, and saffron.

If you liked sea foods more individually prepared, the Mediterranean capital also had a bountiful supply of fish, lobsters, crabs, and other crustacean delights.

Oysters, mussels, cockles, ascidians, and sea hedgehogs, which look like exaggerated chestnut burrs, were served at city and seaside res-

taurants, but many people preferred to eat them in true Marseillais manner down by the Old Port (opposite).

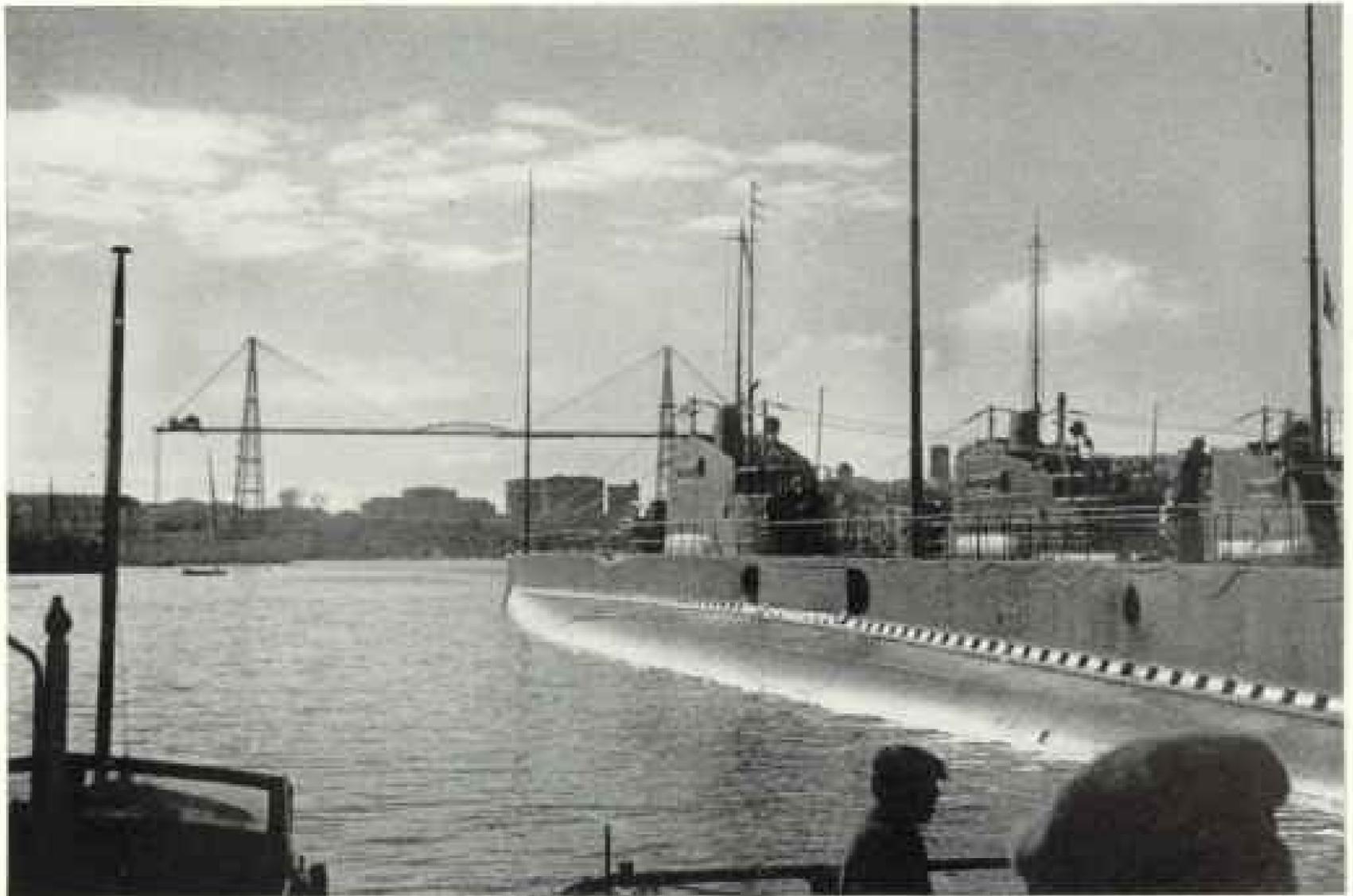
"Fruits of the Sea"

Here, along the water front, stand displayed the various *fruits de mer* in flat baskets. Eating was arrived at openly, as the dealer pried open the shells with a sharp knife and handed them to the customer.

Under Nazi occupation fishermen were forbidden to leave port most of the time. Consequently, with the sea-food supply cut off, the food situation in Marseille became acute. Among all cities in France it was one of the poorest fed. Prices on the black market have been fabulously high.

Before war began, there was talk of filling the Old Port to make more room for the expanding city. If that is done, Marseille will lose a picturesque and historic landmark.

Especially at nighttime when the basin was almost still, it was a wide dark pool of loveliness. Encircling lamps of the streets and on the hills cast long wavy banners of white, red, and green across its inky surface. Yellow masts speared the velvety sky, while the brightly painted hulls appeared as doublets in the water.



Staff Photographer Maynard Owen Williams

Inspiration to Patriots, a French Submarine Ties Up in Old Port for Public View

Of 20 submarines in Toulon in November, 1942, when the Nazis marched in, at least nine were sunk and three escaped to the Allies. *Sarconf*, largest of submarines in her time, was lost in the service of the Fighting French.

The streets around were always thronged by gay talkative crowds, out for a stroll after the dinner hour. Music blared from open cafes and from radios on some of the quay-side boats. From the windows in the gray waterfront façade of the Old Town that the Germans have blasted, one often heard a lusty tenor singing *O Sole Mio*, followed immediately by *Santa Lucia*.

And across the entire end of the quay, at the beginning of the Canebière, noisy boatmen shouted themselves hoarse in an effort to get passengers to take their two- and three-franc excursions out along the Corniche and around Château d'If.

Irrespective of the number of times one had made the cruise, there was always the temptation to return to see the lights that banked the hillsides and beribboned the coast, as well as to look at the famous old castle, silhouetted atop its tiny isle.

One of my treasured experiences in Marseille occurred when a friend called one evening to tell me that a dramatic group was presenting *Le Comte de Monte Cristo* out at the Château.

So again I went over, where I sat for three and a half fleeting hours under a moonlit

sky and saw Dumas's masterpiece superbly acted below those brooding towers.

At the moment when the Count was imprisoned, stage backdrops in the courtyard were drawn aside and he was led directly to the door of the old dungeon. Later, when he effected his escape by taking the place of the dead abbot, we saw the sack containing his body cast from the turrets into the sea.

Few plays, indeed, have ever had a more impressive setting or stage managing than this.

Such were some of the facets of the huge Mediterranean port of Marseille, which was humbled by Nazi conquest.*

* For additional articles on France in the NATIONAL GEOGRAPHIC MAGAZINE, see: "Paris in Spring," October, 1936, and "Carnival Days on the Riviera," October, 1926, both by Maynard Owen Williams; "Coasts of Normandy and Brittany," August, 1943, and "Rehearsal at Dieppe," October, 1942, both by W. Robert Moore; "France Farns as War Wages," by Harrison Howell Walker, February, 1940; "Normandy—Choice of the Vikings," by Helen Churchill Candee, May, 1936; "Land of William the Conqueror," by Inez B. Ryan, January, 1932; "Mont St. Michel, a Medieval Masterpiece," 22 duotone illustrations, May, 1936; "Camargue, the Cowboy Country of Southern France," by André Vialles, July, 1922; "Across the Midi in a Canoe," August, 1927, and "Through the Back Doors of France," July, 1923, both by Melville Chater.

The Society's New Map of Southeast Asia

TIMELY addition to the National Geographic Society's wartime series of map supplements is the new Map of Southeast Asia and Pacific Islands, distributed with this issue of the NATIONAL GEOGRAPHIC MAGAZINE.*

The new chart, together with its companion Map of Japan (April, 1944), portrays in detail the heart of the vast Pacific battleground.

Consulting these two maps, members can follow every move by our land, sea, and air forces to crush the Japanese. They are drawn on the largest scale ever used by your Society's cartographers in mapping this area.

From Calcutta to the Solomons

Northwest to southeast, the chart extends from Calcutta, chief base for the campaign in Burma, to Guadalcanal and Tulagi in the Solomon Islands, where United States Marines first checked the Japanese sweep.

The map reaches north as far as Shanghai and the southern tip of the Japanese mainland. On the south it includes Darwin, Australia, base for our bombers raiding the Japanese in the Netherlands Indies. Westernmost points are the Nicobar and Andaman Islands in the Indian Ocean, which were seized by the Japs in 1942.

On the east the map shows the new United States bases for B-29's in the Marianas Islands, within bombing range of both the Philippines and Japan.

Likely scene of operations is the Philippine archipelago, which lies close to the center of the new map. General Douglas MacArthur, upon his arrival in Australia from Corregidor in March, 1942, said: "I shall keep the soldiers' faith. I shall return."

Beyond the Philippines are Formosa, Jap-seized Hainan, and the broad stretches of the South China coast which Admiral Chester W. Nimitz has proclaimed a U. S. Navy goal.

In that part of western China shown on the map are airbases from which Superfortresses bombed Japan and Manchuria.

Our Navy's victorious operations in the Pacific have added new names in that area. For the first time on a GEOGRAPHIC map the Philippine Sea is listed. This is the title Admiral Nimitz has given to the waters between the Philippines and the Marianas.

Two other water areas are named for the first time on a general map. These are the Solomon Sea, between the Solomon Islands and New Guinea, and the Bismarck Sea, bounded by the Bismarck Archipelago and New Guinea.

"The Slot," term given by Navy men to the narrow stretch of water between New Georgia Island and Choiseul and Santa Isabel Islands, in the Solomons, has stuck. It appears now for the first time on a GEOGRAPHIC map supplement.

Key cities and strategic islands are charted in twenty-two large-scale insets on the new map. Six, in the upper right-hand corner, show Shanghai, Hong Kong, Singapore, Soerabaja, Manila, and Davao.

Sixteen others, in the lower left-hand corner, portray important islands and island groups. Among them are Saipan, Tinian, Guam, Pagan, and Rota, scenes of United States triumphs in combined land, sea, and air operations last summer in the Marianas.

Also included are the Jap island strongholds near the Chinese mainland—the Pescadores between the China coast and Formosa; the Nansei Islands, between Formosa and Japan; and Pratas, southeast of Hong Kong, in the South China Sea.

Old English Names for Bonins, Marianas, May Replace Jap Terms

Shown in detail are Chichi Jima and Haha Jima, fortified islands in the Bonins south of Tokyo. When the uninhabited Bonins were colonized by British and Americans back in 1830, they were given English names, which were in use until the Japanese took over the islands in 1861.

On the map these old designations appear in parentheses beside the Japanese: Muko Jima (Parry Group); Chichi Jima (Beechey Group); Haha Jima (Baily or Coffin Group); Nishi no Shima (Rosario). The Japs even changed the name for the Bonins to Ogasawara Gunto.

These old-time American and European names have a new meaning. Will they soon be restored by our conquering soldiers and sailors?

Palau and Truk (Color Plates I-XVI), important targets of American air and sea strikes, and Yap and Ponape, other Caroline Island strongholds which have been heavily bombed, are shown individually. Also charted

* Members may obtain additional copies of the new "Map of Southeast Asia and Pacific Islands, from the Indies and Philippines to the Solomons" (and of all other maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices, in United States and Possessions, 50¢ each, on paper; \$1 on linen; Index, 25¢. Outside of United States and Possessions, 75¢ on paper; \$1.25 on linen (*postal regulations generally prohibit mailing linen maps outside of Western Hemisphere*); Index, 50¢. All remittances payable in U. S. funds. Postage prepaid.



Staff Photographer Willard R. Cuyler

Preparing a News Broadcast, Cecil Brown Checks Place Names on a GEOGRAPHIC Map

John Whitmore, chief of the News Department of the Mutual Broadcasting System, confers with the network's noted commentator. The chart is your Society's Map of the World, now available in greatly enlarged form, on sheets 67 $\frac{3}{8}$ inches by 43 $\frac{1}{2}$ inches. On the wall are two other GEOGRAPHIC maps.

In insets are our big new base on captured Eniwetok, in the Marshalls, and Marcus Island, east of Japan, which has been attacked repeatedly by U. S. Navy raiders.

The new chart is based on a transverse Mercator projection, computed by your Society's cartographers. This projection reduces the map's scale error to a minimum. Printed in 10 colors, on a sheet 41 by 26 $\frac{1}{2}$ inches, it is drawn to the same scale, 126 miles to the inch, as its companion Map of Japan.

The National Geographic Society's wartime map series of Pacific areas provides detailed coverage over a vast stretch of the earth's surface. This series includes, in addition to

the new map and the one of Japan, the Map of Asia and Adjacent Areas, issued in December, 1942, and the Map of the Pacific Ocean and the Bay of Bengal, September, 1943.

Closely allied is the World Map (Van der Grinten's projection), December, 1943, which clarifies Pacific operations in their relation to global strategy. In response to hundreds of requests, the National Geographic Society has completed an enlargement of this World Map on sheets 67 $\frac{3}{8}$ by 43 $\frac{1}{2}$ inches, a size which makes it valuable for classroom or lecture use. Scale of this "blown up" World Map is 395 miles to the inch.*

The United States Army Air Forces found the Map of Japan so valuable that they requested permission of your Society to reproduce it in greatly enlarged form for military purposes.

Since Pearl Harbor, the National Geographic Society has supplied to the Army, Navy, and Government Departments more than half a million wall

maps. These have been distributed among our armed forces all over the world.

Including the new Map of Southeast Asia, your Society has printed the amazing total of nearly 20,000,000 maps since we entered the war in December, 1941.

* Copies of The World Map enlarged to 67 $\frac{3}{8}$ x 43 $\frac{1}{2}$ inches may be obtained by writing the National Geographic Society, Washington 6, D. C. This wall display map is sent *rolled* to all points in the United States and Possessions except the Hawaiian Islands. Postal regulations necessitate *folding* the map for mailing to the Hawaiian Islands and all places outside the U. S. and its Possessions. Prices: in U. S. and Possessions, \$2 each; Index, 25¢. Outside of U. S. and Possessions, \$2.25; Index, 50¢. All remittances payable in U. S. funds. Postage prepaid.

What the Fighting Yanks See

BY WANDA BURNETT

"It's a tough fight, but a darned good geography lesson!"

From the South Seas, from Africa, from China, from Europe, they are coming back—American boys with tales that may sound tall to stay-at-homes. But sift down the keen observations of some of these fighting American Marco Polos and you have unpolished, but fresh and colorful travel talks and chapters that schoolbooks never told.

They sound incredible, some of these stories of rats as big as alley cats, of chocolate-brown natives with golden-blond hair, of goggle-eyed fish that climb trees to take sun baths, of native "dollars" that weigh tons. But they are true, even if not told in scientific terms.

Troops that fought their way through jungle-swarled rain forests, bogged down by knee-deep ooze, found them filled with strange sights and unfamiliar sounds. They tell of "emergency" food that grew wild and was good to eat, even though it looked poisonous and unedible.

Luscious fruits and berries hung invitingly from bushes and trees, but would "tie a man in a million knots" if he ate them. They learned that sickly-looking grubs made palatable snacks when roasted, and that larvae of a certain moth, the Australian ghost moth, bardee, or "blackfellow's grub" (*Trictena argentata*), could be cooked to taste like rich condensed milk.

Boys who were used to ordering Cokes at the corner drugstores back home learned to take their drinks straight—straight from the cut sections of vines that yielded pure drinking water where ordinary sources of water might have been polluted.

Native customs, too, were strange. Languages were hard to understand. Just when the boys would think they had "mastered" the dialect, they would bump into a neighboring tribe with customs and languages totally different from the one they had just learned. Even the pidgin English of the more "civilized" natives wasn't always understandable.*

"Men of the World" Return

These accounts of what the Yanks are seeing all came from personal interviews with men just back from the Pacific theater of war. Some were on rest leave from the firing lines and anxiously waiting "to get back and finish the job." Others were in various stages of recuperation in Army and Navy hospitals where I interviewed them.

Not being trained observers, the boys frequently made up their own names for the fantastic things they saw. In many cases, their descriptions are fairly accurate. Their "stories" can be identified.

The first Yank I talked with was a tall, angular youth from Iowa who knew his own ducks down on the farm, but not those on the Ellice Islands where he had been stationed.

"I saw me the funniest animal on that island," he exclaimed. "It looked just like a duck, but it wasn't no duck. It didn't seem to have no wings, but man and boy, how that thing flew! It just zoomed along at ninety miles an hour. It moved so fast I never could get a good look at it!"

Another helpful Yank said that in his part of the country—Texas—they called them "diadampers," just plain old mud hens.

It took me some time to find out that the "duck" the Iowa Yank was referring to and the "diadamper" known only to the lad from Texas weren't just something they both dreamed up.

The duck which looked like a duck, but wasn't, was probably a little grebe, a dabchick, a helldiver—many names for one water bird. It did have wings. Its speed wasn't attained in flight but in rapid diving.

The diadamper was a "didapper," a Yorkshire name for a little grebe, or the duck that wasn't a duck.

Before the Ellice Island Yank could continue with more of his personal nature rambles, a Marine from Guadalcanal popped up with his story.

"Yeah, but that ain't nothing," the "Canal" Marine beamed, with the knowledge that his story would top them all.

"Remember the land crabs? And the rats?" And here he looked around for verification from his buddies.

"Well, one night I was comin' home to my own cozy little apartment on Foxhole Boulevard. I was thinking would my butler have my bed turned down and all, when there I was. Right at my own front door. I opened the door—this was the top of my sleeping bag—and crawled in. I stretched out. My foot hit something. I felt company.

"And, sister, I got out! I didn't lose no time, either. Right in my sleepin' bag, comfortable

* See "Treasure Islands of Australasia," by Douglas L. Oliver, NATIONAL GEOGRAPHIC MAGAZINE, June, 1942, and "Into Primeval Papua by Seaplane," by E. W. Brandes, September, 1929.



Staff Photographer Robert Stone.

"It Was Something Supercolossal in Snakes—Believe Me!"

Using his fingers and arms, a Yank tells the author of a snake he saw in a Pacific jungle. These boys, back from battle and wearing the red convalescent suits of Walter Reed General Hospital, were eager to tell their experiences.

as you please, there was one of those blasted land crabs, big as my steel helmet, and a rat that looked like a half sister to a wild pig!" Land crabs seemed to be one of the "objectionables" on Guadalcanal. Many of the boys remembered them.

Mosquitoes Worse Than the Japs

One Marine proclaimed that the mosquitoes were worse than the Japs, and the land crabs were worse than the mosquitoes.

"When we turned in at night," he said, "we slept with our guns and bayonets handy. Not just for the Japs, but for those darned affectionate and nosy land crabs. They walked all over our faces and crawled right down inside our shirts to keep warm."

Another Marine, a quiet sort of fellow with a bent for facts, not fiction, had held his tongue up to this point. Evidently he felt that here was a good place to clear up once and for all some of the wilder jungle stories.

"You know all those things you civilians hear about every tree in the jungle just dripping with deadly snakes? Well, don't believe 'em. I never saw a snake the whole time I was down there." He finished with a bit of disgust in his voice for the gullibility of people in general.

"Then what do you call that thing that slithered out of a tree and draped itself around my neck?" the other demanded. "If that wasn't a snake, I never did see one!" And he rubbed his neck as if remembering the unpleasant coldness of the yard-long jungle coiler.

Actually there are two sides to the story. Snakes don't drip from every tree on Guadalcanal or on any of the other islands in the group. On the other

hand, the islands aren't entirely free from snakes. Some are extremely poisonous. Others are harmless.

They range from the small, innocuous, and wormlike blind snake (*Typhlops*), which makes its home in rotting logs or even shares an apartment with the termites by burrowing into the nests or mounds, to the poisonous cobra family (*Denisonia* and *Micropechis*).

The snake that "slithered," as the Yank put it, was probably one of the deadly-looking but relatively harmless little boas (*Enygrus*), which seem to have developed a habit of dropping from their tree perches into the soldiers' camps to have a look around. The boas are fairly common in the Solomons. Their fat, sluggish bodies often measure five feet and

are as big around as a soldier's wrist.

With the exception of the swift-moving tree snake, the majority of the islands' coilers are sluggish and lazy. Most of them would rather take a well-aimed blow than make the effort to move out of the way. Even the poisonous ones, apparently, are none too aggressive, for I could find only one record of snake bite in these islands.

But if the boys disagreed on the snake question, they definitely agreed on another puzzler.

"I'd sure like to know what that crazy-looking thing was that sat up in the trees at night and just stared down at us. The first time we saw it, I can tell you none of us slept. We just stared back and didn't dare move."

The Yank who told this story shook his head in bewilderment and asked the other "Canal" boys if they remembered it.

They did.

In fact, one remembered it so well that his description ran something like this: "It had a face almost human. It looked like a monkey's face, but a little more pointed. It had ears like a cat, a body like a possum, and a tail like a rat."

This strange combination which seemed to baffle a number of the boys was a cuscus (phalanger), the only marsupial in the Solomon Islands. The jungle "night horror" that alarmed so many of the troops at first later became one of their favorite pets (page 459).

It is a small, woolly little animal, about a foot and a half long, with tapering ratlike tail. It is seldom seen during the day, but prefers to do its tree prowling at night.

The birds seemed to hold high interest for the boys, too. They told me of small, brightly



A. B. Lewis

"We Gave Him a Safety Pin and He Hung It in His Ear"

This wealthy native from northern New Guinea wears his fortune of cowrie shells and dog teeth strung around his neck, entwined in his bushy hair, and as trim on an arm band. He has just dipped the oversized toothpick into his gourd for a spot of lime to mix with his chew of betel nut (page 464).

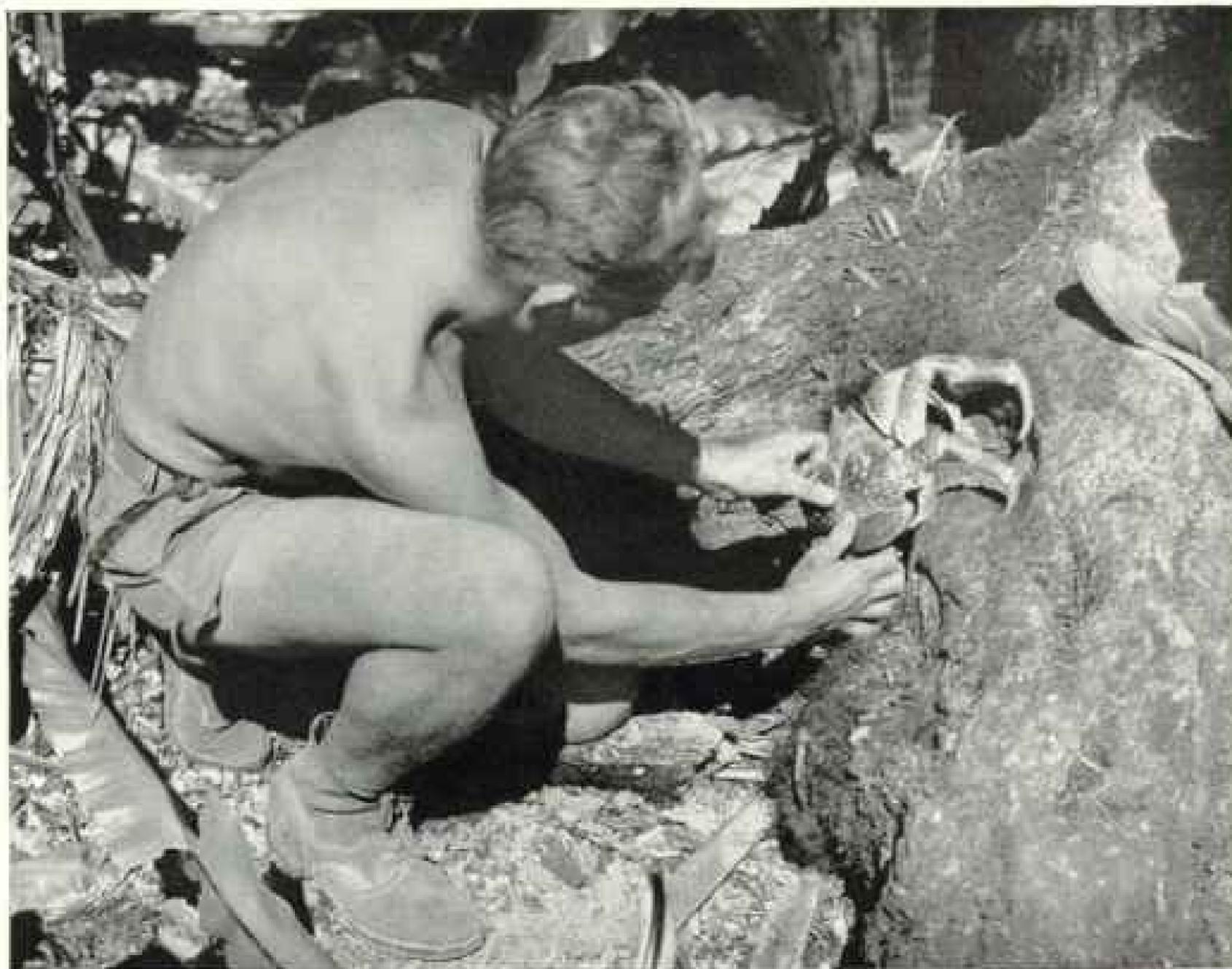
colored parrots they had caught and how they taught them to sit on their shoulders and take food from their hands.

"It wasn't no trouble at all gettin' a bird," one lad told me. "You could just pick 'em off the trees and bushes everywhere. They were all shell-shocked. Most of 'em went around in a dizzy daze."

The "Hallelujah Bird"

A major who had taken part in the battle of Munda on New Georgia, northwest of Guadalcanal, had his own bird story to tell.

"There was one bird there—I think it must have been related to the macaw family—that was certainly a friend to us," he said.



U. S. Marine Corps, Official

"Sneak Up Behind 'Em and Take 'Em Unawares," Says This Crab-hunting Marine Corporal

So sharp and tough are the coconut crab's claws that it can nip off a finger with a simple twist. At night after a crab has clambered into a palm for a coconut, Pacific islanders tie ropes around the trunk and pile jagged coral at its base. When the descending crab touches the rope, it thinks it has reached the ground and lets go, only to fall on the spiked bed and become a tasty unrationed meal.

"Every time Japs tried to filter through our lines that bird would set up such a commotion you could hear it all over the place."

"Oh, that old sentry!" another Yank piped up. "That wasn't a macaw. That was the good old 'hallelujah bird.'"

Here I ventured to question a little. I had never heard of a hallelujah bird. I had my doubts that these boys had, either, until one, an earnest jungle listener with a well-developed ear, volunteered to clear up the matter.

"You see," he pointed out with all the patience of a parent explaining to a questioning child, "it's like this. You get so you listen for everything in the jungle. You can't see the damn Japs. You know they're there. And you know they're full of under-handed tricks. Every time a twig cracks, or a leaf stirs, you think the enemy's on your neck.

"You get so you know the 'natural' sounds

made by the birds and the 'unnatural' sounds made by the Japs." He paused here, evidently remembering some of those unnatural sounds all too well.

"That eerie sound they made by striking two hollow bamboo canes together—well, that was one of their specialties. It'd make your blood curdle. This was their way of signaling to each other. When we heard this, we knew the Japs were 'talking,'" he said.

"At first we could depend on the birds to warn us when the Japs were moving in," he went on. "Then the Japs took to imitating the birds to confuse us. We found a lot of their whistles, wooden ones they had made to use in imitating bird calls.

"But nobody could fool the old hallelujah bird! Not even the Japs," he continued. "They have a racket all their own.

"Every time our troops heard this noise in the jungle—and believe me, it was some noise—they'd yell 'Hallelujah, here they come



Charles Barrett

Major Mitchell Ruffles His Fine Feathers and Tells a Tall One

This perky pink cockatoo is a far cry from the green parrot the Yanks left at home mimicking the family. But he is a cousin of that familiar pet and a relative of the "hallelujah bird" which served as a sentry for Yanks in the Solomons (opposite page). Pink-feathered, orange-crested Major Mitchell is one of the best known of Australia's cockatoo clan. Aussies call him their "wee juggler."

again!' And that's why we called this old sentry the hallelujah bird."

The bird in question was a white cockatoo, a rather common tropical dweller and a noisy one. Whenever its peaceful haunts are disturbed either by friend or foe, the cockatoo becomes indignant. Perched generally in the topmost branches of the trees, these gregarious birds set up a screaming and scolding that can be heard throughout the jungle.

But not all birds the boys encountered were as helpful as the cockatoo. A lot of them gave warnings, but false ones. Some were imitators, and, from what the boys report, they did their imitations too well and too often.

Hornbill Whistled Like a Shell

"Many a time we'd dive into a foxhole, hold our ears, and wait for a whistling artillery shell to hit," one Yank told me. "But if they did hit, they must have been duds. We certainly never heard 'em.

"It took us a long time," he explained rather sheepishly, "before we finally discovered that a bird about the size of a sea gull that came soaring over the island every night about dusk made that noise with its wings. Then we all felt like darn fools."

This bird that carries a whistle in its wings and sounds, according to the Yanks who were there and heard it, "just like a 75 artillery shell en route" is the hornbill (*Rhyticeros plicatus*). It makes its home not only in the Solomon Islands but whistles its way over parts of New Guinea, the Bismarck Archipelago, and the Moluccas.*

The Solomon Islands hornbill, like most of its homely hornbill relatives, is a clumsy bird in flight. It seems weighted down by its own oversized bill. When it takes off from a tree-top perch, it moves with a heavy and slow flapping of its wings and produces a sound similar to "korwe korwe." As it gathers speed, the sound evens out into a loud whistle.

Some experts compare the sound this bird makes to that of a steam engine.

But while its wing whistling is unusual, the hornbill's nesting habits are even more peculiar.

Spotting a hollow in a good-sized tree—one "prepared" either by a disease in the tree itself or one which the obliging termites have scooped out—the female moves in, shuffles around until she faces the hole in the trunk, drops a couple of feathers carelessly on the floor of her new nest, and prepares herself for her confinement.

Having convinced herself that this is a most satisfactory spot in which to raise a family,

she hurriedly walls herself in before she changes her mind. Using her huge bill as a trowel and a substance which seems to resemble clay but is a mixture of seeds, fig pulp, droppings, mud and like substances, she plasters the opening neatly and closes the door to her new home.

The male hornbill, wanting to have some part in this new venture, puts the final touches on the "wall" from the outside. And both conveniently leave a slit long enough and wide enough for the female to push her bill through and receive provisions from the outside world.

When the male comes home with the rations, he knocks with his bill at the "door" and the female hungrily thrusts her bill through the opening. The male is a good provider, but carries his dainty offerings to his mate in strange sacks made from the lining of his own gizzard.

The only name the boys had for this whistling wonder which drove them into their foxholes was the "fufu" bird. They didn't know where they had picked up this name. Some thought it came from the natives. Native names vary from village to village, and in some places the bird was called a "kuri kuri."

Others thought that their pals' yells of "fools, fools" when they hit the shelters was more likely the reason for the name of "fufu."

Then There Is the "Spittoon Bird"

While the Guadalcanal foxhole divers were unwinding their yarns about the hornbill, a corporal who had been in Australia remembered a whistler he had heard there, a "spittoon bird."

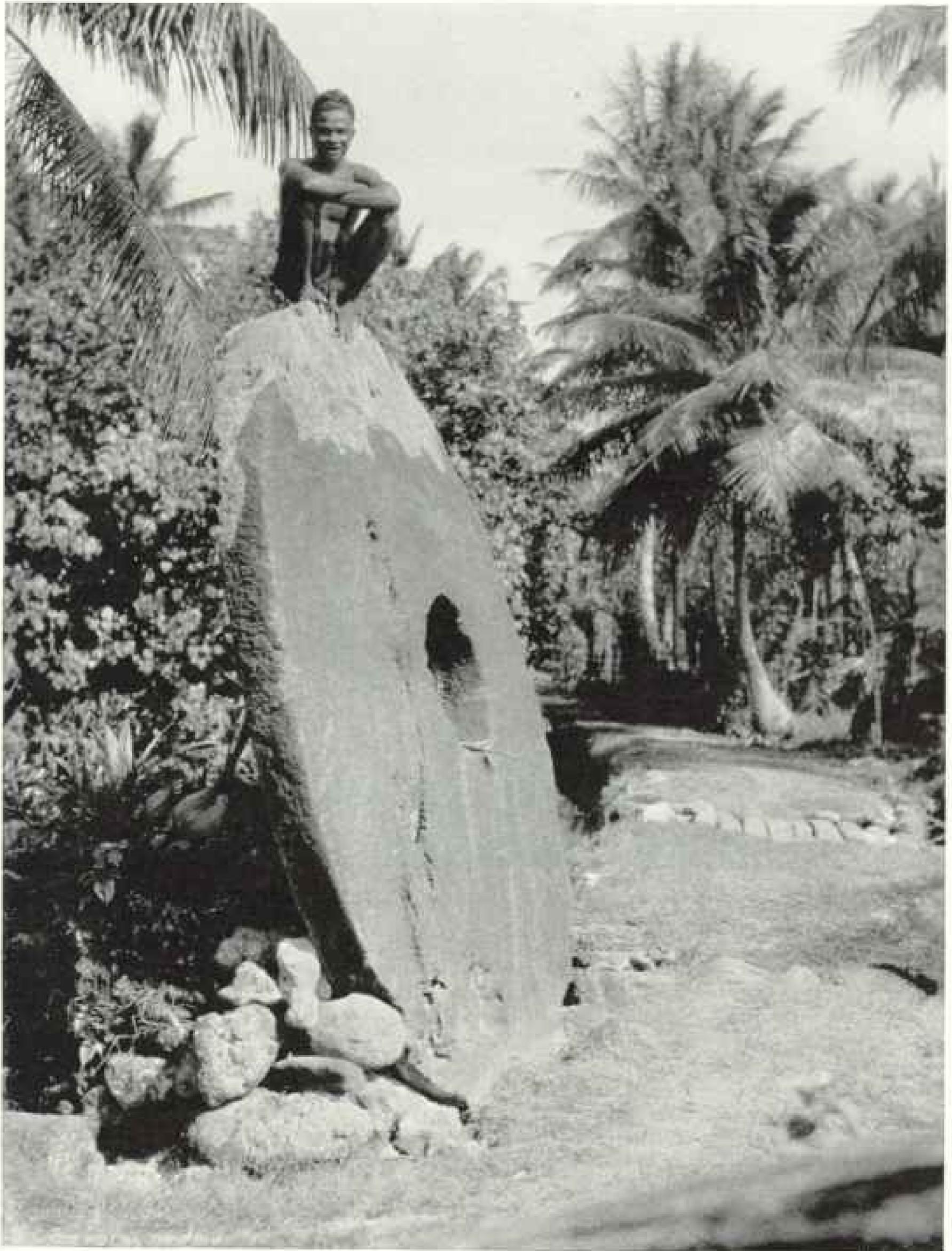
"I didn't hear it anywhere but in Australia," he told me.

"I think it was a little bird, although I never did get to see it very close. But what a song! To me it sounded just like a movie sound man trying to get the effect of an old hillbilly aimin', spittin', and hittin'. It's just one long-drawn-out whistle with a sudden 'ping' on the end."

First one Yank and then another told his bird story. None wanted to be outdone, especially after the "spittoon bird" had made its appearance.

The fellows who had merely caught and tamed a "few old colored parrots" began to feel cheated. The boys from New Guinea who had been "laughed at" every morning when they got up and every evening when they

* See "Around the World for Animals," by William M. and Lucile Q. MARR, NATIONAL GEOGRAPHIC MAGAZINE, JUNE, 1938.



WILLIAM PRYOR

Yap "Dollars" Look Like Giant Stone Doughnuts

Too big to carry, too valuable for one man to own, the 11-foot "coin" belongs to the entire community. This money is not made on Yap, but is imported from the Palau Islands to the southwest. A wealthy native may own several, varying from a few pounds in weight to several tons. He may stand them against a tree by his house for all to envy or leave the big ones at the quarry in the Palaus. He may even lose one overboard while bringing it home, but as long as he can prove ownership he is wealthy.



C. R. Marine Corps, Official

Off Duty, a Sentry Bird "Bums" a Cigarette from a Marine

It may be "Thanks to the Yanks" from this pet cockatoo, but the Yanks have thanked the white cockatoos, or hallelujah birds, many times for their noisy chattering which warned them of Japs approaching through the jungle.

turned in by the laughing jack—a near relative of the Australian kookaburra, or laughing jackass (*Dacelo gigas*)—felt their stories were pretty tame, too, after this tale.

But a lieutenant from the Russell Islands, another link in the double-chained Solomons group, was determined to tell his.

"Before we got used to the jungle sounds," he said, "we spent most of our time in foxholes and bomb shelters.

"You know the trill of an M. P.'s whistle? Sounds just about the same as the corner cop's. Well, three blasts on that whistle meant 'Duck! The enemy's on the wing.'

"There was one bird on that jungle-covered island that either had learned to imitate that

warning whistle, or else it was just its own natural song. But until we recognized it as a bird call and not as an air raid signal, we were constantly popping in and out of foxholes and taking shelter against raids that didn't come."

Since the lieutenant had never seen the offender and had only its "song" for identification, it is difficult to determine which of the many tropical birds was actually the culprit.

It may have been one of the numerous and colorful parakeets. It may have been a tiny lory, a small tropical parrot, some kinds of which sleep upside down, hanging by the legs to branches. Or it might even have been the hallelujah bird in a more playful frame of mind.

"I think somebody ought to give the wild dogs a little credit," remarked a lanky Marine who felt that even a wild dog could be a man's best friend.

"They must have had good ears," he pointed out. "And it was a good thing for us they

did. Those darn things would set up a howl that would raise the dead. It seemed as if they always knew at least five minutes before we did when there was going to be an air raid. And believe me, they didn't lose any time in letting us know, either."

There are numerous "wild" dogs in the Solomon Islands, as well as in most of the other Southwest Pacific islands. However, they are not indigenous. Like the ones in the Solomons, they were brought in by early settlers and left to shift for themselves. Finally they reverted to their wild state.

And while the Guadalcanal Yanks were concerned with their whistling artillery birds, rats, land crabs, and mosquitoes, and the Tulagi



Staff Photographer Bernard Owen Williams

"He Whistled with His Wings"

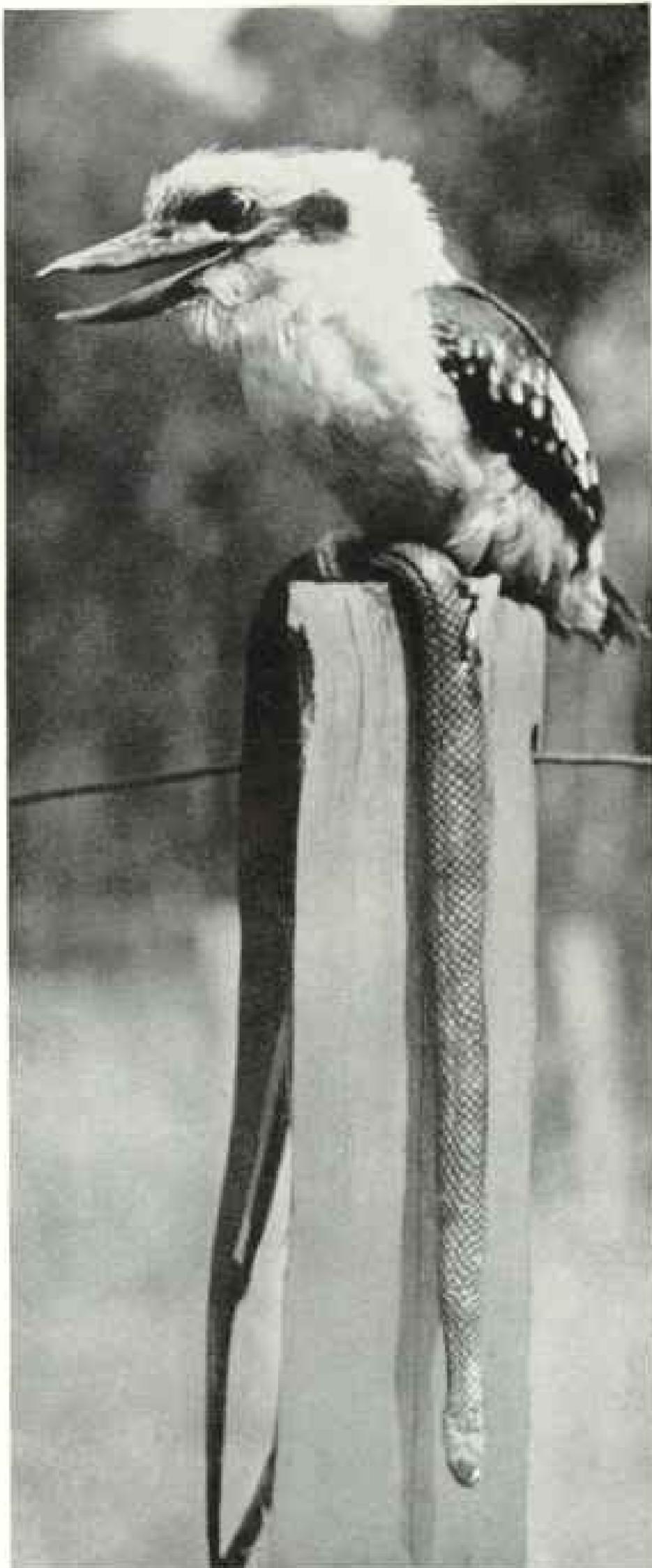
When the hornbill flaps his wings, he makes a whistling sound like the warning of a 75-mm. shell. Guadalcanal Yanks wore out their foxholes before they discovered the trickery of this feathered artillery shell. "You can eat fufus, but, boy, they're tough!" a Marine reported (page 456).



Richard Archibald

"That Crazy Thing That Stared"

Guadalcanal Yanks cursed this woolly night prowler, the cuscus, which perched in trees and scared them out of much-needed sleep (page 453). But when the boys got to know him better, they found him a cooperative pet. Cuscus are found in New Guinea, Australia, and almost all the Southwest Pacific islands.



Australia News Bureau

A Laughing Jackass Chuckles Over His Catch.

With a wild and infectious laugh, "jackie" swoops out of the sky, strikes at a snake on the ground, and, if it is not too large, carries it into the air, then drops it. He repeats until convinced the snake has lost its wriggle. A relative of this Australian bird laughed at the Yanks in New Guinea (page 458). The snake pictured is oversize for eating and may have been a present.

boys, north of Guadalcanal, were "potting" sharks and seeing lizards "as big as my St. Bernard dog back home," and some of the boys on Bougainville had taken a sudden interest in fine butterfly specimens, they were all united on one topic:

"If it hadn't been for the natives," one enthusiastic Marine told me, "we might have lost Guadalcanal.

"They were the workingest natives I ever saw. They pitched in and helped with everything. They'd just walk right under a 100-pound load as if it was a feather! They could carry a load that most of us couldn't even lift and, what's more, they'd carry it all day, uphill and down, and they wouldn't even puff!"

One husky Marine told me it just plumb wore him out watching the natives carry those heavy loads.

"And smoke!" one exclaimed. "They all had pipes. From the tiniest baby to the oldest man and woman. Sometimes I think those people were born with pipes in their mouths."

"But the thing that struck me funny," one lad volunteered, "was their hair. You'd expect those black-skinned boys to have black hair. But they didn't. Not all of 'em. Some had blond streaks right down the middle. Others were sort of mottled—blond and black. And some of them were even reddish."

Here a Marine who evidently had been a jitterbug before his war-filled days on Guadalcanal offered his views on the subject.

"Oh, those babies!" He grinned as if he were cuddling a little secret information and hated the idea of wasting it on an unappreciative audience. "They're the local wolves—all bleached and ready for the 'hunt.' That's their special 'come on' sign."

Bleaching the hair with coral lime is practiced by natives in many of the South Pacific islands. It is one way of achieving "beauty" and decorativeness and at the same time ridding the hair of nesting lice (page 471).

In the Solomons, according to the boys, who said they got their information directly from the "native pipe line," this bleaching serves a third purpose.

When a native boy reaches a marriageable age, he is given his diploma from childhood. He is a marked man. His mop of youthful black hair is bleached to a golden blond with applications



Otto Witt

Though Islanders May Eat Such Bats, Yanks Say "They Stink"

Of all strange creatures seen in the Pacific, fruit bats, or flying foxes, are among the most unpopular. The fur-lined monoplane, with heads like foxes and clawlike hind feet, have an average wingspread of over four feet. A disagreeable odor comes from glands in the skin of the bat.



Australian Travel Assn.

A Fancy Frill Makes a Tough Mouthful

Accustomed to a diet of snakes, birds, and rabbits, this monitor lizard, or Australian goanna, bites into the stiff, flaring collar of the frill-necked lizard. Soldiers in northern Australia had many visits from lizards; some thought they were crocodiles! "Those darn six-foot devils were always rattlin' around in the garbage cans lookin' for a handout," one GI told the author.



Dana Wood

A Bed for a Bat—Not a Bush for a Berry

When a flying fox retires for the day, he hangs himself upside down from the limb of a convenient tree. Wrapping wings about him, he sleeps away the daylight hours. At dusk the fruit bats rise in clouds to resume their night life of rifling fruit trees and berry patches. "Bedrooms" for fruit bats often cover twenty or more acres in northern Australia, with sleeping space for as many as fifty million (page 461).



Michael Lorent.

Worms Come by the Yard in Gippsland, Near Melbourne, Australia

Taking a giant earthworm (*Megascolides*) from its comfortable burrow is no easy job. Reluctant to leave their tunnels, these giants—often six, eight, and even eleven feet in length—frequently break off in sections. An experienced digger can locate a burrow by the gurgling sound the worm makes as it moves.



T. C. Roughley

Aborigine Bartenders Make a Drink Called Moolah from the Larvae of These Ants

They brew the thirst quencher by crushing larvae of the green tree ant, adding sea water, and straining the milky concoction through grass. "Abos" drink moolah or sop it up with balls of chewed grass. Yanks thought moolah was tea! Ants above are examining a herd of mealy bugs to be used as "dairy cows."



D. JENNERS

A Kite Keeps the Bait Dancing

Trailing a cobweb lure from his high-flying banana-leaf kite, a fisherman of Dobu in the D'Entrecasteaux Islands calmly waits for a strike. Surface-swimming garfish are usually attracted by the strange bait which trips lightly over the water with every movement of the kite (page 468). Once the needlelike teeth have fastened on the mass of strong cobwebs, the fish is hopelessly caught. The fisherman "reels in" or sends out a swimmer for the struggling fish.

of coral lime and much ceremony. A bleached blond in the Solomons simply means to the local maidens that another male is on the marriage market.

Natives of the Solomon Islands are Melanesians. Some wear bone ornaments stuck through their noses and pigs' tusks around their necks.* Some pierce and slit their ears. And on Malaita, northeast of Guadalcanal, live the "bad boys" of the Solomons, natives with head-hunting reputations. They all chew betel nut.

"When we landed on Bougainville," a Marine confided, "I took one look at those natives and ran for our medical officer. I thought they were all bleeding to death. I didn't know then that the stuff that trickled from their mouths and stained their lips was just plain old native 'chewing gum.'" †

Edible Worms

By this time several boys back from Samoa and Fiji had joined the group. They asked what was going on at this "chin wagging."

I asked one of them if he had eaten worms while he was in Samoa or Fiji.

He wrinkled his face in disgust, shook his head emphatically, and said: "Naw! We left that stuff for the Japs."

I explained that the worms I was referring to were not exactly fish bait, but the palolo (*Eunice viridis*), an edible sea worm and a real native delicacy.

But he still seemed unconvinced even when I told him the islanders wrap the sea wrigglers in breadfruit leaves, toss in a few fat yams, and bake them until the "dish" emerges from the hot coals tasting like fish roe or crabmeat. But I didn't tell him that these same islanders prefer to scoop them alive and wriggling from the sea and down them uncooked, in quick gulps on the spot.

The journey of this peculiar threadlike worm from its sea-buried home in the coral reefs to the surface of the water is one of the strangest known. Its annual trip is linked with certain phases of the moon and occurs with almost calendarlike precision.

It blankets the water in an almost solid mass between dawn and sunrise on the day before and the day of the last quarter of the moon in both October and November.

The October rise is rather light and causes little interest among the natives, but the November swarm coats the water for miles.

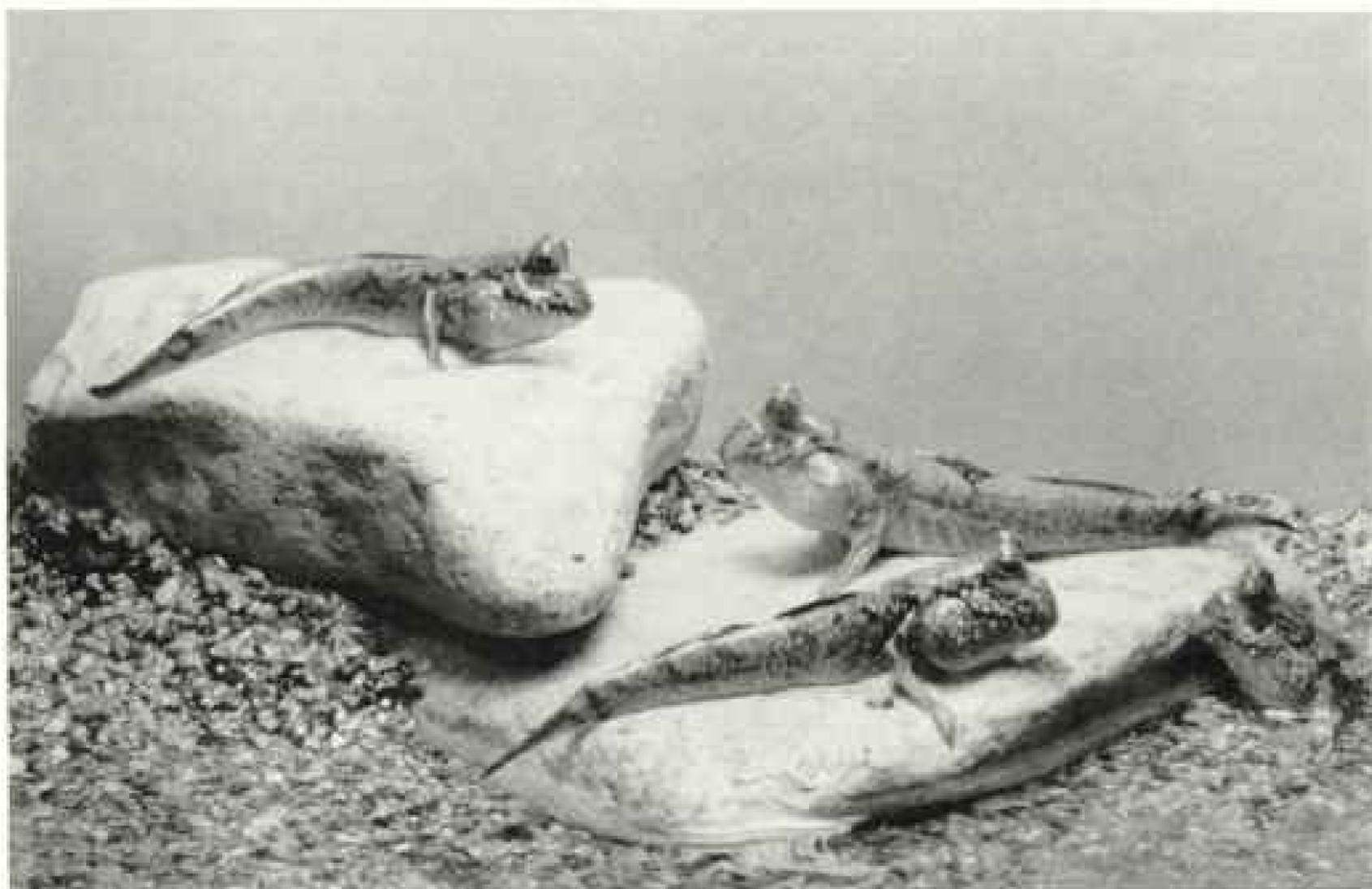
* See "A Woman's Experiences among Stone Age Solomon Islanders," by Eleanor Schirmer Oliver, NATIONAL GEOGRAPHIC MAGAZINE, December, 1947.

† See "Timor a Key to the Indies," by Stuart St. Clair, in THE GEOGRAPHIC, September, 1943.



H. Johnson

With Kite and Cobwebs, This Dobu Islander Fishes from His Canoe
As far east as the Solomon Islands natives employ the strange fishing tackle (page 468).



Loren Tuttle

Yanks Preferred "Pink Elephants" to the Amphibian Fishes of North Queensland

When our men saw mudskippers basking in the sun and "hopping along on their fin feet, flicking mosquitoes out of the air," they thought they were seeing things (page 476). Mudskippers swim like fish, leap like kangaroos, and climb "like monkeys." Their eyes, hoisted like periscopes, work independently of each other. One eye keeps watch for enemies, while the other searches the air and water for edibles.

Natives paddle out with buckets, nets, and baskets, and some even scoop the rare seasonal dish from the sea with their bare hands.

Actually, only half the worm makes the trip to the surface. The back half, carrying the eggs, moves slowly out from the holelike nest in the reef, breaks away from its other half, and shoots like a tiny living comet toward the water's surface. The front, or head half, merely slips back into the hole, unconcerned with the fate of its other half, and awaits the next moving day.

"Well, after what I saw down there," pointed out Private Jones, "I'm ready to believe almost anything!"

He told me of walking along the beach one day and seeing two Samoan women gathering something which they tossed into buckets.

"I couldn't tell at first what they were picking up," he went on. "When I got closer, I saw the younger woman look quickly in the direction of the other to see if she was out of sight.

"Then she grinned at me, quickly picked out a squirming mass of something from the bucket, dipped it into the water, and before I knew what she was doing, she had bitten the eyes out of a baby octopus and was chewing and smacking her lips as if it were a T-bone.

"I almost had to crawl away from there. And I didn't care whether I ever ate again."

Here a sergeant from New Guinea remembered the time they were cutting their way through the jungle over the Owen Stanley Range and ran out of supplies.

"We had a native guide, a good guy, too." He added the last by way of convincing me that the Guadalcanal natives weren't the only helpful natives in the Pacific.

"We called him Charlie—all the natives had been given American names by the boys—Charlie, George, John. Every once in a while he'd disappear, and when he came back he was loaded down with roots and plants and grubs. He told us they were good to eat, but I guess either we weren't hungry enough or, as you put it, we hadn't got used to it yet."

Elusive Bird of Paradise

I asked this Yank whether he had seen any of the beautifully plumed birds of paradise, or the huge, flightless cassowaries, or just what he had encountered in the way of strange birds or animals.

"I guess our gunfire scared them all out," was his reply. "We heard a lot of racket in the jungle. The fellows said they were parrots and laughing jacks. But it seemed like every time we advanced, the birds and animals knew there was going to be trouble and they all cleared out."

The New Guinea area is noted for its varied bird life. More than 600 species make their home there. Some, like the birds of paradise, are found only in this part of the world. But since most of these rare birds are shy and keep to the higher mountain elevations away from the coasts, it is very unlikely that our soldiers would see them.

They are more likely to see parrots and cockatoos, lizards, wallabies, and the huge "flying foxes," or fruit-eating bats, that frequent the island (page 461).

One young private, who had picked up a Jap bullet and was hospitalized in Port Moresby after only a few weeks of jungle whacking, said that as far as he was concerned there was more to see in his own home town of Chester, Pennsylvania, than there was in New Guinea.

"And anybody who tells you that place is one of the paradise isles is just plain crazy!" He was pretty emphatic about this, too. And by way of making his stand even clearer he added: "It's just nothing but ants, leeches, mosquitoes, and hell!"

"I did see a snake down there," he said very casually, as if it really wasn't very much to offer. "It was pretty big—about 12 or 13 feet, I guess. I was clearing the jungle with a bunch of natives, and were they mad! They just clubbed that snake to death because it had swallowed one of their favorite pigs. They even cut the snake open and tried to get the pig back."

This New Guinea pig swallower was a diamond python, and a very little fellow compared with its 30-foot-long relative, the reticulated python, which makes its home in Burma, Thailand, and the Malay region.

While this snake is rather common in New Guinea, very few of the boys reported seeing it. Some were busy finding out what the "woolly brown animal with the bright-yellow belly was that seemed to fly through the air." It proved to be the flying phalanger.

Others were engaged in untangling themselves from the spider webs that had been strung from tree to tree by the ambitious giant spider (*Nephila*). According to a corporal who still brushed his face nervously when he told me about them, they were "just like some kind of Jap camouflage spread between the trees."

This huge spider, often with a leg spread of eight inches, is a rather common inhabitant of most of the islands in this region.

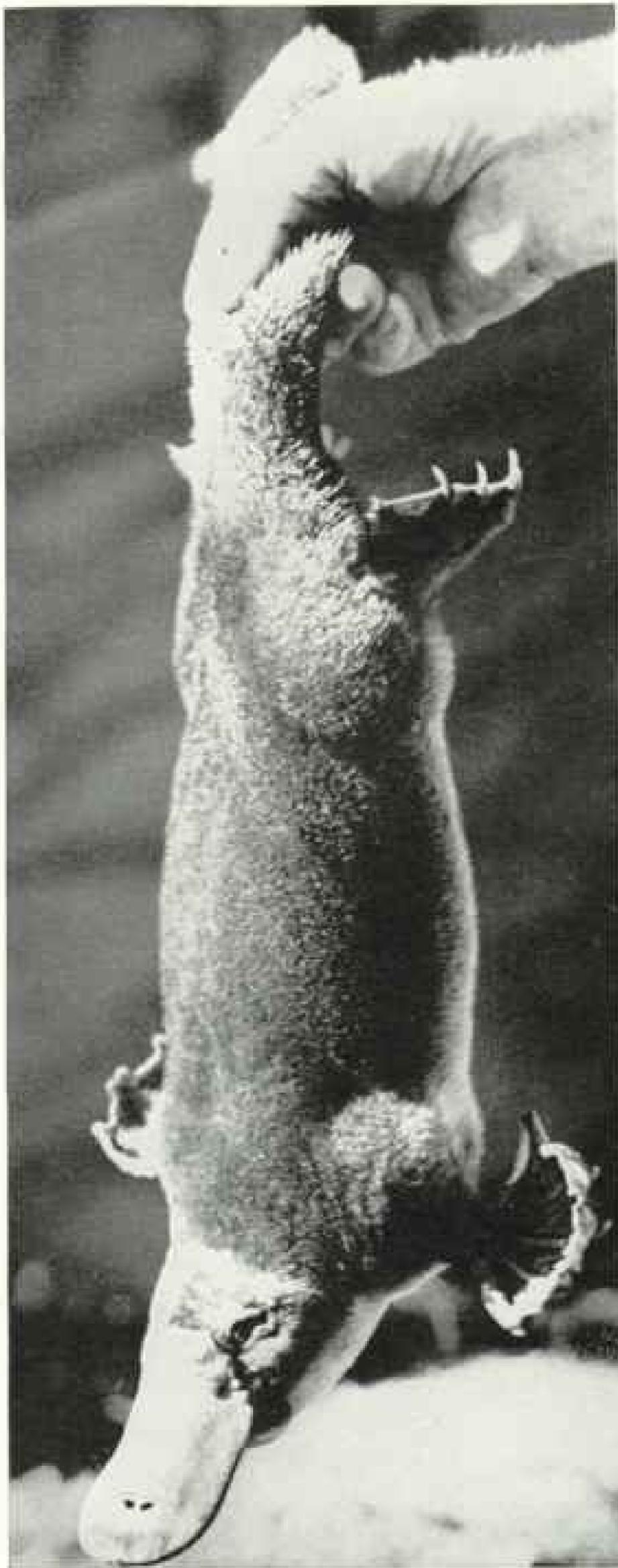
The boys from New Caledonia told me they had difficulty in recruiting volunteers to head some of their night hikes, which usually took them along the dry river beds where the



Howell Walker

Out of the Pouch and on a Bender, Pal Joey Has a Drink with a Yank

It's hard to believe this baby kangaroo was blind, furless, and scarcely an inch long when born. Like all other newborn kangaroos, this one spent the first several months of its life tucked away in its mother's fur-lined pouch. Asked what he was going to do with the pet when it grew up, the captain said, "I'm taking this 'roo back to America with me; and when we dock, I'll ride it down the gangplank."



AUSTRALIAN NEWS BUREAU

"Well, If It Isn't a Duck with a Fur Coat!"

Yanks who saw the Australian duck-billed platypus, strange hangover from days when dinosaurs roamed the earth, thought it one of the craziest things they ever saw. Contrary to most of the world's egg layers, the platypus is a mammal and suckles its young (page 474).

trees hung low and offered fine building spots for these spiders.

"When you ran into one of their webs hung between the trees, you'd bounce back like you'd hit a nest of live springs," was the New Caledonia Yanks' report on these web weavers. "And if there was one of those fat spiders hanging in the web—well, they weren't pleasant things to bump into in the dark, either."*

Spider Webs for Fishing

In New Guinea natives often make use of these strong webs in fishing. Setting up poles where the ambitious spinners are numerous, they calmly wait for the spiders to spin their webs between the poles. Sometimes they offer a little help by stringing a few pieces of cord between the poles.

When the spiders' work is done, the natives lift the poles from the ground and take their "net" to the sea for testing. Ordinarily these spider-made nets are strong enough to hold fish weighing more than a pound.†

When I asked a couple of Yank fishermen if they had ever caught a fish on a cobweb, they said they really couldn't top that one.

But New Guinea natives, and some inhabitants of islands as far east as the Solomons, do just that. With a kite flown high above the canoe and cobwebs trailing lightly over the surface, they "troll" for their catch. Usually it is the garfish, or what is commonly termed the needlefish, that falls for the cobweb lure (pages 464 and 465).

Attracted by the lifelike motion of the bait, these long slim fish snatch at it and tangle their teeth hopelessly in the fine mesh of cobwebs.

The New Guinea natives living on the southwestern coast of the Huon Peninsula call this type of fishing *sepwami*. The cobweb lure, or *hawali*, is gathered on a pandanus leaf attached to a long stick. Walking through the jungle twisting this pandanus leaf around and around in the webs, native fishermen gather fair-sized "bundles" in a very short time.

* See "War Awakened New Caledonia," by Enzo de Chetelat, NATIONAL GEOGRAPHIC MAGAZINE, July, 1942.

† See "Strange Sights in Far-away Papua," by A. E. Pratt, NATIONAL GEOGRAPHIC MAGAZINE, September, 1907.



Australian Press Bureau

GI's Saw the "Sticky Prickly" in Australia

The echidna, or spiny anteater, is a non-nest-building egg layer. The female roams the countryside with her single egg carefully tucked away in her vest pocket, waiting for the "blessed event" to crack the shell. The rubbery-skinned infant lives for several weeks in the mother's pouch until it grows quills of its own. Then the baby is ejected and deposited under a convenient bush. Captured at Dunk Island, a Great Barrier Reef resort off the coast of Queensland, Australia, this echidna is pure white, but has brown eyes.

The fine silk cobwebs are peeled from the leaf and tied to the end of a line as we would a fishhook. The fisherman stands or sits in his canoe and guides the action of the kite and cobweb lure with a heavy bamboo rod.

Here the boys began exchanging their views about the natives. Most of them agreed that the ones living along the coasts of New Guinea were healthier and more civilized than others they encountered. Those living inland seemed thinner, more suspicious, and, as the boys put it, "They were all pretty sickly-looking devils."

Mutilated Fingers for Mourning

A sergeant from the Buna area remembered seeing natives with joints of fingers missing. He thought it was just an accident, but couldn't figure out what could have caused such "regularity."

It may have been intentional. New Guinea natives have strange ways of mourning their dead. Some merely "dress up" in many applications of clay, which they carefully add to from time to time but do not wash off until the end of their mourning period.

Others lop off joints of their fingers to show their grief for dead relatives. Sometimes families are so large and deaths so numerous that a grief-stricken native may be forced by his extreme sorrow to whittle away his entire crop of fingers, including both thumbs.

When a lovesick, bushy-haired lad goes awooing in some sections of New Guinea, he takes with him a very weird present for the lady of his choice. This is not the conventional engagement ring, but a newly chopped middle finger taken from a victim he has killed to prove his deep devotion to his would-be wife.



Staff Photographer W. Robert Moore

A Couple of Koala Gum Chewers in a Treetop Pose

Yanks thought these cuddlesome bears would make fine pets for the kids back home. But the blunt-nosed, tailless koala will thrive only in Australia. Awkward on the ground, native bears stick close to the treetops where they calmly munch leaves of gum or eucalyptus.

If the courted maid finds the lad to her liking, she calmly strings the "engagement" finger on a cord and proudly wears it around her neck. If she refuses the gentleman, she shows her disapproval by casting the love token on the ground, and the youth takes his affection—and his trophy—elsewhere.

Yanks who had spent much time in the half-dry, half-jungle-covered parts of Australia had some strong words to say about "that jungle."

"Believe me," said one of the boys from the Cape York Peninsula, that northeastern finger of land pointing toward New Guinea, "next time I see a movie siren strolling through the jungle barefooted and wearing nothing but a flower in her hair and a sarong around

her middle, I'm going to hoot, and hoot plenty.

"Why, even a tough-footed native would look twice before he'd put his foot down on that moving jungle floor, and he's used to the place.

"In that man's country," he went on, "even the trees have teeth, and the vines actually crawl out of their way to give you just one more scratch.

"Contacting" a Centipede

"I'd like to see that dame when the wild dogs [dingoes] begin howling at night, or when one of those hand-sized spiders with fur on its legs starts sidling toward her. I'd like to see just what she'd do when a foot-long centipede wraps itself around her neck and begins moving its million and one legs. Boy! When those wrigglers start marching they tattoo a necklace of footprints into your skin that never wears off.

"You couldn't leave your shoes out overnight without finding them full of visiting centipedes next morning. Most of the time we just kept 'em on. It was less trouble."

Most of the boys from the islands in the Southwest Pacific remembered with no affection the centipedes, "all sizes and colors." Their bite wasn't fatal, but extremely painful. Some of the fellows said they had been laid up for weeks after "contacting" a centipede.

The Cape York soldier's spider wasn't the result of his imagination, either. And even though it was really the sight and not the bite of these jungle walkers that got under the boys' skins, they all admitted they weren't anything you'd want to make a pet of.

This particular spider was not the giant *Nephila* that the boys from New Guinea and

New Caledonia had reported, although Australia has its *Nephila*, too. This was what the Australians called a real "triantewondegong," and the Yanks tagged it a "whopper."

It is the huntsman spider (*Ixopeda* or *Delaena*), commonly but mistakenly referred to as the tarantula.

Australia's triante-wondegong is a true night prowler. It hides its furry hugeness under the loose bark of trees and logs during the day and slips out from its hiding place only after the sun goes down. It ambles along in a sidewise, or crab-like fashion, seeking food and diversion.

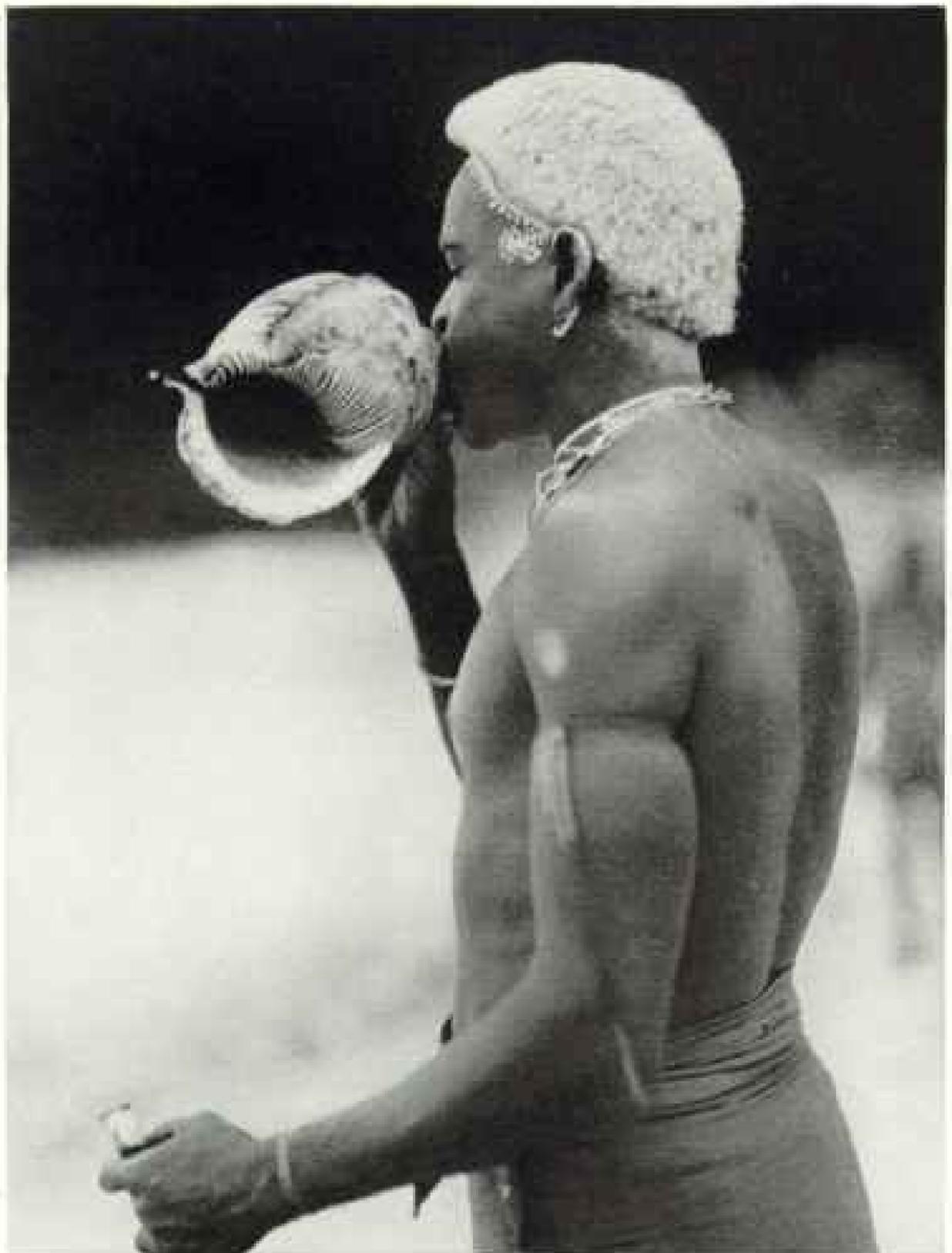
"We didn't need a weatherman to tell us when it was going to rain," said the Cape York Yank. "We just watched those fuzzy devils move in and take over. Sometimes the inside of our tent was plastered with them."

"Smelling" a storm seems to be one of their specialties. Long before the first cloud has appeared, these fur-coated weather prophets roll their forecasting eyes skyward and scoot for the nearest shelter. Once inside, they become pay-as-you-go-guests, earning their keep by catching flies, insects, and moths.

None of the boys reported having been bitten by these prowlers.

"We didn't give 'em a chance—we swatted 'em wherever we found 'em," several told me.

In most cases the swatting was unnecessary. Out of Australia's vast spider population—and there are over 1,200 listed species—only three are definitely known to carry a bite poisonous to man. Neither the bloated-looking web-building *Nephila* nor its equally dangerous-looking spider relative, the huntsman, has so far been proved guilty.



© Merl La Yee

Conch Shell Serves as a Bugle for This Solomon Islander

Temporarily giving up the pipe, held in his left hand, he blows a hearty blast. Americans found the blond hair-do was achieved by bleaching with lime and that it discouraged vermin from building nests in the owner's "bush."

But spiders, poisonous or not, centipedes, trees with teeth (nettle or stinging trees—*Laportea gigas*), and flies "so thick that before you could spear a piece of meat from your plate it was gone, just carried away by the darn flies" were the main concerns of the Cape York Yanks. Boys in other parts of Australia had their problems too, but their eyes were often focused on even stranger things.

Because Australia,* a continent nearly the size of continental United States, has been isolated from other land areas of the world for a longer period than has any other sizable land

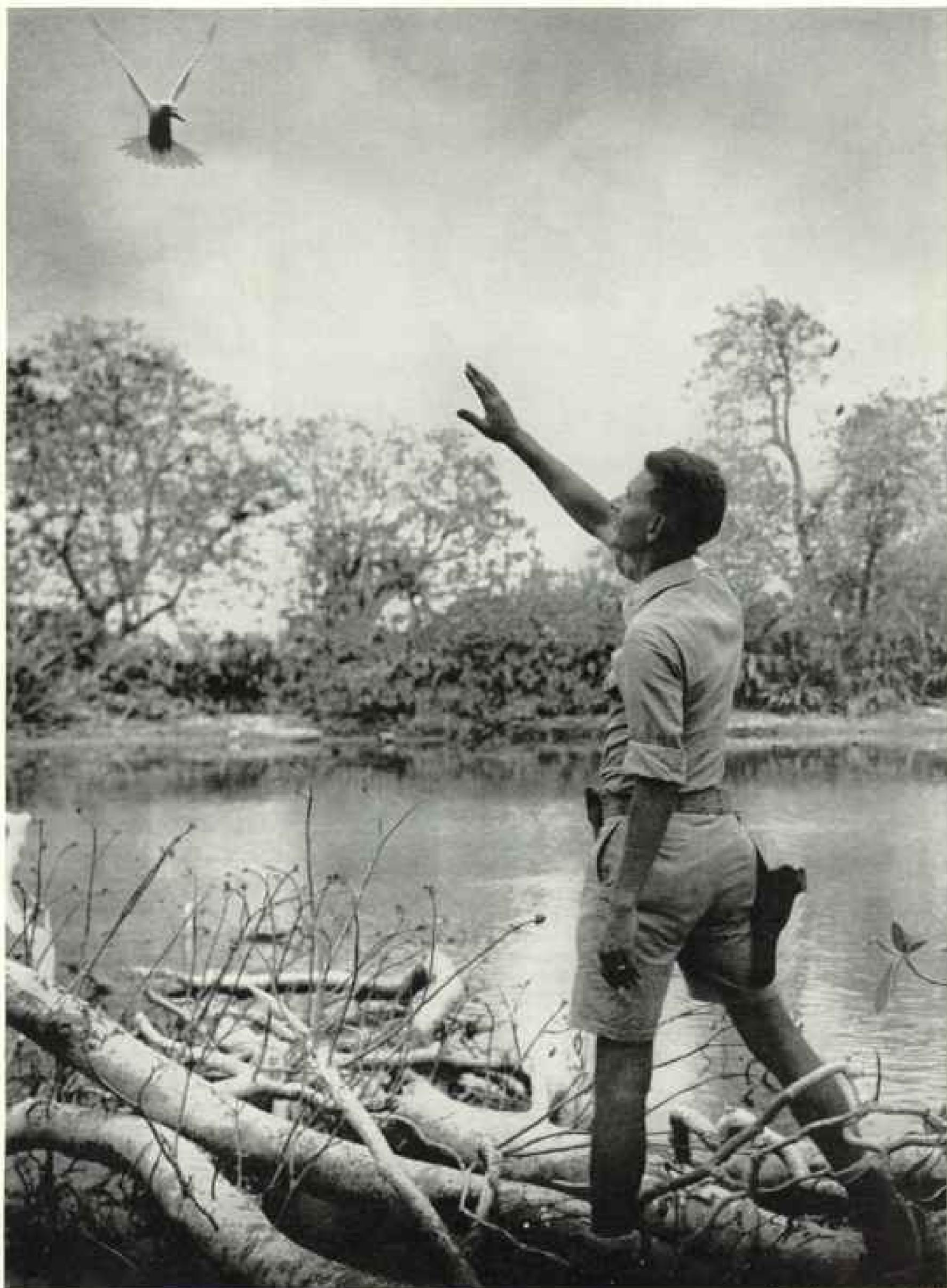
* See "Capital Cities of Australia," NATIONAL GEOGRAPHIC MAGAZINE, December, 1935, and "Beyond Australia's Cities," December, 1936, both by W. Robert Moore.



Australian News Bureau

Pausing for a Drink at One of Australia's Strange "Bottle Trees"

Thirsty GI's soon learned that roots, vines, and even the huge juglike bases of certain trees held good drinking water. Like the bottle trees of Queensland, these barrel-based trees of northwestern Australia contain moisture. Some boys who drank from the desert wells said, "The stuff tastes like water with a kick in it."



(U. S. Marine Corps, Official)

A Marine Makes Friends with an Island Dweller—a Love Tern

Pure white love or fairy terns hover over many of the Yanks' camps in the Southwest Pacific. The boys find their nesting habits unusual. Building no nest, the female lays a single egg in some slight depression on a small branch. GI's wondered "how that darn egg could stick there without rolling off."



Howell Walker

Skyscraper Anthills Serve as Compasses in North Australia

When Yanks learned that termites always build their castles with the narrow sides pointing north and south and the broad east and west, they used the "hills" as compasses. Near Darwin, Northern Territory, hundreds of these apartment houses rear their heads. During the dry season they are a dull gray; in the wet, almost black.

area, and because it has suffered less by way of geological changes, its animal, plant, and bird life is among the strangest known.

Where Christmas Comes in Summer

In this land where seasons roll around in reverse to our own—where winter comes in our summer, and our summer brings Christmas—there are man-sized kangaroos that produce offspring scarcely an inch long; worms that measure six and sometimes nine feet in length; and birds that build bowers of twigs and decorate them with shells and flowers and use their strange bowers not for nesting, but for "show-off" or dancing grounds.

There are marsupial moles (*Notoryctes typhlops*) in the dry western regions that "swim through the hot sand," leaving no trace behind them.

Then there is the platypus, that queer fur-coated mammal with a duck's bill and webbed feet (page 468). It lays its eggs in a leaf-lined nest gouged out and burrowed deeply into the bank of a stream. It incubates its eggs and suckles its young. On the inner side of his hind legs the male wears hornlike spurs that carry a poisonous fluid which he uses for "winning arguments."*

There is the echidna, the spiny anteater (*Tachyglossus aculeatus*), which resembles a ball of active porcupine quills. It gathers ants on its long sticky tongue, lays one egg, generally in September, and hatches its single offspring in its pouch. And there is the koala, that cuddly living "teddy bear,"** and there are trees that look like giant beer bottles and can be tapped for drinking water.

And where Australia's "Burma Road," the recently completed Defense Highway, cuts north between Birdum and the northernmost port city of Darwin† there are anthills "big as houses and hard as cement" built by tiny "white ants" (termites) which measure scarcely a quarter of an inch in length.‡

* See "Australia's Patchwork Creature, the Platypus," by Charles H. Holmer, NATIONAL GEOGRAPHIC MAGAZINE, August, 1939.

** See "Koala, or Australian Teddy Bear," by F. Lewis, NATIONAL GEOGRAPHIC MAGAZINE, September, 1931.

† See "Life in Dauntless Darwin," by Howell Walker, NATIONAL GEOGRAPHIC MAGAZINE, July, 1942.

‡ See "Stalking Ants, Savage and Civilized," by W. M. Mann, in THE GEOGRAPHIC, August, 1934.

Apparently, our troops moving military equipment along this road have had their experiences with these 12-foot-high ant-made skyscrapers.

A Jeep and an Anthill

"Just try driving a jeep into one of those cement pillboxes and see who gives," one experienced driver commented. "I can tell you right now it won't be the anthill, but that jeep'll look mighty sick!"

The ant, or rather the termite, that builds these cement-strong house-sized nests, will, if unrestricted, gnaw its way through books, fences, house walls, telephone poles, or anything containing its favorite food—cellulose. To baffle the termite army, houses in "Termite Territory," as this edible portion of north Australia has been called, are all built on metal-capped stilts.

But if the builders are small, destructive, and ambitious, the queen, for whom the castle is really built, is fat, lazy, and entirely lacking in queenly graces. She is definitely a nonworker, but has an ambition all her own. She prefers to "mother" the entire termite race. She lays eggs—30,000 a day!

And as a "sitter" she requires much pampering, much waiting on, and very much feeding, all of which she gets, without asking, from her devoted subjects. When a queen is well stuffed and "healthy" she often measures four repulsive inches—a lady who can neither walk nor waddle.

"We used those anthills for compasses," one Yank remembered. "When we got lost in the bush, we got our directions from them."

The termite is an instinctive builder. It works entirely on the graveyard shift, but with the position of the sun always in its



OTTO WASS.

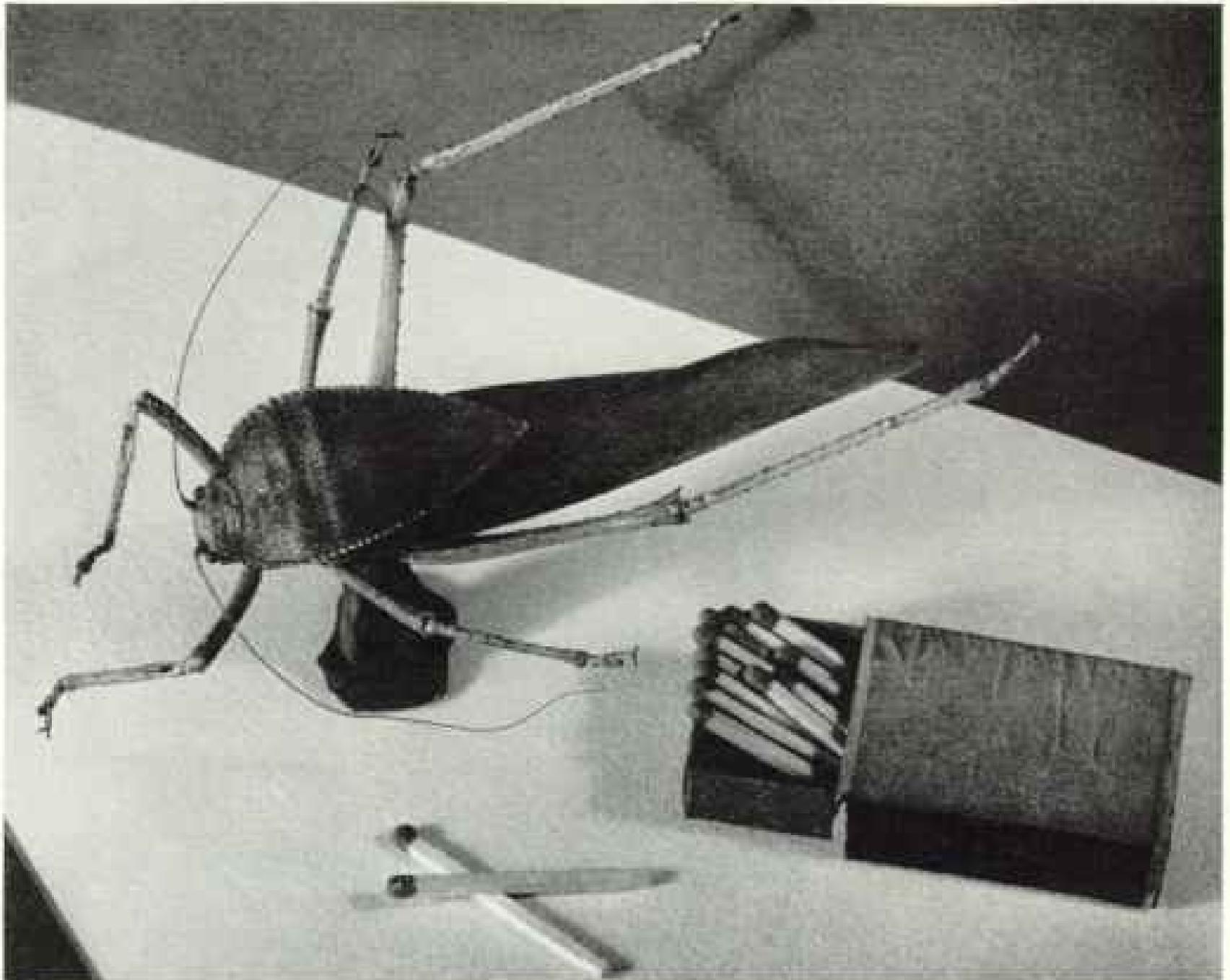
"We Learned Some Swell Tricks in Camouflage from This Bird!"

Australia's frogmouth is no beauty, but when it comes to camouflage he's really a master. Perched motionless in branches, the mottled, barklike, feathered form is often mistaken for a broken limb. Frogmouths do their hunting by night and their "pretending" by day.

mind. To ensure a quick and thorough drying of the walls of its house, the ant builds the broad sides facing east and west so that both the rising sun and the setting sun can do their share in completing the task. The narrow sides always point north and south, and the boys who knew the ants' trick found the hills handy compasses.

Several of the boys told me they had toppled over the hills, crushed and mixed the "cement" with water, and paved the floors of their tents. The Australians frequently use the mixture to surface their tennis courts.

But the lads who felt that their story really took the prize had held back as long as they could. They began to fidget. They felt the



Staff Photographer Robert Stone

"If I Hadn't Seen It with My Own Eyes, I'd Never Have Believed It"

Three perfect green leaves and a half dozen crooked sticks—that's what this long-horned grasshopper (*Phyllophorinae*) from New Guinea looks like. The 5-inch-long "grasshopper" came to Washington, D. C., as a gift to his girl from a sergeant in New Guinea.

gathering was breaking up before they had had time to shine.

"I'll bet nobody'll believe this one, not even Bob Ripley." This came from an enthusiastic Yank who cast a knowing look at one of his pals who had seen, but hadn't believed, either. "And that's a fish that can walk, can climb a tree, and even drowns if it stays in the water too long."

Evidently this Missouri doubter and his pals had tossed this fish story around quite freely among their friends and had finally reached the stage where they knew no one would believe them.

A Fish That Takes to the Trees

But such a fish *does* exist. And, what is more, to Australians who are familiar with life in the mangrove swamps off the coast of northern Queensland, it is a common sight.

When I told the boys that our own Navy includes the amphibious wonder on its "survival food" list, they wouldn't believe it.

Periophthalmus is what the scientists call this land and water lubber. Australians have given it a less dignified title. They call it the mudskipper. But the American boys who saw this speckled, bulbous-eyed swimmer for the first time "half in and half out" of the water, calmly sunning itself on the bank—well, they had a name for it, too. They called it a "helluvavision"!

"When I saw that darn thing skipping around on the ground on its fin feet, flicking mosquitoes out of the air—well, I wanted my own brand of pink elephants back," was the exclamation of one dubious Yank (page 465).

"But when that fish took to the trees—just climbed right up those snarled and twisted roots of the mangroves—it was too much for me. I wanted to get me out of that country—and for permanent," remarked another doubter. And he meant it.*

* See "Where Nature Runs Riot" (Great Barrier Reef), by T. C. Roughley, NATIONAL GEOGRAPHIC MAGAZINE, June, 1940.

Capital and Chief Seaport of Chile

By W. ROBERT MOORE

ON JANUARY 20, 1943, President Juan Antonio Ríos signed the decree ending Chile's diplomatic relations with the Axis. In a radio broadcast he declared that Chile had "an essential interest in this fight."

It was a decision not easily arrived at, for narrow 2,650-mile-long Chile could not adequately patrol her extensive Pacific coastline.

Today Chile is feeling the pinch of war. Ships which brought imports and carried away produce now are sailing other seas on secret missions. As a result, factories and industries are being developed and Chile is gaining steel plants, a tire factory, and textile mills.

"We still have no rationing except limited gasoline," said one Government official. "But we've long since stopped even asking shopkeepers for many imported products."

Let us look at Santiago and Valparaíso, capital and chief seaport of this southerly South American neighbor.*

Air Route over the High Andes

To begin properly, one should steam into the spectacular hill-girt crescent of Valparaíso Bay, or trek across the thirsty northern deserts in the path of Don Pedro de Valdivia, who, in 1541, came from Peru to conquer Chile and to found its first cities.

Instead, let us hop the back fence from Santiago.

Like a condor with pinions set, our giant Panagra sky bird soared into the blue sky from the dusty airport of Mendoza on the last lap of the journey from Buenos Aires.

Tilting gently, first on one wingtip, then on the other, and dropping or bouncing on the air currents, it rose higher and higher toward the forbidding rugged barrier of the lofty Andes.† At 16,500 feet the cabin reminded me of a Levantine coffeehouse filled with people sucking at long flexible-stemmed narghiles. We were using the oxygen tubes.

Below spread vivid slopes and crags, molded by volcanic fires long since cooled. Above this chaos reared the white crowns of higher peaks.

In winter the whole Cordillera is blanketed in snow, but now, in the early March autumn, much of it was bare.

My ears crackled with the elevation, yet I caught the words of the purser: "There's Aconcagua. We'll pass close to it soon."

Aconcagua, loftiest peak in the Western World! High above other crests towered the glacier walls of this 23,081-foot mass of rock.

Once before I had had a similar thrill when I first saw remote Everest from a hilltop in the Himalayas.

Swiftly we winged abreast the hoary monarch, above whose icy head hung a silvery halo of wispy clouds. Off the opposite wingtip rose Tupungato, its own snowy summit 21,489 feet high.

When winter winds roat over the pass the crossing can be filled with bumpy moments. Ours was clear. Looking on Uspallata Pass, 4,000 feet below, the bronze statue of Christ, standing on the Argentina-Chile boundary, seemed tiny. Up the slopes twisted a hair-pin road, which weeks later I climbed by car.

Flying past Caracoles, where the Transandine Railway burrows into the mountainside, over the blue waters of Inca Lake (Laguna del Inca), and out of the hills that wall the Aconcagua River was a matter of quick-moving minutes.

Then we turned southward over dusty green plains and soon circled Santiago.

From the air Santiago seems a flat gray patch at the foot of the mountains. Save for the tree-covered bump of Santa Lucía, San Cristóbal Hill at its outer fringe, and tall buildings in its business heart, the Chilean capital is a level expanse of corrugated iron and clay tiling, set amid gold and green fields (page 484).

Santiago Founded at the Foot of Santa Lucía Hill

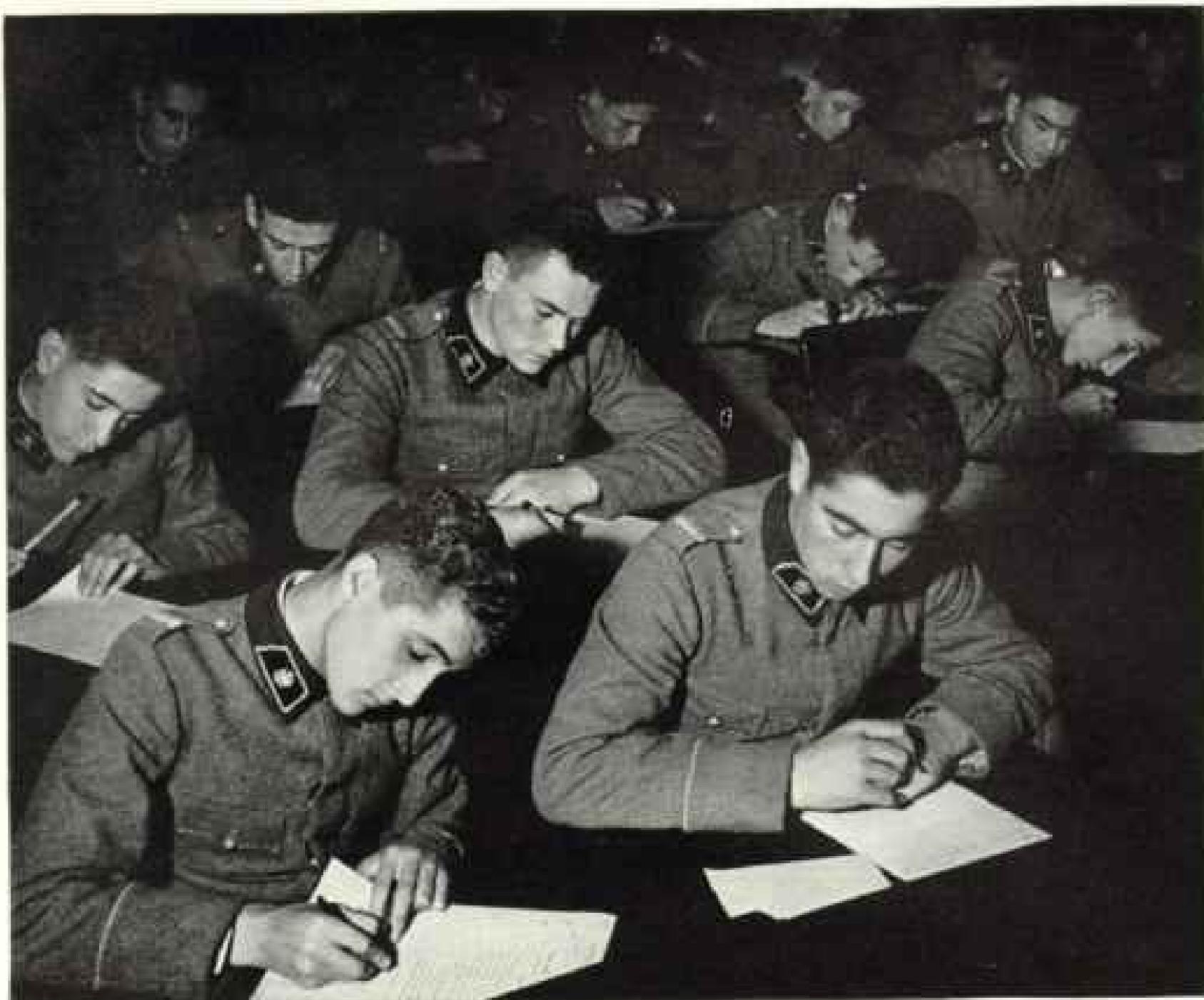
To orient yourself in Santiago, climb Santa Lucía Hill, which is at once a hanging garden and a miniature Acropolis. Below is where the city began.

Don Pedro de Valdivia climbed to the top of Santa Lucía on a warm February day in 1541. With his little band of Spanish followers he had trekked across the mountains and deserts from Cuzco, Peru, and found the land good.

The Mapocho River swept around the hill, leaving a large area where a settlement could be built, free from surprise attack. The hilltop afforded an excellent site for a fort to guard the infant colony.

* See "Twin Stars of Chile: Valparaíso, the Gateway, and Santiago, the Capital," by William Joseph Showalter, NATIONAL GEOGRAPHIC MAGAZINE, February, 1929; and "Longitudinal Journey Through Chile," by Harriet Chalmers Adams, September, 1921.

† See "Flying the 'Hump' of the Andes," by Capt. Albert W. Stevens, NATIONAL GEOGRAPHIC MAGAZINE, May, 1931.



From Janine from 'Three Lines'

A Physics Examination Knits Brows at Chile's West Point

At Santiago's *Escuela Militar*, founded in 1817, cadets study five years for commissions as second lieutenants. Collar insignia has shield, feathers, condor, and Chilean huemul, the last being a deer of the Andes. Chile's well-trained army consists of 1,300 career officers and an annual draft of some 20,000 youths.

So he and his men set to work fashioning homes out of mud and wood from a now non-existent forest.

Don Pedro and 90 of his companions signed their names in the calfskin book in which had been penned the Act of Foundation: "At noon on the twelfth day of the month of February in the year Fifteen hundred and forty and one, this city was founded in the name of God, and of His Blessed Mother, and of the Apostle Saint James, by the Most Magnificent Pedro de Valdivia, Lieutenant Governor and Captain General under the Most Illustrious Francisco Pizarro, His Majesty's Governor and Captain General in the Provinces of Peru."

Were the "magnificent" Pedro to come back and stand beside his statue on Santa Lucia, he would gaze proudly upon a broad, spire-studded panorama.

Don Pedro had no plans for Santiago as the capital. He later founded the fort of Im-

perial, near Temuco, for that honor. Yet today Santiago is a city of some 1,000,000 inhabitants; Imperial is but a few crumbling stones.

Down in the red-spired Church of San Francisco, Valdivia would find the small statue of the Virgin that he carried on his saddlebow when he rode here from Peru. In the museum he might recognize pieces of armor that some of his men wore. He might identify Plaza de Armas as his own Plaza del Rey, where he laid the foundation for a church on the site of the present Cathedral. Other than that the conquistador would be utterly confused—even on Santa Lucia itself.

Seventy years ago Don Benjamin Vicuña Mackenna, one of Chile's leading literary figures, converted Santa Lucia into a pleasure park. Others have added to it since. Now it is a vine-covered, flower-embroidered series of stairs, quiet nooks, lookout towers, pavilions, and small plazas.



Photo Jacobi from Three Lions

A Fair Daughter of Chile Learns Her Future Is "Tall and Handsome"

Adriana Delano (palm extended) traces her ancestry to Capt. Paul Delano, a Yankee who settled in Chile about a century ago. Chile, famed for its beautiful women, offers Adriana and her friend as examples. The gypsy is a nomad whose tribe makes a circuit of South America.

Here, where ancient Araucanian chiefs held powwows and Valdivia's men fought for their lives shortly after founding the settlement, workaday Santiaguinos resort on Sundays and holidays to eat, dance, loiter, hold hands, or look at the scenery.

Students from both the National and Catholic Universities come here, too, to study and cram for examinations. Slowly they pace back and forth, or sit on benches, their brows knitted over heavy volumes.

In the evenings, when the light grows too dim to read, young men and women still linger in pairs.

Deep down in the heart of the hill is a seismological observatory where earth tremors that so often rock Santiago and the rest of the country are recorded.

To the northeast of Santa Lucia is the higher, sharp, conical hill of San Cristóbal. It, too, has been converted into a pleasure place.

From near the zoological gardens at its base, a funicular railway climbs the steep slope to flower gardens and an open plaza, on which are often grouped the trappings of a fair. A spiral looping highway also mounts to the top.

Statue of Virgin Tops San Cristóbal Hill

Surmounting the crest stands a monumental statue of the Virgin. Beneath it is a tiny chapel where thousands pause to worship. At night floodlights illumine the figure, so that from almost any place in the city it can be seen, radiant white against the dark sky.

Aside from the popular stargazing that goes on from the hill, scientists scan the skies from an observatory on a knob of its northern slope.

Passing along the southern side of Santa Lucia and cutting across the city is Santiago's finest thoroughfare, the Avenida Bernardo O'Higgins. Here flowed the Mapocho River



Staff Photographer W. Robert Moore

From 13,780 Feet, Christ of the Andes Surveys the Desolate Chile-Argentina Border

Made of melted cannon, the 26-foot figure commemorates the settlement in 1903 of a territorial dispute. Says the plaque: "Sooner shall these mountains crumble into dust than the people of Argentina and Chile break the peace they have sworn to maintain at the feet of Christ the Redeemer" (page 497).



Twin Stars of Chile Are Her Capital, Santiago, and Chief Port, Valparaíso

Los Andes is the postal address of Hacienda San Vicente, the model ranch illustrated in the color plates. In Uspallata Pass stands the famed "Christ of the Andes." Aconcagua, the New World's highest peak, lies across the border in Argentina.

that Valdivia knew. For many years the river threatened large sections of the town when it went on a rampage.

But no more. The "bully that brawls in winter and hides in summer" has been put in a strait jacket. This babbling muddy stream in the dry season, or angry torrent from rains and melting snows, now follows an orderly course through a rock-walled channel.

Along its banks are the Parque Forestal, the Baquedano gardens, and other stretches of greensward and flowering parks. Countless bootblacks swarm here, looking hungrily at every pair of dusty shoes in the strolling crowds.

It is fitting that the city's leading avenue should bear the name of one who fought to free Chile from Spanish domination and became supreme director of the new independent republic. On street signs, tramcars, and buses the name Bernardo O'Higgins appears officially, but no one calls the boulevard that.

Formerly it was known as Avenida de las Delicias, and it is truly all that that name signifies—"Avenue of Delights." Santiaguinos, however, do not call it that, either. Instead, they always refer to it as "the Alameda."

Down its center extends a wide tree-bordered *paseo*, or walk for pedestrians, flanked by narrow park plots. On either side of these are the tramcar lines and two wide roadways for vehicular traffic. It makes the widest streets in many capitals look narrow, for it averages some 325 feet in width.

Walk along the Alameda and look at the monuments. You touch many of the highlights of Chilean history or see in bronze the men that shaped the country's progress. General O'Higgins, champion of independence; General José de San Martín, who crossed the Andes from Argentina to share in the struggle; Vicuña Mackenna, historian and philanthropist; a symbolic group to the heroes of the battle of 1882 at Concepción—these and other statues adorn the boulevard.

Other patriots, military heroes, scientists, and benefactors are honored elsewhere in the city's plazas and parks.

A few blocks east of Santa Lucía Hill the Alameda touches Plaza Baquedano and there loses its identity in the Avenida Providencia, which reaches out to an aristocratic residential section.

New Structures Dwarf Chile's "White House"

In the opposite direction from Santa Lucía rises the Casa or Palacio de la Moneda, about which the Chilean Government centers. A low, sprawling colonial structure with two large patios, it covers an entire block.

The Moneda, as the name indicates, was originally designed to house the mint. But now it is Chile's "White House" and the home of the Ministry of Foreign Affairs and other offices.

Today this most Spanish of Santiago's buildings finds itself in strange company. All

about it rise lofty buildings reaching to 12 and 14 stories. Several Ministries and Government departments occupy these offices.

A new skyscraper hotel, the Carrera, is 14 stories aboveground and three below.

Like most large structures in Chile, it represents a veritable league of nations in building materials.

The lobby walls are surfaced with black Belgian "marbrite," upon which a Chilean painter has depicted several mythological Araucanian scenes and the arrival of Pedro de Valdivia. Other marbles came from Italy. Chilean woods vie with imported walnut in some of the public rooms. Stoves and dishwashers in the kitchen came from Germany. Electrical refrigerators and the central-heating system were imported from the United States. The ventilation was installed by a French concern.

From a bathing pool atop the roof terrace, which commands a view of entire Santiago, to the last mail chute, the new hotel is modern in every appointment—one of the best in South America.

A building boom was stimulated during Chile's depression years by a law which provided exemption from taxation for ten years for all construction started before 1936. Government loans made possible much of this construction.

Hundreds of buildings, some two-thirds of them private dwellings, were erected. Thousands found employment.

Another of the city's face-lifting operations around the Moneda was the razing of several old buildings and the construction of the Plaza de la Constitución. It is a wide expanse of concrete, edged by narrow flower beds and low shrubs.

Don Diego Portales, with rolled-up Chilean constitution in hand, gazes with serene indifference over the "Desert of Atacama," or "Plaza of Sunstroke," as some Santiaguinos call this square.

Modern Garage Goes Underground

Under the sun-heated cement is hidden a modern garage with machine and repair shops, brake-testing machines and lubricating stands, and parking space for rent.

War shortages in gasoline have cut traffic. But in peacetime this centrally located service proved a boon to business men and officials who could run in on the way to work for a car wash or to have a fender ironed out.

Three times a week squads of smart, khaki-dressed *carabineros* and the band line up on the plaza in front of the Moneda for the ceremony of changing the guard.

One morning when I passed, the band was taxing its lungs with "Ti-Pi-Tin"!

On Sundays, when the ceremonies end, the band moves over to the Plaza de Armas to give a concert to strolling crowds just out of church. Once a bull ring, this square has become the center of open-air social life.

Here young señoritas walked with their dueñas to cast shy glances at smartly tailored young caballeros and were in turn carefully appraised, as the crowds moved round and round. They still do, but much of the romantic flavor is passing.

Passing, too, like the old Spanish barred balconies, is the lovesick swain who twanged on a guitar and sang sweet nothings beneath his fair lady's window. He's more likely now to dial the telephone and say: "How about going to the movies tonight?"

But the guitar is far from outmoded by the radio. One evening I visited classes in guitar and popular folk songs. The lady instructor told me she had 500 young men and women students!

Many Bloods Mingle in Chilean Veins

In the crowds that gather on the Plaza de Armas, at the race course, and at clubs, I was impressed by the blue eyes, fair skins, and blond hair among elite Chileans. Blood from Britain, Germany, France, and other countries mingles with the Spanish in many veins.

Here one finds such names as O'Higgins, Mackenna, Lyons, Ross, Fox, Edwards, Buchanan, Schnake, and Cohen. Some who are Anglo-Saxon in name and features speak not a word of English. Many Chileans trace their ancestry to the Basques.

Women have not yet achieved full political equality with the men. Yet a few years ago Santiago had a woman as mayor!

Much of Santiago's business and trade is centered between the Plaza de Armas and the Alameda. Here are grouped numerous smart shops. A maze of neon signs hangs far out over the walks, in some places even bridging the street.

One shopping street is the Bandera. It gained its name long ago when a merchant there used to fly a flag (*bandera*) whenever he held an auction. Now big business and banking are conducted along the Bandera behind impressive marble fronts.

Throughout this district I had difficulty elbowing my way through congested crowds at noontime. Yet suddenly the streets became deserted.

As a war measure, to relieve transportation, Santiago ordered a short lunch hour. It didn't work. Salads or "hot dogs" do not



From Jacinta from Three Lions

"Be Good Children and I Will Tell You the Story of Caperucita Roja" (Red Riding Hood)

These offspring of working mothers are supervised in a day nursery. Quite a few Chilean heiresses study social work and campaign for progressive legislation. Once a year taxi drivers round up the capital's orphans and treat them to a ride.

suffice for those accustomed to a roll and cup of coffee at breakfast. So again most people vanish for an extended midday siesta.

Santiago Has Transportation Troubles

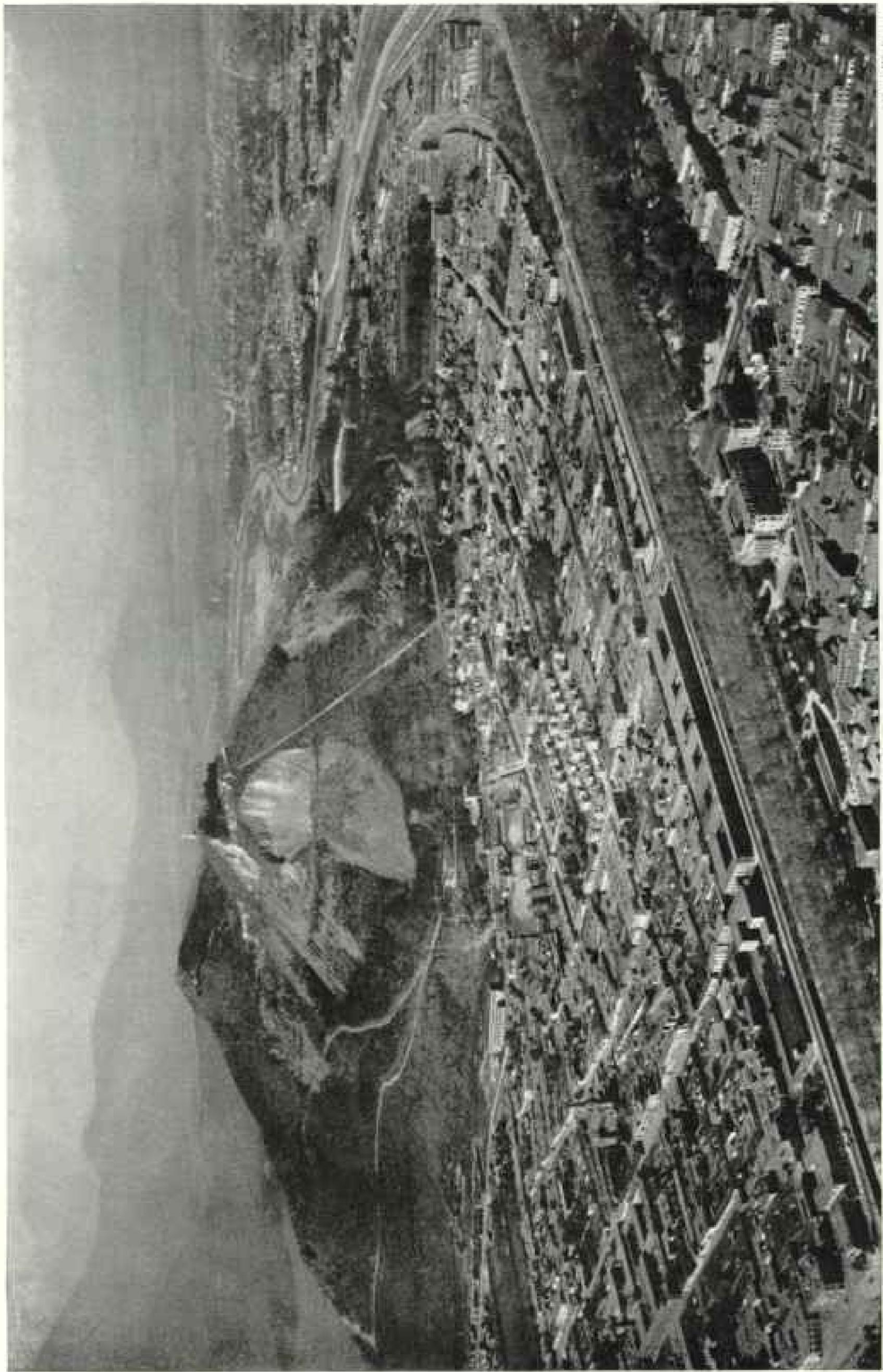
Santiago was well served with cheap transportation before priorities came. At the moment the clanking yellow trams are suffering from lack of replacements and repairs. Bus service, because of gasoline cuts, has been curtailed.

Now crowds must wait to catch the "tomatoes," as the red buses running out Los Leones way are dubbed. Others grow more tired waiting for "cabbages" (green buses) or

"squashes" (yellow). Only the white buses seem to lack a vegetarian name. Perhaps they're carnivorous! Omnivorous, too, it seems from the numbers packed inside them.

Visitors used to early dining in the evening have to change their habits in Santiago and eat late. At 10 p.m. the leading restaurants are usually more crowded than at nine.

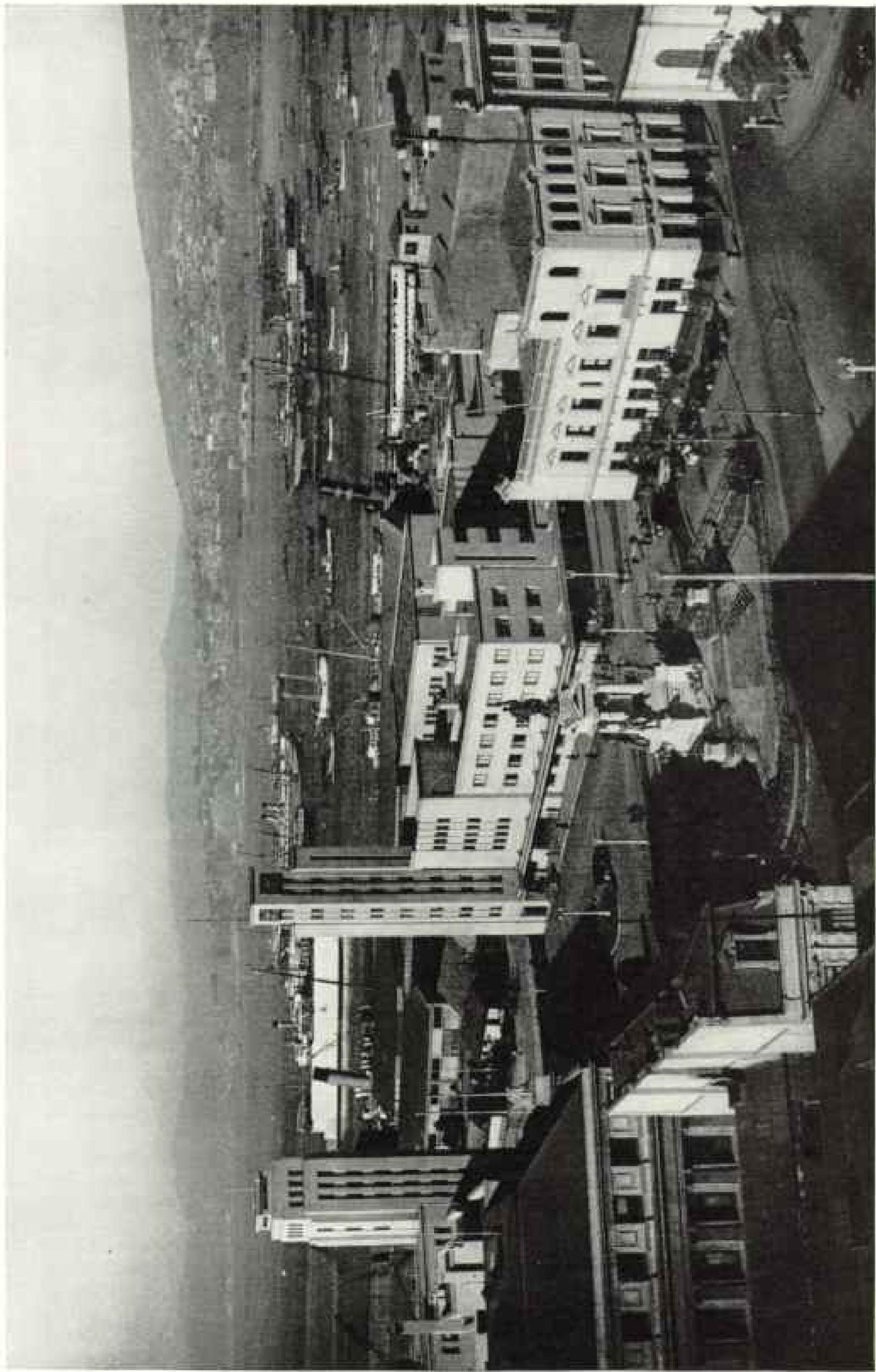
In a comparatively heavy meat-eating city, "Naturista" restaurants with all-vegetable diets have become popular, as also have "Fountains of Youth," which serve only fresh fruit juices. One of the most refreshing drinks that I came across was almond juice, made from the nuts.



Albert W. Johnson

San Cristóbal Hill, One Knob Crowned with a Statue of the Virgin, the Other with an Observatory, Is a Santiago Playground

A funicular climbs straight to the top; a highway loops around the slope. Above their intersection is the Zoo. Rock-walled and tree-bounded, the Mapocho River divides the city. In the foreground, the large building is the Palace of Fine Arts. Everywhere the massive Cordillera browns down (page 479).



Photographer W. Robert Moore

Cliff-girt Valparaíso, Chile's Largest Port, Stretches around the Rim of Its Crescent Bay

Plaza Sotomayor, built on reclaimed land, is the heart of the city. Its twin towers are Customhouse (left) and Port Railroad Station. The monument is to Arturo Prat, a naval hero. Boats of all sizes cram the harbor behind a jetty built in 190 feet of water. To the distant left is Villa del Mar, Chile's fashionable summer resort (page 497).



From Janes from Three Liras

Casa Moneda, Chile's White House, Is a 3-story Relic of Colonial Days

Provincial governor's office (center) and Workers' Insurance Fund Tower (left) are its neighbors. Constitution Plaza, nicknamed "Sunstroke Plaza," is parking lot aboveground and garage below. Lack of gasoline has demobilized its parade of Detroit-made cars. At the extreme left is a corner of Don Diego Portales' pedestal.

In autumn, however, *chicha* is sold everywhere. Unlike the potent *chicha* of Peru and Bolivia, made from chewed and fermented corn, it is a mildly fermented grape juice.

Of national foods there are many. Perhaps one of the outstanding dishes for its contents is the *cazuela*. It contains corn, rice, meat, vegetables—and is served as a soup! Chileans also have the same enthusiasm for corn on the cob as do people in the United States.

Striking among Santiago's institutions is her fire department. Over in the gardens of the Congreso Nacional (National Congress) and out in the General Cemetery are two monuments that recall vividly the reason for its founding.

Once the large church of La Compañía stood on the site of the Congressional gardens. On December 8, 1863, while an elaborate fete of the Virgin was in progress, it caught fire, claiming more than 2,000 victims. Scarcely a family in all Santiago was left untouched by the terrible disaster.

Shortly afterward, men banded together in groups to form an adequate fire brigade. The organization is voluntary, its members paying for the privilege.

Sons of leading business men and colony groups operate the fire companies. Even presidents have been listed on the volunteer rolls.

The only persons paid are the chauffeurs, mechanics, telephone operators, and porters.

From *Journal from Three Lines*

Group Exercise Keeps Chile's High School Girls Slim and Trim

"L. N. 1" on students' blouses stands for Santiago's *Liceo Número Uno*. The girls speak excellent English, for that language is now a compulsory subject. The pupil has a choice of either French or German. Boys attend separate schools.

Others buy their own uniforms, pay monthly dues, and even contribute to the purchase of equipment.

Victims Must Prove Fire Was Accidental

Theirs is a strict routine. If a member misses duty too often, fails to pay his dues, or commits any breach of regulations, he is taken to task before a tribunal.

When a fire starts, the owner or manager of the building is immediately arrested and taken to court. There he must prove, if he can, that the fire was of accidental origin.

Unlike Rio or Buenos Aires,* Santiago has been slow to adopt night clubs. Casino devotees look forward rather to spinning the wheels of fortune during "the season" at *Vina del Mar*.

Social life flourishes in the aristocratic atmosphere of the Club Unión and other exclusive organizations.

There is also the Club Hípico, one of South America's finest racecourses.

From the fountains and flower gardens that catch your eye, to the snow-crowned Cordillera you see from the grandstand, the Club Hípico is about the last word in magnificence.

To the three huge stands, four stories high, gravitate all Santiago and his wife. Racegoers range from the stockholders, whose position and comfort are assured by iron rails and uniformed attendants, to humble adobe

* See "Rio Panorama," by W. Robert Moore, NATIONAL GEOGRAPHIC MAGAZINE, September, 1939; and "Buenos Aires: Queen of the River of Silver," by Maynard Owen Williams, November, 1939.

dwellers who occupy the farthest stand.

Within the white-fenced oval, a steeplechase is laid out in a figure 8. Two polo fields and a small flower-fringed lake also occupy the lawnlike expanse.

Chilean horses are good, so good that they are winners all over South America. Many have made the long trip to the United States. Chilean Army teams have performed outstandingly at international competitions held in Madison Square Garden, New York, and at other horse shows.

At the Quinta Normal de Agricultura one week end I saw a thrilling display of horsemanship. In the spacious park, where the Agricultural Department conducts experiments and holds expositions, dozens of *huasos* from the country gathered for a rodeo.†

Many of these cowboys were the sons of wealthy farmers. With short jackets, tight trousers, leather chaps, huge clinking spurs, wide-brimmed hats, and bright-colored *mantas* over their shoulders, they were a striking lot.

In a circular corral a pair of horsemen were chasing a steer around the ring. The outer rider pinned the beast against the wall, between two flags, by spurring his horse into its shoulder or ribs.

Then the steer was raced back again and the other rider attempted to stop it, too. A third test was made and the steer then driven from the pen.

Horsemanship, of course, is best seen on a large estate, such as that shown in the accompanying color series (Plates I-VIII).

On the haciendas, too, rodeos are most brilliant when the farm hands and young women gather to cheer the riders. Afterward there are guitar playing, singing, and gay couples dancing the *cueca*.

Cueca Is Colorful Dance of Chile

Chile's *cueca* can best be described as the court of the cockerel. With much waving of a handkerchief, as if it were a wing, the man dances around his partner in complicated steps, a mixture of strutting and quick, spur-tinkling stamping. The girl alternately retreats and gives encouragement.

On the opposite side of town from the Club Hípico and the Quinta Normal, Santiago has a massive stadium which seats 80,000. In this sports-minded city, football, bicycle races, and other competitions are held. It also has golf courses and several sports clubs.

Excellent hunting roundabout Santiago lures many from the city during the shooting season. Dove shooting on some of the large *fundos*, or farms, is a social event.

Parties of 20 or more go out in the early

morning for the flight of the doves from the hills to feed on large thistles. Young boys from near-by villages act as retrievers. In the afternoon the hunters go up the hills for another chance at the return flight.

Quail, imported from California, are seen everywhere. Shier inhabitants of the hills are *perdices*, which look like partridges but are a species of tinamou, second cousins of the ostrich. Within an hour or so by car from the capital, sportsmen also find good duck shooting.

For winter-sports enthusiasts, skiing is only an hour away in the hills.

Occasionally there is snow even in Santiago. A fall a foot and a half deep has been recorded. Normally the city's winter consists of a few rains and a bit of sharp weather. The sun shines most of the year.

Andean Snows Irrigate Farms and Produce Electric Power

When snow blankets the high Cordillera, Santiago can be justly proud of its majestic setting. But the Cordillera snows are more than a picturesque backdrop. Engineers have transmuted this water into electric power for lighting and running trains. Both the Santiago-Valparaiso railway and Chile's section of the Transandine line are electrified.

Melting snows also irrigate fertile farmlands, vineyards, and gardens that spread over the plains. The Aconcagua Valley grows some of the richest farm and fruit produce of all Chile.

On one trip I decided to trace the Aconcagua River to one of its sources. By train we went to Los Andes at the base of the hills. From there we mountain-climbed in a Ford.

It was April—and autumn.

The grapes and melons were harvested. Husked corn had been spread to dry in yards and on rooftops of the farmhouses. The autumn chill had touched the long rows of poplars in the valley and changed them from green to gold.

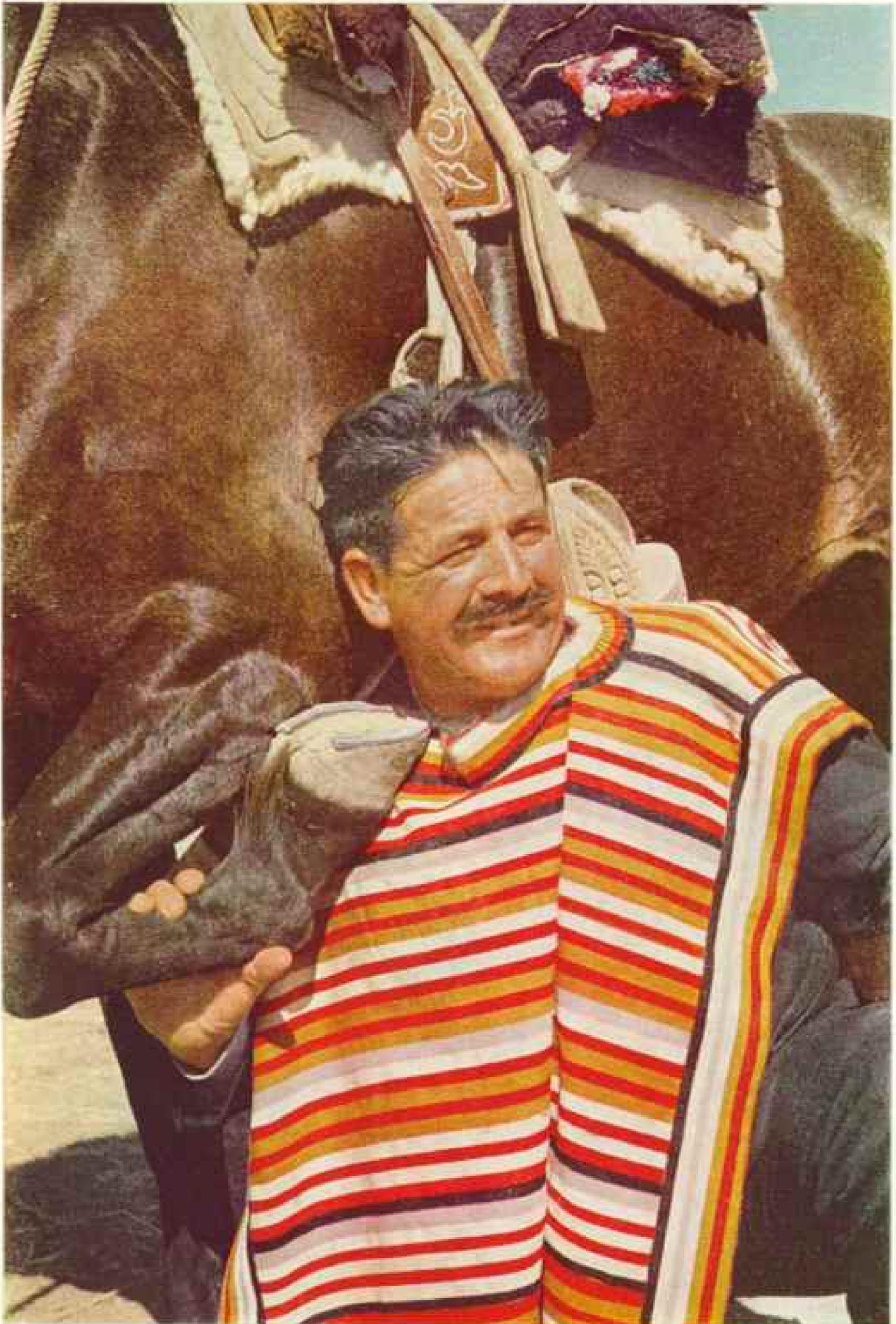
Numerous hairpin bends, steep gradients, and curves—such is the road through the canyons to Portillo, a winter-sports center. Along the way vegetation vanishes, save for a night-blooming cactus. Soon even that surrenders its foothold.

"Where are the ski fields?" I asked a Portillo resident.

"Everywhere. Snow often reaches a depth of twenty feet here. We tunnel out from the hotel," was his reply.

† See "Chile's Land of Fire and Water," by W. Robert Moore, NATIONAL GEOGRAPHIC MAGAZINE, July, 1941.

On a Chilean Hacienda



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Reproduction by E. P. Haddon

Kneeling, the Boss Wrangler Shows How He Gentes Ponies on Hacienda San Vicente:
Though his saddle is cushioned like an overstuffed sofa, he's a hard rider at Chile's model ranch.



© National Geographic Society

Kodachrome by E. P. Haddon

In Sunday Regalia, a Huaso, or Chilean Cowboy, Surveys the Andes and Tells His Pony, "Pardner, We Should Be in the Movies!"

Poncho, boots, and stirrups are strange to North American eyes, but his hat holds ten gallons—almost! In the green valleys, where hemp grows for export to Britain, he has no chores. Duty calls him to the high, dry grazing slopes. At a level with his chin, a row of poplars marks an irrigation canal.

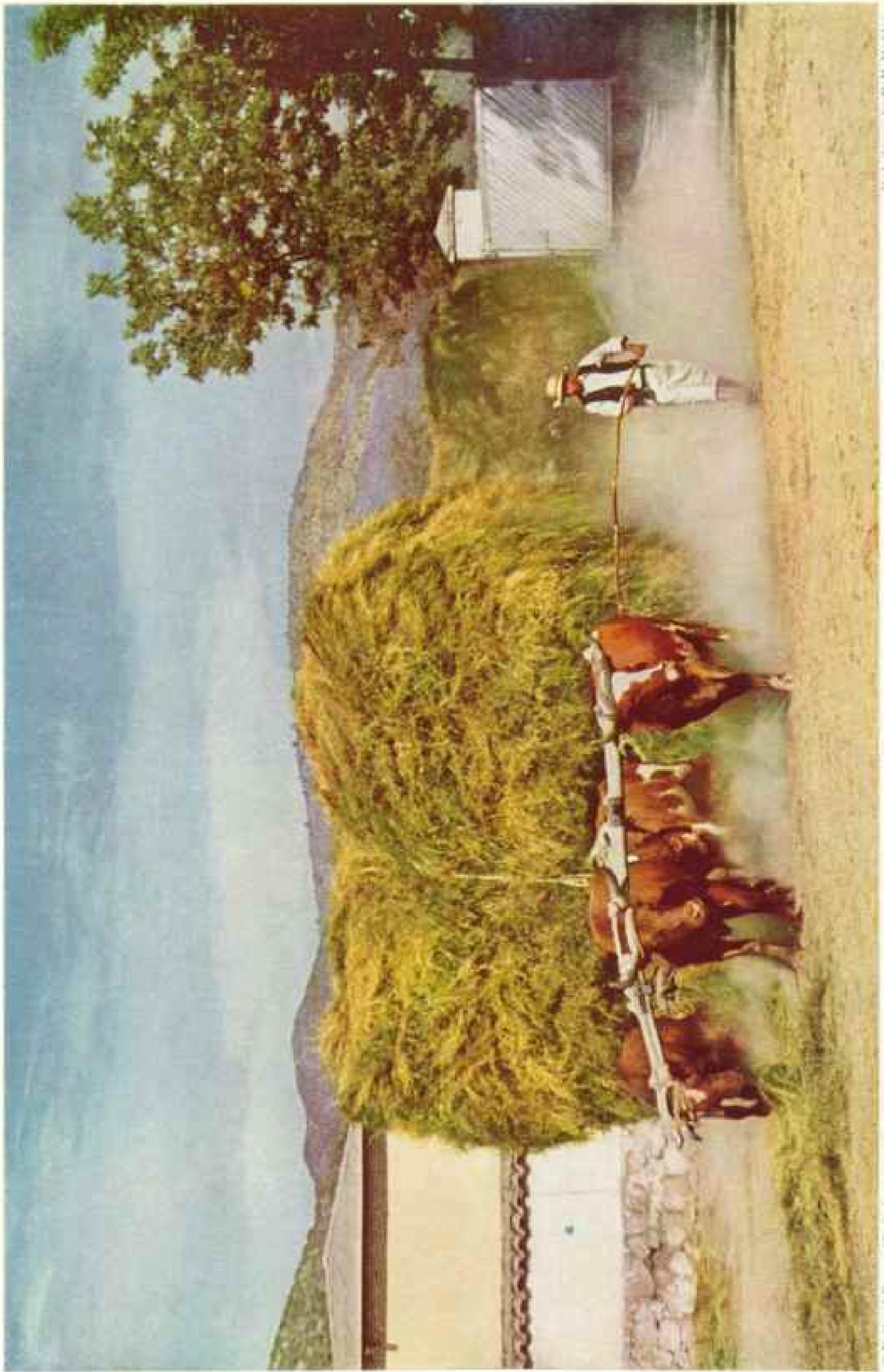


© National Geographic Society

Illustration by E. P. Haddon

Stone and Adobe Corral Walls Contain Beef Steers Shipped in from the South To Be Fattened on San Vicente's Alfalfa Pastures.

Purebred Holstein cows with calves likewise get lush grazing meadow. Twice daily 30 milkmaids attend the herd. A dehydrating plant converts the milk into a powder sold all over Chile. Fresh milk remains the Spanish language's *leche*, but dried milk is *miffo*.

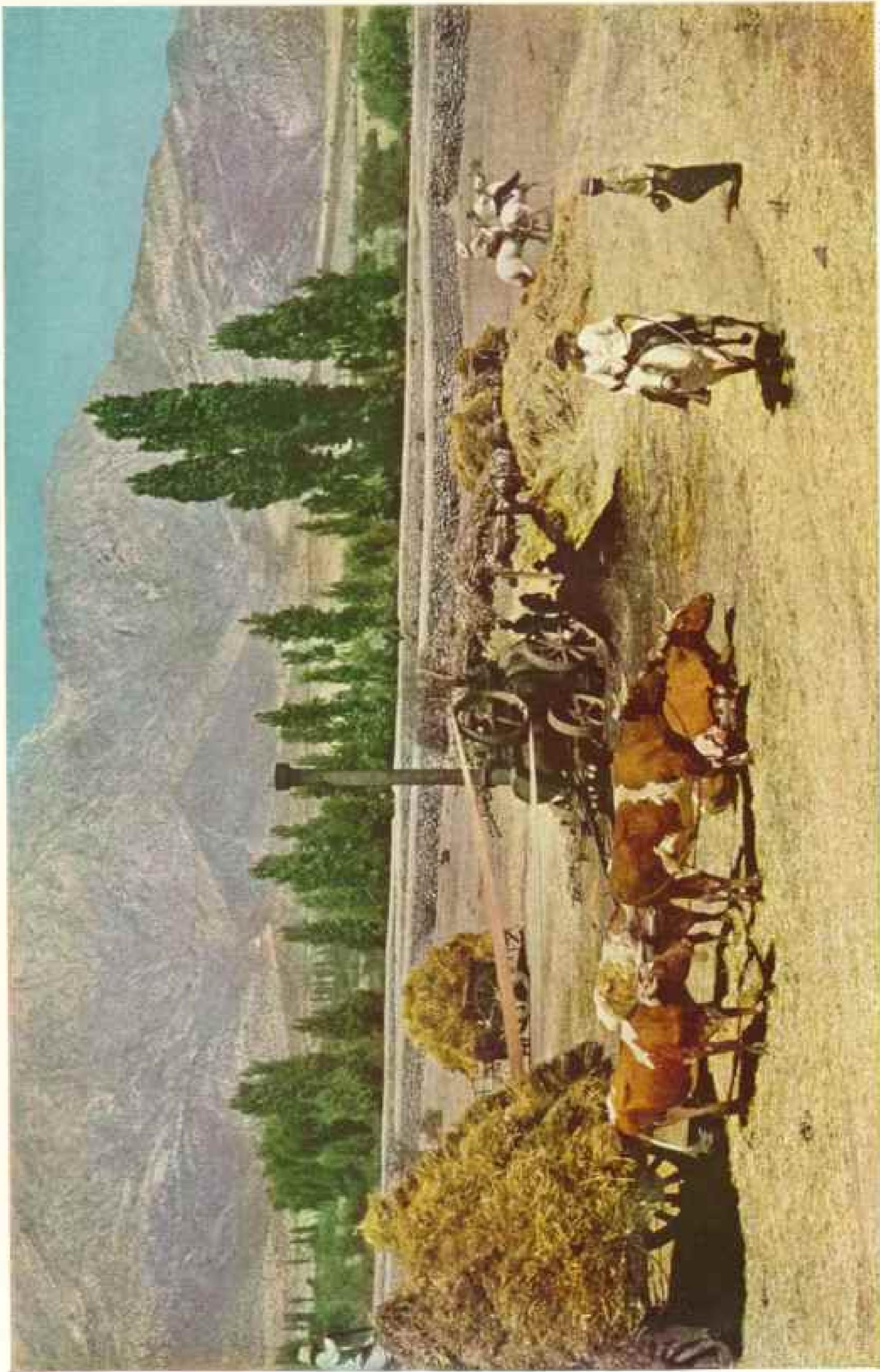


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Underground by R. P. Hapton

Slowly Following a Green Trail, Two Yoke of Oxen Draw a Three-ton Load of Alfalfa into the Baling Lot

In Chile even are the supreme draft animals. San Vicente, however, is replacing them with Diesel tractors. The big ranch lies near Los Andes, a town east of Valparaiso and north of Santiago. Its alfalfa, growing luxuriantly under irrigation, finds a ready market.

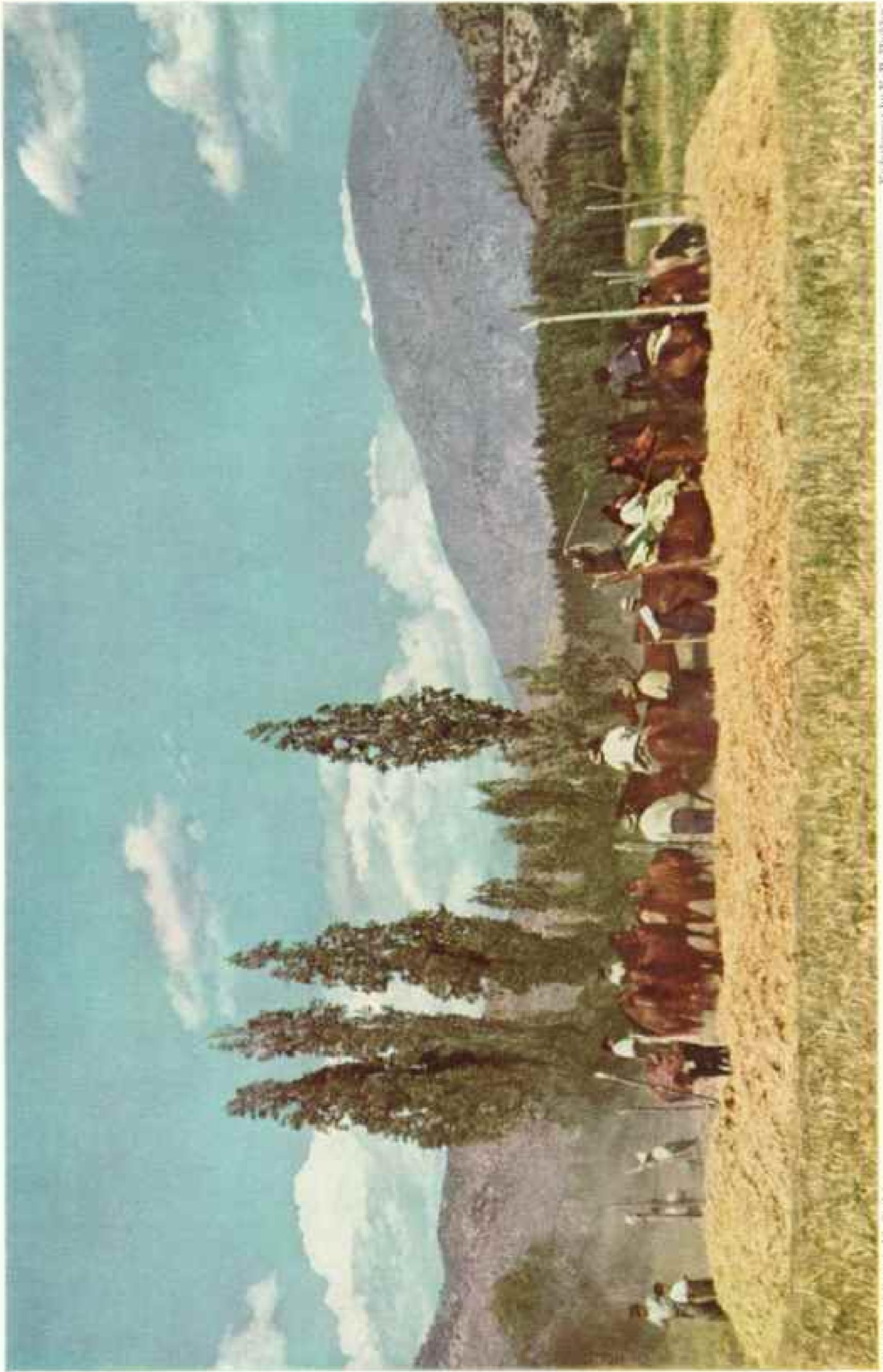


© National Geographic Society

A Threshing Machine, Driven by Belt from a Straw-burner, Separates the Landlord's Wheat from the Chaff

Wherever it has water the valley is incredibly fertile. "Spit on the ground, drop a seed, and you have a plant," say Chileans. Warm and dry, the climate is like southern California's, but, of course, the seasons are reversed. Lombardy poplars and weeping willows trim the scenery as they do all over Chile's central valleys.

Illustration by E. P. Hopkins

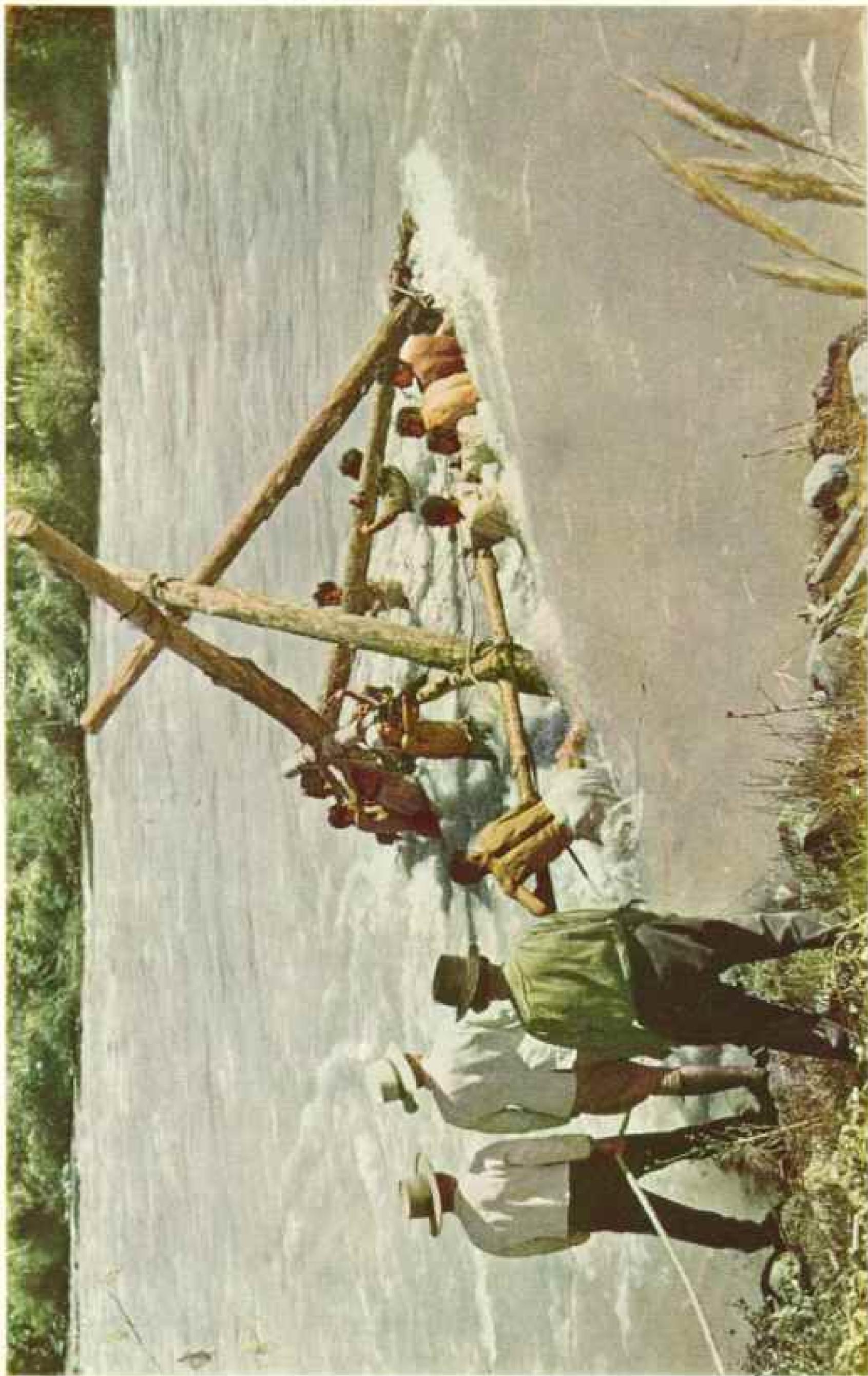


© National Geographic Society

Illustration by E. T. Bolton

Tenant Farmers, Who Divide Their Time with the Owner, Thresh Their Own Grain by Driving Horses around the Straw

For labor on the hacienda, each receives wages, a home, and the use of a few acres. Progressive San Vicente, home of 2,000, gives its workers exceptional advantages. Under the will of its majority stockholder, the ranch is being converted into an agricultural school for poor boys.



© National Geographic Society

Reproduction by E. P. Dutton

A Tripod, Strong Base for Holding a Temporary Irrigation Dam, Is Dragged into the Swift and Icy Aconcagua River

Out of the Andes flows this life-giver, which feeds the canals watering 4,800 of San Vicente's 75,000 acres. Brush and straw will complete the dam, which will force water into an irrigation channel a short distance downstream. Two of the hacienda's foremen are in white jackets.



© National Geographic Society

Costumes by E. P. Hadden

Winter Scholar, Summer Cowboy, the Manager's Son Loves Spurs More than Textbooks.
To Ricardo Jordan, in his rainbow poncho, the fence is a throne for watching events in the corral.

Only a short distance away, over a chaos of broken lava, is Inca Lake, a mountain-locked sheet of fantastically blue water. A charming resort is rising here; only part of its new hotel is completed.

Steep Twisting Climb to Christ of the Andes

Above Portillo the road continues its gymnastics. Mounting the pass, the road serpentine, zigzags, kinks, and almost loops back over itself. Near the top stands the impressive monument of Christ, dedicated to perpetual good will between Chile and Argentina.

When we reached the monument, at an altitude of 13,780 feet, the wind was so strong that I could hardly hold my cameras still enough to make an exposure.

"The wind velocity is about 50 miles an hour now," said the chief of the Argentine meteorological station near by.

"Our instruments have recorded a velocity of 150 miles an hour! The temperature has gone to 17 degrees below zero Fahrenheit."

As we turned to leave, the Panagra plane going to Santiago roared overhead. It relies on the weather reports from the station here for its safe crossing of the Andes.

When a great part of the Transandine Railway was washed out ten years ago, the land journey took several days by train and motorcar. Yet the flight between Buenos Aires and Santiago is just under six hours. On March 24, 1944, the rail route was restored. Under construction is a second transcontinental railway which will run between Antofagasta, Chile, and Salta and Buenos Aires, Argentina.

Aconcagua Valley Has Rich Farms

Rolling down toward Valparaíso, our train passed through the garden paradise of the Aconcagua Valley.

Orchards and haciendas sprawl on the rich flat lands. From here come most of the table grapes, normally exported from the country. Apples, nectarines, and other fruits also are produced in quantity.

Here, too, were grown many of the honeydew melons which in peacetime appeared in the winter markets of the United States. In 1917 a New York fur dealer, buying rabbit, hare, fox, nutria, and other skins, introduced honeydew seed among Chilean growers.

Personally supervising the packing, carting, and handling of the melons, he developed a tremendous export business. Just before the war he sent as many as 2,500 tons of honeydews in a season northward to American tables. But shipping shortage now has virtually halted export.

The same is true of onions. Before the war approximately 4,000 to 10,000 tons of large mild Valencias were exported annually, chiefly to Europe.

In summer trains debouch most of their passengers six miles short of Valparaíso at Viña del Mar. Here Chileans with pesos enough for a holiday come to relax, play roulette, bask in the sun, and, if hardy enough, bathe in the ocean cooled by the Humboldt Current.

Viña is lovely. Elaborate castles, chalets, and fine homes are set in its hills among colorful gardens.

The President's summer palace is perched on a high bluff above Miramar (Facing the Sea) Drive. All around, bougainvillea and flowering vines cascade over the cliffs and walls.

One day I went out to "the races." But there was no flash of silks, no thunder of hoofs on turf. Race fans sat in the stands to talk horses and bet—by telephone—on the Santiago races more than a hundred train miles away!

Valparaíso Shipping Reduced by War

Valparaíso is as commercial as Viña is social. Normally, its eyes are on the ships moored behind its breakwater.

But war has reduced this panorama of masts, funnels, and cranes in the crescent-shaped harbor. Axis ships are gone and many Allied vessels now halt at other Chilean ports for priority copper and nitrates.

In peacetime "Valpo's" docks and warehouses are piled high with melons, apples, pears, onions, garlic, and other farm produce. Lobsters wiggle in baskets and crawl around in large storage barges. Freight engines switch clanking flatcars and boxcars along the water front and fill the harbor with soot.

"Valparaíso is built on solid business, Santiago on politics," a merchant told me. "When Santiago developed San Antonio down the coast, she took some of our shipping away, but we still rank high among South America's major ports. More than 1,200 ships, exceeding 2,500,000 net tons, steamed in and out of our harbor in prewar years."

Valparaíso's commercial district is crowded into the ribbon of land lying between water front and bluffs. In places it is only a few blocks wide.

At the time of the disastrous earthquake in 1906, much of this lower portion of town was reduced to debris. Modern buildings, several stories high, have replaced the old.



Photos Jamba from Three Lions

Baton and Arm Speak for Traffic Light and Whistle

On Santiago's 325-foot-wide Bernardo O'Higgins Avenue, the *carabiniero* performs a ritual meaning "Stop," "Go," and "Left turn." When in profile, he halts San Diego Street's one-way traffic.

Harbor improvements, begun as far back as 1912, have also made striking changes. In some places fills in the harbor have added two blocks to the city's width.

Before a massive breakwater was put across Valpo's harbor, heavy northers sent huge rollers crashing against the water front. So terrific was their force at times that ships were blown up on land.

Building the half-mile-long mole was a Herculean task. To conquer the turbulent sea, 190 feet deep, engineers floated 2,000-ton, hollow cement blocks into position and sunk them to form its base. Then a hill was cut down across the bay and the rock and earth dumped in the sea over the blocks. Eighteen years and 50 million dollars were spent improving the harbor.

Now so still is the harbor that old-timers even wonder what has happened to the weather!

Lumber trucks, horse-drawn wagons, double-deck trams, buses, and donkeys crowd Valparaíso's streets paralleling the harbor. Cross streets are short, ending abruptly in tall flights of stairs or cobble paths that tilt skyward. Some of these are so steep that even sure-footed donkeys have difficulty making the ascent.

Valparaíso has built nearly 40 *ascensores* (cages hung on wires) and elevators to mount these heights. A few of the hill-climbing streetcars are temporarily out of use because new steel cables cannot be bought.

It takes a stout heart, strong legs, and a sure foot to be a cliff dweller in Valparaíso. Yet thousands live on the steep hillsides. Exploring this curving amphitheater around the bay, I saw fine homes perched on flower-studded terraces beside modest ones of corrugated iron, with the family wash fluttering from the windows.

Valparaíso, Like San Francisco, Has Fogs

At the northwest end of Valparaíso's hill horseshoe is Cerro Artillería (Artillery Hill), where stands Chile's Naval Academy. From its garden terrace all Valparaíso and its sickle-shaped harbor spread below. The view here at night of the long, curving shoreline, lights flashing and twinkling, is a sight to remember.

Farther along on the bluff is a large park and the lighthouse that guides ships through the port's sea lane. Often its foghorn sends out penetrating wails. Like San Francisco, to which Valparaíso has been compared, the port has its share of fogs.

Here the gold-colored cliffs drop almost sheer to the sea. Far below, I could see a

short but magnificent motor highway curving around the promontory, close to the sea. Huge breakers of the none-too-pacific Pacific were surging against the rocks.

Perched high on the cliffs at the opposite end of the city stands the Technical University of Federico Santa María, founded through the generosity of the late Federico Santa María Carrera.

In his will Señor Santa María directed that a large portion of his fortune should go to the founding of a technical school where the poorer youth of Valparaíso might be trained. An interesting clause specified that if the money was not used for this purpose it was to be turned over for similar use to the United States!

Today the school is doing an admirable job providing technicians for the new industries of Chile.

"It's much like the Monterey coast, minus the trees," commented a Californian as we drove along the delightful rock-strewn shore to Concón, near where the Aconcagua River empties into the sea.

Small fishing villages dot several of the sand beaches along the way. In the mornings fishermen row in with their catches and remain to dry and mend their nets. On hillsides I saw men spreading out long-tentacled octopuses to dry.

"Our waters teem with fish, yet only now are we beginning to develop a fishing and canning industry," explained a Chilean friend.

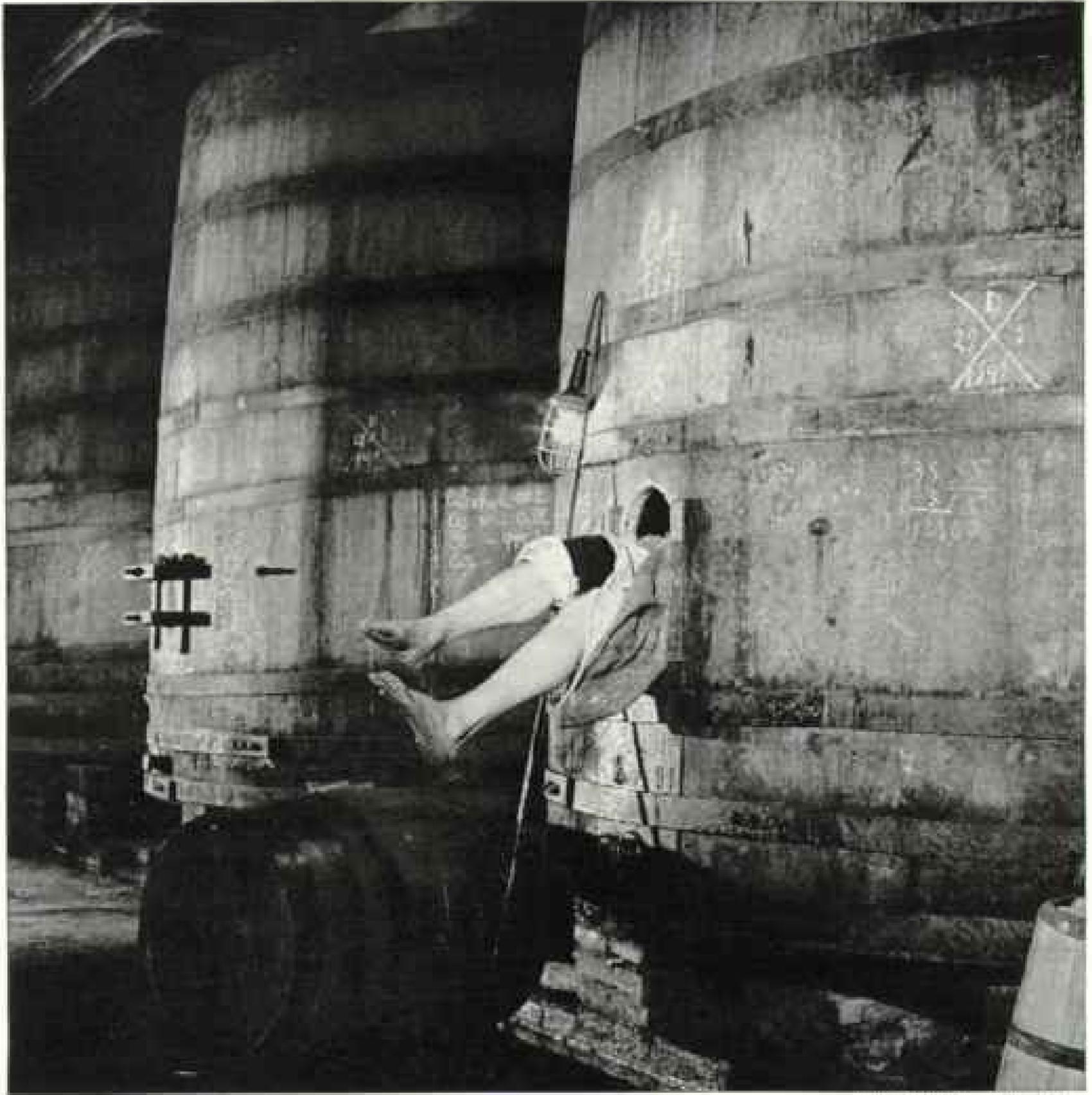
Lobsters Come from Robinson Crusoe Islands

Seaward some 400 miles directly west are the Juan Fernández Islands.* More romantically, they are known as the Robinson Crusoe Islands. Daniel Defoe is supposed to have used the exile of Alexander Selkirk there as the basis of his story. If so, Robinson and his man Friday apparently missed one of the gustatory delights the islands offer—lobsters. Today they are a profitable trade for Valparaíso.

Technically, one should call these crustaceans "sea crawfish," for they lack the large pincer claws of the true lobsters (*Homarus americanus*) of North American waters. The Chilean "lobster" is called *Jasus lalandii* (Lamarck) and is close cousin to the American marine "crawfish," or spiny lobster of Florida.

Seeing a lobster boat coming into port from Juan Fernández one morning, I requisitioned a harbor "taxi" and rowed out to

* See "A Voyage to the Island Home of Robinson Crusoe," by Waldo L. Schmitt, in the NATIONAL GEOGRAPHIC MAGAZINE, September, 1928.



Francis Jacobs from Three Lions

Two-legged Snail in a Wooden Shell Cleans a Winery Cask

Chile's excellent wines are a 100,000,000-gallon-a-year business. Having imported its root stock from France, the country sold wine to France for blending. War destroyed that market. Now the United States is Chile's best wine customer.

watch the unloading. In the sea water in the hold wriggled 8,500 pieces of cargo.

One by one the lobsters were lifted out, counted, and weighed in small lots before being dumped into barges.

"Do you like to eat them?" I asked the crew.

There was a chorus of "No's."

Perhaps if I helped handle 80,000 to 120,000 every year, as they do, I'd feel the same way!

From November to February a fleet of small boats works around Juan Fernández, catching and putting the shellfish into reserve pools. Other ships shuttle between the

islands and Valparaiso bringing them to market.

"Eighty percent of our stock goes to Santiago," explained one of the managers.

Mineral products normally account for more than three-fourths of the value of Chile's total exports. Valparaiso has but a small fractional share of this trade, lagging far behind Antofagasta, San Antonio, Tocopilla, Chañaral, and Iquique.

For long years Valparaiso has topped all other Chilean ports with its imports. The present lull is only temporary. When peace comes Valparaiso's huge crescent harbor will resume its hurried tempo of sea trade.

The Delectable Shrimp

Once a Culinary Stepchild, Today a Gulf Coast Industry

BY HARLAN MAJOR

SHRIMP, which once had a very limited market in the canned and fresh state, are now big business—to the extent of 150 million pounds a year, or more.

Often an unprofitable off-season side-line before the use of the otter trawl in taking them, shrimp have attained fourth or fifth rank in value today among all the fisheries' products of the entire country and rate first in our southern States. Shrimp have also gained recognition for the superior flavor they impart to many dishes, the high nutritive quality of their protein, and their high content of essential minerals.

In an extensive survey of fishing facilities I visited every water front from Seattle to San Diego; from Brownsville, Texas, around Florida, and up the eastern coast.

This trip was followed by another to Mexican waters of the Gulf from our Texas line to Progreso, Yucatán. When roads were impassable, I flew. In all, I covered 28,000 miles, and much of the time I was breathing air as salty as any enjoyed by a beachcomber.

In my travels I ate shrimp about every way it was prepared; the unshucked kind served in San Francisco, the Louisiana jambalaya, the hot but excellent soup in Mérida, Yucatán. Never a regret did I have, for shrimp have become friendly.

The commercial shrimp is a decapod, one of the 10-legged crustacea. To the class Crustacea belong the crabs, lobsters, and crawfish. The commercial shrimp differs from the fresh-water crawfish in the lack of large pincers.

Shrimp Live to Ripe Age of One

Before shrimp reach the pinkish-white stage in which they are eaten, they have had their day, or to be more accurate their *year*, a year seemingly being the length of their life cycle. They start out as fresh spawn in deep water, and each one may have as many as 800,000 brothers and sisters.

The eggs of these commercial shrimp are not carried about by the female like those of many other of their relations, but drift around for two or three weeks. At just the right time they are carried by tides and currents into the brackish water of some bay or inlet which for a time is their nursery. They are now about a quarter of an inch long and can get on very well under their own power.

The young grow rapidly, and with increasing size work their way into deeper water of greater salinity. From the smaller bayous and bays they move into larger ones and eventually to the outside waters of the Gulf.

The trek, although definite in its objective, consists of a series of short stages which spread the migration over several months. Thus the small (sometimes called lake) shrimp, the average, and the large jumbo are for the most part the same species taken at different ages and at different stages of their migration.

Many North Carolina shrimp winter in the balmy waters along the coast of Florida. Unlike these, the Gulf shrimp of the deep South follow no coastline when they seek milder waters, but find their relaxation in the deeper waters of the Gulf. There seems to be a feud between the shrimp found on the east side of the mouth of the Mississippi River and those on the other side, for the neighbors do not intermingle.

Shrimp migrations have been determined by small identification tags placed on individuals. When tagged shrimp are caught, the tags with location and other information are sent to the department making the study. As a rule, each tagging produces considerable material to further the study; but of one group, a thousand shrimp tagged and released in Lake Pontchartrain, none has ever been found.

Neither the shrimp's skeleton nor its shell expands or grows. When quarters get too small, the shrimp moves out and grows a new and larger shell. Almost everything that swims relishes the shrimp in its unprotected state as a delicious tidbit; consequently, the shrimp must hide while growing its new shell or become a casualty.

Shrimp's Best Speed Is in Reverse

Usually it swims forward by means of its abdominal legs; but when speed is important, the tail gets into action and then travel is backward. The shrimp, when cornered by water enemies, uses its tail and all ten feet to raise a smoke screen of fine sand, under which it scoops itself into a tiny trench.

The Gulf of Mexico enjoys a virtual monopoly of the shrimp yield. The south Atlantic and Gulf States produce 98 percent of all the shrimp taken in the United States and Alaska, and seven-eighths of this volume originates from States facing the Gulf.



Before Going into the Hold, the Fresh-caught Shrimp Get a Final Dousing

Fish and other undesired marine life brought up in the trawl nets are thrown back unharmed, and the shrimp are rinsed off by dipping alongside the boat. They are then stowed away between layers of ice (page 503).

Mexico, though still young in the industry, adds to the volume taken from the same waters. Louisiana waters produce about three-fifths of the total average shrimp catch of the five Gulf States. Texas follows and then Florida, Alabama, and Mississippi.

Because, in some cases, shrimp are taken from the waters of one State and prepared for the market in another, the marketing and production reports do not coincide. Thus Mississippi, which is at the lower end of the list in catch of raw shrimp, is up near the top in marketing. Nearly 50 percent of the shrimp landed in Mississippi are taken in Louisiana waters.

The really edible part of the shrimp is its so-called tail. The head and thorax contain the gills and viscera but little meat.

As to an iodoformlike odor and taste sometimes noticed in cooked shrimp, no one need worry. No preservative is used in any method of preparing shrimp for the market. What people think is preservative is *Balanoglossus*,

or "acorn worm," a little wormlike animal, a twig on the ancestral tree of the vertebrates, which shrimp eat as an appetizer. Sometimes they get more appetizer than main course, and as a result their flesh is perfumed with the iodoform or iodine-like aroma of *Balanoglossus*. They are equally wholesome with or without this flavor.

About half of the shrimp taken in the Gulf States are canned. Other methods of preparing them for the market include drying, cooking, freezing, and barreling green (fresh).

In Houma, Louisiana, the Shrimp Is King

Many of the larger cannery centers are supplied with a great portion of their raw shrimp by boats which follow the heaviest runs, selling wherever they reach a market. Thus a trawler of Florida registry may deliver its catch at Biloxi, Mississippi, and two weeks later unload other shrimp at Morgan City, Louisiana, or Bayou La Batre, Alabama.

To picture a typical shrimp community, let



Like Cake Filling, Each Fresh Draft Is Poured over a Layer of Ice

The wacker at the right will smooth the course of the shrimp, and more ice will cover them, the process being repeated until every section of the hold is filled to the top (page 510).

me take you to Houma, seat of Terrebonne Parish, Louisiana. The canneries here are supplied with their entire raw product by local boats. A father and son may operate a small drag boat while a daughter grades shrimp at the local cannery.

The town lies 45 miles southwest of New Orleans. It was settled by the Acadians and it remains almost as French as the day the Acadians were driven from Nova Scotia.

Most of the 9,000 inhabitants, as well as the folk between the town and the Gulf, depend for income upon the taking or processing of shrimp.

To ask anybody in Houma about shrimp is just like asking Mrs. Jones about her new baby. In no time at all I had the key to the city and, in fact, the entire parish. To talk of shrimp opens wide every door!

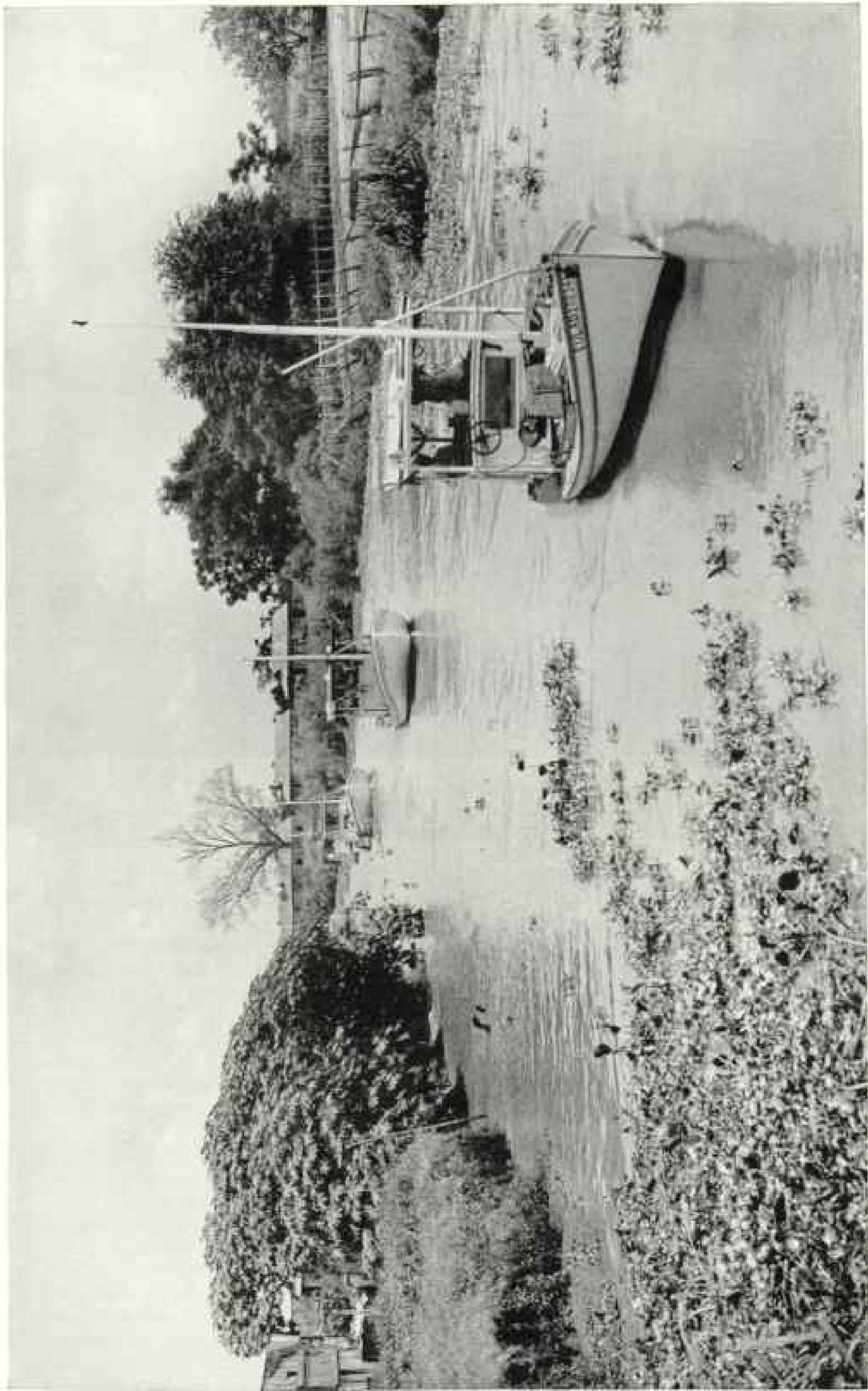
With the aid of Eugene Dumez, Chamber of Commerce secretary, and Julius Dupont, storekeeper, I found my problems eased, and at two o'clock the afternoon after my arrival

I was on the Pelican Lake Oyster and Packing Company's ice boat, *Gloria J*, chugging merrily down Bayou Terrebonne.

At the outskirts of Houma we turned into the Gulf Intracoastal Waterway, a 100-foot water boulevard with its side streets of bayous branching out in every direction. At 3:15 p.m. we turned into a connecting bayou and were soon back in Bayou Terrebonne. We had turned into the wider and deeper parallel waterway because of its straighter course.

At the villages of Bourg and Montegut we made short stops to add a few items to our larder. We were now in the wholly Cajun (Acadian) country, and I heard no English spoken in either village. It was as if I had been whisked suddenly to France.

A Cajun, however, is a loyal American. On registration day of the first selective-service draft the entire shrimp fleet chugged up the bayous to Houma, and everyone within the age limits climbed off his boat with his



Through a Channel Partly Cleared of Water Hyacinths, the Fleet Chugs Down Bayou Petit Caillon

This water plant, though attractive and interesting to visitors, is one of the worst enemies of the shrimpers. It grows thick in the channels and the cost of removing it takes much profit out of the industry (page 508). Before dawn the men turn out for breakfast and they are ready for the first haul of the nets as the sun comes over the horizon.



Work Ahead! The Fleet Sets Out for the Shrimping Grounds

The trawlbouts almost always carry ice, unless fishing grounds are close by and shrimp abundant enough so that catches can be landed in a few hours. If the boats do not carry ice, catches are usually transferred to the ice or "boy" boats which take them to the packing plant (page 510).



The Blessing of the Fleet for the Fall Season Is a Gala Day at Houma, Louisiana

Many of these people are French-speaking descendants of the Acadians ("Cajuns") whom Longfellow immortalized in *Evangeline*.



Quick Freezing Puts Up Shrimp in Attractive Form
At Palacios, Texas, part of the catch is frozen into five-pound cakes for shipment. Most of the workers here are Mexicans.



Staff Photographer J. Parker Roberts

A Shovelful Would Make a Lot of Salad
From the hold of an incoming boat the fresh shrimp is unloaded quickly into tubs and rushed to the cannery. Delay may mean spoilage (page 510).



Laden with Spoil, the Trawl Net Is Hauled In and Emptied

This craft is too small for the entire catch to be brought aboard at once and dumped on the deck for sorting. As soon as the storage space has been filled, the fishermen will go alongside an ice boat and unload.



Staff Photographer J. Bayler Roberts

Small Shrimp Boiled in Brine Are Dried in the Sun

To Oriental customers these are a rare delicacy. Platforms for the processing as well as houses of the workers are built on piles over mud bars. This community is one of several around Barataria Bay, Louisiana. Formerly "shrimp dancers," heavily shod, tramped off the shells, but now machinery is used (page 517).

dunnage bag, ready right then to go to war or to any place his Uncle Sam wanted him. It took a couple of days to convince these men that they were only to register and that the factory was idle and waiting for shrimp.

Back on our course, we passed a beautiful but very troublesome display of water hyacinths along both banks of the bayou. The channel had been cleared by forces of laborers with hoes, pitchforks, and mangle-boats to prevent the hyacinths from blocking navigation. These hardy and beautiful plants have become a costly menace in vast stretches of waterways in some southern States.

"Bearded with Moss . . . in Garments Green"

In many places along the banks there were live oaks, the branches dripping with the moss known as *barbe espagnole*—the Spaniard's beard. It hangs from the trees like huge draperies swinging to and fro in the breeze.

This vegetable hair not only adds a finishing artistry to the surroundings, but furnishes work for hundreds of swamp dwellers who harvest it for sale to manufacturers of upholstery and harness.

By the time we reached Terrebonne Bay, darkness was falling. The trees had given way an hour earlier to short, shrubby growth which in turn had been replaced by swamp grass. Terrebonne Bay and Timbalier Bay constitute one of the most active areas for bay shrimping in this section.

Hundreds of islands divide the bay waters into many so-called lakes, with names reflecting the atmosphere of those who live and work around them: Tambour, Chien, Felicity, Barre, Raccourci, and Lagraise.

In a quiet channel formed by several closely grouped islands we found the Pelican Company's boats made fast to one another and about ready to settle down for the night. The evening's ice boat, now loaded with



Drawn by Theodora Price

shrimp, cast off and started on the journey up the bayou to Houma.

The first man to come aboard as we made fast was Joseph Thiriot, boss of the fleet, a giant half again as large as any of the others. With outstretched hand and expansive smile, he welcomed me.

Though I tried to convince him that I had brought along ample bedding, he dumped my sack and grunted that one automobile robe was not enough. He gave me the skipper's bunk in the cabin of the ice boat and began shouting orders in French to everyone. Soon a straw-filled, cotton-covered mattress appeared from another boat.

The Skipper Looks Out for His Guest

Thiriot shook the mattress and pounded it, fluffed it out level on the wooden bunk, and then smelled it. Seemingly satisfied, he shook

a cotton blanket, put it to the smell test, and carefully folded it on the mattress.

Next came a pillow. There was no getting around the fact that it had seen use, and he gave it a severe beating and dusting; but when he sniffed it, it did not pass.

Leaning out of the cabin door, Thiriot belted some instructions. Another pillowcase came quickly aboard. This one was freshly washed and, believe it or not, embroidered in pink.

At last satisfied that his guest would be comfortable for the night, my benefactor left me alone save for the innumerable mosquitoes that fogged about me.

I soon realized that removing any of my clothing would invite disaster. I just tied my trouser cuffs close, pulled my collar as high as possible, and, after a thorough dousing of mosquito repellent, went to sleep.



Staff Photographer J. Bayler Roberts

"Shrimp Nickel" Always Pays for the Heads

Throughout the industry the deft pieceworkers who decapitate the shrimps receive their wages in five-cent pieces. This girl in a Biloxi, Mississippi, cannery gets a handful of coins for the bucketful of waste she has brought to the forewoman.

Before sunrise I could hear the crews getting ready for their day, and the smell of coffee penetrated the aroma of mosquito dope. I washed hurriedly, leaning over the side of the boat. Soon a good breakfast and the activity of casting off in one of the trawlers made the world look brighter.

It did not take us long to get to likely-looking shrimping waters where a try net, a small replica of the otter trawl, was lowered. After we had dragged this net for a few minutes, inspection showed some shrimp. The large otter trawl was promptly lowered and pulled along bottom at four or five miles an hour.

As the pocket at the small end of the net filled with shrimp, the added pull on the engine was evident, and the crew seemed to divine by a sort of sixth sense when the net had a load.

Most of the shrimping boats haul their nets with power; but the boat I was on had no hoist, and the net was pulled aboard by the crew. The moment the contents were dumped on the deck, stray fish were returned unharmed to the water and the shrimp were cleared from the collection of grass.

Within two hours we pulled over to the ice boat, transferred our catch to it, then

started out again. All the other trawlboats were going through the same performance, working always within a short distance of the ice boats so that never more than two hours elapsed between taking of the shrimp and packing them in ice.

After watching several hauls on the trawler, I transferred to the ice boat to watch the procedure at that end. Two ice boats—one loaded with ice and the other empty—had been made fast to each other. The unloading trawler came alongside the empty boat and the shrimp were passed over with a heavy pole net, but not before being doused several times in the water. Then the shrimp were measured in a basket and dumped into the hold.

A Layer Cake of Shrimp and Ice

Icing was evidently especially important, for Captain Thiriot insisted on doing that job himself. First crushed ice, passed over from the other boat, was spread on the bottom of the hold and covered with a layer of shrimp. Alternate layers of ice and shrimp followed. When loaded, the hold was like a many-tiered cake of six-inch layers.

During this operation the open hatches were



Harlan Major

Headed and Skinned, Shrimp Go into a Flume of Pure Water

After the refuse is weighed and settled for in nickels, it is dried and ground into meal for animal feed.

protected from the sun by a large tarpaulin. When all the compartments had been filled, a heavy canvas was tucked over them, the wooden hatch cover was put in place, and finally another canvas was pulled down tight over the whole thing. The boat next to us had now transferred all of its ice to us. It was the next to be loaded.

About dark, with everything made tight and carrying a full load of iced shrimp, we left the cluster of boats and pointed the bow toward Bayou Terrebonne and Houma. We were in our place at the unloading platform of the cannery six hours later.

During a good part of the season the cannery help is often called to work as early as 3 A.M. During my visit the Pelican Company carried 1,800 workers on its Social Security list, and the cannery was a veritable beehive even early in the morning.

Many employees live in Houma, but they are supplemented by workers from the entire neighborhood brought in by school buses. At stated periods all must pass rigid medical examinations. As many are employed in processing the shrimp as in catching and delivering them to the factory.

From now on the shrimp travel fast and seldom make a stop until they are in cans. A belt conveyer is lowered into the hold within

reach of a shoveler who keeps the load coming. Three conveyers can unload boats at the same time.

The shrimp are dumped off the conveyer into a flume and carried in running water into a washing vat. Here they are picked up by a metal inspection belt, from which six to eight girls remove defective shrimp.

All the girls at this belt must have more than usual experience and ability, for their inspection determines whether the entire boatload is to be canned or dehydrated for meal. If the load of shrimp looks old or if rejections reach five percent, the entire lot goes into meal.

U. S. Inspector Has an Eagle Eye

Near one of the inspection belts stands an inspector of the United States Food and Drug Administration. G. K. Little, who represented the Government at the time of my visit, was no swivel-chair inspector. How anyone could be so unyielding in his perception of what constitutes acceptability and have a friend in the cannery baffles me; yet all the shrimp men liked him. Under his eagle eye not even a slightly discontented shrimp got into a can.

After this first inspection the shrimp are weighed to check at the standard rate of 210 pounds to the barrel. They are now placed

in wire baskets and rolled on a small narrow-gauge flatcar into the picking room.

The entrance is through a vestibule large enough for the car and with double-screened doors at entrance and exit. Long rubber fingers brush off any flies from the baskets, and flies have a hard time hitchhiking along with the shrimp into the picking room. Flies that do get past the doors become the prey of half a dozen boys armed with swatters.

In the picking room the shrimp are spread on long metal-covered tables, where the shuckers, mostly Negro girls with flying fingers and wagging tongues, remove the heads and shells.

One can hardly follow the operation with the eye as the waste goes into a pile and the meat, or tail, lands in a metal flume in the center of the table en route to the next operation (page 511).

This is a piecework job, and when I was there the girls were being paid ten cents for a 14-quart bucket of skins and heads. If the shrimp are averaging small, a smaller bucket becomes the standard of measure. Fifteen or twenty buckets a day is about average, but some shuckers do much better. The record for a day is fifty.

The flume carries the shrimp meat from the picking room to the packing room, where it goes through a series of six washings and on to another inspection belt. The water used for the washing and fluming comes from 400-foot wells. After being treated with sodium aluminate and lime and filtered, it is considered as pure as possible.

From this point all the handling of shrimp is done by regular payroll workers. Blanching is the next process. This consists of pan-boiling in large wire baskets in water about three times as salty as sea water.

Boiling Curls Shrimp Tails

Shrimp to be dry-packed boil for ten minutes and those for wet pack for six minutes. This operation brings out the bright-red color markings in the shrimp and curls the tails as we see them later in a salad.

A wide conveyer then carries the meats through a path of forced cold air which takes out a certain amount of moisture. From here the shrimp go through a mechanical grader which separates the four commercial sizes.

Since these machines are only about 80 percent efficient, each size must go through hand-grading, which assures uniform size in each grade as demanded by the trade. Final grading keeps 80 to 100 girls busy.

The standard No. 1 can holds 7 ounces of wet-pack shrimp meat and 6½ ounces of dry

pack. The count to the can of jumbo shrimp is 25 or under; large, 25 to 35; medium, 35 to 56. Small shrimp are those that go over 56.

The final grading operation puts the shrimp into the cans or, for some classes of trade, into glass jars. They are then weighed and started on another conveyer to the capping machines. Those for wet packing now get a 25-parts-to-the-thousand solution of salt water. The capping machines, of which there are four, can vacuum-seal 320 cans a minute.

In large metal containers the full cans are placed in retorts, where they are given their final cooking in steam.

Upon removal from the retorts, the can-filled containers are dipped into cooling water to stop the cooking instantly. They go then to the warehouse for labeling and storing on shelves for several weeks. During this last stage samples are constantly being tested as a final precaution.

Prior to 1930, the refuse of heads and hulls from shrimp canning was usually disposed of by burial in deep pits. Nowadays a portion is dehydrated, ground, and converted into animal feed.

Dehydrated shrimp meal is exceptionally high in lime content and in a form easily assimilated by dairy stock, hogs, and chickens. Therefore 55 percent of the shrimp bulk which used to be thrown away now brings \$60 to \$70 a ton as poultry and stock feed.

Chinese Relish Dried Shrimp

Dried foods have always been considered a great delicacy in China, dried shrimp being especially enjoyed. Lee Yim came from Canton, China, to Louisiana some 70 years ago and started a shrimp-drying industry of his own. Soon others engaged in the business, and now dried shrimp create an annual income of \$500,000 in Louisiana alone.

Shrimp to be dried are boiled in kettles of salt water for ten to fifteen minutes until the meat separates from the hulls.

The boiled shrimp are placed on large wooden platforms along the marshy coasts and exposed for three or four days to hot sun (page 508).

Up to a few years ago the hulls were removed from the thoroughly dried shrimp by families of shrimp dancers, including women and children, who lived on the platforms. Shod with heavy-soled wooden shoes, they danced on the shrimp in a sort of shuffle, with a rotation of the heel at each step. The shrimp were piled in a ring and continually turned by men with shovels.

Today mechanical beaters are used, and dancing is confined to Saturday night.

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To carry out the purposes for which it was founded fifty-six years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 16, 1939, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 291 B. C. (Spinden Correlation). It antedates by 200 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

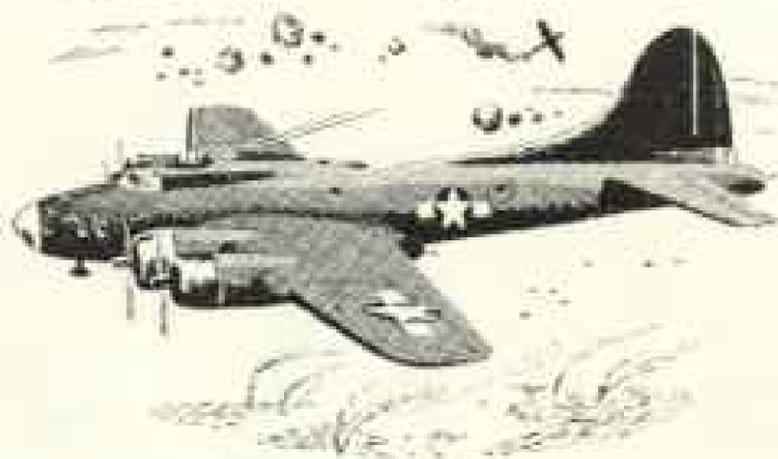
The National Geographic Society-U. S. Navy Expedition camped on desert Canton Island in mid-Pacific and successfully photographed and observed the solar eclipse of 1937. The Society has taken part in many projects to increase knowledge of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted \$25,000, and in addition \$75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1938.

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And so, we stood upon an island in a sea of mist and there were only stars and you—and no words to speak.

Out here, I see again our dream of home.

And I can see there can be just one future when war ends, just one meaning to the power of America at war. The power of men and women working together to build ten million guns . . . ten thousand ships and ten hundred thousand tons of bombs . . . must be the power after war to create and build a cleaner, finer, a greater America than we have ever known before . . .

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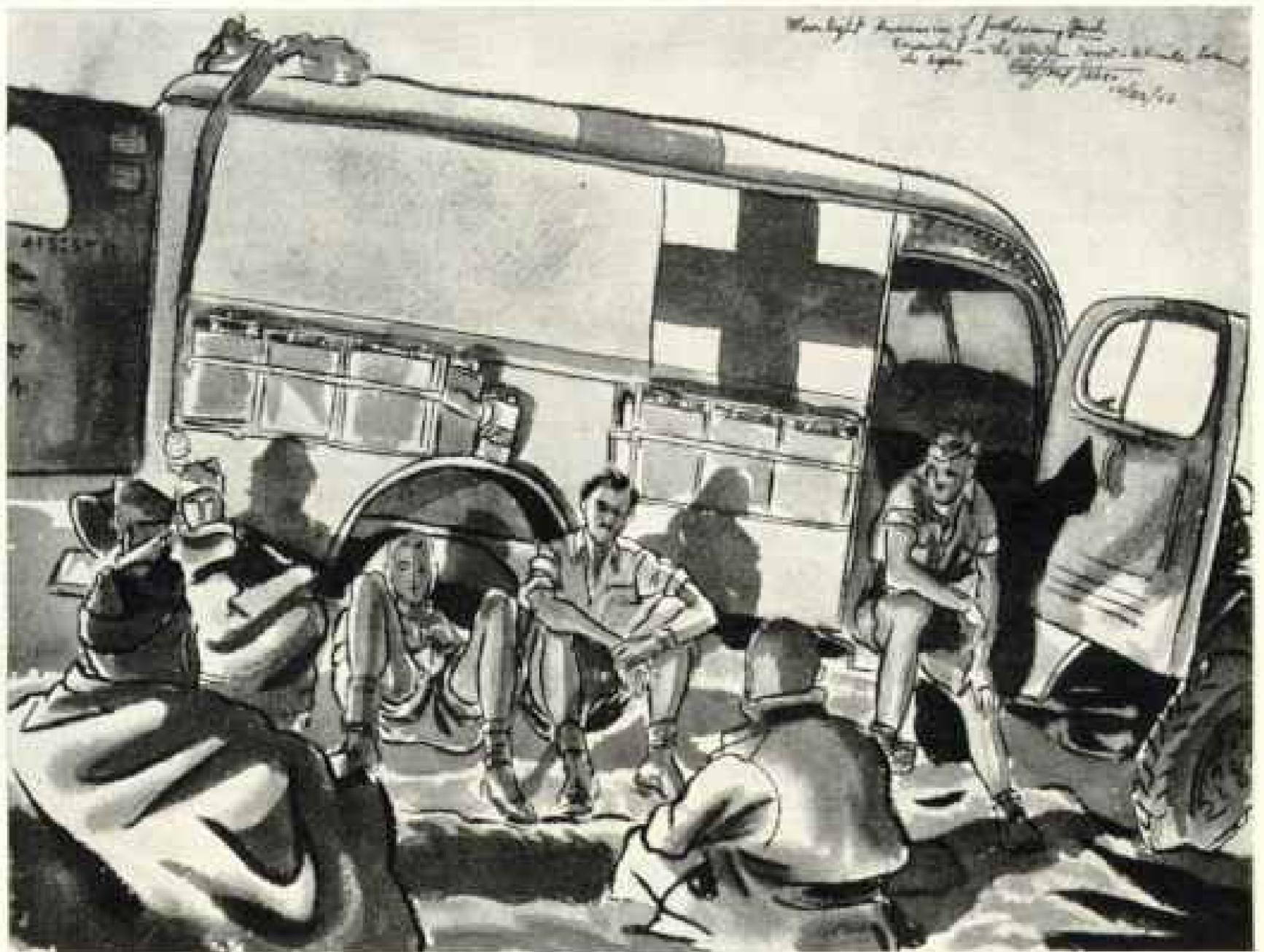
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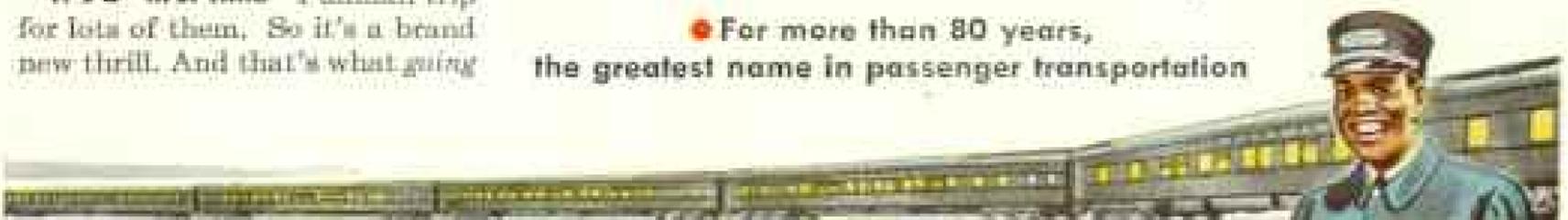
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Tom Hinkle's boys do him proud in the Army *just as they did on their Studebaker jobs*

IT'S a long way from the Fiji Islands to the Studebaker factories where Wright Cyclone engines for the Boeing Flying Fortress are built.

It's still farther to the U.S. air bases in India from which vital war cargo is flown into China across the Himalayan "hump."

But there's a link that spans those distant spots where Tom Hinkle's boys are now stationed and their father in South Bend. That link is a comradeship in craftsmanship which had its beginning when all three were working close together in the Studebaker plants.

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Lieutenant, corporal and craftsman
—the Hinkles still "work together"
—Veteran Studebaker craftsman Tom Hinkle now builds Cyclone engines for the Flying Fortress. One son, George, is an AAF lieutenant in India, Tom's other son, Bill, is a Coast Artillery corporal in the Fiji.

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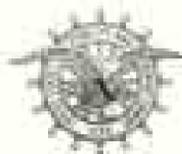
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*One of a series of scenes in the lives of immortal composers, painted for the Magnavox collection by Walter Richards

How music entered George Gershwin's life

GEORGE GERSHWIN'S introduction to good music came when he was six years old. "I stood in a penny arcade listening to an automatic piano leaping through Rubinstein's *Melody in F*. The peculiar jumps in the music held me rooted. To this very day I can't hear the tune without picturing myself in the arcade, standing there barefoot and in overalls, drinking it all in avidly."

To hear George Gershwin's music is to know that he grew up on the sidewalks of New York. He did his composing atop Fifth Avenue buses—on trains—in rooms crowded with chattering friends. "I frequently hear music," he wrote, "in the very heart of noise."

Although George's formal training in music was slight, his first success, *La La Lucile*, opened on Broadway when he was only twenty-one years old. In 1924—in his twenty-sixth year—he graduated from Tin-Pan Alley

to Carnegie Hall by composing *Rhapsody in Blue*. It brought him a million dollars in royalties—and highest praise from serious critics the world over.

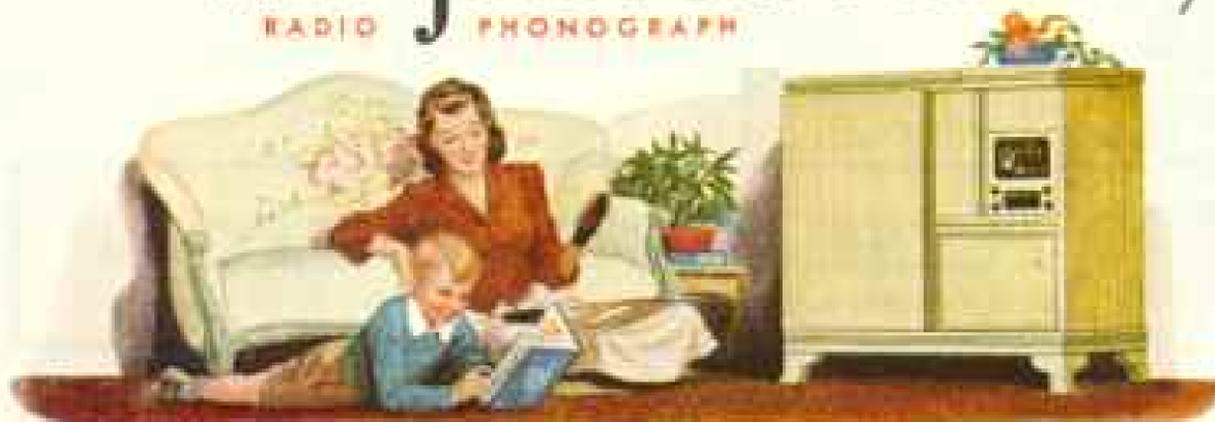
Whether you prefer the George Gershwin of *Lady, Be Good* and *Of This I Sing* or the George Gershwin of *Rhapsody in Blue* and *Porgy and Bess*, it will add to your enjoyment of his recorded music to hear it played by a Magnavox. Probably the best evidence of this instrument's notable superiority is this: The Magnavox is the radio-phonograph chosen above all others by such great contemporary artists as Kreisler, Heifetz, Ormandy, Beecham and Horowitz.

*Send for Reproductions of Paintings: Set of ten reproductions of paintings from the Magnavox collection—size 11½" x 9", suitable for framing—50¢ at your Magnavox dealer. Or send 50¢ in War Stamps to Magnavox Company, Department NLG10, Fort Wayne 4, Ind.

Magnavox.

RADIO PHONOGRAPH

The choice of great artists



MAGNAVOX™

To appreciate the marked superiority of the Magnavox listen to a Frequency Modulation program over this instrument. Magnavox was an FM pioneer and the reproduction qualities required to take full advantage of FM broadcasting are inherent in the Magnavox radio-phonograph.



Buy that extra War Bond today.

CLEANING STEEL with BRUSHES of FLAME



Without paint protection, the strongest exposed steel structures would eventually succumb to rust. Now modern flame-cleaning makes paint cling closer to steel, forming a better, longer-lasting shield against corrosion. It speeds repainting by rapidly cleaning and dehydrating the surface to receive the priming coat.

This process is one of many advanced metal-treating methods fostered by Air Reduction. Valuable in war, these methods promise even greater usefulness when peace returns.

★ BUY UNITED STATES WAR BONDS ★

AIR REDUCTION SALES COMPANY
MAGNOLIA AIRCO GAS PRODUCTS CO.
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WILSON WELDER & METALS CO., INC.



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OXYGEN, ACETYLENE AND OTHER ATMOSPHERIC GASES • GAS WELDING AND CUTTING APPARATUS • CALCIUM CARBIDE
ARC WELDING MACHINES AND SUPPLIES • CARBON DIOXIDE • "DRY ICE" • ANAESTHETIC AND THERAPEUTIC GASES AND APPARATUS



Buy War Bonds — to Have and to Hold

The story behind the Boeing Superfortress

Remember back to January, 1940? The war in Europe was not yet five months old and war with Japan still two years away, but the U. S. Army Air Forces even then demanded an airplane that would carry a heavier bomb load farther, faster and higher than any the world had ever known.

Leading aircraft companies were invited to submit designs.

In February, thirty days before Hitler invaded the Low Countries, the Army radically increased its specifications. Those new requirements made the design problems still more difficult. But Boeing—with its unequalled background of 4-engine experience in building

such planes as the Flying Fortress, the Stratoliner and transoceanic Clippers—was in the best position to solve them.

Wind tunnel tests of the Boeing model so impressed the Army that Boeing was authorized to build three experimental airplanes. And then—even before the first of these had been completed and flight tested—the Air Forces decided that this was the world's number one bomber! Quantity production was ordered—one of the greatest manufacturing programs ever put behind any weapon of war. This program eventually included the Bell and Martin plants as well as three Boeing

plants, and literally hundreds of sub-contractors.

This placed a tremendous responsibility upon Boeing, not only in engineering the design but also getting it into production.

So sound was the basic design that not one major change had to be made when flight tests began. And approximately a year and a half later the first production models were bombing Japan.

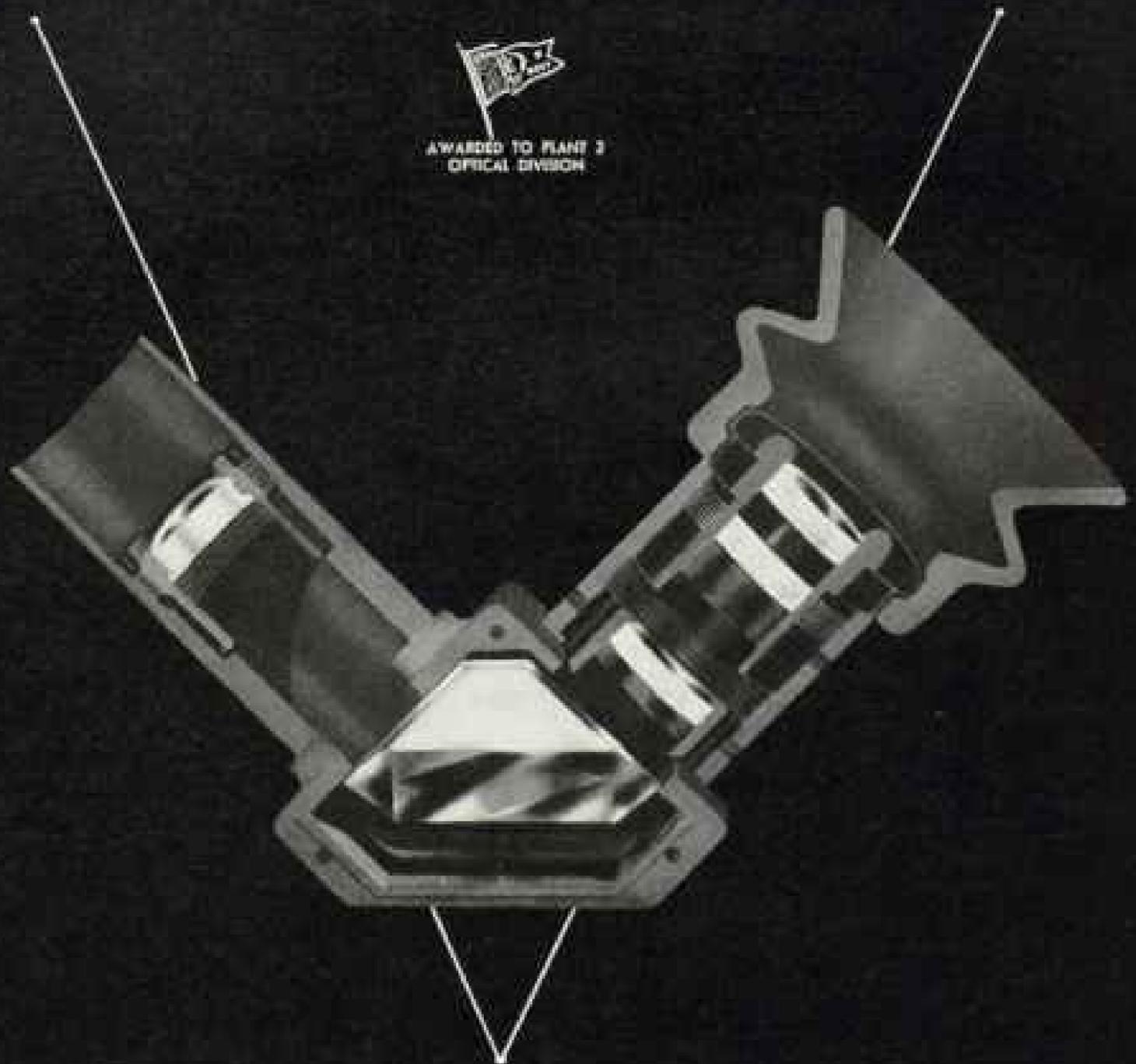
Superfortresses are taking their place along with the famous Flying Fortresses in Boeing's effort to provide the Army's great bombing crews with the best possible airplanes to accomplish their hazardous and important missions.

Jewels of Today

ARGUS EYES FOR VICTORY



AWARDED TO PLANT 3
OPTICAL DIVISION



MILITARY OPTICAL INSTRUMENT

argus

Cameras and Optical Instruments



ARGUS, INCORPORATED . . . ANN ARBOR, MICHIGAN



"Young man — you have it!" said the Wizard of Menlo Park

IT IS A warm August evening in 1896. Around a banquet table on Long Island sit Thomas A. Edison and the country's leading men of the electrical industry.

The talk swings naturally to politics, to Bryan and McKinley and the Cuban situation—then back again to business. There is high discussion about storage batteries to drive America's "horseless carriages". Someone points to young Henry Ford, Chief Engineer of the Detroit Edison Company, and says: "There's a man who has built a gas car!"

At once, Edison eagerly begins to ask questions—and to listen. "How do you explode the gas in

the cylinder? Do you do it by contact or a spark?"

On the back of a menu, Henry Ford sketches the details of his engine. Edison thumps the table so hard the glassware tinkles.

"Young man, that's the thing—you have it. Keep at it. Your car is self-contained—carries its own power plant—no fire, no boiler, no smoke, and no steam. *Keep at it!*"

Here was just the challenge and encouragement which Henry Ford needed most. It was something he never forgot. And through the years, keeping-at-it has remained a firm tradition of the Ford Motor Company as it has

moved forward in the creation of 30 million reliable cars and trucks.

It is this keeping-at-it in research, in engineering and production, that has made the Ford name a synonym for smart, comfortable, economical transportation, priced to serve the needs of the greatest number.

In peaceful days ahead, the new Ford, Mercury and Lincoln cars will reflect all the established Ford skills and inventiveness. Their advanced styling will match their quality leadership, and they will benefit by the newer knowledge of materials and techniques being achieved as Ford *keeps at it* in making the tools of victory.

FORD MOTOR COMPANY





To take the measure *of a coming job*

FEW PEOPLE notice or even think of the many special abilities the railroads have been required to develop. One of these is accurately anticipating the need of agriculture and other industry for rail transportation.

Because they do this, freight cars for years have almost always appeared at the right place, at the right time and in the right number. This has been a *must* for orderly marketing and efficient low-cost transportation.

Today, while everything they have is working day and night to hasten victory, the railroads are busy also taking the measure of the jobs that lie ahead.

What new kinds of goods will have to be carried? What kinds of cars will they need? Where will they come from and where will

they go? What service and rates will be needed to develop business, shipping and employment?

Long before the call comes for postwar action, the answers to these and hundreds of other questions must be ready. Finding the answers to these questions is the work of a separate group of seasoned railroaders—the Railroad Committee for the Study of Transportation.

In this way, the railroads are looking ahead to the time when America turns again to peacetime work—and planning their necessary part in helping to make it a wonderful land to live in, just as they have helped make it strong in time of war.



ASSOCIATION OF
AMERICAN RAILROADS
ALL UNITED FOR VICTORY



WESTWARD REACH

In the long lifetime of man, civilization has ever set a westward course. That was true sixty-two years ago, when Matson first bent its canvas to a westward reach and began the long task of joining Islands to Mainland in harmony and understanding. Today, Matson men and Matson ships are busy on many seas and at many tasks of war; but the day will return when it will again be our duty to assist in opening new horizons, by sky as well as by sea. Matson will welcome this opportunity to serve, in still wider sphere, those who have come to rely on us in the past.

Matson KNOWS THE PACIFIC

MATSON LINES TO HAWAII AND THE SOUTH PACIFIC
SAMOA • FIJI • NEW ZEALAND • AUSTRALIA



FACTS ABOUT THE PACIFIC COAST

1. A Growing Market

For decades—during wars, depressions and booms—this region has made steady increase in population and now has over 11 million enterprising people.

2. Higher Buying Power

Leading the nation in per capita wealth, this region with only 8 1/2% of the population has 12% of the U. S. Spendable Income—\$13 1/2 Billion—and Retail Sales of \$7 1/2 Billion.

(SM Survey of buying power)

3. Diversified Industries

Advanced at least 25 years industrially due to the war, the Coast faces easier conversion due to its great agricultural development, oil, lumber, mining, motion pictures, wholesaling and widely diversified manufacturing.

4. Plants and "Production Brains"

Modern, well equipped plants, easily convertible to peacetime production, plenty of skilled workers, and seasoned management mean economical manufacturing costs.

5. Strategic Location

San Diego offers low cost water transportation for raw materials and finished products. Economically accessible to all parts of the United States, Alaska, South America, the Orient, plus a co-operative climate.

"After the War, here's our best Opportunity"

...THE FACTS PROVE IT

War-busy executives who are informed on the basic economic trends of the Pacific Coast know that this mighty industrial and agricultural empire offers a practical approach to their company's reconversion problems when hostilities cease.

"Ready-Made" Facilities Here

Tremendous sales opportunities will open up from this region in both domestic and foreign markets.

Since constructive planning is the first step in a successful return to peacetime pursuits, the economic advantages of manufacturing in and distributing from the great Southern California industrial area are worthy of complete and objective study.

Rohr management and manufacturing facilities are still on the front line of the Battle of Production. They will remain there until the last shot is fired, because Rohr equipped Liberator bombers, the Lightning fighters and the Rohr converted Commodore cargo carriers are on the front line of attack

and supply operations. "When it's over", Rohr's ideal location, directly on San Diego Bay, in the most uniformly favorable year-round climate in the United States, has ready-made ingredients of management, skilled labor, plant facilities and cheap re-entrance to east markets.



Buy More Bonds...
Hold them till maturity.





BOY WAR BONDS AND STAMPS

The army moves at dawn

It was cool in the field last night. . . . The army gets up reluctantly, at the command of a twelve-year-old sergeant. Steam rises from each warm patch of earth. Slowly the column forms and trudges toward the barn.

It's not a very big army, but it's important to America's military strength. For milk is this country's most valuable crop. Milk is nature's most nearly perfect food. And milk products make up about 25% of the food consumed by the average American.

Well-fed civilians work better. Well-fed soldiers fight better. *And the nation's dairy farm families - toiling long and hard to lick the shortages of manpower and machinery - are making a major contribution to victory.*

As our forces overseas increase, huge supplies of *all* foods must follow. As the peoples of ravaged lands are freed, they'll need food from us until they can grow their own. *Every American can save lives by saving food.*

National Dairy is proud to have a part in this big job. We delivered \$96,000,000 worth

of milk products for direct-war purposes last year. And our research laboratories helped develop new products for the Army and Navy that will be as beneficial in peace as they are valuable in war.

Dedicated to the wider use and better understanding of dairy products as human food . . . as a base for the development of new products and materials . . . as a source of health and enduring progress on the farms and in the towns and cities of America.

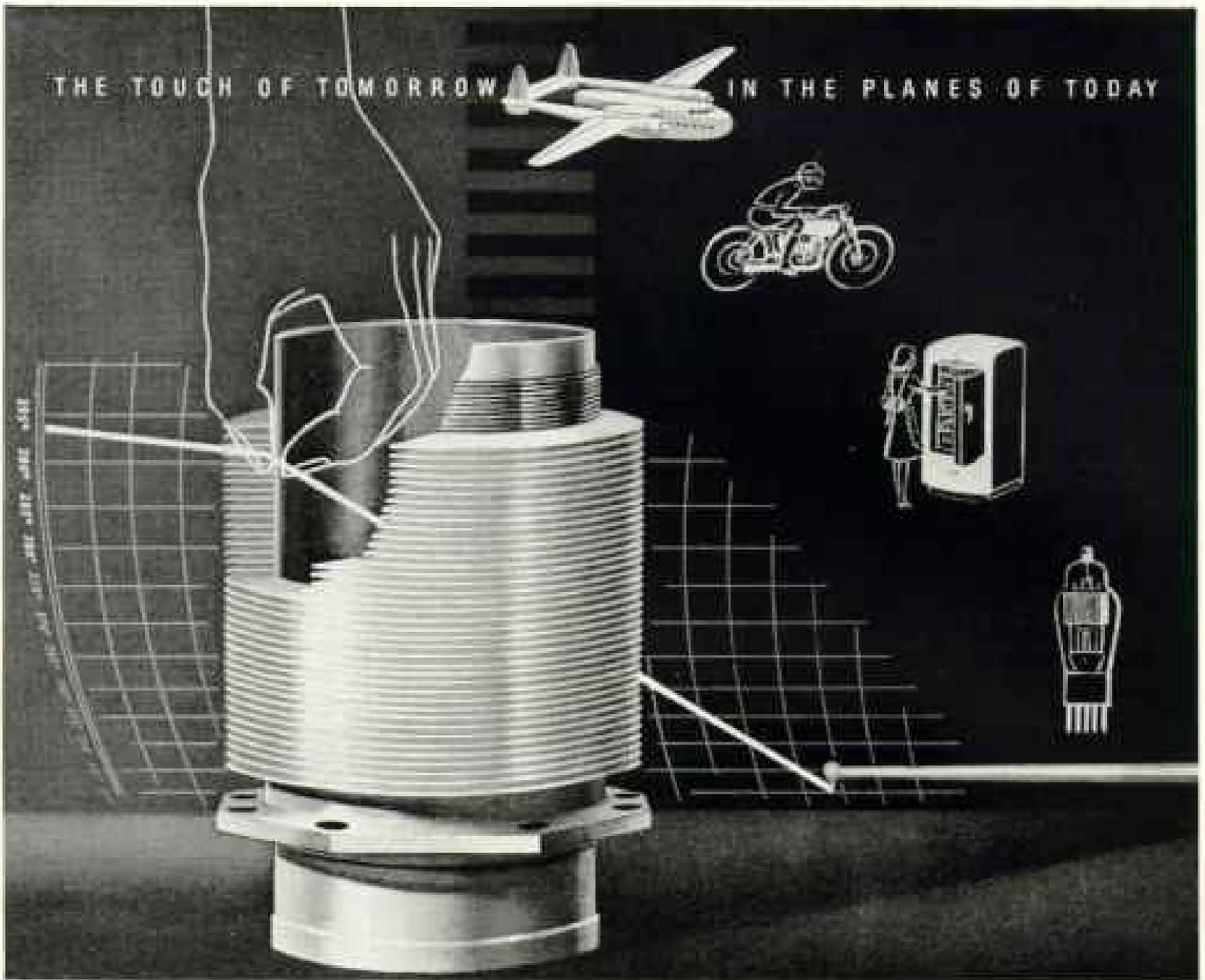


**NATIONAL DAIRY
PRODUCTS CORPORATION**

AND AFFILIATED COMPANIES

THE TOUCH OF TOMORROW

IN THE PLANES OF TODAY



Milestone in Metallurgy

In 2,000 B.C., man alloyed copper with tin to make bronze.

In the 14th century, craftsmen fused iron with carbon to make steel.

In the 19th century, man first successfully welded one ferrous metal to another.

Today, as result of Fairchild engineering and research, *man can now join aluminum to steel!*

Through its application to aircraft engines—the chemical bonding of aluminum to cylinder barrels—Fairchild engineers have been able to achieve far more rapid dissipation of heat—greater development of horsepower without increasing piston displacement. The Al-Fin cylinder is being used exclusively on all higher-power Ranger engines.

The future of the Al-Fin principle in aviation

and other heavy-duty industries is assured.

It also has wide possibilities in the consumer field—refrigerators and radio tubes, motorcycles, family planes and autos. In appliances for home, office, factory and farm, the Al-Fin process can effect decided improvements.

Listed here are a few of the possible additional applications of the Al-Fin Process.

As you consider their magnitude consider what makes them possible—the research and engineering of an organization whose credo is "The Touch of Tomorrow in the Planes of Today."

The Future of Al-Fin

Bearings • Cylinders • Pistons • Brakes
Radiators • Refrigerators • Compressors
Fire pumps • Motorcycles
Auxiliary power plants • and many others

BUY U. S. WAR BONDS AND STAMPS

 **FAIRCHILD**

ENGINE AND AIRPLANE CORPORATION
30 ROCKEFELLER PLAZA, NEW YORK

Ranger Aircraft Engines Division, Farmingdale, L. I. • Fairchild Aircraft Division, Hagerstown, Md. . . . Burlington, N. C. • Drummell Division, New York, N. Y.
Subsidiary, Al-Fin Corporation, New York, N. Y. • Affiliated, Statco Corporation, New York, N. Y.

Copper is the trunk of an indispensable family tree

The copper family of alloys is versatile indeed... has helped make possible the telephone, refrigeration, radio... has contributed to the development of practically all technical and industrial progress.

For these time-tested, dependable copper alloys combine strength and workability, electrical and thermal conductivity, resistance to corrosion and

freedom from rust... properties that make these metals so necessary for war equipment.

But as soon as conditions permit, copper and its alloys will be ready for expanded peacetime uses. Manufacturers will again have Anaconda Copper, Brass, Bronze and Nickel Silver for the products that play so important a part in American living.

COPPER

- LEADED BRASSES** (COPPER PLUS LEAD)
 - Extruded architectural shapes for door frames, doors, thresholds, etc. Printers' rules, clock and instrument parts, door butts, screw machine products, plumbing accessories, hardware.
- LEADED NICKEL SILVER** (COPPER PLUS LEAD AND NICKEL)
 - Pins, eyelets, snap fasteners, musical instruments, stamped and drawn parts such as automobile reflectors and lamps, artillery and cartridge cases, electrical sockets, lamp bases, etc.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - For applications requiring special properties: Hardware bolts, tie rods, pumps, valve stems, heat exchanger tubes and sheets, wire screens, perforated plates.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Waterboat shafting, marine hardware, nuts, bolts, rivets, airplane turnbuckle barrels, valve and pump parts, welding rods. *Reg. U. S. Pat. Off.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Free-cutting alloy, white alloys used for screw machine products such as cigarette lighter and filing reel parts. Extruded architectural shapes, grilles, keys, etc.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Water pipe, auto radiator cores, drawn, stamped and spun parts, vanity cases. Oil refinery, chemical processing, air conditioning equipment.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Base metal for silver-plated ware. Drafting and tool instruments. Hospital, dental and optical equipment. Architectural trim, slide cases, electrical resistances.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Custom jewelry, grilles, weatherstrip, ammunition components, forgings, screws, rivets, hardware stampings, screen cloth.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Engineering alloys, exceptionally corrosion resistant. Used for marine condensers, tubes and tube sheets, turbine blades, salt water piping, chemical and processing equipment.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Screw machine products: Hardware, gears, pinions, bearings, bushings, valve, pump and other parts where high resistance to wear is essential.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Aircraft engine parts: Valve seats and guides, propeller hub cones, spark plug inserts, bushings, etc.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - High strength springs, snap switches, socket and plug contacts, fuse clips, diaphragms, screen plates, flexible tubing, hardware, bearings, welding rods.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - A heat-treatable copper alloy with unusual spring setting and high endurance. For springs, contact brushes, knife blades, vibrator arms, diaphragms, instruments.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Strong, weldable copper-silicon alloys for water heater tanks. Sewage, water works, chemical equipment. Bolts, nuts, screws, marine, pipeline hardware. *Reg. U. S. Pat. Off.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Electrical wires, cables, bus conductors, commutator segments, electronic equipment, water pipe and tube, storage tanks, refrigeration tubes, vats, stills, and kettles.
- NICKEL SILVER** (COPPER PLUS NICKEL AND ZINC)
 - Chemical and cooking equipment, gaskets, automobile radiators, connector heaters, engravers plates, Roofing, flashing, gutters, downspouts.
- LEADED BRASSES** (COPPER PLUS LEAD)
 - For applications requiring special properties: Hardware bolts, tie rods, pumps, valve stems, heat exchanger tubes and sheets, wire screens, perforated plates.
- TOBIN BRONZES** (COPPER PLUS TIN AND PHOSPHORUS)
 - Waterboat shafting, marine hardware, nuts, bolts, rivets, airplane turnbuckle barrels, valve and pump parts, welding rods. *Reg. U. S. Pat. Off.
- RED BRASSES** (COPPER PLUS ZINC AND LEAD)
 - Water pipe, auto radiator cores, drawn, stamped and spun parts, vanity cases. Oil refinery, chemical processing, air conditioning equipment.
- COMMERCIAL BRONZES** (COPPER PLUS TIN)
 - Custom jewelry, grilles, weatherstrip, ammunition components, forgings, screws, rivets, hardware stampings, screen cloth.
- LEADED BRONZES** (COPPER PLUS LEAD AND TIN)
 - Screw machine products: Hardware, gears, pinions, bearings, bushings, valve, pump and other parts where high resistance to wear is essential.
- BRONZES** (COPPER PLUS TIN)
 - Aircraft engine parts: Valve seats and guides, propeller hub cones, spark plug inserts, bushings, etc.
- ALUMINUM BRONZES** (COPPER PLUS ALUMINUM)
 - High strength springs, snap switches, socket and plug contacts, fuse clips, diaphragms, screen plates, flexible tubing, hardware, bearings, welding rods.
- BERYLLIUM COPPER** (COPPER PLUS BERYLLIUM AND NICKEL)
 - A heat-treatable copper alloy with unusual spring setting and high endurance. For springs, contact brushes, knife blades, vibrator arms, diaphragms, instruments.
- EVERETT** (COPPER PLUS SILICON)
 - Strong, weldable copper-silicon alloys for water heater tanks. Sewage, water works, chemical equipment. Bolts, nuts, screws, marine, pipeline hardware. *Reg. U. S. Pat. Off.



Anaconda Copper Alloys

BUY WAR BONDS...
More than before

THE AMERICAN BRASS COMPANY • General Offices: Waterbury 88, Conn. • Subsidiary of Anaconda Copper Mining Company
In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

FALSE TEETH WEARERS

Why
risk Double Danger
by brushing with
makeshift cleaners

BRUSHING your plates with tooth pastes, tooth powders or soap, may scratch the denture material which is 80 times softer than natural teeth. These scratches cause film, food particles, and stains to collect faster and cling tighter . . . resulting in unpleasant breath. Remember, you may not know you have it, but others do! Besides, brushing with makeshift cleaners often wears down the delicate fitting ridges designed to hold your plate in place. With worn-down ridges, of course, your plate loosens.



DO THIS  EVERY DAY!

PLAY SAFE... SOAK YOUR PLATE IN POLIDENT. Place denture in Polident solution for 15 minutes, or longer if convenient. Rinse—and it's ready to use.

No brushing

A SAFE, MODERN way to keep dental plates, partial plates and removable bridges sparkling clean is to soak them in Polident every day.

Polident is approved by many leading dentists and the leading makers of modern denture materials.

No brushing, no danger, yet the daily Polident bath works into the corners and crevices no amount of brushing seems to reach—keeps your denture sparkling clean.



"NOW WE GO OUT... meet friends . . . have fun together." Millions call Polident a blessing. No fear of unpleasant breath due to unclean dentures—no risk of wearing down and loosening the plate due to brushing. Polident used daily helps maintain the original, natural appearance of your dental plate for less than a penny a day. Today—get Polident at any drug, department or variety store. 3 oz. size—30¢; 7 oz. size—60¢.

FREE—Booklet on Care of Dentures. Write: Hudson Products, Inc., Dept. M-104, 8 High St., Jersey City 6, N. J.

POLIDENT

The Safe, Modern Way to
Clean Plates and Bridges

FOOD fights for FREEDOM
produce and conserve—
share and play square!



10 DIVISIONS OF FIGHTING ENGINES

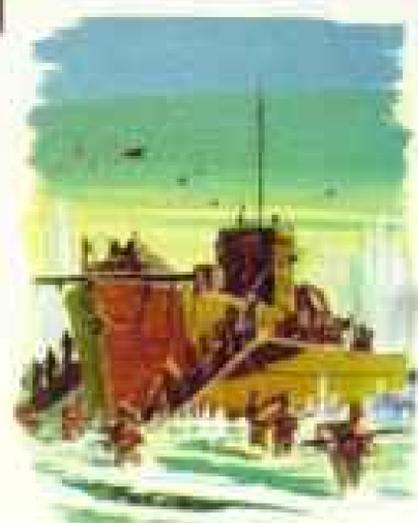
MONTHS ago the Detroit Diesel Engine Division of General Motors sent engine No. 100,000 off the production line to its war job. Many more have followed since. Measured as men, more than ten divisions of these six-cylinder Diesels are actively in the fight.

They're in landing craft helping to crack Fortress Europe and to cut the Nips' string of islands. They're in tanks, trucks, bulldozers and all

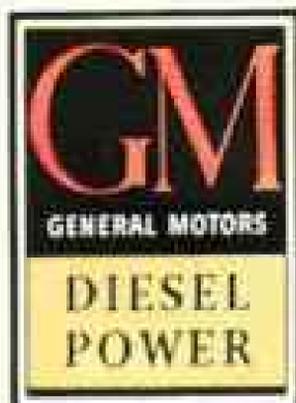
kinds of other equipment.

The reasons are, these Diesels are tough and dependable. They're easy to maintain. They burn inexpensive fuel oil.

They have been tried and proved in all sorts of war jobs on every battle front. And they've been found good. With the coming of peace these engines will be available for all the applications where America will need reliable, low-cost power.



*KEEP
AMERICA STRONG
BUY
MORE WAR BONDS*



ENGINES . . . 15 to 250 H. P. . . . DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.

ENGINES . . . 150 to 2000 H. P. . . . CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

LOCOMOTIVES ELECTRO-MOTIVE DIVISION, La Grange, Ill.

SHIP RECOVERY, 1794
A trade mark of Old Spice for Men



EARLY AMERICAN
Old Spice
 SHAVING REQUISITES

The historic tang of Early American Old Spice . . . the historic touch of early American pottery containers . . . the historic triumph of shaving requisites that have won the unstinted praise of American men. Free-lathering Old Spice Shaving Soap in pottery mug \$1.00, refreshing After-Shave Lotion \$1.00,* invisible Talcum 75¢.* *Not illustrated:* Bath Soap, 2 cakes, \$1.00. Also in sets—\$1.00 to \$5.00.* Each a Shulton Original.

*Make Your Dollars Fight. . . Back Up Our Men
 Buy War Bonds*

*Trade Mark Reg. U. S. Pat. Off. ©1942 The
 SHULTON, INC. • ROCKEFELLER CENTER • N. Y. 20



One of the famous MOVADO Watertight watches. Made in stainless steel, steel and gold, 14K gold. Varied sizes for men and women. No superfluous parts have been added which might affect the efficient construction of its full-size movement. Moderately priced. The supply of these watches is limited.

MOVADO

Winners of 165 Observatory Awards
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 Dept. 1848, Movado Watch Agency, Inc. 610 Fifth Ave., N. Y.

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 WEBSTER'S NEW INTERNATIONAL
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 The Merriam-Webster is the standard of schools and colleges; State Supreme Courts; the Government Printing Office; professional and business offices everywhere. Contains 600,000 Entries—122,000 more than in any other dictionary. 17,000 terms illustrated. 3,350 Pages. G. & C. MERRIAM CO., Publishers, Springfield 2, Mass.



"The
 Supreme
 Authority"

"Buy U. S. War Bonds—They Identify You"



"But, Doctor, can't you get here sooner?"



DO YOU KNOW what to do for illness or accident before the doctor comes?

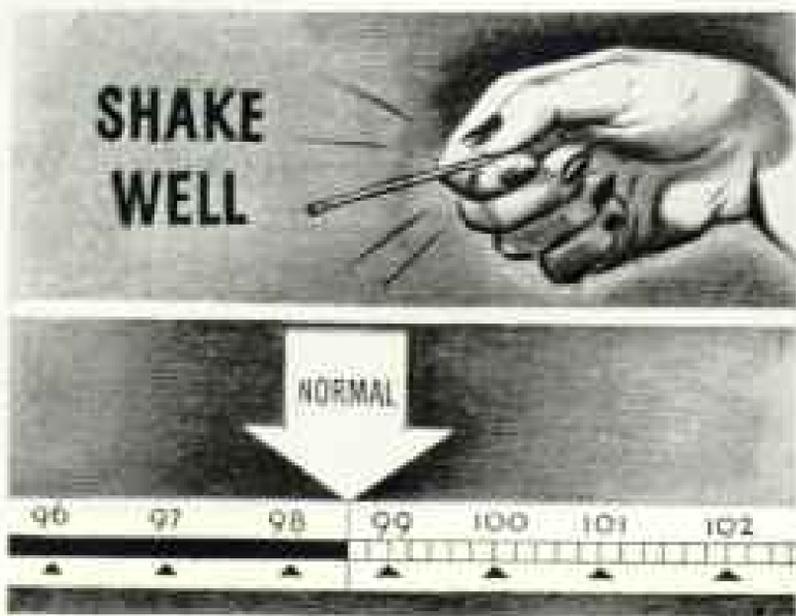
It's mighty important these days. Doctors are busier than ever and often can't come the minute they are needed.

So it's up to you to know elementary first aid

and the most common signs of disease.

Most of all, of course, you can help yourself—and your doctor—by keeping well. And if any unusual or persistent condition develops, see your doctor *early*. You'll save your time and his.

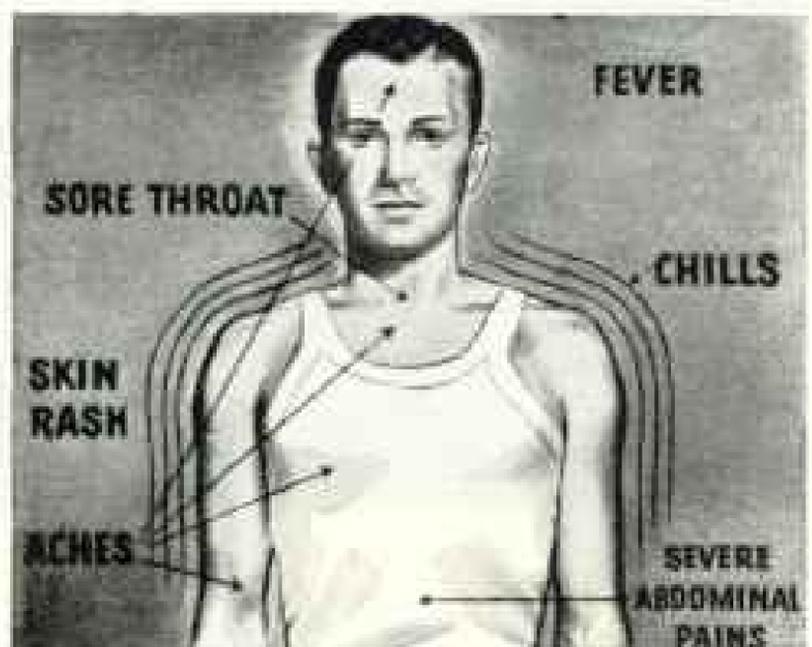
Meanwhile, check on these important points.



1. Can you take a temperature?

Fever thermometers are easy enough to use. The mercury should be well shaken down. Leave thermometer under tongue at least three minutes.

Any person with a temperature much above normal (98.6°) probably needs medical attention and should go to bed.



2. What are common danger signs?

Sore throat . . . skin rash . . . chills, fever and aching . . . persistent or severe abdominal pain are often signals that precede a real illness. If one or more of these symptoms are present, it's best to consult a doctor.



3. Do you know how to call a doctor?

If it's illness, the doctor wants to know signs and symptoms as accurately as you can tell him, how long they've lasted; the patient's temperature.

If an accident, describe the injury; what you've done; the victim's apparent condition.

With your intelligent help the doctor can offer suggestions, decide how urgently he's needed, and foresee what equipment he will need.

Don't let your first aid knowledge get rusty. You'll find Metropolitan's free booklet, "First Aid," helpful. It contains, too, a check list to see if your medicine cabinet is fully equipped.

COPYRIGHT 1944—METROPOLITAN LIFE INSURANCE CO.

Metropolitan Life Insurance Company

(A MUTUAL COMPANY)

Frederick H. Esher, CHAIRMAN OF THE BOARD

Levy A. Lincoln, PRESIDENT

1 MADISON AVENUE, NEW YORK 10, N. Y.



Metropolitan Life Insurance Company
1 Madison Avenue, New York 10, N. Y.

Please send me a copy of your booklet, 104-N, entitled "First Aid."

Name _____

Street _____

City _____ State _____



Cercopid—The Fortress Builder

THE CERCOPID, or froghopper, begins life as an inconspicuous, soft-bodied bug, less than a quarter of an inch long.

He is found on plant stems and blades of grass all over America.

There are many insect enemies that are eager to make a meal of him. And he can't run away from danger until the time comes for him to grow wings and jumping legs.

But the froghopper is an ingenious little bug. He builds a fortress. And this fortress is unlike any other found in the insect world.

Soon after birth, he starts secreting a liquid. This he beats into tiny bubbles with his tail until it forms a white froth which gradually covers him.

When the bubble fortress is finished, the froghopper is snugly hidden beneath what looks like a bit of beaten egg white. Perhaps you, yourself, have seen the tiny masses of froth, sometimes called "cuckoo spit," in the fields and woods near your home.

The fluid which forms the bubbles is of a resistant, sticky texture. In addition to concealing him, it prevents most of the froghopper's enemies from breaking through and seizing him.

Yet even with this remarkable protective de-

vice, the froghopper is not entirely secure. There are some enemies, a species of wasp, for example, that can penetrate his defense. And then he must face certain disaster.

Now man, too, can build a fortress for protection. But his is far more dependable.

It is a financial fortress. And it protects him not against physical mishap but against the heavy expenses and economic disaster which might follow. This fortress is insurance.

If an automobile accident or a fall down the cellar stairs should land you in the hospital for several months, Accident insurance will provide an income for your family while you must be away from your job. It will pay your doctor's and hospital bills, too.

One never knows when an accident may happen. To play safe, you need the important protection which Accident insurance can give you. Your local Travelers man will be glad to talk over this problem with you.

MORAL: Insure in The Travelers. All forms of insurance and surety bonds. The Travelers Insurance Company, The Travelers Indemnity Company, The Travelers Fire Insurance Company, Hartford, Connecticut.

Have a "Coke" = Ahoy, mates



...or keeping up the good work

Faster and faster the ships go down the ways in the wartime shipbuilding program. From sunny California to the coast of Maine, workers have learned that *the pause that refreshes* helps everybody do *more work and better work*. Have a "Coke" says a hard-working shipbuilder to his mates. It's a little minute long enough for a big rest. Whether in a shipyard or in your own living room, Coca-Cola stands for *the pause that refreshes*,—has become a symbol of friendly relaxation.

* * *

Our fighting men meet up with Coca-Cola many places overseas, where it's bottled on the spot. Coca-Cola has been a globe-trotter "since way back when".



"Coke" = Coca-Cola

It's natural for popular names to acquire friendly abbreviations. That's why you hear Coca-Cola called "Coke".

Pictures carry him back...



2X Minicolor Print, from
a miniature Kodachrome
transparency. Reduced in size.

Minicolor Prints

A letter . . . a Minicolor Print . . . and he's back home again . . . walking a well-remembered street with a little daughter who can't take her eyes off him.

Send your serviceman real-as-life Minicolor Prints made from Kodak Bantam or 35-mm. Kodachrome Film transparencies. Full-color photographic enlargements, they reproduce all the beauty of your original transparencies. Three sizes. Order through your Kodak dealer.

Kodacolor Snapshots

Or send Kodacolor snapshots. With Kodacolor Film, anyone—in bright sunlight—can take these beautiful color snapshots with an ordinary Kodak or Brownie. From the negatives, the Kodak Company makes Kodacolor Prints—full-color snapshot prints on paper . . . Kodacolor Film, like all film, is scarce; but there's a little to be had. Ask your Kodak dealer . . . Eastman Kodak Company, Rochester, N. Y.

THE MARCH OF COLOR

IN 1928 Kodak brought out a film for making home movies in full color.

IN 1935 Kodak introduced full-color Kodachrome



Kodacolor snapshot, reduced in size.

chrome Film—making color movies available to every American home.

IN 1936 Kodachrome "still pictures," shot with a Kodak Bantam or 35-mm. camera, became the joy of tens of thousands.

IN 1938 Kodachrome sheet film led to full-color photographs as magazine and newspaper illustrations.

IN 1941 Kodak introduced Minicolor Prints from miniature Kodachrome Film transparencies—the first direct full-color photographic prints.

IN 1942 Kodacolor Film fulfilled the dream of generations—color snapshots, full-color prints made from color negatives in an ordinary roll-film camera.

Kodak Research

HAS MADE COLOR PHOTOGRAPHY
A PART OF EVERYONE'S LIFE

The glory of Autumn
remains undimmed in

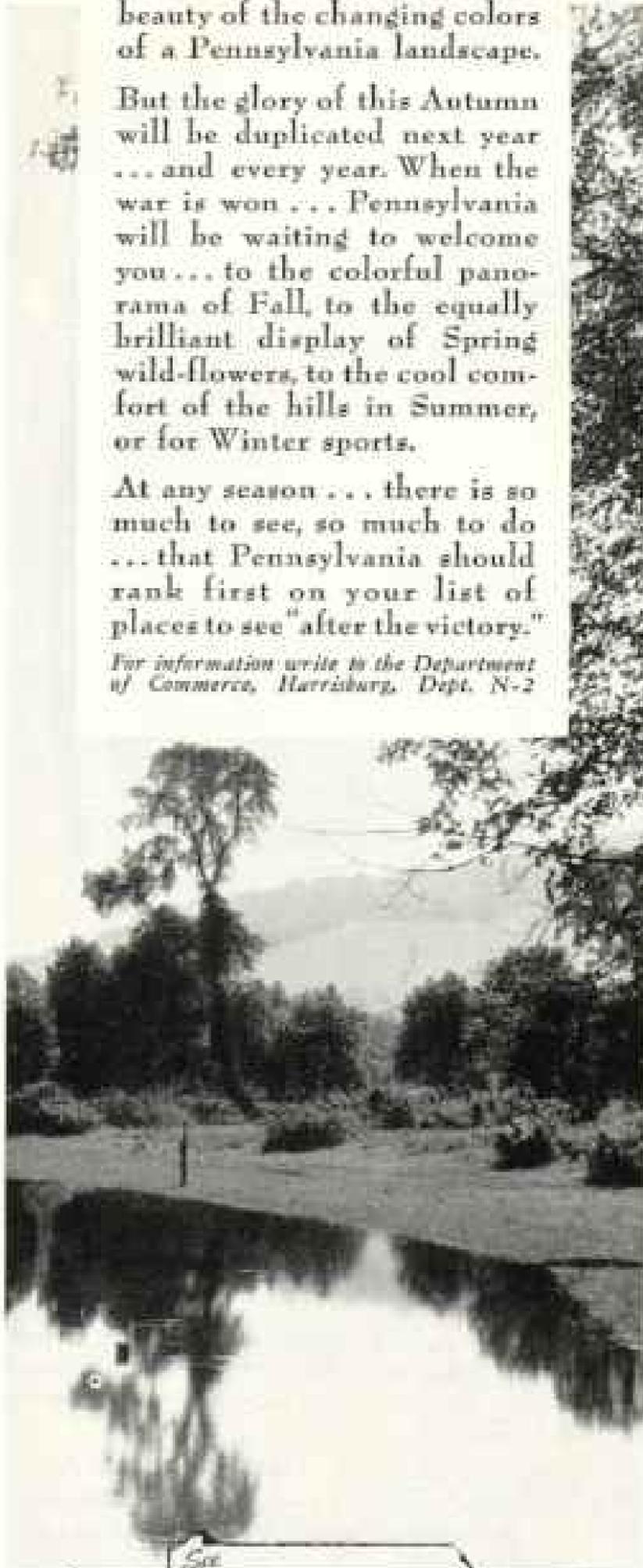
PENNSYLVANIA!

• When Autumn works its magic this October, you may not be able to rejoice in the beauty of the changing colors of a Pennsylvania landscape.

But the glory of this Autumn will be duplicated next year ... and every year. When the war is won ... Pennsylvania will be waiting to welcome you ... to the colorful panorama of Fall, to the equally brilliant display of Spring wild-flowers, to the cool comfort of the hills in Summer, or for Winter sports.

At any season ... there is so much to see, so much to do ... that Pennsylvania should rank first on your list of places to see "after the victory."

For information write to the Department of Commerce, Harrisburg, Dept. N-2



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For information and free booklet, write our 23-year, non-profit Tucson Sunshine Climate Club, 4403-d Rialto, Tucson, Arizona.

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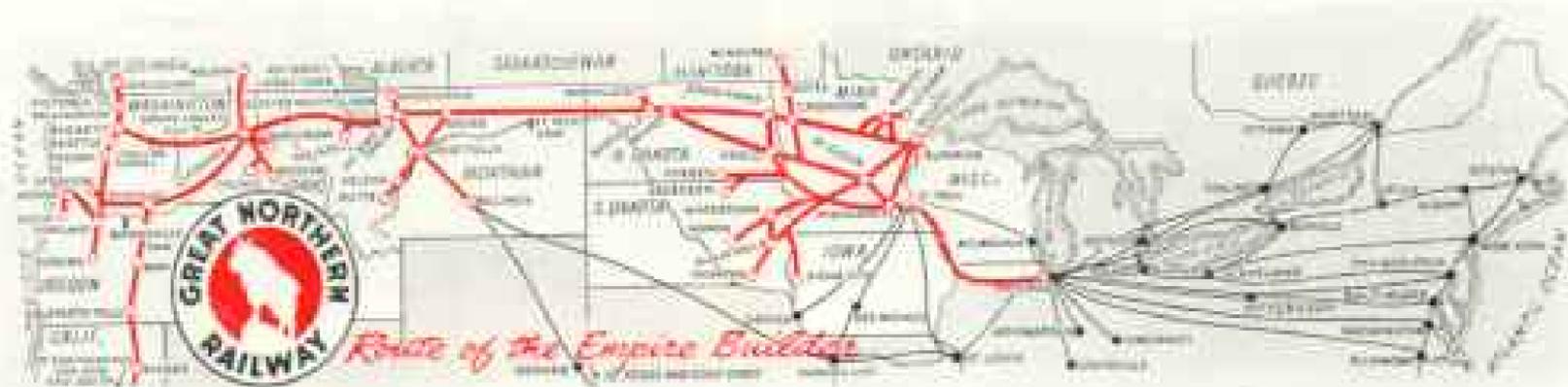


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LIGHTER, FASTER FREIGHT CARS OF PLYWOOD, STEEL AND LUMBER

Combination of Materials Results in Sturdiness, Less Weight

Construction of the American railroad industry's first plywood-steel freight cars is under way by Great Northern Railway in its own shops.

Another symbol of progres-

siveness—one of the many things which make Great Northern great—1,000 of these new, bright orange-painted freight cars will be in wartime transportation service before winter.

Developed by company technicians, the modern, 50-ton capacity cars are a combination of steel, Douglas fir plywood and lumber.

Lighter-than-conventional steel was utilized for underframes, while lumber and steel form the superstructures. Outside and inside sheathings, including ceilings, are of $\frac{5}{8}$ -inch plywood. To prevent warping, the plywood is treated with a "sealer."

Two tons lighter than the conventional boxcar, the plywood-steel units roll faster because of high-speed trucks, non-harmonic springs and wrought steel wheels. Steel ends and metal roofs add to sturdiness.



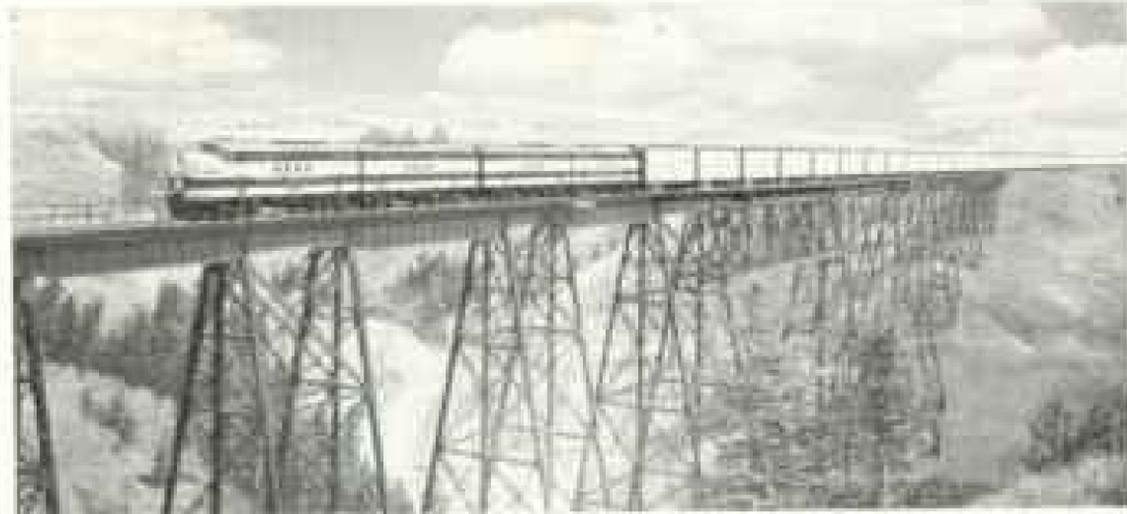
Sheathings of $\frac{5}{8}$ -inch Douglas fir plywood are placed outside and inside steel and lumber superstructure.



Interiors are sprayed with varnish. The plywood first is treated with a "sealer" to prevent warping.



Plywood panels are bolted and nailed to superstructure of steel and lumber.



Powered by G. N.'s newest 5,400-horsepower diesel locomotives, a 100-car train of plywood-steel cars approaches Glacier National Park en route to the Pacific Northwest.

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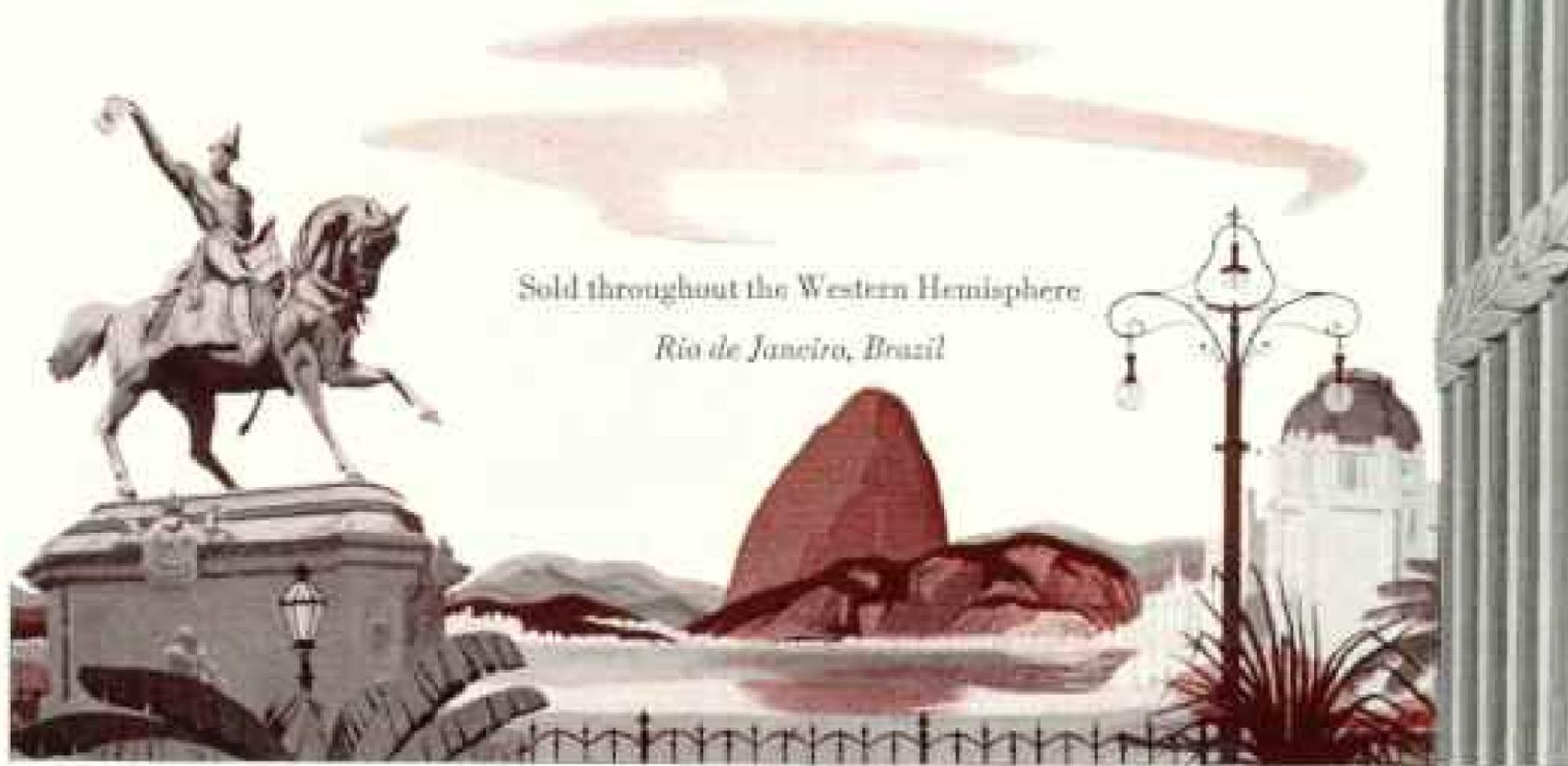




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