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Special Map Supplement of the World

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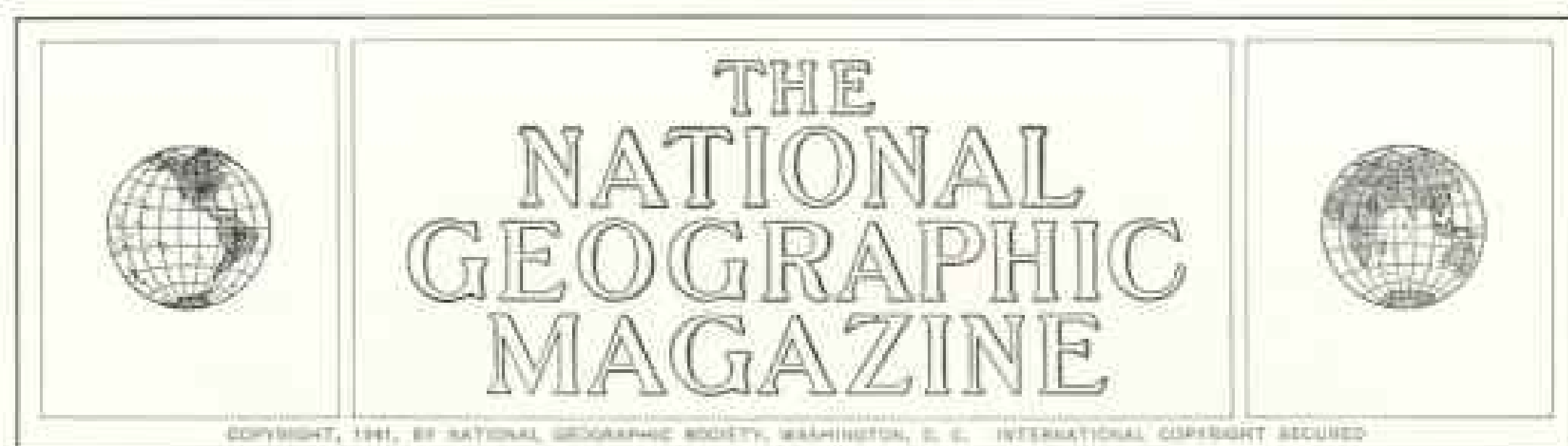
CHARLES M. BROOKFIELD

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U. S. Roads in War and Peace

BY FREDERICK SIMPICH

UNIQUE in highway history is the tremendous traffic now carried by our public roads.

Strange martian vehicles swarm over our highways. Cannon speed by on big fat tires. Turtle-shaped tanks rattle past, manned by soldiers in crash helmets. Long lines of brown army trucks follow, their prairie-schooner tops rounded like elephants' backs.

How startling this parade, compared with our familiar laundry trucks, ice-cream carts, and Greyhound buses! Yet it gets longer and longer as our Army grows; day by day, roads carry more and more such armored cars and motorized artillery—machine-bred grandchildren of the war chariots of ancient times.

Anywhere you go you may meet some kind of vehicle full of soldiers. I just saw one army column rumbling through Holland Tunnel, under the Hudson River at New York, and in Baltimore we found all downtown traffic arteries clogged and jammed with tanks and trucks. "Detour! The Army is moving through!"

Lately whole mechanized divisions have sped through Washington, D. C., after midnight; people didn't know, till next day, that 15,000 or 20,000 soldiers had come and gone in the dark.

Roads a Key to National Defense

Truly, war is on wheels. And wheels need roads to run on.

That's why, from our vast highway system, the Army chooses a certain network of "strategic military roads," picked routes for use in training maneuvers or in fighting any invader.

To help our new mechanized army move even faster over these roads, a new Highway Defense Bill, in Congress, seeks funds to:

Strengthen bridges, so they can carry heaviest tanks and guns.

Improve existing roads.

Build new access roads to connect with army posts, powder mills, munitions works, fuel and raw material sources, etc.

Enlarge tunnels where necessary.

Build "flight strips," or runways parallel with roads, where warplanes may land and take off.

As I write, soldiers by hundreds of thousands move in practice maneuvers, in sham battles, and in nocturnal work by purple lights in blackouts. In North Carolina, Georgia, Kentucky, Louisiana, from Massachusetts to Texas, California, and Washington, their tanks, guns, and supply trucks are rolling in regiments, brigades, divisions, even in whole army corps.

Around Camp Beauregard in Louisiana, in September, 1941, the Army staged the greatest practice maneuvers in its history. Some 500,000 men took part, using about 35,000 vehicles—all on a few hundred miles of roads.

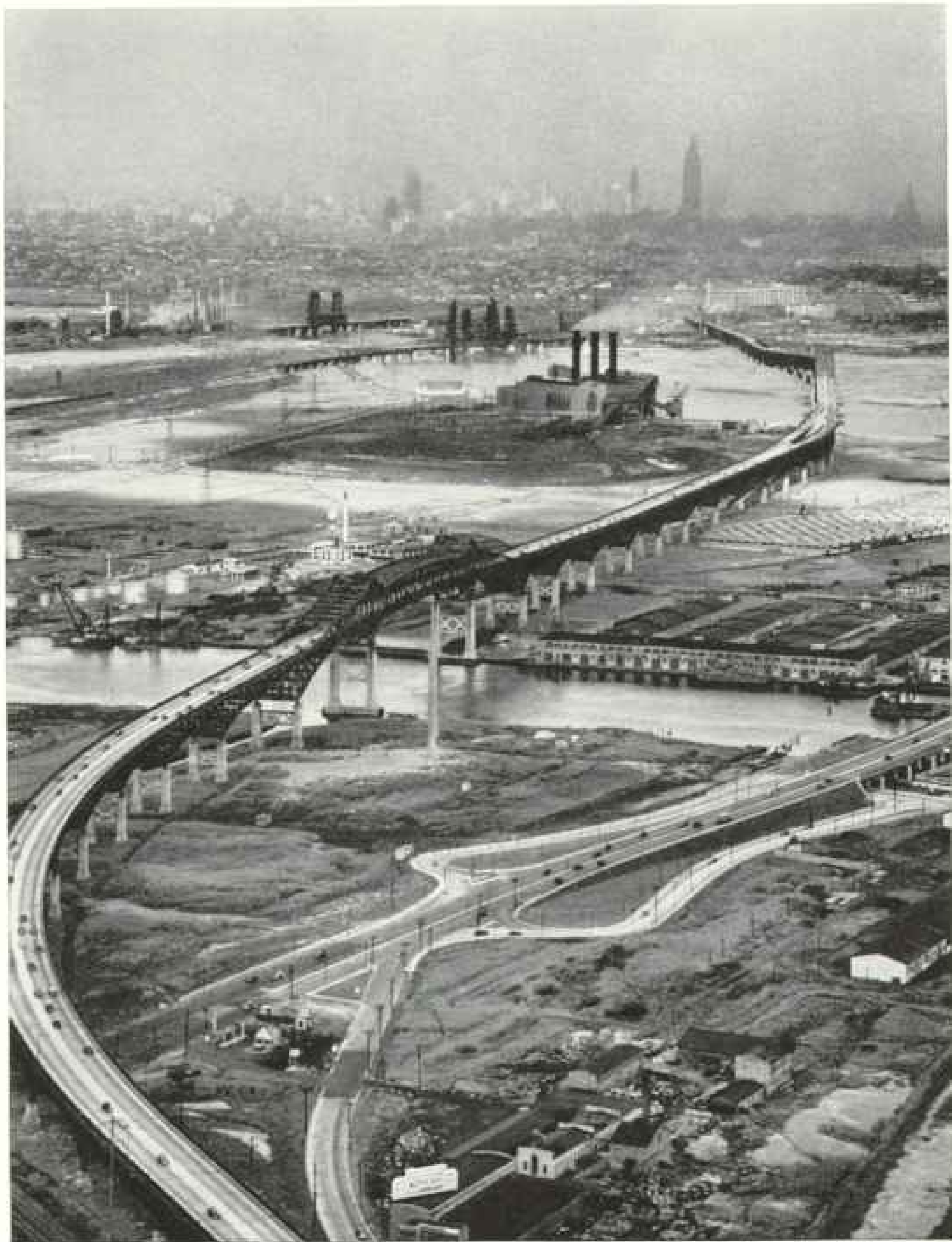
Boom psychology spreads as mass production of war goods multiplies, and mushroom traffic swamps the roads.

One army division only, with its 3,500 vehicles spaced 150 feet apart for safety, would stretch from New York south to a point ten miles below Philadelphia.

How can the Army crowd the roads with its myriad vehicles, yet not interfere too much with civilian traffic?

What about civilians blocking the Army's movements?

To such riddles army engineers, quartermaster transport specialists, and State highway officials, aided by experts from the Yale University Bureau for Street Traffic Research, turn their best brains.



Staff Photographer J. Darius Roberts from Goodyear Airship Enterprise

New Jersey-New York City Traffic Speeds over These Dizzy Spans, High above Meadows, Rivers, and Congested Streets

The 5-mile Pulaski Skyway carries cars across the Passaic and Hackensack Rivers, thence into Holland Tunnel. Grateful acknowledgment is made to Mr. P. W. Litchfield, of The Goodyear Tire & Rubber Company, for making the airship *Enterprise* available for some of the low-altitude aerial photographs in this article (pp. 691, 700, 713). This ship with its large ground crew was sent from Washington to New York especially for the purpose.

By trial and error they get answers. One plan, for moving an army column through a State, is fascinating in its simplicity.

Each State names its own picked men with whom the Army works. They are road men, engineers, and bus line operators, who know every hill, bridge, and tunnel.

If a division has to move, say, through Maryland, the Army sends a report ahead, stating on a printed form when and where the outfit plans to enter the State, what roads it will use, how fast it will run, how many vehicles in the train, where it will stop for food or gasoline, etc. Thus Maryland's road men know just what to do.

How to move people hastily out of our big cities, should enemy bombers come, is a road problem studied now by the Office of Civilian Defense. Britain knows! It has handled more than 1,350,000 schoolchildren and mothers with babies.

Reporting Ohio and Mississippi floods, I saw how refugees fled by country roads to higher ground. Confusion was inevitable. When you look even at peacetime traffic jams, think how packed the roads might be, should we have to move women and children quickly out of Baltimore or Boston. Where would you put all these people? Refugees coming out, bag and baggage, would have to meet and pass the Army coming in, with all its anti-aircraft guns, ammunition, kitchen, supply, and hospital trucks.

Remember what happened in France when the Germans came? Swarms of fugitive civilians so blocked the narrow roads that French soldiers could not move up to meet the invaders.

Such jams worry Mr. Hitler but little in Germany. He built some 4,000 miles of *Autobahnen*, or strategic military roads, which link Berlin with frontier points. Over one of his high-speed dual roads he can move soldiers at the rate of 70,000 an hour.

Highways Shape Destiny of Nations

Rome built a road system that stretched from Scotland to the Euphrates and beyond. The famous Watling Street is a part of Rome's old road running northwest from London; an extension of it ran down to Dover.

The New World's most remarkable highway, between Quito, Ecuador, and Cuzco, Peru, was laid by the Incas. "Nothing in Christendom equals the magnificence of this road!" exclaimed Hernando Pizarro, brother of the conqueror, when he saw it.

That long Silk Route from China to the Mediterranean resembled our historic Santa Fe Trail.* It was merely a path, though

marked in places by towers flanked by inns at the end of each day's march. But armies used the Silk Route, just as our cavalry and supply wagons long used such pioneer American paths as the Mohawk, Cumberland, Oregon, and Mormon Trails.

Early Road Making Was a Slow, Painful Adventure

Earliest American white settlers trudged the Indian trails or paddled along creeks and rivers. For generations after Jamestown and Plymouth Rock, America had few horses and wagons; settlers stuck to a narrow strip along the Atlantic seaboard.

Till long after the Revolution, road building made little progress. It is true General Braddock in 1755 opened a trail west from Fort Cumberland, in Maryland, and the British built a military road from Bedford, Pennsylvania, out to Fort Duquesne in 1758. But these were not really roads any more than was the Wilderness Trail blazed by Daniel Boone through the Cumberland Gap, used later by immigrants bound for Kentucky.

First real highway development in the United States was the surfacing with broken stone, in 1792, of a 66-mile road from Philadelphia to Lancaster. By 1802 stages and freight wagons were plying between Boston and Savannah, Georgia; coaches, pulled by relays of picked horses, made 53 miles a day on this road and covered the 1,200 miles in 22½ days.

When home-seeking immigrants began moving across the Appalachians to settle the Old Northwest Territory, Congress in 1806 gave funds for the first Federal road. Known as the National Pike, it ran west from Cumberland to Wheeling, then in Virginia.

Later, this historic highway was extended westward to St. Louis on the Mississippi.

Today this National Pike, known as U.S. 40, is one of the most heavily traveled roads serving transcontinental motor traffic.

Then, in the 1830's, railroads were born. As they spread and paralleled main wagon roads, the latter began to fall into disuse. Travelers deserted the National Pike and other stagecoach lines for the "steam cars." For fifty years after the railroads came, road building in America was sadly neglected; on country lanes people struggled through seas of mud and clouds of dust.

It wasn't until bicycles came into wider use, after 1885, that the public clamored for hard, smooth roads. Thousands of people

* See "Along the Old Silk Routes," by Lawrence and Margaret Thaw, NATIONAL GEOGRAPHIC MAGAZINE, October, 1940.



U. S. Army Signal Corps, Official

Any Day, on Any Highway, You May Get Caught in Just Such a Jam

Here near Fort Benning, Georgia, during field maneuvers, soldiers of the Third Army and a long line of motorists crawl along sharing the narrow highway—a good example of the need for more “access” roads near military and naval bases.

took to wheeling, especially after the “safety bicycle” was invented. As early as 1880 they formed the League of American Wheelmen, first pressure group in highway history. They demanded, and got, not only the construction of bicycle paths along many main highways but improvements of country roads.

After 1900 the bicycle craze began to lag with the advent of the automobile. Everybody knows, now, how the motorcar gradually brought good roads to America.

U. S. Highway System Best in World

Today the United States has more good roads than all the rest of the world together; but they're something new.

Even up to Civil War times our roads were so bad that fire engines in certain cities often had to run on the sidewalks to get quickly to a blaze.

Classic among bad-road yarns is one from Chicago. Seeing a man's head sticking up

from a mudhole, a wayside pedestrian stopped to help.

“Keep your mouth up out of the mud,” yelled the Samaritan, “till I fetch a rope!”

“Thanks,” gurgled the muddy victim. “Then we can get my horse out, too; he's under me.”

Today, on smooth concrete or bituminous roads, a boy could roller-skate from Boston to San Diego, or a woman might wheel her baby carriage from Seattle to Miami—if you gave her time!

To make it easy for travelers to find their way, especially with the aid of road maps given away at filling stations, all U. S. and State highways are plainly numbered and marked with signs calling attention to curves and sharp turns, detours, and slippery roads.

Frost Cannot Destroy Modern Roads

Cold weather for years cracked and heaved concrete pavements, made holes and bumps



Staff Photographer J. Baylor Roberts from Goodwar Airdrop Enterprise

No Cross Streets or Red Lights Slow Traffic on Connecticut's Merritt Parkway

Access to the high-speed dual highway is by intricate clover-leaf networks such as the entrance for Norwalk above (page 703). This "Gateway to New England" enters Connecticut from north of New York City and runs eastward, paralleling historic Boston Post Road. On the landscaped road no trucks or buses ply. All tolls are used in paying off its cost.

in macadam, and filled once hard, smooth gravel roads with mud holes.

"Frost boils," caused by tiny ice crystals in the soil, showed a lifting power of several tons per square foot! Forming beneath pavements, these ice crystals—tiny as they were—actually worked like a powerful jackscrew, often lifting a heavy slab of concrete as much as a foot.

Long study and experiment by engineers in the Federal highway service, however, finally solved this old problem. Today, thanks to this pioneering by the Public Roads Administration, we know how to build a sound, safe road in whose foundation the troublesome little ice crystals can no longer form.

Since about 1921 the central Government and the States have worked constantly together. This policy is in a large degree responsible for the network of improved roads that now stretches from coast to coast.

New road building has also been accelerated by emergency grants made during the depression; much of this money was spent by the W. P. A.

Until recent years attention has been concentrated almost entirely on rural roads. Now it has become evident that the main arteries through cities are equally important, and such work is now included in the State and Federal programs.

Experiences on Country Roads in Older Days

Most important function of the Public Roads Administration under its veteran director, Thomas H. MacDonald, has been in guiding the creation of the main network of highways so that it is now possible to reach any city or well-settled corner of the United States over good roads.

Spin down Highway 66 now, from Illinois



Arizona Highway Department

Fearing Some Jinx, This Indian Carefully Leads His Burro Behind a Reflector "Eye"

All such glass markers, and especially the "electric eye" that counts passing animals and vehicles, are avoided by superstitious red men. This is Indian Joe Webster, of Canyon de Chelly, Arizona; his tribal name, by coincidence, is "Brave Walking Around!"



Courtesy Public Roads Administration

Up to His Axles in Mud and Water—on a South Dakota "Road" in 1904

Buggy and wagon tongues were sometimes actually pulled out, as straining teams leaned into their collars and tugged to move the stalled vehicles. Many country roads are still impassable in rainy weather.



Fairchild Aerial Surveys, Inc.

New York's Triborough Bridge Keeps Through Traffic Off Crowded City Streets

Here on Randall's Island, now a recreation center in the East River, the Manhattan link (right) joins the Bronx-Queens span at right angles (page 697). Stretching southward toward the skyscrapers of mid-Manhattan, the giant bridge passes New York's municipal stadium, crosses Little Hell Gate, and then turns eastward over Hell Gate to Long Island. The bridge was opened to traffic on July 11, 1936.

into Texas, letting your car float smoothly over gently graded Ozark hill stretches, and it's hard even to imagine how bad those roads used to be.

After a wet winter, clay mud got so deep and stiff that often our buggies and wagons were utterly useless. One muddy March day I actually got stuck *going downhill in an empty wagon* drawn by four mules!

To get to town for sugar and coffee, we had to walk, or else ride horseback along the edge of the road; or "lay down" a panel of rail fence and ride through fields and pastures.

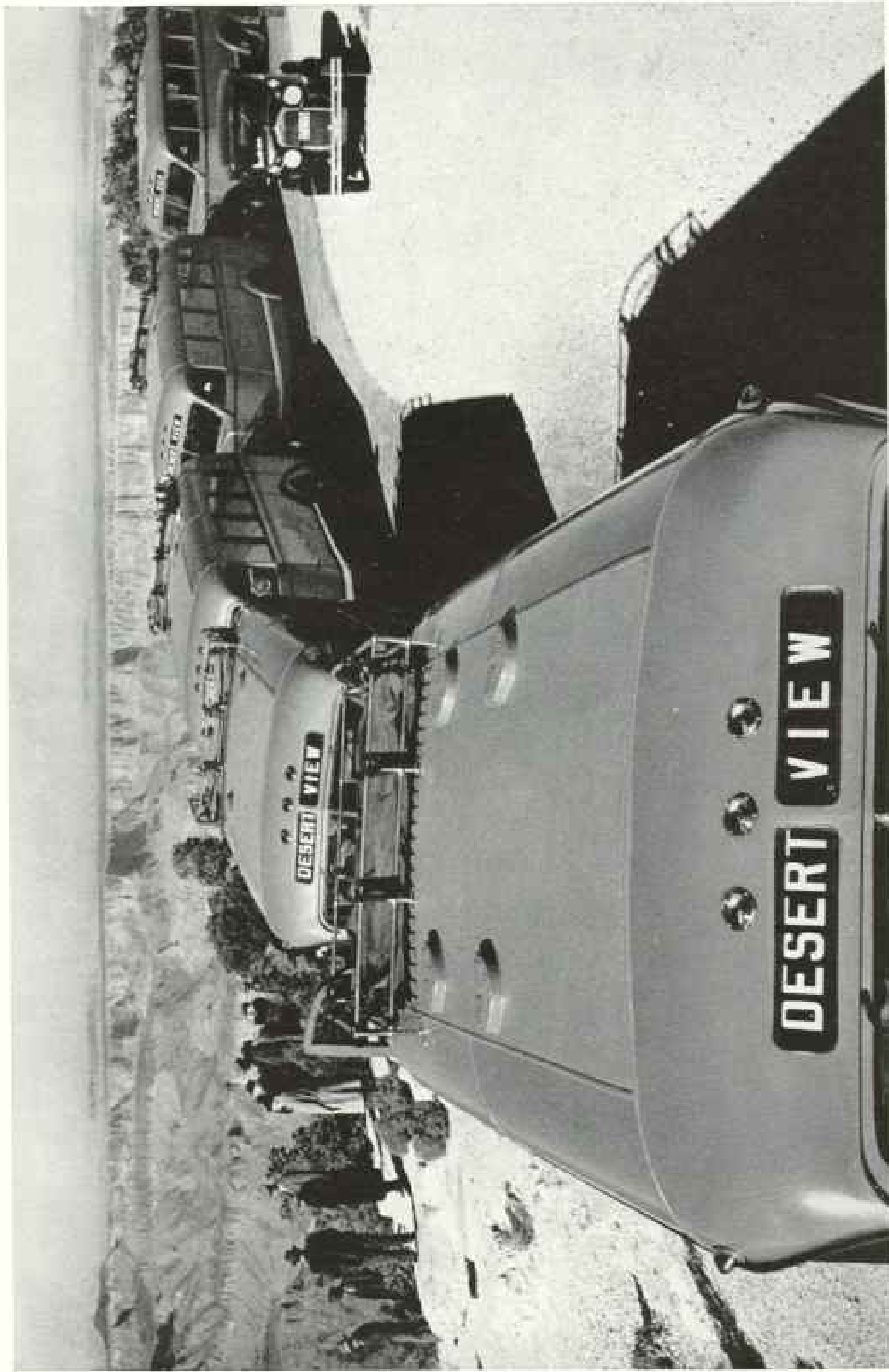
Wooden bridges often washed out. Where there was no bridge we forded the streams. At dusk one rainy night my father returned from town on horseback. On the saddle before him, wrapped in his raincoat, he carried a 50-pound sack of flour. So much rain had fallen that the creek near our house, where the road ran through it, was out of its banks.

Father stopped his horse on the far side and studied the yellow, stinking flood. Green willows along the creek banks lay flat before the racing waters, which carried dead brush, straw, and driftwood of all kinds. From our side of the bank my brother and I watched "boss man," as we called him.

Then we saw him pick up the precious sack of flour and boost it to his shoulder. "I'm coming across!" he yelled, and urged his nag into the flood. It was so swift that as soon as the horse got into deep water it was swept downstream. But it swam, strong and steady.

Since it was a small, light animal, however, at times all we could see was the horse's face and the head and shoulders of our father, trying to keep the flour from getting wet. He got across, and nobody said a word—which was the way of life in that time and country.

Smooth and speedy as main highways are now, they're minus the intimate relationship



U. S. Department of the Interior

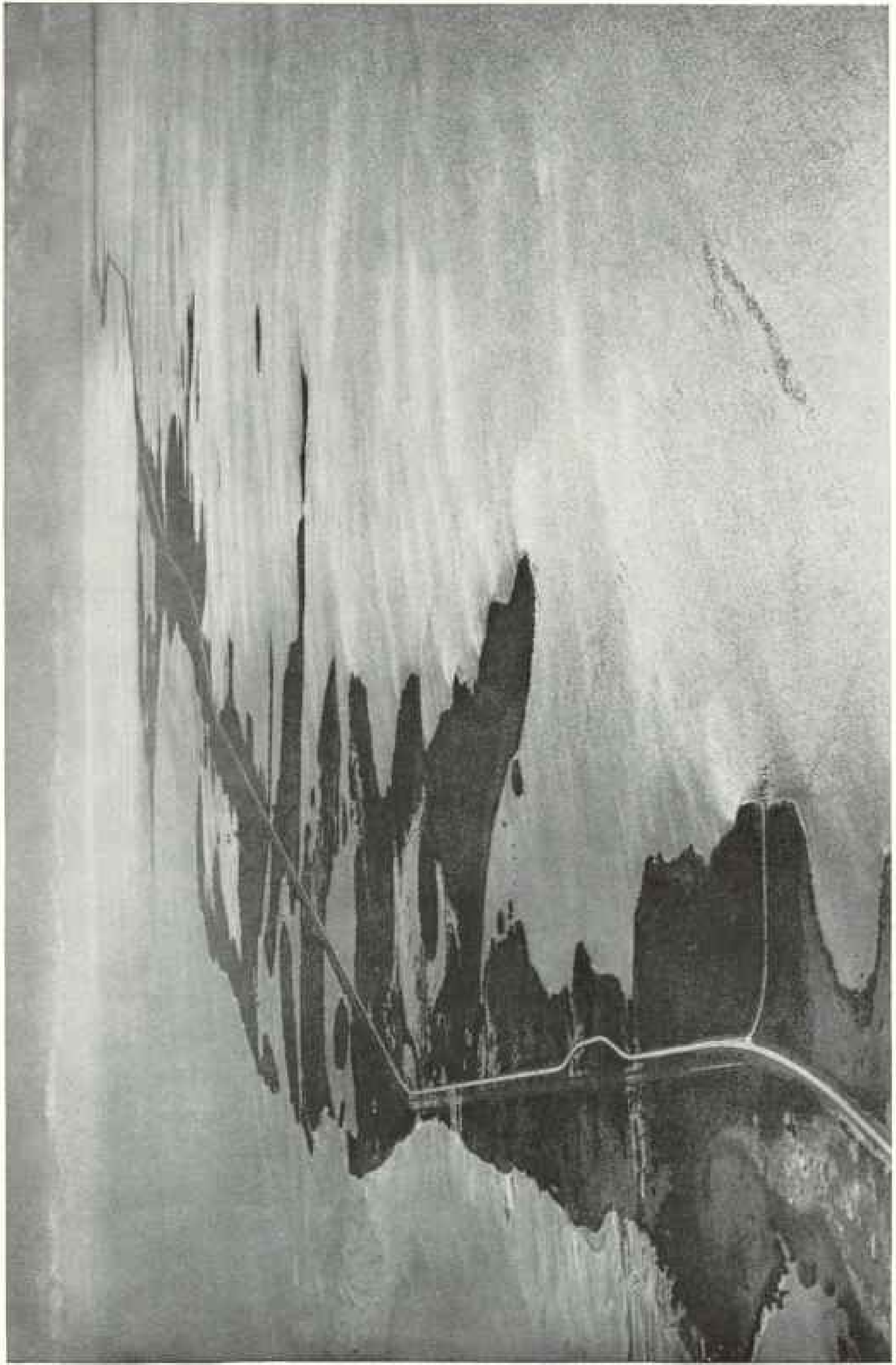
Buses Unload Wandering Spectators at Dizzy Brinks of the World's Greatest Gulch in Grand Canyon National Park

Ever-increasing millions can now enjoy America's scenic wonderlands, unfolded by spreading roads. Of all the visitors to National Parks, about 85 percent come by automobile (page 714).



Traffic Jam in a South Carolina Bus Station—“What’s the Round-trip Fare from Columbia to Washington, D. C.?”

Between training camps and near-by cities bus lines now haul soldiers by scores of thousands, especially over week ends. To avoid congestion most big camps need more and better “access” roads.



Sharks Play in Shallow Waters along Florida's Overseas Highway to Key West

Only seagoing thoroughfare in the world, much of this highway is built on the roadbed and trestles of the old Flagler railway, destroyed by storm. One bridge is nearly 7 miles long. Southwest from Grassy Key, the road twists and squirms like a jigsaw puzzle. Fishing camps are located along its route.



Painted Aerial Survey, 1916

Here Is the Road Engineer's Answer to the Riddle of Traffic Jams at Intersections

No waiting for red lights to change, for the policeman's whistle, or for lagging pedestrians to get out of your way. On such ramps and crossovers you simply keep moving in the riverlike traffic stream. This is a close-up of page 603 showing Triborough Bridge crossing Randall's Island in New York's East River.



Staff Photographer J. Baxter Roberts

An Open-air Theater Shows Pictures 53 Feet Wide So All May See

Movie fans sit in their automobiles, parked on ramps which spread out fanwise to a depth of 600 feet. The cars' front wheels are slightly raised, so the natural sight-line of patrons meets the center of the screen. On U. S. 1, near Alexandria, Virginia.

that old dirt roads bore to country people. There's little kinship now between the riders who whiz by at 60 miles an hour and farmers who live beside the roads. Motorcars don't make familiar, individual footfall sounds, as horses do. To most ears they all sound alike.

Reading Daily News in Wagon Tracks

To sit in a rocker on the front porch and "watch the passing" used to be a favorite country pastime in horse-and-buggy days.

There was old Uncle Bunty. He had lost one arm in the Mexican War. Learned in woodcraft, he could walk down to the dusty "big road" at sunset and read the tracks. Actually, from these tracks and from close observations of the behavior of neighbors and the condition of their work animals and vehicles, he could tell who had passed along the road during the day.

"Old man Lobbin passed," he would say,

"He rode that old gray mare that drags her off hind foot. He came first; his tracks are under the others.

"Monk Todd went by, drunk again, whipping his mules. See where their hoofs tore up the dirt!"

"Old lady Crews" was another road pilgrim. Even we boys could tell when she had passed. She drove a rattletrap phaeton, with one front wheel so badly "dished" it made a track in the dust crooked as a snake's.

The Santa Fe Trail itself led right past our place. It was no road originally; it was nothing but a pattern of parallel ruts, from Missouri to New Mexico. Once I followed it, for this magazine.* West of Dodge City, in Kansas, we set fire to prairie grass and burned it off so we could see how the road sprawled out across the plains.

* See "Santa Fe Trail, Path to Empire," by Frederick Simpich, NATIONAL GEOGRAPHIC MAGAZINE, August, 1929.



Des Chandler

Bulldozers Grade Army "Access" Roads to Camp Bradley, in California

This odd-looking but highly efficient machine does the work of many men, mules, and hand dump scrapers. Five thousand men of the 26th Field Artillery Brigade will use this new road to their camp, and move quickly their trucks, tanks, and guns.

"A road," a Mexican once said to me, "is just tracks on the ground."

That's all the original Santa Fe Trail was. Yet over it, and its northern counterparts, some 80,000 immigrants rolled out to the coast in one frantic year during the great California gold rush.

Today U. S. Highways 50 and 85 are two slick, easy-riding roads that parallel parts of the old Santa Fe Trail and are favorite routes into the Southwest for motor parties who want to see Taos, Santa Fe, Albuquerque, the Navajos, Pueblos, Hopis, and Apaches, the Grand Canyon, and wonderlands beyond.

Roads Give Small Towns New Life

Other historic routes, now turned into smooth, high-speed motor roads, have profoundly changed the lives of the people who live along them.

There's no longer such a wide difference between city and country people. The "by-

heck-he-done-wrong-by-our-little-Nell" stage farmer of comedy, with a straw in his mouth and one lock of hair sticking out through a ragged hat, has vanished, along with the mustached city slicker in striped pants and white vest.

Thanks to better roads, country women can now shop in town; and you may see the same rayon underwear, open-toed slippers, and 10-cent-store plastic jewelry in the shop windows of Ozark and Great Smoky towns as you do in big city stores. Farm women think nothing now of driving 20 miles to buy a hank of yarn, see a movie, or to visit a neighbor in the next county.

The small town has been remade by the automobile; its day of isolation is ended.

Look what bus lines alone do to change the country.

Few who ride the roads in their own cars like a bus. But the people in it like it. They go for it, by increasing millions!



Staff Photographer J. Harlow Roberts from Goodyear Aerially Photographs

See by How Many Different Lanes You Can Reach New York's George Washington Bridge

No stop lights delay motorists; overhead bridges carry Fort Lee traffic across the main approaches here at the New Jersey end of the huge Hudson River span. Completion of the bridge in 1931 opened a vast new commuting area to New Yorkers. About 8,500,000 vehicles cross the bridge in a year.



Byron A. Photo

Instead of Flowing, Crowded Traffic Crawls Here Like Cold Molasses

This New Year's Day snarl occurred near Eagle Rock, suburb of Los Angeles, California, when thousands of motorists drove back to the metropolis from Pasadena's Tournament of Roses. When mass troop movements are under way, army experts seek cooperation with highway and police forces to reduce army and civilian friction.



© Chicago Aerial Burro

Chicago's Famous Outer Drive Parallels Lake Michigan's Shoreline for 24 Miles

This artery links the North and South Shore sections by an elevated road which crosses both the Chicago River and Ogden Slip (center) by bascule bridges. It passes Grant Park (lower left) and skirts the business section of the city over man-made land "stolen" from the lake.

Many see America first by bus. Flying across the country, you marvel at the everlasting spectacle of buses flashing their way north, south, east, west. Our bus-line net, like another railway system, pokes for 315,000 miles into every corner of this country where people live who like to ride. (I am not considering here the people who ride city buses to business or for sight-seeing purposes.)

Buses Run to the Sun and Back!

"How many passengers can our buses now haul, if all loaded at once?" I asked of R. E. Cochran at the Greyhound Lines offices in Cleveland, Ohio.

"Counting buses of all kinds," he said, "we could seat all the 1,588,500 soldiers now in the U. S. Army and still have empty seats enough left for about half the folks in either Arizona or New Hampshire."

"Your Greyhounds must pile up a big mileage," I ventured,

"Enough," said Cochran, "to more than equal a round trip from the earth to the sun—or, roughly, some 206 million miles a year."

"What a lot of buses you must wear out."

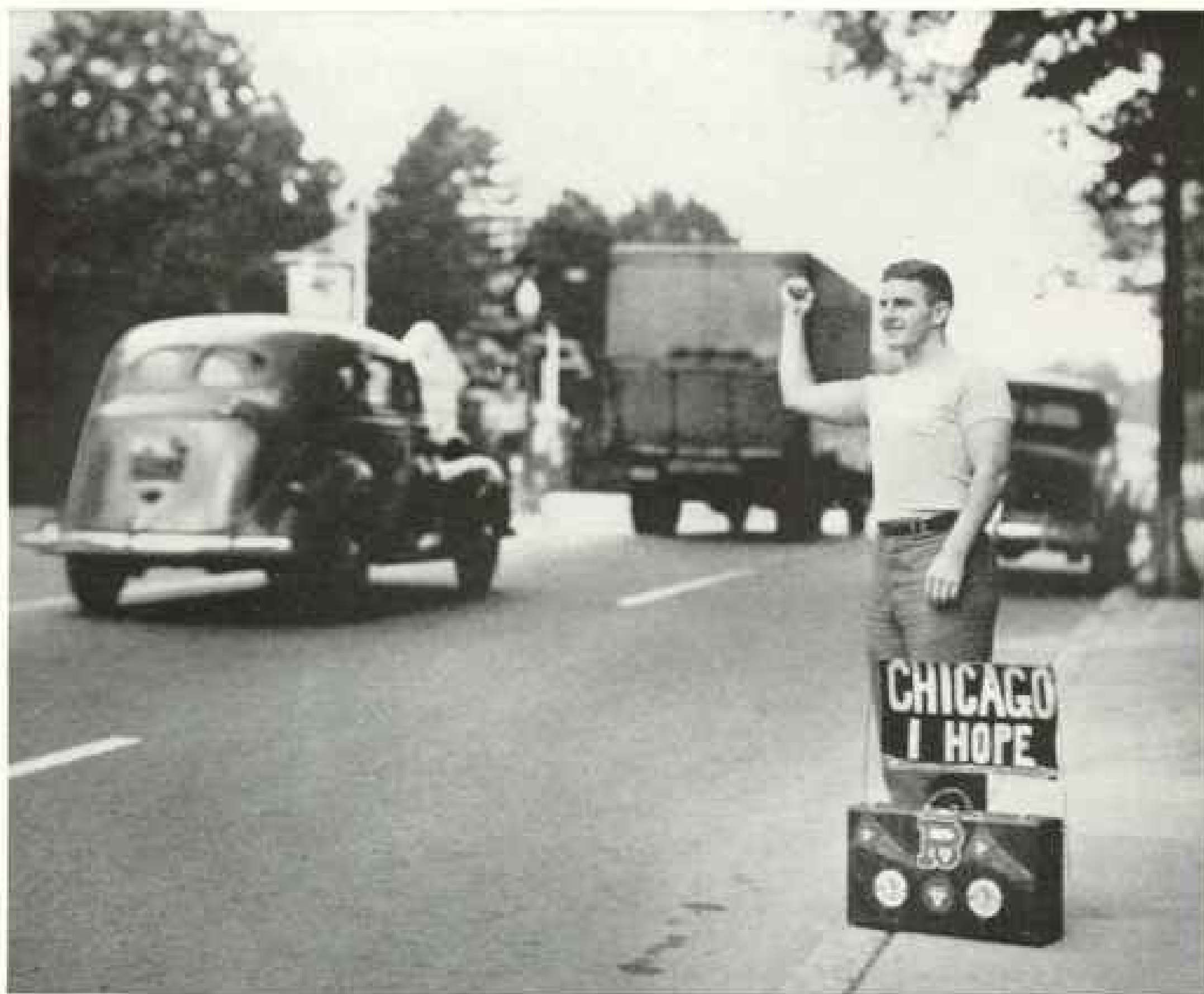
"No. Thanks to good roads and frequent overhauls, we don't. Some are 10 years old. We have some running now, in fine shape, that have piled up over 1,000,000 miles!"

"But you buy a lot of tires?"

"Not a one! We rent them from a rubber company at so much a mile."

"Say something about national defense and buses," I suggested.

"When big cantonments and ammunition plants, like the powder works at Charlestown, Indiana, and Childersburg, Alabama, are building, buses haul thousands of workers. That's true at scores of other factories, from the Glenn L. Martin airplane works near Baltimore, with an expected peak of about 42,000 this winter, to the Allison motor shops in Indianapolis. Soldiers at week ends crowd the



Staff Photographer J. Dwyer Roberts

**Hitchhiker, Thumbing Ride, Holds up His Signboard, "Chicago, I Hope!"—
Ardmore, Pennsylvania**

buses; literally scores of thousands, for example, go from Fort Benning, in Georgia, to Atlanta, or from Fort Knox, Kentucky, to Louisville."

"But what about the Army, as such?" I asked.

"It, too," said Cochran. "Private buses and trucks moved a whole National Guard outfit from towns and cities all over Arkansas to Camp Joseph T. Robinson at Little Rock. We're doing it again in these fall maneuvers, all over the map. All these buses are ready, including the drivers, whenever the country needs them."

Two Fine Examples of Superhighways

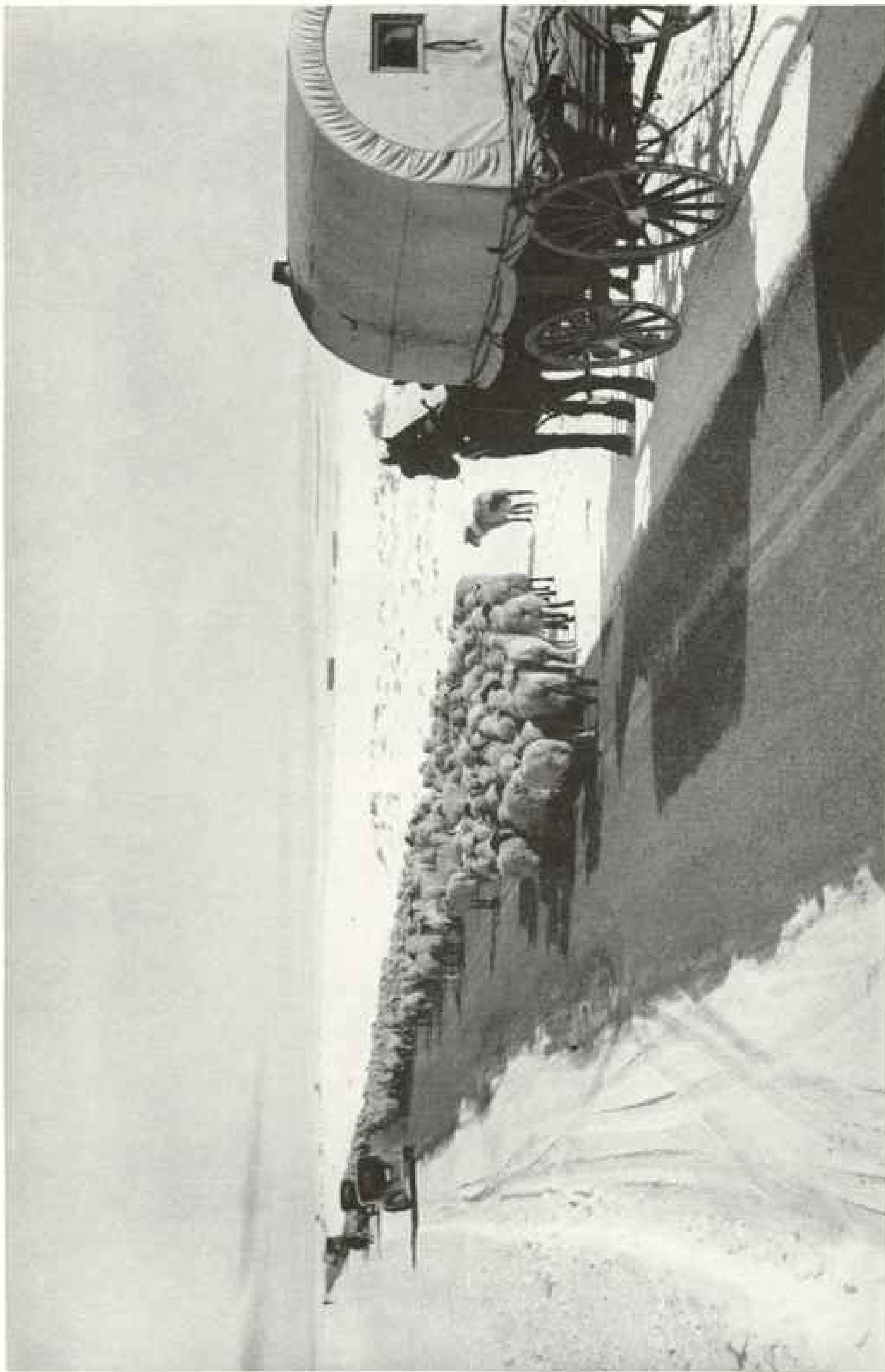
Gateway to New England is the western boundary of Connecticut. For decades all traffic through here had to use the historic Boston Post Road, linking New York City and Boston. It is now part of U. S. Highway No. 1, which stretches from Maine to Florida and carries the Nation's heaviest travel load.

Now scenic Merritt Parkway runs east from the New York State-Connecticut line to New Haven. Near there, across the Housatonic River, it ties in with the beginning of the new Wilbur Cross Parkway, planned to extend to the Massachusetts border. The Merritt was opened for its full length on September 2, 1940.

Rising and falling as it sweeps across beautifully wooded ridges and valleys, its borders landscaped by expert gardeners and foresters, this four-lane divided parkway marks the dawn of a new era in road building. It by-passes congested areas and is unmarred by billboards, stoplights, and dangerous intersections (p. 691).

On it no trucks or buses are allowed; they still use the old Post Road, which lies to the south and east and parallel with the new parkway.

Average daily traffic is around 14,000 cars. On one peak holiday 54,163 vehicles used it. Magnitude of that traffic may be seen, say engineers, when you stop to think the average length of a car is 18 feet; so, had all these



Prof. Photographer J. Taylor Roberts

Sheepmen Use Western Roads for Moving Flocks in and out of Mountains

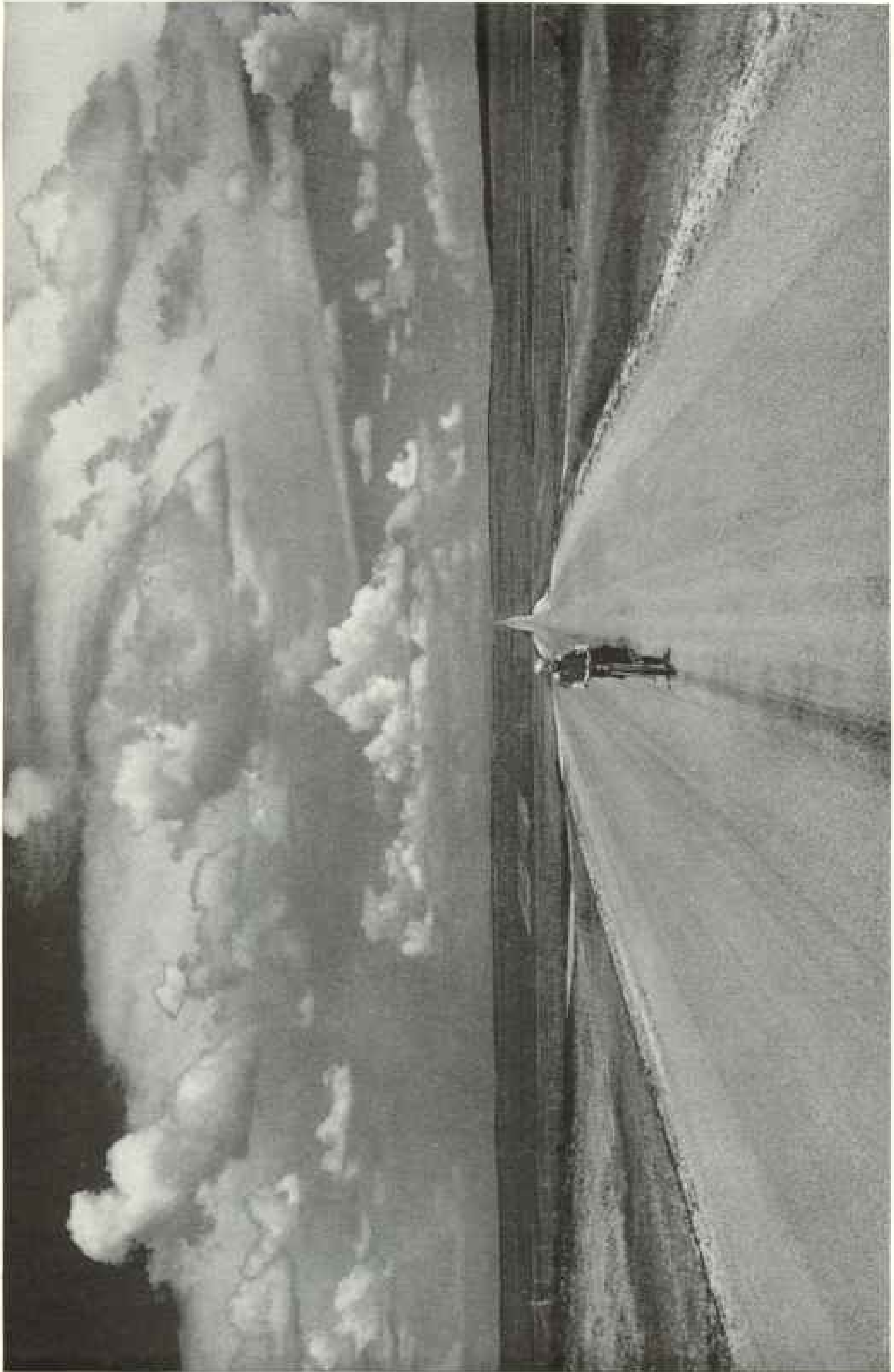
Sometimes careless motorists run into such flocks, killing or crippling many animals. Here a shepherd's wagon follows a flock along U. S. 30, in that part of Wyoming crossed in early days by Mormon emigrants and by the famous military explorer, General John C. Fremont.



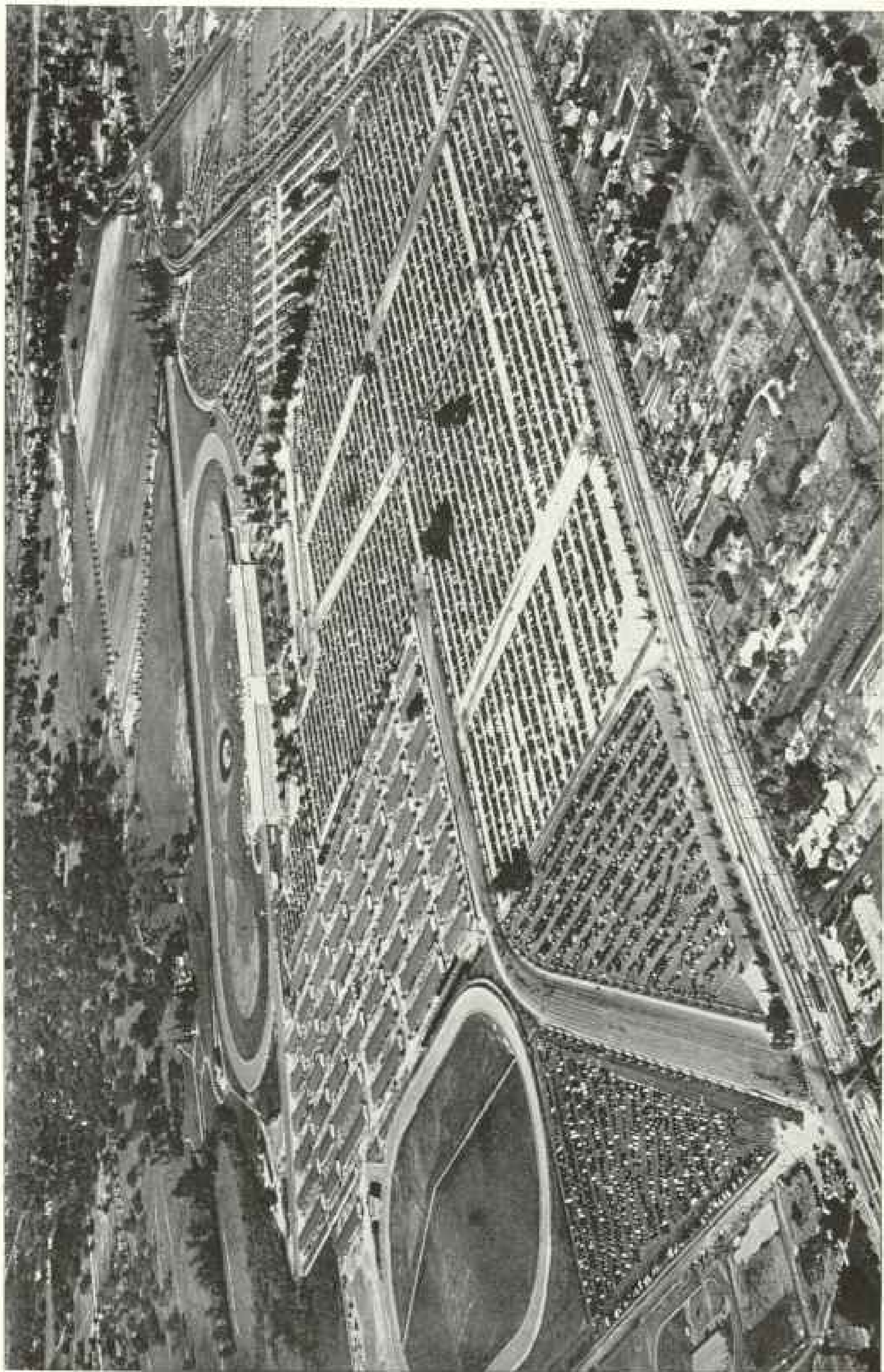
Wyoming Department of Commerce and Industry

This Lone Pine Growing from a Boulder between Cheyenne and Laramie Owes Its Life to Passing Trainmen Who Watered It

With its roots in a rocky crevice the tree stands on Sherman Hill, Wyoming. Near by, the famous Lincoln Highway climbs to its highest point, 8,535 feet above sea level. The original roadbed of the Union Pacific Railway, followed by the present transcontinental highway, was deflected to avoid disturbing the tree.



This View of the "Wide Open Spaces" Shows a Lonely Section of U. S. Highway 285, Some Miles South of Santa Fe, New Mexico. On such vast stretches of the public domain, engineers are free to drive their roads straight as an arrow, unhampered by towns, factories, or the rights of landholders. This picture aptly illustrates the old saying that on the western plains you can see farther and see less than anywhere else.



Spencer Platt Photograph

"Where Can We Park?" Shout 20,000 Car Drivers on Handicap Day at Santa Anita Track, Arcadia, California

See how much of this vast space is filled with parked cars! Think of all the bent fenders and angry shouts when this crowd jams the streets, going home! At every other race track, at baseball and football games, you hear the same cry, "Where can we park?" So far, city traffic experts struggle in vain.



From Air Photo

On Pennsylvania's Spectacular Toll Turnpike, Even Trucks Are Permitted to Run at 70 Miles an Hour

Following the line of an old railroad grade, this remarkable high-speed boulevard, bored straight through range after range of mountains. Motorists may drive through rain when entering a tunnel, and emerge in bright sunshine on the other side of the mountain. At right center is a tollgate near Carlisle, Pennsylvania. Though it cost millions, this new road is steadily paying for itself (page 710).



Soldiers of the 28th Division, with Field Equipment, Pile Aboard Buses Bound South for Maneuvers

Those vehicles accompanied the rest of the Division's mechanized units, proving the feasibility of bus transportation for Army use. Under simulated war conditions, the men made camp every night, pitched their "pup" tents, and prepared their meals.



© Fairchild Aerial Surveys

This Is a Fourth of July Crowd at Jones Beach, on Western Long Island

Visitors frolic on sands at left. Cars, sometimes 75,000 of them, are parked in immense squares. High-speed roads from New York now bring visitors to Long Island by the million. Coney Island lies west of Jones Beach.

54,163 tried to use the four-lane parkway at once, they would have covered every foot of its 37 miles, bumper to bumper, with more than 9,500 cars left over!

Where Even Trucks Can Hit 70

More spectacular, and carrying almost incredible traffic loads, is the new four-lane Pennsylvania Turnpike, completed in 1940, which links the outskirts of Harrisburg with those of Pittsburgh. Trucks and buses use it, too, and the speed limit is 70 miles an hour (page 708).

Using six abandoned tunnels of an old railroad, and one new one, aggregating almost seven miles, this astonishing motor road bores for 160 miles right through the Appalachians. Nowhere on its whole length is there a red light or an intersection.

Crossroads go over the turnpike or under it. Fences keep dogs and livestock off; to cross, at one place where there is a big restaurant, people must use a tunnel under the high-speed road.

Both this turnpike and the Merritt Parkway are toll roads. This is interesting and significant when you recall that decades ago the public turned against toll roads; in some regions farmers built "shun-pikes" around the tollgates, or rioted and tore them down.

Immediate and signal success of these two superhighways proves that, with the tremendous growth of motor-vehicle traffic, it is again feasible, in certain busy regions, to operate toll roads.

Concrete Ties with Canada, Mexico

Millions of people ride the roads between Canada and the United States; Congress and the Canadian Government are studying plans now for a road to tie our Northwest with Alaska.

Of more military importance are the ancient trails which link us with Mexico. Three figure in national defense.

One runs south through Arizona, as U. S. 89, to Nogales, then down the old Silver

Trail through Sonora and Sinaloa to Guadalajara, Mexico's second largest city. This road, cut by the mule feet and cart wheels of the conquerors, has been used since the days of Coronado and the priests who settled California. At present it is partly an all-weather route.

Another, long known to Aztecs and Apaches, and first used by Spaniards in 1581, is the road now named U. S. 85, running south to the border at El Paso. It can claim to be the oldest highway in the United States. Up this road Oñate brought his 83 wagons, his 400 settlers, and their 7,000 head of cattle when he came in 1598 to colonize New Mexico.

Up this same road, European goods, landed at Vera Cruz, were freighted for generations, when Santa Fe was an important Spanish trading center.

Up from El Paso on this same history-soaked U. S. 85, General H. H. Sibley brought his army in 1862, seeking to conquer the West for the Confederacy.

Again today over this same road, where so many guns have rumbled, guns are moving again. But today they don't rumble. They roll on the fat rubber tires of the motorized army from Fort Bliss, near El Paso, passing in maneuvers over more miles a day than the Spaniards used to make in a month with their ox-drawn cannon.

Future Motorists May Drive from U. S. A. to Buenos Aires

Most important of all roads to Mexico, however, is U. S. 81 to Laredo, Texas. Motorists by thousands use it in going to Mexico City. At Laredo it meets the Inter-American Highway, which, when completed, will run on down to Panama, some 3,500 miles away. More than half of it is already passable in all seasons, although not all the completed sections are connected.

From Laredo to Mexico City it is an all-weather highway, 761 miles long, and you can drive on to Mitla, 365 miles farther south.

This fascinating stretch takes you through deserts, tropics, across dizzy mountain heights—at one spot you are more than 8,200 feet up—through regions of scenic grandeur, on down to Mexico's enchanting capital. At one point, about 80 miles from Mexico City, you can look from your car and see, if the day is clear, snow-capped Popocatepetl to the south.

A short detour takes you to the pyramids of San Juan Teotihuacán, sacred city of the Toltecs, and its Temple of Quetzalcoatl with the plumed-serpent decorations.

The Pan-American Highway system, of

which the Inter-American Highway is the Central American link, will eventually connect all the South American capitals with each other and of course with those of the United States and Canada. Already three-fourths of the South American section, from the Colombia-Panama border to Buenos Aires, is passable at all seasons.

Who knows how many motorists may roll along this 12,000-mile drive from our Mexican border to Buenos Aires in the years to come! Local traffic on parts of it is already heavy—just as traffic is heaviest on certain sections of our own transcontinental roads which are yet traversed throughout their whole length by only about 500 cars a day.

A Highway through History

"Greatest single highway project in history," engineers call this all-hemisphere road. Not only is it opening vast hinterlands in Central and South America to new sources of needed raw materials, such as minerals, hardwoods, hemp, hides, foods, and medicinal plants, and creating new markets for man-made goods, but it is literally paving the way for motorists from the United States into a world with a history older than their own. Aztec, Toltec, Maya, Inca, and other ancient ruins lie along its path.

In Guatemala the road passes over a 200-foot stone-arch bridge built by the Spaniards in 1592, and other countries are equally rich in reminders of Spanish colonial history.

Uncle Sam, through his Export-Import Bank, has already loaned millions to help Central American countries work on their sections of this road.

All three of these roads, tying Mexico to the United States, loom large in our defense plans. Should enemies land in Mexico and seek to invade us, their armies coming north would have to use these three ancient trails.

Freight Riding on Rubber Tires

We might not fuss at trucks which block the road ahead if we stopped to think. Millions of people in small towns and communities depend on trucks.

Also, roads are built primarily for commerce, not for pleasure.

Trucks pay enough taxes to build 8,000 miles of up-to-date highway a year, with enough left over to maintain every mile of State highway in the U. S. A.

Railroads themselves operate more trucks than locomotives. Some of them own the bus lines that parallel the railroad tracks.

If you live in a fair-sized city, consider all the different trucks that stop at your own



Staff Photographer J. Taylor Roberts

Past This Spot Galloped Paul Revere on His Midnight Ride

Motorists swarm now along the Massachusetts road where Revere hastened, shouting warnings that the British were coming. On Lexington Green stands this bronze monument to the Minute Men who, on April 19, 1775, fired the first shots of the Revolution.

house—U. S. mail, laundry, groceries, meat, soft drinks, dyers and cleaners, rugs, fuel oil, coal, the gasman, the plumber, the tin-roof man, the painter, the paper hanger, the lawn man and the florist, the telephone fixer, the furnace and gutter specialists, the termite exterminator, the knife and scissors grinder, the Salvation Army truck after old clothes and newspapers, and—sad finale!—the wrecker's truck that drags your own contrary car off to the garage!

Strange Cargoes Travel by Truck

So it goes. You can't even go coyote hunting in the West without a pick-up truck that carries the greyhounds out to the sagebrush

where the chase begins.

Two long-necked giraffes rode a special truck from New Jersey out to San Diego, California. Soft moss on the truck's floor saved them from jars; special distilled water, carried along, saved them from tummy fuss, and blankets shielded them at night from mountain chill.

In one truck, from New York to Washington, rode just one quarter of an ounce of radium, packed for safety in a heavy block of lead.

Goldfish, 200,000 to a load, travel in specially insulated water tanks.

Silver, more than \$1,290,000,000 worth, moved by truck from New York to great Government vaults at West Point.

Art treasures, enough to fill a museum, were moved twice across the continent in making the movie "Marie Antoinette."

Army Engineers Are Crack Road Builders

For soldiers' comfort now comes a rolling shower bath, following the moving army. It

sucks up water from any wayside stream, heats it, and squirts it over tired, dusty soldiers.

Only the sea is as important as roads in national defense.

To keep roads open for use in case of war, and to make them impassable for invading enemies, are two of the big jobs of Army's combat engineers.

It is the way of enemies to destroy the other fellow's roads.

Invaders, flying over heavy-traffic roads, drop bombs that blow holes from the size of a bushel basket up to craters 100 feet across and 30 to 40 feet deep. Enemies and fifth columnists blow up tunnels and bridges,



Staff Photographer J. Earle Roberts from Gasbarr Airship Enterprise

Henry Hudson Parkway Speeds Motorists in and out of New York City

Today automobiles coming from lower Manhattan (background) whiz along the West Side elevated highway up above street crowds. At 72nd Street they come down to this broad boulevard which leads on into New England, or up the Hudson, or across the George Washington Bridge into New Jersey.

and lay mines that explode under roads as troops move over them.

Much camp training now has to do with road work. At Fort Bragg, North Carolina, the 15th Engineer Battalion has figured out a new type of corduroy mat which can be rolled up for easy transport. It can be unrolled quickly and spread over mud holes. Colonel Royal Lord of the Engineer Corps uses an overhead cableway, quickly assembled, to ferry tanks, trucks, etc., in mid-air across streams and canyons.

At Fort Belvoir, Virginia, you see soldiers training with pontoons and other portable bridges. Engineer reserve officers and selectees include thousands experienced in civilian road work.

Army engineers work fast, even when bullets are flying. You can gauge the size of their job when you read that one German army, moving west in 1940, in eight or ten weeks built 183 bridges—some of them 1,300 feet long and able to hold 24 tons—and laid 57 pontoon bridges as well!

Swift movement of troops is being studied now, around camps and on practice marches all over America. Every war machine that rolls, from tiny "jeep" cars to huge 10-wheel transport trucks, is under scrutiny.

How to move the most men and guns over the roads and into action in the shortest time is the problem. Between front and rear of long columns, radio is used to talk between swiftly moving vehicles. Portable electric traffic lights, smoke screens, camouflage, use of purple lights in blackouts, dust, rain, and heat, all figure in the trials.

More and Better Access Roads Needed

Never in all history have our roads carried such loads as now are thrown on them by maneuvering armies and through the multiplication of truck loads because of national defense production.

"We badly need more and wider access roads," engineers insist. An access road, in army talk, is one that leads to an army or navy base, to some source of strategic raw materials like coal, oil, and lumber, or to an arsenal, airplane factory, or a powder mill.

Speaking of traffic jams due to inadequate access roads, when the great Du Pont powder works was being built for the Federal Government at Charlestown, Indiana, Superintendent Don Stiver of the Hoosier State Police said:

"Cornfields turned to brick buildings in less than a week. Seven thousand acres of farmland changed into a forest of wheels and smokestacks.

"Workers from as far away as the Panama Canal Zone flocked here—and every mother's son seemed to bring his own car.

"Imagine the roads! Every morning, 25,000 men in 4,000 cars on a short two-lane drive! And back again at night. It took 'em more than two hours to make 12 miles.

"We had to make a parking lot to hold their 4,000 cars, and a wide overhead pedestrian walk, to keep 'em from running over the thousands of workers that got off early-morning trains from Louisville, Kentucky, just across the river.

"Cars commenced to arrive as early as 6 in the morning, and by 6:45 they were bumper to bumper, as far out the road as you could see. This kept up, every morning, for two hours.

"Then, at 4:30 p.m., it commenced all over again. Thousands and thousands of men poured out, filtered into their cars, and formed a three-line caravan inside the plant—like race horses at the barrier—eager to get home."

San Diego is another startling example of overloaded roads. Its population, because of the boom in defense industry, particularly aircraft, jumped 50,000 in one year; it is now 275,000 and should reach 310,000 by May, 1942, exclusive of Army and Navy personnel.

21,000,000 Visitors to National Parks This Year, 85% by Automobile

"How many visitors do you handle?" I asked of Newton B. Drury, Director of the National Park Service.

"This year our parks have had 21,050,426 visitors, compared with 3½ million in 1933. Our people are truly out to 'See America First.'"

"How many went by automobile?"

"Fully 85 per cent. Our park system now comprises 164 recreational areas, covering more than 21,000,000 acres, all accessible by good roads."

"Where do you see the most increase in this pleasure travel?"

"Before we had motor roads old-time favorites like Yellowstone, Yosemite, and Grand Canyon, reached by railway, got the bulk. But today our vast highway system opens a whole new recreational world.

"In the year which ended on October 1, 1941, the Great Smoky Mountains National Park, in the highlands of western North Carolina and east Tennessee, was host to 1,247,019 guests, surpassing all others.

"In Virginia, Shenandoah National Park was close with 1,054,479.

"Rocky Mountain National Park was third with 685,393.



International News

Soldiers Halt for Rest at a Country Store in Bell Buckle, Tennessee

Scout cars in army maneuvers may suddenly appear on quiet country lanes, long given over to farm and village use. They may be fore-runners for a whole armored division. Air Corps insignia on the hoods identify them from the air, during sham battle, as friendly or hostile. Instead of a bumper, each car is equipped with a roller, which gives traction when crossing steep ditches or nosing up banks of streams.

"Magnificent Yosemite, in California, came fourth with 594,062, and Yellowstone, with its geysers, bears, and colorful canyon, drew 581,761 to take fifth place.

"To Mount Rainier National Park, in Washington State, went 446,636 visitors.

"Grand Canyon drew 431,816 persons to see its depths and sun-tinted rainstorms, and Acadia, in Maine, attracted 423,088.

"Far-off Hawaii National Park ranked among the leaders with 324,728."

Patriotic Pilgrims to Battlefields and National Shrines

"How does all this war talk affect travel to our historic battlefields and national monuments?" I asked.

"They're more popular than ever. Patriotic emotions are stirred. You can see a deeply reverent expression on the faces of men and women when they approach such shrines as

the great Lincoln Memorial at Washington.

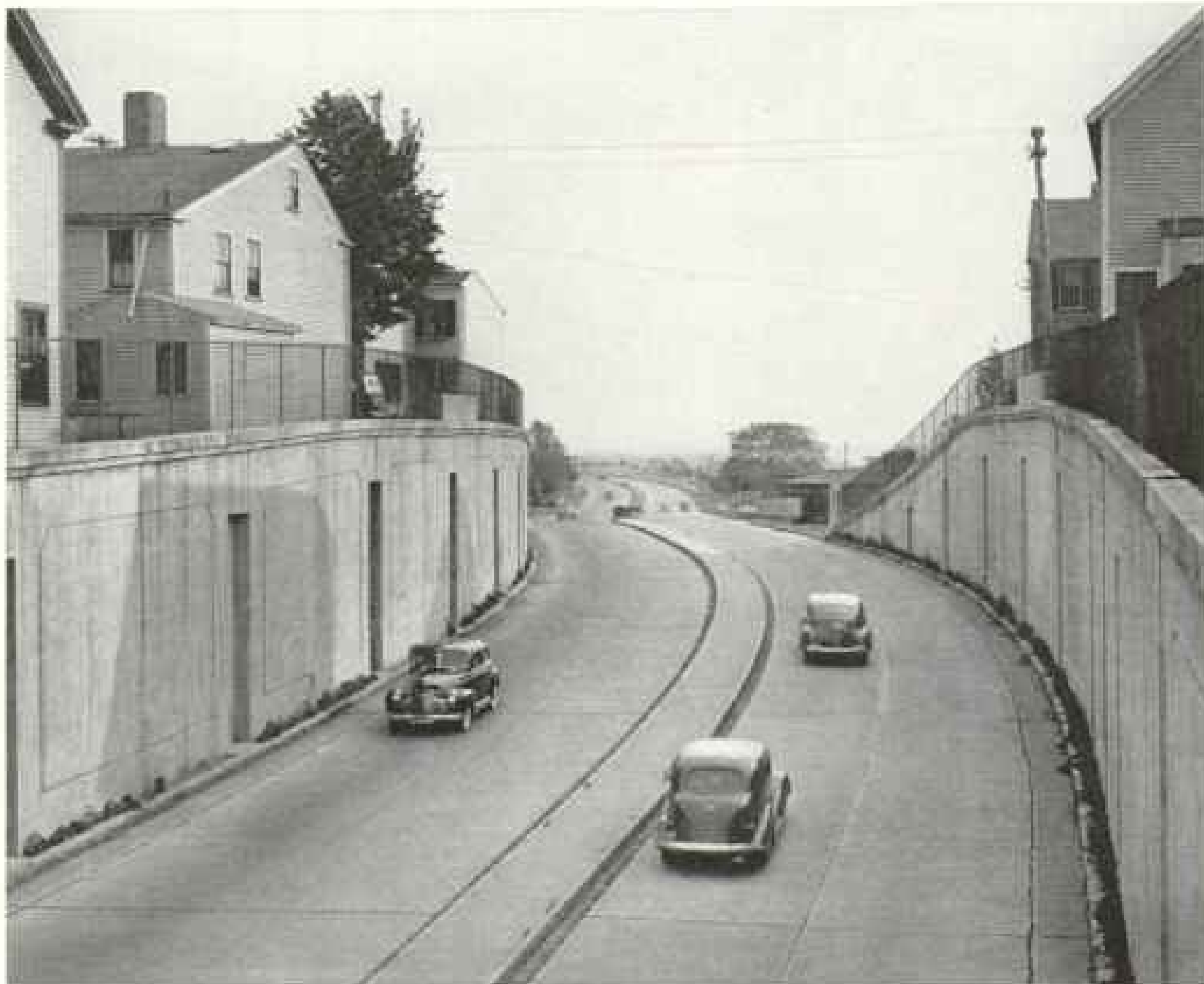
"Yorktown and Jamestown, where Captain John Smith built his English settlement and which now form Colonial National Monument, attracted 643,037 travelers in twelve months.

"Gettysburg had 654,411 pilgrims; other thousands went to Chickamauga and Chattanooga.

"To Lincoln Memorial, rising beside the Potomac, came 1,796,752 people to stand in awe before the heroic marble figure of the Great Liberator, and 882,507 went to see George Washington's beautiful home at nearby Mount Vernon."

Today you can cross the United States from coast to coast, or north and south, by scores of different roads, and infinite combinations of roads.

Officially, however, there is no such thing as a "transcontinental road." None was ever built; they just grew, one section at a time.



Staff Photographer J. Taylor Roberts

Link in "U. S. No. 1," the Old Newburyport Turnpike Is Streamlined Today

When "horseless carriages" weren't even a dream, whalers, sea traders, and ship builders used the road, which bisects this Massachusetts town on the Merrimack River. Newburyport's fame as a shipping center has faded, but fine silverware still is made here in a shop which traces its origin to colonial times.

For example, U. S. 40 now crosses the continent, from Atlantic City to San Francisco; but, originally, short divisions of it merely connected certain towns along its eastern stretches. In the same way, U. S. 1 now runs from New England down to Florida, but at first parts of it served traffic mainly between Boston and New York, or Baltimore and Philadelphia.

Many Roads from Sea to Sea and Border to Border

Transcontinental roads, as we call them, were first designated, numbered, and uniformly marked some 15 years ago, merely for the convenience of motorists.

That designation, "U. S. Highway," is only a quasi-official term. No federal funds to build and maintain roads as "United States Highways" were ever appropriated; federal aid has, however, helped the States to do this work.

When you drive across the States, too, you note that some numbered routes are short and some long; some fork into two roads, then later reunite.

The routes of the U. S. highway system were chosen because of their importance as *inter-state*, rather than *intrastate* routes. This system now comprises about 130,000 miles.

Some 56 highway routes over 1,000 miles in length are shown on maps of the Public Roads Administration. Eight principal routes cross the country from east to west. The longest of these, U. S. 6, is 3,652 miles in length and runs from Provincetown, Massachusetts, to Long Beach, California. Other important east-west roads are U. S. Nos. 20, 30, 40, 50, 60, 70, and 80.

There are 29 main north-south routes by which to cross the country. Of these, U. S. 1, from Fort Kent, Maine, to Miami, Florida, 2,280 miles, is the longest.

From Sea to Clouds in Ecuador

BY W. ROBERT MOORE

IN THE one-day trip from Guayaquil, chief seaport of Ecuador, to Quito, the capital, trains climb more than 9,000 feet—through the gamut of seasons, and centuries of pre-Spanish history.

Ecuador, named for the Equator, is really equatorial at Guayaquil. Yet, on a clear day, one can look northeast from the steaming hot city and see the snowy summit of Chimborazo rearing 20,702 feet into the sky.

Out of Desert into Jungle

Jungle, startlingly green to the eye of the traveler who has voyaged up the parched, rocky coastline of Chile and Peru, smothers the flat, oozy banks and midstream islands of the chocolate-colored Guayas. It even encroaches on the settlements that stand on stilts along the waterside.

From ship deck Guayaquil seems to be floating on the river like the masses of purple-flowering water hyacinth which drift up and down with river current and tides.

Freight barges, balsa rafts, dugout canoes, and other small craft line the two and one-half miles of water front. Ocean liners and tramp freighters anchor in midstream to discharge and take on cargo, lighters clustering around them (pages 720, 721).

Guayaquil has been no boom town. Today, after more than four centuries of existence, it has only about 150,000 inhabitants.

"We've had more progress here in the last 15 years than in the previous 150," said an English-speaking Ecuadorian who took me under his wing when I arrived in Guayaquil.

"The Panama Canal shortened distances to our world markets, but health improvement has played an even greater part. People once stayed only long enough to make their money, then moved to some more favorable place. Now they stay, and build."

Uphill from Guayaquil to Quito

Since Panagra (Pan American-Grace) air lines have been established, Quito is only an hour's flight from Guayaquil. Under new train schedules, the train trip is made in a day.

I went first by train. Dawn was struggling to overcome masses of black storm clouds when we boarded the ferry for the railhead of Alfaro (Durán), up the river and on the opposite bank.

Chugging slowly upstream, we passed men fishing with large fan-shaped nets from dugout canoes and sand bars. Six steers, three swim-

ming on either side of a canoe with their horns tied to crossbars, passed downstream on their way to market. A boatload of bananas barely missed our bow.

As we bumped the dock and hurried to the cars, daylight began to detach the Andean mountains from the clouds.

"We measure our climate by the kilometer; you'll soon see!" said my Ecuadorian companion as he bade me farewell.

Between Guayaquil and Bucay, about fifty miles away, I saw scenes such as I had known in tropical Thailand (Siam). Flooded rice fields, rank jungle foliage, and sugar cane or cacao plantations cover the countryside. Here, too, grow quantities of bananas that are shipped to New York, California, and down the west coast to Chile. Bamboo houses stand on stilts along streams in this half-aquatic land.

Sun-browned youngsters, innocent of clothes, waved from doorways or played in the mud. Men paddled boatloads of pineapples and other produce along the waterways. Buzzards sat on rooftops airing their wings.

Beyond Bucay, however, the scene quickly changes. For here the train begins its dizzy ascent up the steep Andean barrier. As it climbs, dense jungles filled with fantastic parasitic growth gradually lessen in height and merge into subtropical verdure. This in turn gives way to green fields.

At Palmira we were in the midst of an area of black volcanic ash. The wind blew, and blew cold.

Yankee Engineers Conquered the Heights

In fifty miles the snorting Baldwin locomotives drag the cars from an elevation of 930 feet to 10,632 feet. Twisting back and forth over frothing, muddy rapids, the railroad crosses 88 bridges and burrows through three tunnels.

Here, too, is the famous Devil's Nose (*Nariz del Diablo*), up the side of which the train mounts by a series of switchbacks.

The ride fairly took my breath. As the train zigzagged up the sheer mountain wall, chugging alternately forward and backward on the switches, I looked almost straight down and saw the town of Huigra slowly dwindle to toy size.

Yankee imagination and engineering skill carved the ledges and laid the tracks on this bold mountainside between 1897 and 1908.

After negotiating the first range of the



George M. Dyott

Though Chimborazo Is Capped with Snow, Hot Water Flows from Its Sides

This giant is the highest of four volcanoes that loom over Riobamba. In 1797 the city was destroyed by an earthquake and was rebuilt on its present site nine miles from its original location.

Andes, the train coasts along a high plateau rich in agriculture before dropping down into gorges to Riobamba.

At every station along the way Indians flock around the cars, selling local produce. Some hawk fruits; others milk, sandwiches, and eggs. At Alausi popcorn is a specialty; and at Guamote women and young girls tempt passengers with cheese and spongecake. Of the latter, I was told, recipes are proudly and jealously guarded. Rug merchants also congregate to shop their wares.

Here on the uplands Quechua-speaking Indians live much as they did under the ancient Incas. Near long reed-studded Lake Colta, crowds had gathered for a community potato dig, their red ponchos forming gaudy splashes against the hillside. Only the boys, to whom falls the task of watching the cattle, sheep, and goats, seemed to have been left out of the gay party.

Riobamba, halfway pause on the way to Quito, was formerly an overnight stop for

railway passengers until schedules were speeded up. Now it offers only indigestion to those who want to bolt a quick lunch and go on to the capital the same day.

Snow peaks rim this thriving industrial and agricultural trading center with dramatic splendor. Gazing at the lofty ice-covered crests of Chimborazo, Carihuairazo, Altar, and Tungurahua, the visitor can hardly believe he is near the Equator.

Nature here seems jealous of her charms; the hoary monarchs are often veiled in heavy clouds.

Leaving Riobamba, the railway climbs to the shoulder of Chimborazo to reach the highest point on the line, 11,841 feet, where several passengers had mild attacks of mountain sickness. Chimborazo's summit towers nearly 9,000 feet higher.

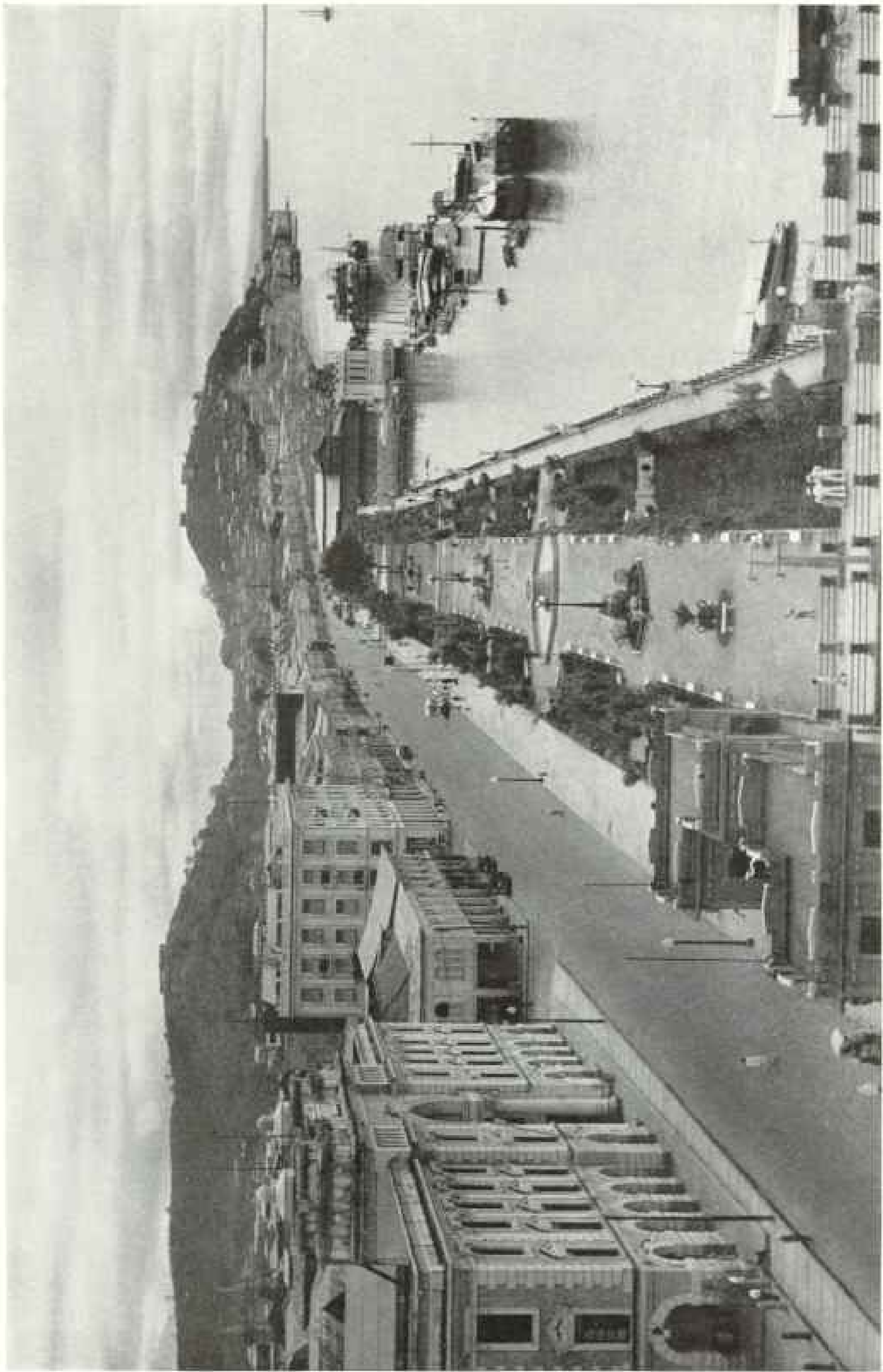
In Quito I met members of the Colorado Biological Survey, who had just come down from the slopes of Chimborazo. They had been making a study of the mountain fauna



— Staff Photographer W. Robert Stone

A Modern Skyscraper Seems an Interloper in Venerable Quito

Looking from the Government building over Plaza de la Independencia, one sees the contrast between old and new in the Ecuadorian capital. A part of the Cathedral is at the right, a reminder of Spanish days. A residential suburb of up-to-date bungalows clashes even more sharply with Quito's colonial homes.



—James E. MacCallister

Once Shunned by Ships as a Pest Hole, Guayaquil Has Banished Disease and Become a Busy World Port

A trimly kept park, the Malecón Simón Bolívar (foreground), lends charm to the two-and-a-half-mile water front, flanked by business houses, consulates, warehouses, and shipping offices (page 717). Before yellow fever and bubonic plague were conquered, vessels coming into the river here were under quarantine (page 740).



Staff Photographer W. Roberts Moore

Ecuador. Timber Farmers Make One Crop Carry Others to Market

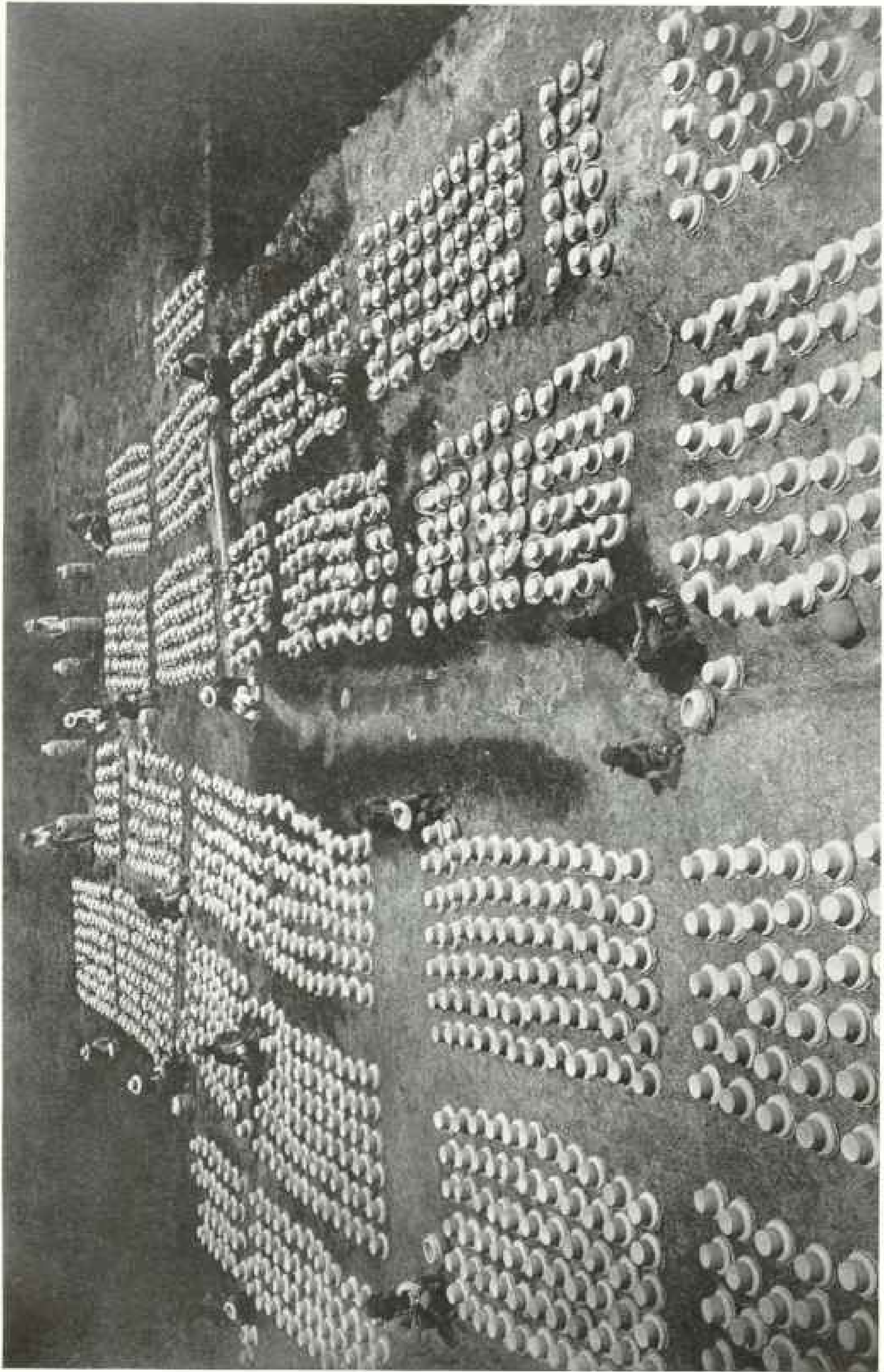
In the foreground are bulsa wood rafts used by planters to float their produce down to Guayaquil, where both logs and load are sold for export. In the Guayas River seaport a Grace Line steamer takes on a cargo of bananas. Barges used for lightering the fruit from wharves to deck are anchored alongside the ship.



Parish of Yumbura

Quito, City of Eternal Spring and Ancient Inca Stronghold, Keeps Cool 15 Miles from the Equator

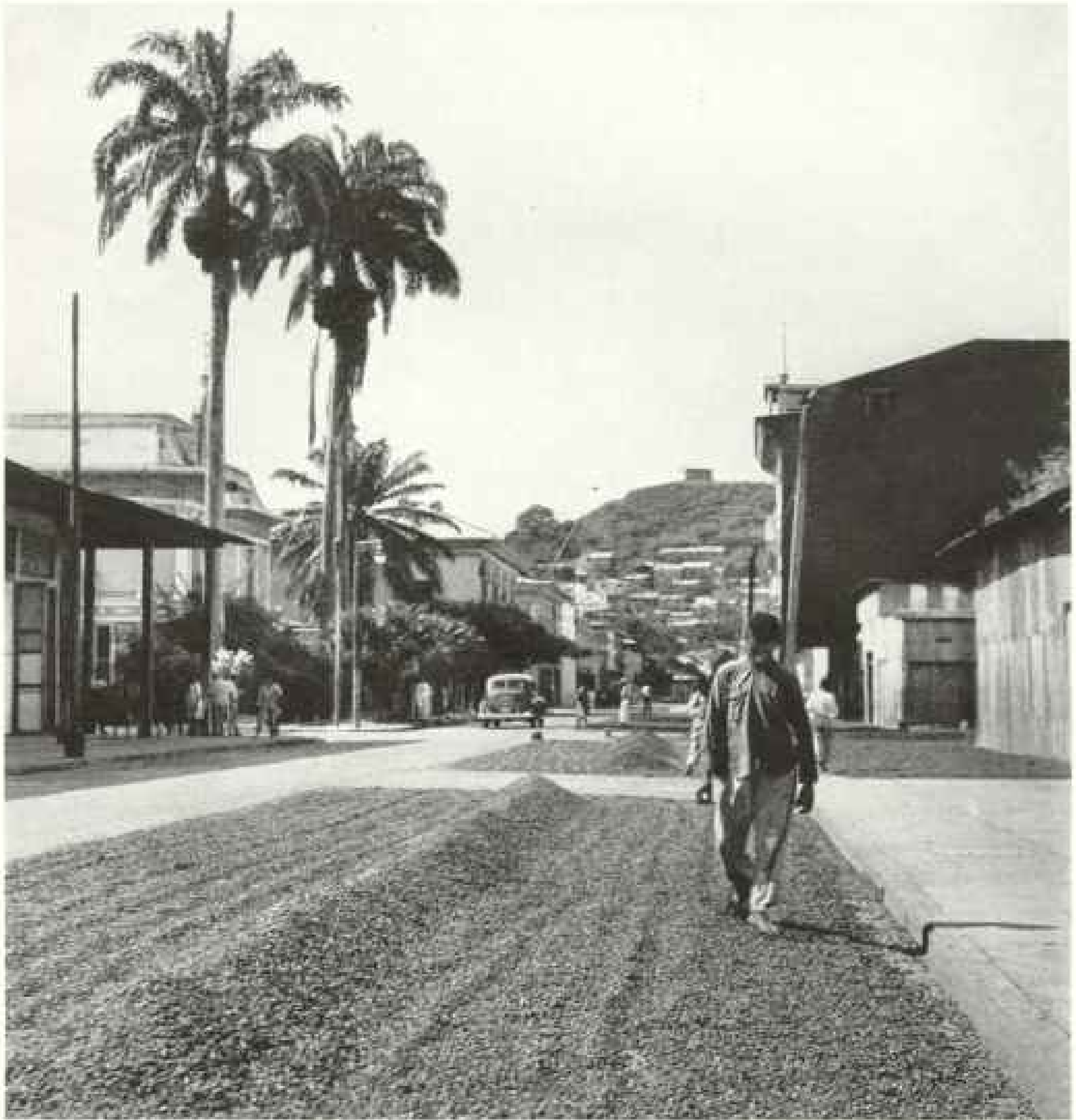
Pichincha thrusts its peak into the clouds. The commercial district lies in the valley to the left; in the lower center is the American Legation and to the left of it the golf course. Eucalyptus trees, introduced from Australia, border walks and fairways (pages 725-6).



Stanley Freeman

Acres of Hats Purchased from Country Weavers Receive Final Treatment before Shipment

The "Panamas," ranging in price from a dollar or two to two hundred or more, are mostly the product of Ecuadorian home industry. Traveling buyers collect them and bring them to Guayaquil, where they are washed, sulphur-bleached, and blocked (pages 736 and 740).



Staff Photographer W. Robert Mann

Some Guayaquil Streets Are Chocolate Coated!

Here cacao is spread out to dry on canvas laid over the pavement, near the warehouses. This man is "plowing" through the beans, turning them over to insure that all get the direct rays of the sun (page 735).

and had a fascinating collection of specimens, three-fourths of which were unknown and unnamed.

Wingless Insects above Timberline

"Flies and beetles live up on the high wind-swept ridges at around 16,000 feet," explained Dr. F. Martin Brown.

"When we first saw them we thought they were spiders, for they were darting over the ground. All have lost their wings; otherwise they'd be blown away. How they live up there at all in the rain, hail, and snow I don't know, but there they are!"

From the mountain slope the railway again tilts downward to Ambato. It rises again, however, to nearly the same height at Cotopaxi Volcano before reaching Quito.

Ambato, at less than 8,500 feet, is a garden spot snuggling among the high hills. Here grow apples, pears, strawberries, cherries, grapes, and other Temperate Zone fruits. The town makes furniture, woolens, and cotton goods, and is also a popular resort.

Baños, a few miles away in the lower gorges, has large thermal baths. It is one of the main gateways to the Oriente, that vast unexploited region on the eastern side of the

Andes, where live the Jivaro head-hunters and other little-known tribes.

From near Ambato many an expedition has got under way to seek the gold of the Incas. Legend says large quantities were cast into a lake when bearers on their way to the Inca court heard that their emperor Atahualpa had been murdered by Pizarro. So declares the Guide left by Valverde, a soldier with the Spaniards during the Conquest.

"Placed in the town of Pillaro, ask for the farm of Moya and sleep the first night a good distance above it; and ask there for the mountain of Guapa, from whose top, if the day be fine, look to the east, so that thy back be towards the town of Ambato, and from thence thou shalt perceive the three Cerros Llanganati, in the form of a triangle, on whose declivity is a lake, made by hand, into which the ancients cast the gold they had prepared for the ransom of the Inca when they heard of his death."

Thus reads part of Valverde's Guide, which he willed to the King of Spain.

Fruitless Search for Inca Treasure

An expedition was dispatched to find the treasure; others have followed, often with tragic results. After four centuries, the gold, presumably, still lies in the lake; and the mines from which it came remain unknown. Unless . . .

I talked with Capt. E. Erskine Loch, author of *Fever, Famine, and Gold*, who a few years ago explored and surveyed the Llanganates Mountains and probed the secrets of the headwaters of the Curaray River.

"The first stages of the Valverde Guide are easily followed," he explained. "But there seem to be hidden contradictions."

The genial captain, having toyed with golden fishhooks and small nuggets that he happened upon by chance down in the Oriente, was flying to New York on the same plane as I to arrange for mining machinery!

Through Latacunga, past Cotopaxi Volcano and the icy peaks of Hiniza, and into Quito we journeyed after dark. Later I returned to see the pumice-stone homes of Latacunga, and put in days trying to photograph the mountains in the brief intervals when they were free of blanketing clouds.

Cotopaxi (19,498 feet) is the highest active volcano on earth (page 728). Ecuadorians jokingly assert that it is higher even than Mount Everest—if one measures from the earth's center to gain the advantage of the "bulge" near the Equator!

Quito, most westerly of the South American capitals, is almost as far east as Washington,

D. C. Until I ran my finger up the longitudinal line, I did not realize that the bulk of the South American Continent lies so far out toward Europe and Africa.

Venerable Quito, Calm and Courteous

Washington, compared to Quito, is but a youngster.

Long before the Spanish came to the west coast, Quito was an important stronghold of native tribes. Here, according to some chroniclers, dwelt an ancient tribe of Quitus, who were overcome about A. D. 980, when Cara tribes pushed inland from the coast.

On the crest of a hill, the Panecillo, which rises in the eastern part of the city, once stood a temple where the natives worshiped the sun god. Unlike Cuzco, however, Quito has no forts or closely fitted rock walls dating from Inca days.

Quito spreads on a plain at the foot of lofty Pichincha, 15,672 feet high. A checkerboard of verdant fields surrounds the town and rises to uncanny heights up the slopes toward the snow-spattered summit of the mountain backdrop. Parks, gardens, and patios are green all the year round. Here, only a few miles from the Equator, weather, like the hours of daylight and dark, varies little (page 722).

An even unhurriedness marks the activity of its people. This may be attributed both to the altitude of more than 9,000 feet and to long isolation.

Everywhere an air of Old World calm and charm pervades the town. Business men close shop for extended lunch periods. Indians trot rapidly along under heavy burdens, it is true, but they also sit for hours on their haunches around piles of goods, waiting patiently to make a sale.

No one is too busy to be courteous. Several times when I asked directions, my informant accompanied me to point out the way.

Quito Bells Outclamor Poe's Poem

Though calm, Quito can hardly be called quiet. Bells of the city's 56 churches are forever clanging. At 4 o'clock in the morning some begin their periodic persistent ringing.

Even less melodic are the cries of women and boys who vend the latest editions of the city's four newspapers. Hawkers selling fruit, ice creams, and chocolate; police tooting whistles; and motorists honking horns add to the cacophony.

Even in my hotel there was a frequent sounding of gongs. Thus was the manager, a former seafarer, reminded of his days on shipboard.

Of Old World architecture, Quito's churches

have been adorned lavishly with gold. The Jesuit church, La Compañía, an excellent example of Spanish baroque, is decorated inside and out with astonishing profusion (p. 739). San Francisco church, built soon after the arrival of the Spanish, is no less elaborate.

One day I climbed to the tower of La Merced church to photograph the city. One of the attendants went up at the same time to wind the clock made by Handley and Moore of Clerkenwell, England, in 1817. Both weight cords and the bell ropes are of twisted rawhide. The bells likewise are suspended by rawhide thongs.

Wandering about the cloisters of San Agustín one day, I chanced upon a plaque beside a door which bore the information that the treaty of independence from Spain had been signed within. A kindly priest unbolted the heavy door and let me enter.

Carved wood tribunal, two-tiered seats around the wall, and the carved table are the same as when the room was used on that August day in 1809 when the patriots had made the first attempt to throw off the yoke of Spain. Not until 1822, however, was the royalist power completely broken by Marshal Antonio José de Sucre at the Battle of Pichincha.

Modern Buildings Seem Anachronisms

On the wall hangs a letter signed by Sucre, dated less than two months after the battle. In it, one José Solano was ordered to return a horse to its rightful owner, Sr. Francisco de Soto. Ten days later De Soto had receipted the letter, having received the horse specified. Apparently the hero of Pichincha was also master of small conflicts as well!

Gradually changes come to Quito. A new nine-story "skyscraper" now contests the sole dominance of church spires over the panorama of low red roofs (page 719). Several other modern structures and an excellent motion-picture house have also been built in the downtown district.

Recently stores have increased the variety of their merchandise, though there are hundreds of tiny hole-in-the-wall shops that sell native goods. These have changed little through the centuries.

In doorways and arcades Indians sit with hand-woven blankets and ponchos that set the visitor fingering for his purse. Women fruit vendors set up shop everywhere. At the time of my visit several were selling the largest custard apples I have ever seen.

My hotel boy was also a merchant. Surreptitiously he hauled "Jivaro shrunken heads" from inside his coat, and argued eloquently

for me to buy one. Some manufacturer with an eye to tourist sales had cleverly fashioned them from goatskin. The Government places a heavy fine on a person possessing one of the real heads.

As a caution to pedestrian traffic in Quito's narrow streets, city authorities have placed many signs on the walls. Warnings in Spanish read "Obey the police," "Children do not play in the streets," "Ladies, do not obstruct the sidewalk, pass on the right." Nothing at all is said about the men standing on the street corners, unless the general request is supposed to apply to them!

One of the most delightful trips out of Quito is a visit to Los Chillos Valley. The road circles and climbs to heights overlooking the city before it plunges down into the patchwork quilt of green and gold farms that spreads for miles over the broad valley.

From the heights, too, on fair days, one can see seven snow-capped peaks in Ecuador's twin chains of volcanoes. One morning I watched clouds boiling up from the farmlands like some brew seething in a gigantic caldron. Higher and higher they plumed into the sky and blew themselves into oblivion. On another occasion, however, they massed with dramatic suddenness and dumped torrents of rain and hail. Some three inches of rain fell in a few moments!

Besides lovely haciendas in Los Chillos, there is also a small spa where one can bathe in the thermal waters or swim in a pool of constantly changing water from the springs.

Girdle of the World Near Quito

Some 15 miles north of Quito is the Equator. There is something remarkably fascinating about being on this invisible line that divides the hemispheres.

A large pink granite monument, surmounted by a globe, was unveiled here in 1937 by the Ecuadorian Government. The inscription commemorates the scientific expedition to the locality by the 18th-century French mathematician Charles Marie de la Condamine and his companions Louis Godin and Pierre Bouguer (page 732).

Visitors delight in having their snapshots taken while walking the "line." I varied the procedure slightly by passing out cigarettes to Indians who, though sitting side by side, were hemispheres apart!

In Ecuador, with a population estimated at about 3,000,000, Indians considerably outnumber the white inhabitants. Still speaking the ancient Quechua language and clinging to their old customs and dress, they are an interesting people.

Where Snow Peaks Temper the Tropics



© National Geographic Society

Kollachuma by W. Robert Moore

Backs Free of the Goods Sold at Otavalo, Indians Return Home Happy

Most of them trudge barefoot along the road, unmindful of sudden showers. The more prosperous ride in state on their pack donkeys. Near by is the mysterious Yaguarcocha, "Lake of the Blood," into which Quechua legend says the Spaniards cast 2,000 slaughtered natives.

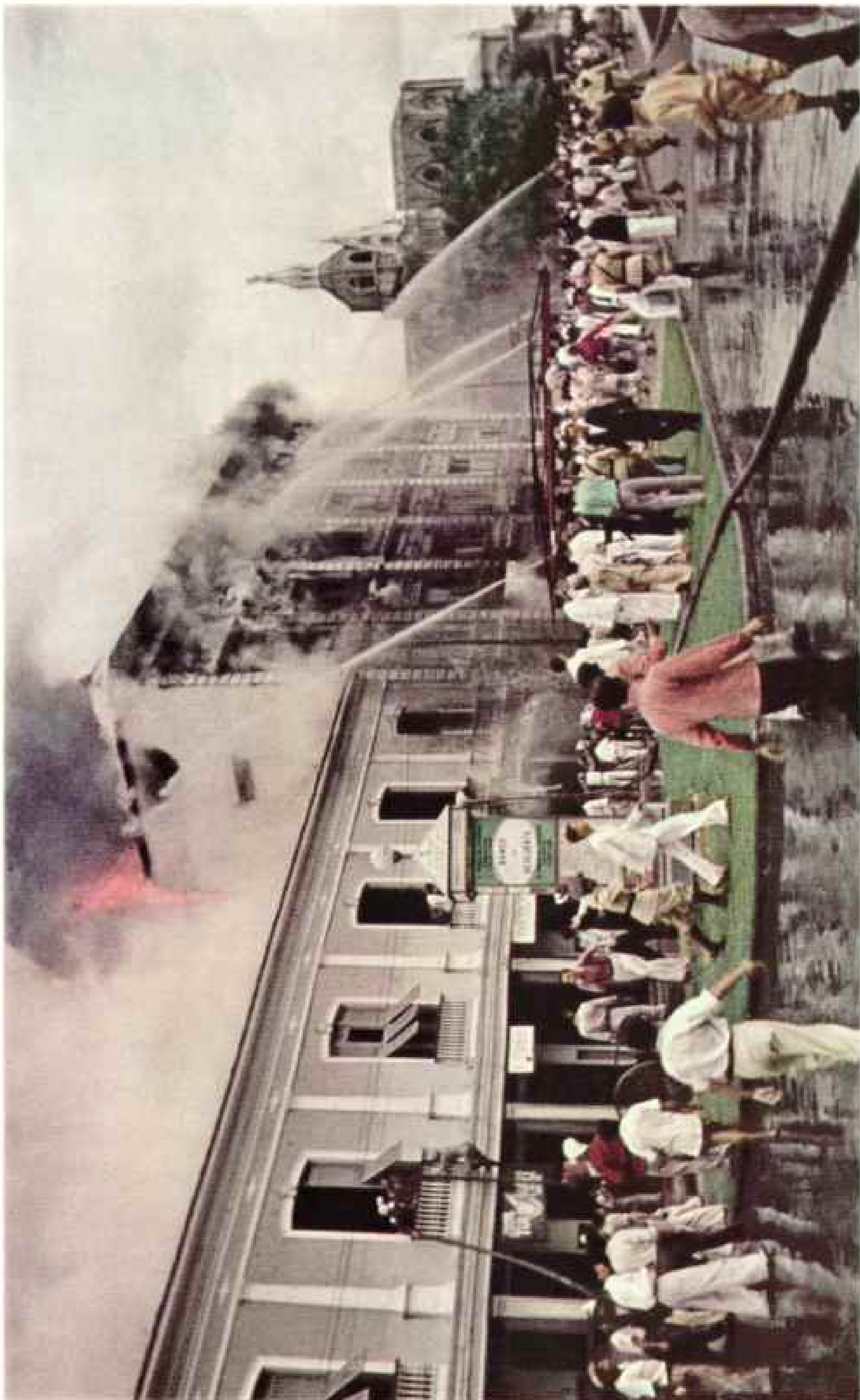


© Scullion Geographic Society

Illustration by W. Robert Moore

Cotopaxi, Highest Active Volcano in the World, Rears Its Crown of Snow above Equatorial Heat

To the mountain farmers it is a constant menace, for at any moment it may fling fire and lava from its icy maw. It towers 19,498 feet above sea level—one of 22 giant Andean peaks which pierce the sky in the highlands of Ecuador. In the ascent from Guayaquil to Quito, train passengers go from tropical to frigid temperatures. "We measure our climate by the kilometer," a travelling companion told the author.



© National Geographic Society

Guayaquil Volunteers Fight Flames Flung from the Sky by an Airplane Crash

Because many downtown buildings are of wood painted to resemble stone, fire has always been the archenemy of the city, repeatedly laying waste large areas. The citizens have a fire department of 5,000 members, organized into 24 well-drilled companies proud of their discipline and efficiency. Officers wear resplendent uniforms and receive as much honor as high-ranking military leaders. Despite modern equipment and heroic work, an entire business block was destroyed on this occasion, and several lives were lost.

Kodachrome by W. Robert Mann



Oranges Tempt Gaily Clad Customers at Otavalo

Though smaller than North American varieties, the fruit is sweet and refreshing. Some is exported to Britain.



© National Geographic Society

Woolgatherer by W. Herbert Myers

Nimble-fingered Women Weave a Panama Hat near Lake San Pablo

Inferior to those from Montecristi, it may sell for only a dollar; yet it requires a week to make.

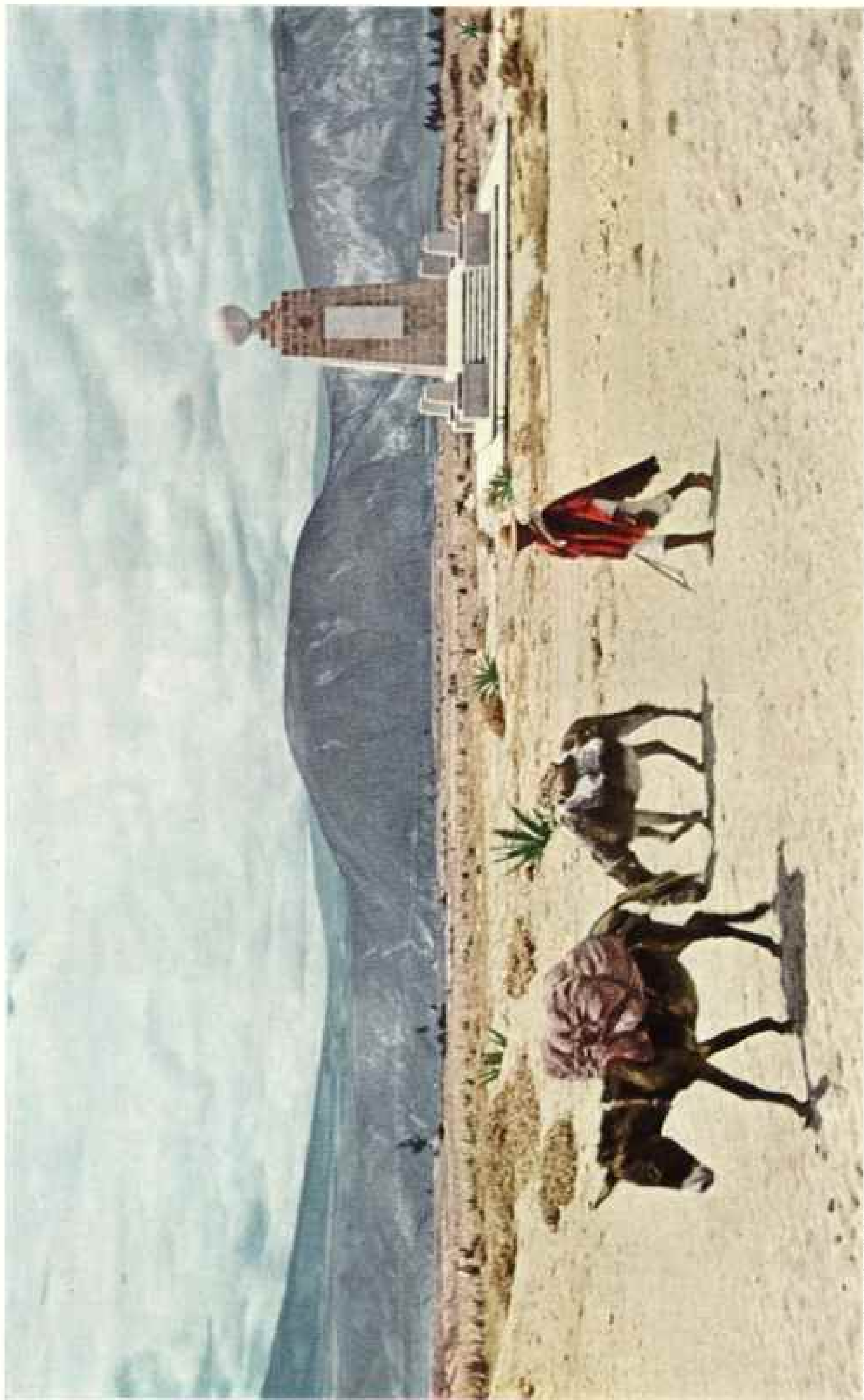


© National Geographic Society

Kolachene by W. Robert Moore

Handy for Many Purposes Is the Pack Cloth

It holds the goods the Indian brings to market, and serves as a shopping bag for his purchases. In its folds a mother will carry her baby, along with her needlework and food for a journey. Even such an awkward burden as this large pottery jar bought in Otavalo can be stowed safely in it.



© National Geographic Society

This Monument Northwest of Quito Is an Ornament on the Belt of the World

It marks the spot on the Equator where French scientists made measurements which proved valuable in studying the shape and size of the earth. Here travelers delight in having their pictures taken as they walk along the line with a foot in each hemisphere.

Redaction to W. Robert Moore



© National Geographic Society

Past Indian Women Market Bound with Sheep on Lensch Speeds an Automobile

Ecuador has few motor highways; this route to Saquisilí was until a few years ago only a path worn by barefoot natives and their pack donkeys. The country, its leaders say, stands in a vicious circle: if it had roads to reach its vast mineral wealth, it could obtain wealth to build roads.

Kochitama by W. Robert Moore



© National Geographic Society

Reproduction by W. Robert Mann

Indians with Their Produce Throng the Market Place at Saquisilí

Their goods sold, devout worshipers will offer thanks in the handsome church fronting the square.

Through generation after generation they have tilled the soil and have extended their farms to amazing heights and angles on the mountain slopes. Some of the cultivated areas are so steep that one wonders how a man can even stand on them to wield a hoe.

I motored ninety miles north from Quito to see the weekly market at Otavalo. Fittingly, the road has been described as a "continuous roller coaster ride all the way."

A few miles from Quito we began twisting and zigzagging down precipitous walls into the deep river trench of the muddy Guallabamba. Then, by equally sharp kinks and bends, we climbed again to the plateau level. Into the banks beside the road the Indians have gouged small caves in which they can crouch during sudden rainstorms.

We skirted the base of massive Cayambe Volcano, which rears its snow-mantled crest 19,160 feet just north of the Equator, and eventually reached Lake San Pablo, a blue gem set in a mosaic of hilly fields.

Before daylight Saturday morning a constant procession of marketers filed into Otavalo from every road and footpath throughout the locality.

Turned up Hat Brims Catch Water

It was raining. People trudged and slithered along, however, seemingly unmindful of the downpour, though they did cover babies and bundles on their backs, and some stopped occasionally to pour water out of the wide, upturned brims of their huge felt hats.

Fortunately the rain ceased later, and they spread their bewildering collection of wares in the two large market squares (page 730). One of the markets was given over largely to livestock and woolen produce. Here were countless bales of wool, about which women sat spinning while they waited for customers. Here also were finished ponchos and blankets.

People sniffed and fingered piles of big, boardlike felt hats. Though most of the Indian garb is suited to the climate, these hats seem absurd. In a region where rain falls much of the time, one feels that they might have turned the parasol-sized brims down, not up!

Rope makers spread out coils of woven and twisted cords, ropes, and sandals made from the *cabuya*, or so-called century plant, which grows everywhere along the fence rows.

In the other market place, long rows of women sat with piles of fruits, vegetables, biscuits, condiments, and mixtures of butter and meat. Others sold grains, coarse- and fine-ground flours, sieves, and reed floor mattings. Several women offered hand-sewn blouses and

shirts, the collars, cuffs, and fronts elaborately stitched in red and blue designs.

Under the arcades of the surrounding buildings gewgaws held the attention of hundreds. Here were displayed crudely made native rings, gaudy beads, buttons, and numerous cheap foreign articles.

Food concoctions that sizzled and boiled on charcoal braziers smelled good, and no doubt were. I saw women using their fingers to wipe out the very last morsel and drop of sauce in the bowls.

Ecuadorians have the proverb: "We live poorly in the midst of wealth, and bravely in the midst of danger." By wealth they refer to the vast mineral and agricultural potentialities of the country that are as yet partially or wholly unexploited. The danger, of course, lies in the possible eruption of the volcanoes.

"We have been in a vicious circle. Wealth lies unexploited because we lack roads, and because we cannot reach our wealth we have been unable to make the necessary investment for road building," a prominent Ecuadorian told me.

After my return from the mountain region, I set out one morning to see something of the life in Guayaquil.

"Have you seen our chocolate-coated streets?" inquired the enthusiast who had volunteered to show me around.

Noticing a twinkle in his eye, I suspected a joke. Still, I reflected, Ecuadorians grow "ivory" on tagua palms to make buttons (page 738). They might make paving out of chocolate!

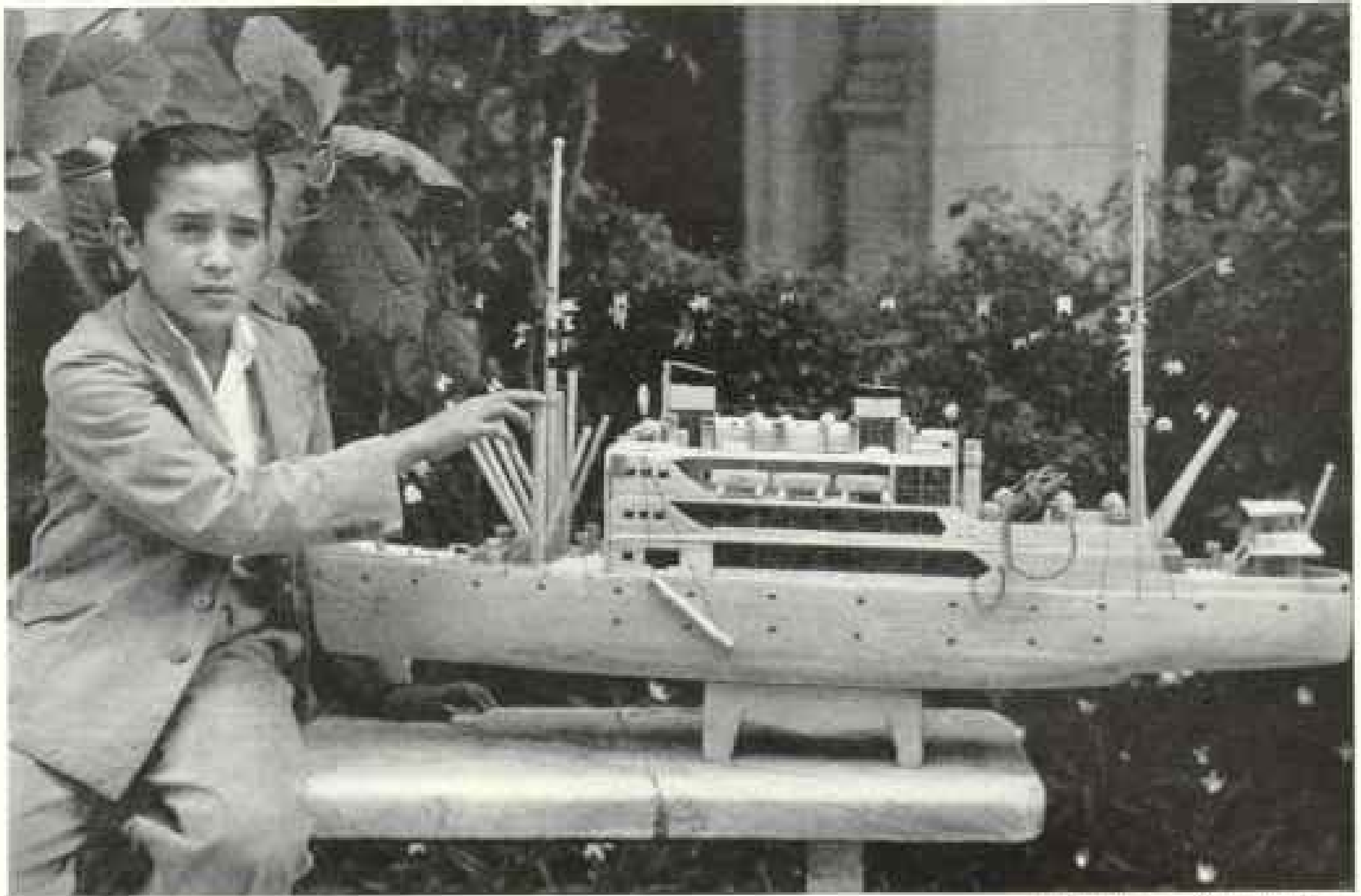
Streets Strewed with Chocolate

In a few minutes my curiosity was satisfied. The streets of a whole district were actually covered with cacao beans spread out on long strips of canvas (page 724).

Men walked up and down, plowing layers with their feet and leveling piles with scrapers to insure even sun-drying. Others with hand-made scoops heaped up dried beans and shoveled them into bags, which carriers hoisted on their backs and took off to warehouses or to lighters being loaded for shipment.

Cacao is still the chief export of Ecuador, although the country no longer shares with Venezuela first place in world output as it did prior to 1910. It is now surpassed not only by Brazil and a few other Latin American republics but by Nigeria and the Gold Coast of West Africa.

Because of two diseases, monilia and witch's broom, production has fallen off, and shipments have dropped from a peak of some 45,000 metric tons in 1916 to a yearly pro-



Staff Photographer W. Robert Moore

For Model Building, Easily Carved Balsa Wood Is the Perfect Material

This toy steamer, pride of the Guayaquil boy who displays it, weighs only half as much as a cork ship of the same dimensions (page 737).

duction which may fluctuate between 11,000 and 21,000 tons.

Some plantation owners who once lived in luxury in Europe and let their holdings yield what they might are now back on the job. By introduction of up-to-date methods of cultivation, they are combating the diseases and raising production levels.

Coffee has never been a principal crop, but it is gaining. It now brings the country about half as much revenue as cacao.

"Panama" Hats Come from Ecuador

Even the casual visitor soon learns of Ecuador's "Panama" hats. Insistent hawkers see to that! They flock to incoming ships, or gather around passengers at the landing pier, with stacks of hats on their heads and in their arms. Dozens of shops also deal in panamas ranging in price from a dollar or two up to \$200 or more (pages 723 and 740).

Among these hats the best are the Montecristis. They take their name from the town where they are made. Quality and weave, of course, vary, but some are so fine as to appear almost like closely woven linen. The finest of all may be rolled small enough to pass through a finger ring!

Hat making has become an important in-

dustry in Cuenca, and the district is now producing much of the "toquilla" straw (*Carludovica palmata*) required for weaving. Normally the output is about 150,000 dozen a year. Many of the popular-priced hats sold in the United States come from Cuenca.

Like the embroidery and lacework in Chinese Swatow, hat making in Ecuador is a home industry, a side line to agriculture. Women do most of the weaving in their odd moments, although some families make it full-time employment, especially when prices are good.

"Are the hats ever woven under water?" I inquired of a man who had devoted years to buying and preparing hats for the American market.

"No," was his quick answer. "That fallacy probably started because the straw must be moistened to prevent it from becoming brittle during the weaving. The only time the hats are in the water is when they are washed."

Commission agents tour the district and attend local markets to purchase the hats from the weavers. The panamas are then washed, bleached in sulphur fumes, blocked, ironed, and trimmed of surplus straws. Finally they are covered with a "smear" consisting of sulphur powder, water, and a little gum and pounded with wooden mallets. This last



Mortimer

High School Girls of Ancient Quito Go in for Modern Sports

With the coming of the railroad and air lines the city, one of the oldest in the Western Hemisphere, has emerged from its age-long isolation (pages 725-6). Up-to-date methods of education are eagerly accepted, and young ladies once sequestered may now enjoy athletics.

process increases their flexibility and evens out the weave.

Those shipped to the United States usually undergo further chemical bleaching after they reach their destination, but those which go to Europe are sold as they come from Ecuador.

"How long does it take to weave a hat?" I inquired.

"About a week for an ordinary one," my informant replied. "With the fine ones it takes longer, often several months."

"If you want a good hat," he advised me, "decide first what you are willing to pay; then pick out one in a reputable shop. Be sure to pick one of uniform weave and color."

Yes, I bought one.

Lightest Commercial Wood in the World

From panama hats I turned to the balsa lumber trade. An incredible wood this. When timbers tumble down on a movie star's head, a clown lifts seemingly impossible weights, or a guard throws a life preserver to a drowning person, the chances are that timbers, "weights," and preserver are all of balsa, the lightest wood used in commerce today. Ecuador is the chief producer.

In a sawmill I watched a 15-year-old lad

pick up 114 board feet of balsa and walk gaily off with it. Had it been newly sawn oak, the load would have weighed 600 pounds!

A cubic foot of balsa weighs only seven or eight pounds, half as much as a piece of cork of the same dimensions. Its lightness, resiliency, and insulation properties afford an amazing number of uses.

In refrigerators, storage containers, and incubators it forms effective insulation. Rooms and airplane cabins are rendered quieter by layers of it in the walls. Floats, life preservers, decoy ducks, hat blocks, scale models, toy airplanes, stage novelties, and shock-absorbing packing for pianos and fine furniture are fashioned from this buoyant wood. Its uses are legion (page 736).

The jungles of the Quevedo region are the principal source of the Ecuadorian supply. In addition to the wild forest growth, balsa is also being grown as a plantation product.

Of large cellular structure, it grows rapidly. In eight or ten years many trees reach a diameter of 25 or 30 inches.

As soon as the trees are cut, the logs are hauled by oxen to the rivers for floating down to Guayaquil or Esmeraldas. All along the river may be seen large balsa rafts on the way

to the mills, many heaped with loads of plantains or bananas for local markets.

The logs are never allowed to lie in the forests, for worms and insects quickly attack them. Some of the cutters even insist that the trees have to be felled when the moon is in the first quarter to keep the pests from destroying the timber!

Because of the coarseness of the wood, there is considerable waste in milling; but if transportation were available at reasonable cost, the sawdust could be used effectively for insulation.

Guayaquil ships six to eight million board feet of balsa lumber annually and Esmeraldas about one-fourth that amount, the greater portion going to North America. More than half of the balsa reaching the United States goes into model airplanes.

"Ivory" Grows on Palm Trees

Some wag has suggested that Ecuador might well adopt the slogan: "We button the world!"

For the last five years the country has shipped an average of more than 27,500 tons of tagua nuts, or "vegetable ivory", from which come millions of buttons. An excellent substitute for elephant ivory in color, texture, and hardness, nuts are also used in making umbrella handles, chessmen, and numerous ornaments.

At home, native Ecuadorian carvers fashion the nuts into likenesses of their heroes and into tiny sewing sets, tops, boxes, and countless other souvenirs. These are the wares most tempting to travelers.

Tagua nuts are the seed of a stunted palm fern, the *Phytelephas macrocarpa*, which grows wild in the hot, steamy jungles of the lowlands. A 15- to 20-foot plant suggests a stunted coconut with wide-spreading fronds.

Drupes, or large burrs, about the size of a man's head, form around the trunk, and in these grow seeds from one and one-half to more than two inches in diameter.

In their formative stages they consist mainly of a clear, thirst-quenching fluid, and later a sweet milky substance that increases in consistency. When fully ripe, the nuts are so hard that it is difficult to cut them.

Nut gatherers, or *tagueros*, roam the jungles collecting the ripened fruit and bring in loads by pack, dugout, or balsa raft to market centers. Much hard work lies back of this button business.

Gaiety in Guayaquil

Guayaquil has its tennis clubs, swim clubs, and a nine-hole golf course carved from the jungle. A colossal ceiba tree which stands in

the first fairway would disconcert even a golf wizard.

Evenings, hundreds of Guayaquileños promenade along the Malecón. For more sophisticated entertainment, there is a night club, the Roxy.

The city's most important parade takes place on Sundays after church. Between 12 and 2 an endless line of shiny cars moves up and down 9th of October Boulevard, Guayaquil's "Fifth Avenue," whose name commemorates the city's declaration of independence from Spain on October 9, 1820. Families take the air; señoritas cast shy glances at sleek-haired males; nods and salutes are exchanged between strollers and patrons of street cafes.

Music is blaring the while in Fortich's Restaurant, and modern young Guayaquil weaves sinuous dance patterns on the floor between sips of cooling drinks. At one of these "vermouth hours" I discovered Ecuador's finest beverage—*Naranjilla*.

The naranjilla (little orange) grows on a low, sparsely branched plant and is seeded like a tomato. Drinks made from the yellow fruit have a medley of flavors, suggesting a combination of orange, lime, and pineapple juices.

Guayaquil society turns out in gala attire for the races every Sunday afternoon. Although the entries are too few for spectacular contests, the crowd is enthusiastic. The smartly turned-out men and exquisitely dressed women offer a better show to visitors than the events on the track.

Guayaquil has no hearths, but it has a plethora of crickets. In December the pests wing into the city in millions, sometimes even dimming the street lights. They get into people's hair, down their necks, into food—everywhere. At the end of the rainy season, in May, a smaller invasion sometimes descends on the city.

It was on one of these latter "slight recurrences," to use the words of a friend, that I shook fifty out of my clothes and from my suitcase carelessly left open inside a screened room!

The Fight Against Bubonic Plague

While exploring the city one day, I went to see how the Health Department, assisted by the Pan American Sanitary Bureau, keeps Guayaquil free from bubonic plague.

Theirs has been no quick Pied Piper of Hamelin solution to the problem of rat riddance. Large numbers of bamboo structures make clearance difficult. Systematically, workers poison and trap the rodents in every



Staff Photographer W. Robert Moore

From Fashionable La Compañía to Humble Shrines, Quito Has 56 Churches

This elaborate entrance is surpassed by the magnificent interior where stand a center altar of solid gold and ten side altars covered with the precious metal (pages 725-6). Indian worshipers are devout. They will kneel for hours in their small chapels, listening to the organ and hearing over and over stories of the Bible.



Staff Photographer W. Robert Moses

The Finest Panama Hats Are Soft as Linen

These, made in Montecristi, have not yet been blocked. To show how pliant they are, the girl has rolled one into a small cylinder. The finest can be passed through a finger ring (pages 723, 736).

house, patio, and garden. Trains coming from upcountry are carefully fumigated.

In the laboratories I saw thirty boys busily packaging mixtures of corn, bran, cheese, and arsenic for the corps of poisoners to distribute. Two dozen men, each provided with 200 snap traps and 10 cage traps, were just bringing in their catch from the previous night.

and in two hours had a swift aerial review of the flat, steamy plains, the mountain capital, and the crumpled, icy peaks of Ecuador. At five o'clock that afternoon I was in Cristóbal, Canal Zone.

On Monday morning I was back at the National Geographic Society in Washington, D. C. Despite its 4,000-mile distance, Ecuador, to me, seems very near.

These rats, an average of 145 to 270 a day, are tagged with cards giving the exact location of their capture. They are put into hydrocyanic gas chambers and later combed of fleas and autopsied. If the doctors find one infected, a clean-up campaign is instituted immediately in the section from which it came.

Through microscopes I looked at the disease-carrying fleas, *Xenopsylla cheopis*. The plague germs resemble a folded-up safety pin.

From 1930 until 1935 plague vanished from Guayaquil. For a time fumigation of trains was stopped. When the fortieth train had come through without fumigation, a watchman at the riverside terminal developed the disease. Since then there has been no relaxation in the rat war. Only three cases appeared in 1939 and none since then. Today, thanks to these energetic modern sanitary measures, the city is no longer on the health black list.

On a Saturday morning I left Guayaquil

Notice of change of address of your NATIONAL GEOGRAPHIC MAGAZINE should be received in the offices of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your February number, The Society should be notified of your new address not later than January first.

New World Map Gives Backdrop for Headlines

A NEW Map of the World with many unusual features is presented to members of the National Geographic Society this month as a special supplement to their Magazine. More than 1,500,000 copies of this map have been printed for distribution to The Society's world-wide membership and to meet future demand.*

Showing the earth in two hemispheres and ten colors on the generous scale of 552 miles to the inch, the new map, 41 by 22 inches, has been carefully designed by the Editor and The Society's cartographers for use on desk or wall as an attractive, inclusive, and accurate reference work.

With headline developments whirling all over the globe, nothing less than a world map is adequate for following the dramatic events of the day. It will enable The Society's 1,100,000 member families to orient themselves quickly and to locate at a glance places featured in news dispatches and war charts.

For more detailed study of particular areas, members can turn to their previous supplements showing individual oceans, continents, or sections; or they may refer to current newspaper maps such as those now being furnished to the press as a special feature of The Society's long-established News Bulletin Service.

Boundaries "Frozen" on Prewar Lines

Because national boundaries mean less and less as war spreads, and because there seems little likelihood of their early settlement, no attempt has been made on this latest world map to show invaded territories. Countries are represented as they were on September 1, 1939, the day German troops marched into Poland.

Because both the United States and Britain have recently become island conscious, several pinpoints on the new map have suddenly found themselves important air stations decorated with the Stars and Stripes or Union Jack, in some cases both.

Canton Island, in mid-Pacific, where in 1937 the National Geographic Society-U. S. Navy Solar Eclipse expedition and a party of New Zealand scientists good-naturedly argued the question of sovereignty, is now a fully equipped jointly administered air base for both the United States and Great Britain.

The new map is drawn on an Azimuthal Equal Area projection. By this method land masses are shown in their true relative areas, in contrast to certain other world map projections which would make Greenland, for example, appear larger than South America.

The use of hachures instead of tinting for portraying mountains lets the countries stand

out clearly in pink, yellow, green, purple, orange, and brown, unobscured by any tint to show relief.

By long-standing map-making convention, the far-flung British Empire is shown in pink. France and its possessions are shown in purple, which likewise has become conventional for the purpose. The United States is depicted here in green, but there is no fixed tradition in favor of any particular color.

Of all the maps issued by The Society, those of the world and of the United States are most popular for handy wall use. Accordingly this map has been made as attractive as possible. The border is an ancient Greek knotted rope design and around the rim of the hemispheres runs a Greek meander pattern.

New Air Routes over Oceans

Much information has been packed into the six insets that enliven the margins.

One of these, in the lower center, shows all of the world's time zones on a single chart. By looking at your watch and that one small map you can see what time it is anywhere in the world.

On the same inset are shown the trans-oceanic airways. Since the previous world map was issued in 1935, these have been extended by thousands of miles. New since then are Pan American's great north Atlantic air routes to Europe and the extension of its Pacific service to New Zealand and Singapore.

The small Land Hemisphere and Water Hemisphere maps in the top corners show the heights of land and depths of the sea over our whole planet. However, if the earth were actually shrunk to the three-and-one-half-inch diameter of these hemispheres, it would be as smooth as a machined steel ball. Its greatest irregularity, 64,402 feet, or more than 12 miles, from the top of Mount Everest to Mindanao Deep off the Philippines, would amount to slightly more than five thousandths of an inch.

These hemispheres emphasize how the land area is clustered about the North Pole. The ancient Greeks, who loved symmetry, were dimly aware of this fact and reasoned that such a thing could not be without causing the earth to turn over. Therefore they invented great land masses for the southern hemi-

* Members wishing additional copies of "A Map of the World" may obtain them by writing the National Geographic Society, Washington, D. C. Prices, in United States and Possessions, 50¢ on paper (unfolded); 75¢ mounted on linen. Outside of United States and Possessions, 75¢ on paper; \$1 on linen—all remittances payable in U. S. funds. Postage prepaid.



Photograph by Laurence Guyot Thaw

Soldiers in Bloomers Stand Guard at the Gateway to India

But don't let the feminine-looking garb mislead you, for this trooper of the British Northwest Frontier Force is a "first-class fighting man." Backed by a stout gate, he stands at the Afghanistan end of the Khyber Pass, which is closed at night because of danger from raiding tribesmen. The sign means it is 34 miles to Peshawar, 25 to Jamrud, and 5 to Landi Kotal—typical of many remote and little-known places turning up in the news these days.

sphere. For nearly two thousand years cartographers mapped this huge "southern continent," until finally the search of explorers reduced its size to the land masses of Australia and Antarctica. The same insets show how much of the earth's surface is water—nearly three-fourths. Hence the great importance of air power in the north and of sea power.

In the bottom corners of the new world map two small hemispheres show population density by green, yellow, red, and purple tints.

Here one can see at a glance the world's crowded spots and its vast open spaces. Among the areas in green, indicating fewer than two persons to the square mile, one finds most of Australia, the interior of Brazil, northern Canada, Arabia, and Siberia, and the great deserts such as the Sahara and Gobi.

Teeming Asia has by far the most purple, indicating over 250 persons to the square mile, but Europe also is blotched with it. Thus the two continents now wracked by wars are likewise the most crowded.

Another chart shows how much progress has been made in mapping the earth's huge face. This World Mapping inset, in the upper center, shows most of the earth on a star-shaped

projection with red, orange, and yellow tinting to indicate regions accurately mapped, reliably mapped, and only roughly mapped.

Though even now only a small portion of the earth has been accurately surveyed, the use of airplanes in otherwise inaccessible areas is rapidly changing the three categories.

How Aviation Foreshortens the World

The Glenn L. Martin plant in Baltimore, Maryland, has just completed a gigantic long-range patrol bomber for the U. S. Navy. Although this flying battleship is experimental, and all figures concerning it are shrouded in official secrecy, it probably has a maximum range of 7,000 miles!

The possibilities of such a plane are amazing. From a base in Newfoundland it could make a round trip flight to Leningrad, or to any point in Germany. It could penetrate Italy as far as Taranto, or circle Dakar, and still return to its Newfoundland base. From the U. S. Naval base at Dutch Harbor in the Aleutians, it could fly to any point in Japan, Korea, or Manchukuo, and come back.

Long before this map is out of date, flights of such length may become commonplace.

Islands Adrift: St. Pierre and Miquelon

In a Key Position on the North Atlantic Air Route, France's Oldest Colony Rides Out Another Storm

BY FREDERIC K. ARNOLD

OUT beyond the Gulf of St. Lawrence, only 15 miles off the southern coast of Newfoundland, lies France's oldest and smallest colony, the island group of St. Pierre and Miquelon.

In a stormy, fog-ridden sea these lonely islands stand symbolically like a last outpost, all that remains of the once vast French empire in North America. Their total area is about 90 square miles, their greatest overall length only 28 miles (map, page 746).

Unlike other possessions of France, with their large native elements, St. Pierre and Miquelon are almost wholly French.

The downfall of France, with the resultant cutting of the old close ties to the motherland, has hurt the islanders in heart and pocketbook. Gone are their European markets for cod, and war has delivered a body blow even to sale of European goods to cruise-ship passengers.

We sailed to the islands from Montreal on a Canadian cargo liner which took five days to make the trip. As we headed out to sea from North Sydney, Nova Scotia, on the last 200-mile leg of the journey, the gun on the poop was held ready and the blackout was rigidly enforced.

The next morning the islands were in sight, and soon we were sailing through La Baie, the channel four miles wide that separates the two main islands.

Snow Dots Hills Even in June

The morning was gray and cold, typical June weather here. On both sides abrupt cliffs rose from the sea. There was much more green than we had expected on these barren islands, but against it were contrasted many white patches where snow still remained among the crags.

At our first sight of the town of St. Pierre our impression was one of surprise at its size. It is a thick cluster of houses crowded between the ocean and the "mountains," as the highlands are called, although the greatest elevation is only 671 feet. The streets run straight up from the water to the mountains, where they simply disappear.

From the moment our ship came alongside the pier we were impressed by how French everything is. Below us were gendarmes and customs officials wearing the same uniforms

as in France. Everywhere were dogs—large dogs of all sorts, but most of them resembling Newfoundlands in varying degrees (p. 759).

Frenchmen first came to these islands more than 400 years ago. When Jacques Cartier stopped in 1536 on his way back to France from his second voyage, he found French fishermen on St. Pierre, which already bore this name. At the beginning of the 17th century a real settlement was made.

There is no record of how the islands got their names, although one may be tempted to think that St. Pierre was called so after St. Peter, protector of fishermen, and Miquelon is a Norman form of the name Michel, or Miguel, as it was called by the early Portuguese navigators.

Isles a Shuttlecock in Many Wars

Several times, in the wars between Britain and France, the colony passed into English hands and its whole population was deported. But each time these shuttlecock islands bounced back to the French, who have now held them since 1814.

As soon as the customs formalities were dispatched (they consisted of a duty of 36 cents on my old portable typewriter), we rode by motor to a hotel. Our trunk followed presently on a two-wheeled dray in the care of a worthy known as *Le Zèbre* (The Zebra), a nickname fastened on him years ago as the result of a practical joke in which his horse was painted with stripes.

The town, we found, had three hotels and a small, respectable boardinghouse. Everywhere the basic rate for room and board (and the latter includes wine at St. Pierre) was two dollars a day. Hotel accounts are not reckoned in francs, since provisions must all be imported from Canada and America.

Most of the buildings in the lower part of town are frame houses veneered with bricks or plastered with a smooth coat of stucco, which is generally painted yellow or reddish (page 748). Far more numerous, especially away from the downtown section, are clapboard houses which are painted when the owner can afford it.

Although one sees windows with sliding sashes (called guillotine windows), the French type is much commoner.



Léon D'Almeida & Son

The World War Memorial Stands as Symbol of the Colony's Fervent Loyalty to France

One hundred and five men were lost in 1914-18—more than a fourth of the islanders who served in the French Navy and Army. If the United States had lost men at the same rate in comparison to its population, its toll would have been nearly three million (page 747).

The visitor gets the impression of a town not all French and yet not American, a little strange from either point of view and possessed of a certain sad charm.

Clearly visible were the ravages of the great fire which in the spring of 1939 destroyed three of the town's best blocks. On the edges of this mass of wreckage reconstruction was in progress.

Fire Is Curse of St. Pierre

Fire has been the curse of St. Pierre. Only five years before, the residence of the Governor was destroyed. In the middle of the last century three conflagrations occurred within 14 years. For this reason there are few old houses, and none goes back farther than the reoccupation of the island by the French a century and a quarter ago.

Nowadays all houses are required to have ladders running up the side and on the roof to facilitate fire fighting. Since the last dis-

aster the town has bought a new trailer-mounted apparatus which operates by pumping water from the sea.

When we returned to the hotel, we found a group of townsmen gathered round the table in the lobby, discussing the news. They were not customers, for, unlike the other hotels, ours had no café. They were friends of the family and dropped in frequently, especially late in the morning when Western Union clerks left typewritten news dispatches.

The town has no newspaper, and because of the war even these dispatches had first to be passed by the censors. Later the dispatch sheet was discontinued, but the public kept in touch with events through radio broadcasts from both Europe and America.

School here, as in France, continues until just before the national holiday on July 14, so we enrolled our small son for the balance of the term.

In the school, run by the Sisters of Saint-



© Léon Briand & Son

French Tars Stranded by War Eat Lunch on Their Beam Trawler

A large part of the French fishing fleet was marooned at St. Pierre in the summer of 1940. Some thirty trawlers and sailing ships, with about 1,500 sailors, found refuge here. Each ship has its dog. At the cry of "Man-overboard!" these mascots often jump into the icy seas to the rescue (page 760).

Joseph-de-Cluny, there is no kindergarten in our sense of the word, but a class where 30 children from four to six years old sit behind regular French schoolroom benches. By June all have learned to read, except one or two of the tiniest.

The sister, a tall woman with frank brown eyes, had several recite individually, reading with great earnestness and in high, piping voices syllable by syllable from an old-fashioned primer. Then the class in a chorus counted up to a hundred and by tens up to a thousand. It all seemed to be done without strain even by the four-year-olds, who do not know that nowadays this is supposed to be beyond their power.

By the end of the year, two and a half weeks later, our little boy had learned to read his letters and the simplest syllables, and could count the dice—the sister called them dominoes—that were arranged at the bottom of the pages with the appropriate numbers.

Leaving Pierre in good care, we continued our exploration of the town. Visitors are always struck by the number of stores, for there are possibly a hundred in all, or one to every 34 inhabitants.

With a static population everyone knows what everyone else's business is, so the show windows are either bare or filled with a jumble of neutral objects that are well faded after years of slumber there and give little or no indication of what is to be found within.

For example, one establishment that we assumed to be a seed business proved to be a treasury of perfumes, soaps, liqueurs, and fine groceries from France, still in stock at the time of our visit.

A picturesque custom does give the stranger a clue as to what is going on inside: slates placed beside the entrance announce that the baker has made *croissants* (typically French crescent rolls), or that the butcher has made sausages.



Last Vestige of a Mighty Empire

Fifteen miles south of Newfoundland lies the island group of St. Pierre and Miquelon, France's oldest and smallest colony. The tiny area of 90 square miles is all that remains of the once far-flung French possessions in North America. Although the two Miquelons are known officially as "Grande" and "Petite," inhabitants and mariners call the smaller islet "Langlade" (page 761).

Alone in proclaiming its purpose is an old pharmacy, its window displaying not only show globes filled with pale-colored water, but jars with pickled tapeworms of various dimensions, mortars and pestles, archaic scales, and other druggists' implements of long ago.

Inside are innumerable hand-labeled jars and drawers of drugs and herbs giving off all sorts of odors at one whiff, like the store-room in *David Copperfield*. One could not help wondering how the owner would ever be able to renew the stock, because the French pharmacopoeia is quite different from ours.

With commerce such an important part of the life at St. Pierre, it is a mistake to visualize a poor fishing village.

Fishing is the main industry of the archipelago, but it is not especially characteristic of the capital, where 3,400 of the total population of the colony (4,200) live.

The natives say of themselves that they are businessmen to the tips of their fingers, and this is so in the very best sense. We never saw signs of aggressive salesmanship or high-pressure tactics.

Once, on our first day, we were stopped most courteously and given a printed card by the proprietor of a store specializing in luxury

articles intended largely for excursionists from boats such as the *Belle Isle*, who normally spend two or three hours ashore sight-seeing and shopping. This did not happen again, for everyone soon got used to us.

St. Pierre, as we know it, is a happy hunting ground for the shopper. Behind the non-committal exteriors lies a wide variety of merchandise. Most tempting were kid gloves, perfumes, cosmetics, clothing, and liqueurs, which arrived from France two or three times a year on a little gray freighter named *Le Celta*.

Revenue duties in the colony are only nominal (as a compensation for the hard life, no doubt), and prices were reasonable, even on articles imported from Canada and the United States.

"Le Whiskey" Brought Prosperity

The prohibition era in the United States seemed almost providential to the little French colony, which was suffering severely from the decline of the fishing industry. In fact, there ensued, in the twenties and early thirties, fifteen years of prosperity such as had never been known there.

Merchants imported beverages from France and elsewhere and sold them to customers who obligingly came to their very doors. Taxes on alcohol and tobacco have always been nominal, and they did not interfere with this lucrative business.

Not only did this trade realize large profits for a relatively small number of merchants, but handling the cargoes created much employment, which was far better paid than fishing. Gradually the St. Pierrais became involved in the actual shipment to the American mainland, but as a rule they remained outside the territorial waters of the United States.

This golden era of false prosperity seemed destined to last forever. The small taxes filled the government coffers and were in turn spent on many improvements—the two reservoirs, the two macadamized roads, and especially on breakwaters and other harbor improvements, which absorbed some two million dollars. Local investors put profits back into business in the form of concrete warehouses, which now stand idle, and expensive boats with high-powered engines.

Repeal of prohibition did not immediately cause the collapse of the liquor traffic, but in 1935 the French Government, yielding to strong pressure from Canada and the United States, clamped down with restrictions that ended the bonanza almost overnight.

Prosperity now changed to grim depression. Local enterprise had neglected to build



Paul Bédou

This St. Pierrais Claims Kinship to a French Statesman

When the fisherman who is removing the hook from a cod was asked his name, he replied, "Briand." He said he was a relative of the late Aristide Briand, French premier and co-author of the Briand-Kellogg Peace Pact of 1929. The author found many islanders bearing the name Briand, including a butcher, a baker, a cobbler, three grocers, a stationer, an importer, and a store clerk, as well as the photographer who made some of the accompanying photographs.

trawlers, which are needed to carry on fishing profitably nowadays. The trawlers from France, which it had been hoped would come increasingly with the new harbor facilities, came more and more infrequently. Within a couple of years the profits of the period of "le whiskey" were spent, and the unemployment problem became serious.

Many Islanders Have Died for France

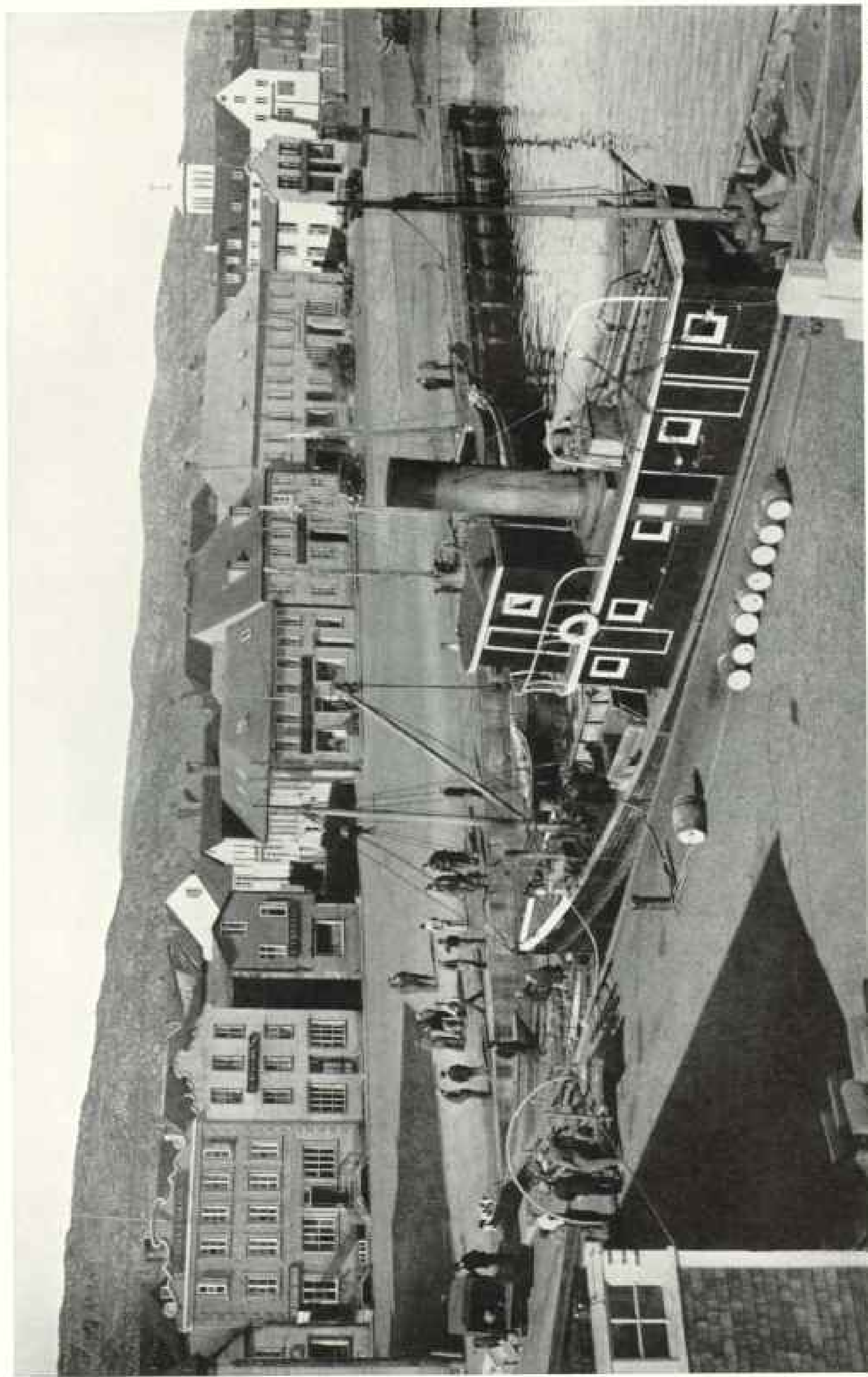
The islands' inhabitants are fervently patriotic. For them France is everything, its name almost magic, although few of them have seen it.

In the first World War the colony lost 105 men, more than a fourth of those sent to Europe (page 744).

Yet in France the St. Pierrais were so little known that when they first landed many officials expected to see negroes. Later they were sometimes granted furloughs in the south of France, army doctors having a vague feeling that they came from some tropical climate and were not used to the cold.

When the present war broke out, a few of the St. Pierrais went to France but were sent home again, because at that time the authorities did not think they needed more men. So St. Pierre carried out its own mobilization, with an unused warehouse as barracks.

By the time we reached St. Pierre the "army" had been dishanded, but the local "navy" was still mobilized. This consisted chiefly of two private boats that had been



© Louis Brand A. 301

To Ancient Cannon, Upended as Bollards, Are Moored Tugs and Fishing Boats in the Heart of St. Pierre.

About the Quai de la Roncière turns the life of the town. When ships put in, everyone, especially the dogs, comes out to watch the unloading. Extreme left is the Hotel Lalanne, where the author and his family lived. Lining the quay are stores and brick shops whose modest fronts camouflage the complete stocks within (page 745). Represented here are ship chandlers, sailors' taverns, hardware and general stores, and the American Consulate (second from right). There are about 150 automobiles and trucks on the island. Almost all trucks have badly corroded fenders, caused by hauling salt fish.



Seen from Sugar Loaf, St. Pierre Sprawls beside Its Harbor

The long moles, which protect shipping from northeasterly winds and seas, were built for with profits from "le whiskey," as islanders call the prohibition era. In the United States (page 746). The large island (left) is Ile aux Marins. The panorama below is an extension of this one to the right.



St. Pierre's Few Farms and Pastures Spread over the Lowlands South of the Town; Reservoirs and Ponds Dot the Valleys

© Léon Braud & His



Leon Brandt & son

Only Rusty Cannon Guard This Last Bit of France's Once Mighty North American Empire

In peace times a lighthouse at St. Pierre, now blacked out, warns vessels off the reefs of Canon Point. Islanders say that many years ago a tipsy gunner tried to fire one of these relics, but the gun exploded and blew him up. He and Martin in the distance.



Law Herald & Son

Home from the Sea, Dorymen Clean and Split Their Cod on the Shingle Beach at Savoyard

Every day on returning from fishing, the codfishers set up their tables and with curved knives split the fish, wash them in a barrel of sea water, and then put them away in salt (page 758). Scraps fall to the scavenging dogs. Dories are hauled out each day for safety, and to keep their bottoms free of worms. These houses are used only during the coastal fishing season, which ends in September. In the distance is Langlade. (page 761).



Boy Plumer from Black Star

Everyone Talks God, Thinks God, and Eats God at St. Pierre

Here two cruise visitors inspect the cod net of a Havre trawler. Transfer of many ships to war duty from their normal runs to St. John's, New York, and Montreal has deprived the island of lucrative trade. When steamers call even for only a few hours, the passengers cram the little shops: (page 745).

requisitioned for the purpose. One was a long, sleek speedboat equipped with two 300-horsepower airplane engines, which proved expensive to operate.

The other was a former American harbor boat used normally in the biweekly service to Langlade and Miquelon. This second boat, the *Béarn*, carried a businesslike cannon, but it was never fired lest it rip off the old craft's deck.

Service in this navy was even less alluring than in the army. The sailors were obliged to dress themselves, which was difficult on pay amounting to about a dollar a month.

News of the disaster to France in June, 1940, was received with anguish. The head of

the church, Monseigneur Poisson, officiated at a solemn Mass for France offered by the civil government.

Although it was a weekday, the stores closed and the faithful flocked from all directions until the church was crowded. The service was most touching. With what fervor everyone prayed!

From all these suffering hearts came one cry, one supplication: "Save France!"

On Sunday, June 23, the administrative council and other influential citizens decided to send a cable to the Government of France to continue the fight. At that dark hour this may have seemed nothing but an empty token to the outside world, but to the St. Pierreais it was symbolic of their determination: "St. Pierre will remain *French!*"

Even Cemetery Vaults Have Portholes

Speech here is normal modern French, but, as might be expected in a seaport where the very vaults in the cemetery have portholes, many nautical terms are current.

For example, carpenters building a house use terms designating parts of a boat.

The islanders are in general of Norman origin, largely from the region around St. Malo. Basques have come over in numbers, and, although there are few left today at St. Pierre who can speak that strange language, Basque names are common—Etcheverry, Borotra, Hacala, Olano, etc.

A society called the Zaspik-Bat maintains the Basque sport of jai alai, which is still played, now very frequently with the open hand only, without the basket, or *cesta*.

At the beginning of the present century the population reached its maximum of 6,400.

Then, as it became increasingly hard to earn a living by fishing, many of the inhabitants migrated to Canada and the United States. In recent years the population has remained relatively constant at about 4,200.

On the whole, the St. Pierrais are reluctant to leave their bleak islands, although they frequently complain. They dwell on the lack of amusements, which is very real, especially since the destruction of the only motion-picture theater in the fire of 1939.

Nevertheless, modern conveniences, such as adequate plumbing, are more frequent at St. Pierre than in most French towns of comparable size. Its hospital, with a maternity ward, is good.

St. Pierre has town water, sewers, and street lights. Since electricity is not turned on by the power company until 7 p. m., many people have their own plants.

At Miquelon, however, there is no electricity or town water supply.

Despite the somewhat surprising fact that in actual latitude St. Pierre is a good hundred miles south of Paris, the average annual temperature is 43° Fahrenheit. Although the thermometer rarely goes below zero, the cold is most penetrating. Fog is extremely common and sometimes lasts for days.

The summer heat, of which the natives complain, seldom reaches 80 degrees, and the average for August is about 60. We had to wear overcoats until midsummer, and lilacs did not bloom until the second week of July.

Despite the rigorous climate, the children are sturdy, and general health seems good. However, many islanders have bad teeth.

The work of the clergy exercises a great influence upon these devout people, not only through the church but through its charitable works and, above all, through its schools.

The public schools as well seem to do good work, and I was favorably impressed by the oral examinations in July.

The reply of one lad, when questioned on the by-products of fish, is too good a boner, however, to be omitted. He said he thought that cod-liver oil was most important for the perfume industry!

Berets Popular Because of the Wind

There are no local costumes at St. Pierre. People dress as in France, women usually in dark colors. Children wear black aprons to school, and berets are almost the universal type of headgear, particularly for men, because of the wind. Besides ordinary footwear, one sees cloth sandals, wooden shoes, and, along the water front, rubber boots.

People are neatly dressed in general, and some of the women, who follow the trends through fashion magazines, are very well turned out. One can even get a permanent wave!

The St. Pierrais are most hospitable, generous almost to the point of extravagance. Their homes are invariably spick-and-span. There is usually linoleum on the floor, and flowerpots containing green plants, of which the St. Pierrais are touchingly fond, are everywhere in profusion. Practically all houses have storm vestibules.

The problem of keeping warm is serious, since coal is high and fuel oil too expensive for heating. Daily we saw children returning from the mountain, their dogcarts loaded with fagots of dwarf spruce. Often a young dog attached outside the shafts is learning to bear his part of this responsibility (page 759).

Aside from civil servants, some of whom are from France, society may be roughly divided into two groups: fishermen and merchants. The fishermen are usually poor and the merchants sometimes very well off, although business at present is in a slump.

Amusements at St. Pierre are few. In daytime one may putter about in a beloved little garden, nursing along a few radishes, onions, or lettuce which never seems to head up.

Rifle Shooting Is a Favorite Sport

On Sunday mornings when the weather is fair a flag is flown from the top of the Hotel Lalanne. This is a sign that there will be target practice at a little shooting stand outside of town. There are contests with pistol, shotgun, and .22 caliber rifle, but the main competition is with the French army rifle at about 300 yards.

Sunday afternoons in the summer there is usually a soccer game, and sometimes a handball or outdoor basketball game. In the evenings a little reading may be done. The women love to browse in the mail-order catalogues.

Other pastimes for women are limited to visiting, handiwork, attendance at church services, the daily shopping, and a stroll in the evening when the weather permits.

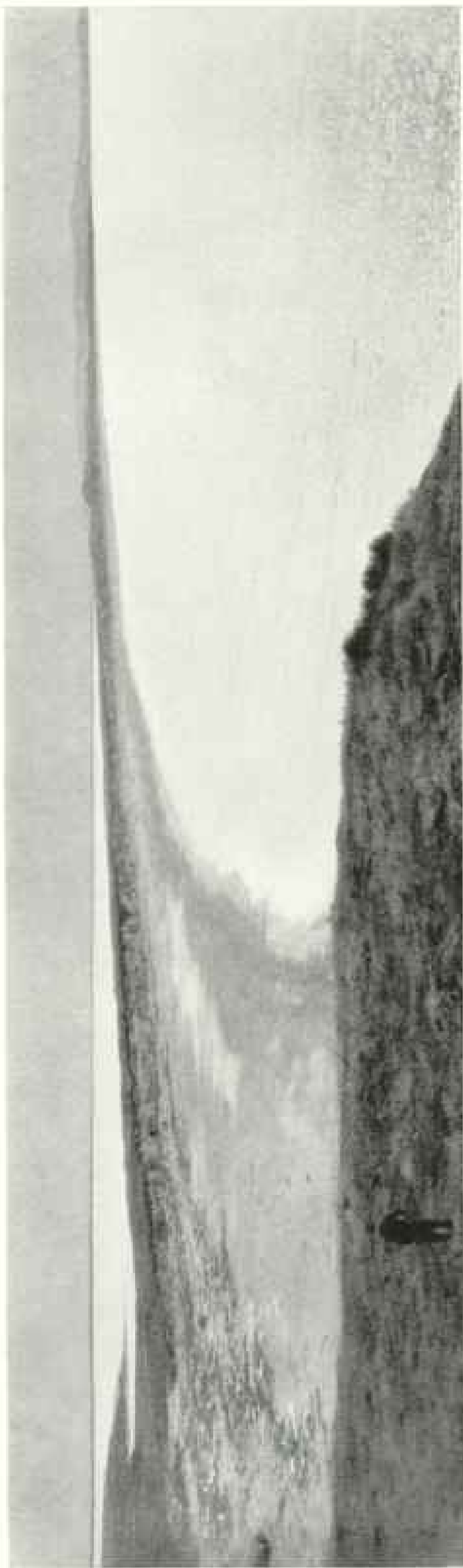
One of the island's two macadamized roads runs around the inner harbor to the Quai de la Roncière and ends at the *frigo*, or cold-storage plant. This road is the evening promenade. Everyone walks briskly, greeting friends and sometimes stopping to exchange a few words. Often sailors are singing as they pass, and occasionally one hears the strains of an accordion. The cafes close at nine, and by ten almost everyone is home.



Leon Breard & Son

Tobogganing, Iceboating, and Skating While Away the Long Months When Snow Blankets the Islands from December to April

Once in a while St. Pierre is isolated by pack ice, but most annoying is the powdery snow, called *powdrin*, whipped down from the mountains by north winds. This blinding, icy "dust" is so fine that it forces its way even into tightly closed houses. Though the climate is not unduly severe, the people find it hard to keep warm, because coal must be imported from Nova Scotia and fuel oil is scarce and costly. Windows are sealed with storm sashes in early fall, not to be opened till spring.



Between Miquelon and Langlade Stretches an Isthmus Where Islanders Say Pirates Lured Ships to Their Doom with False Lights

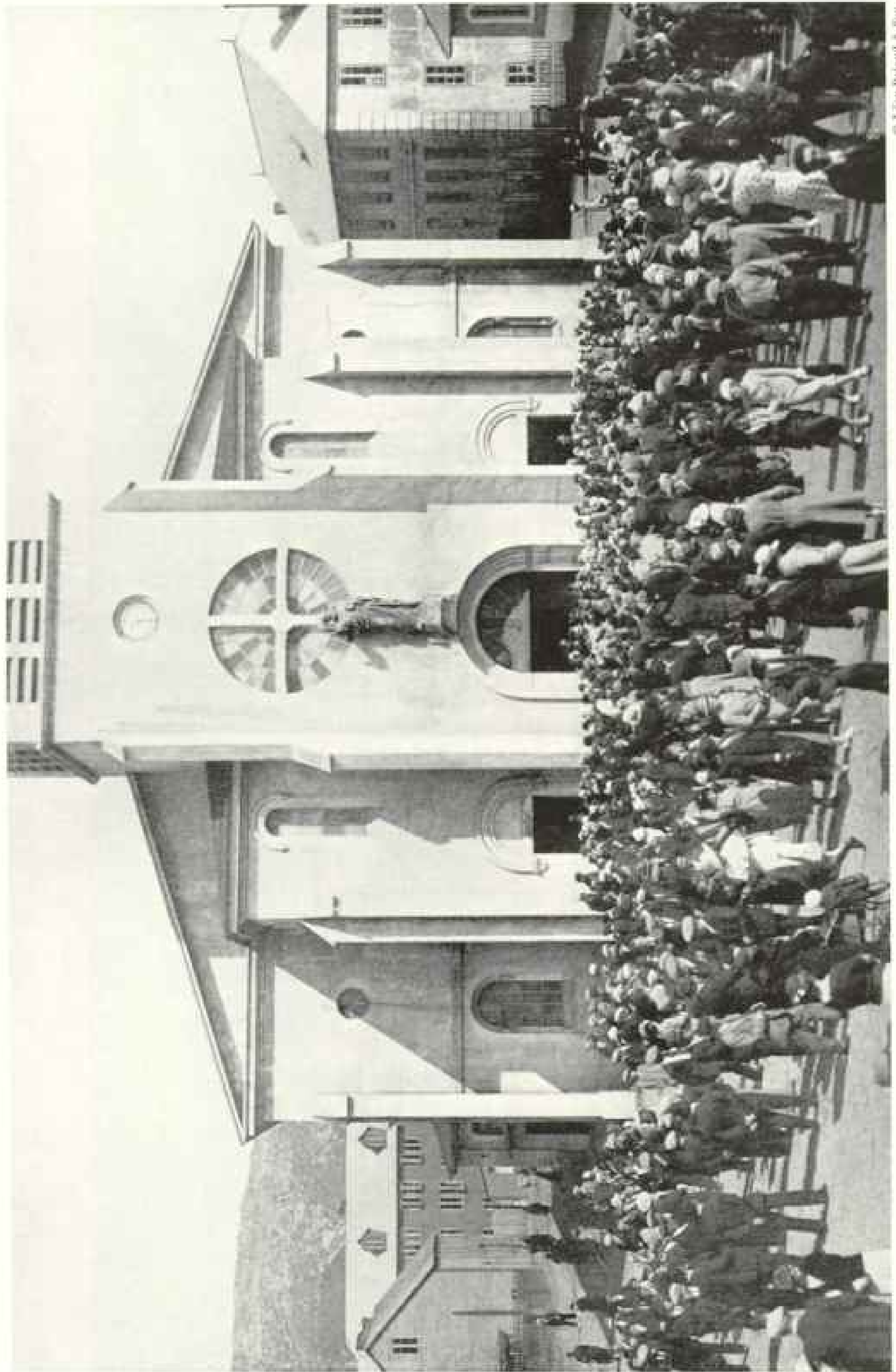
In one storm, according to tradition, a ship was washed unharmed across the dune on a huge wave. Seals breed in Grand Barachois (upper left).



Where Cows Go Down to Wrecked Ships and the Sea

Treacherous currents and reefs encircle these isles of fog and mud. Five vessels within one month ran on the rocks of Plate Point, Langlade, some years ago. Tricky currents were believed to have set the vessels shoreward in blinding fog.

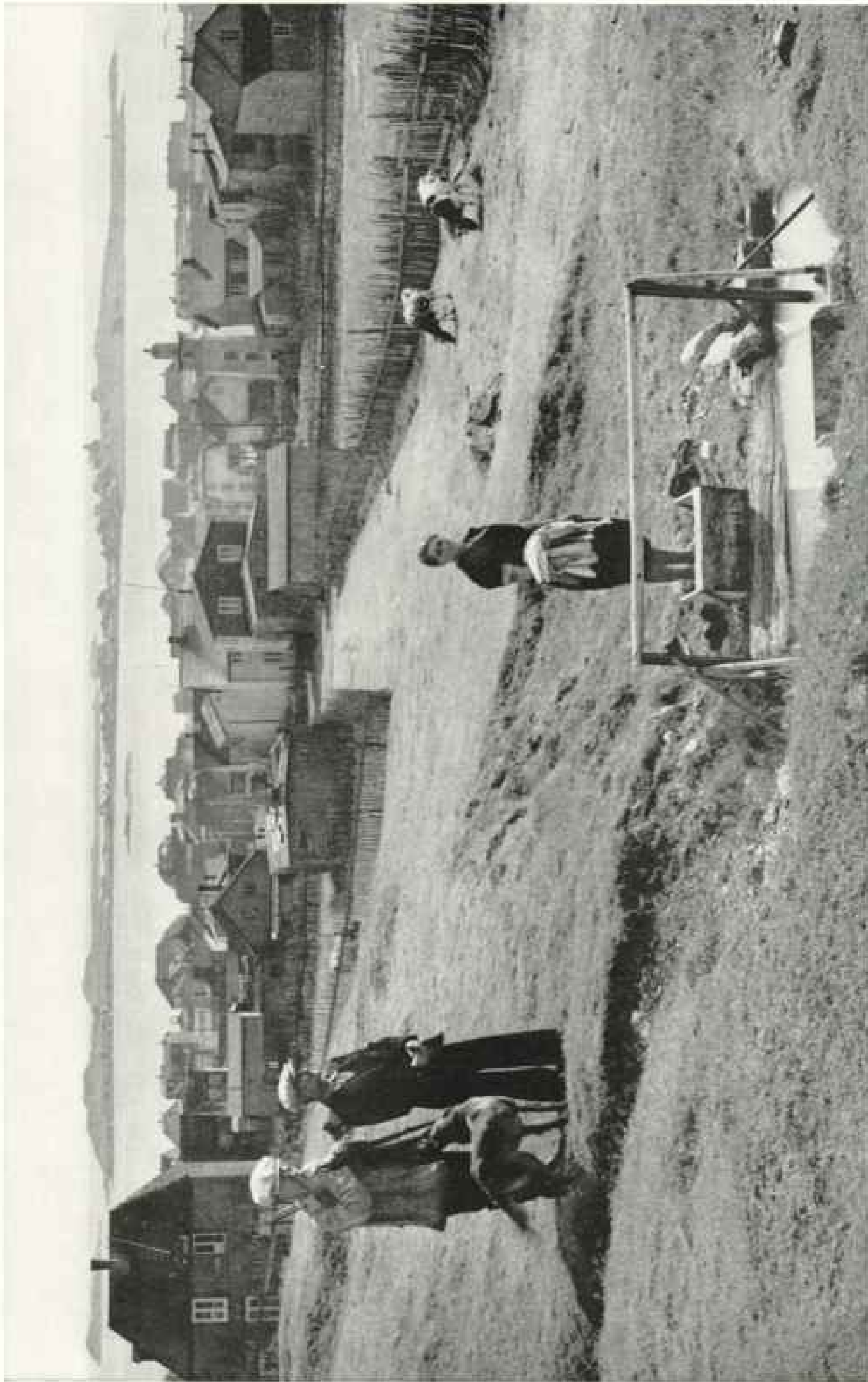
Paul Dohat



© Léon Béraud & Hoff

After Sunday Mass St. Pierre's Meet in the Church Square to Exchange the News and Gossip that Replaces Sunday Papers

From here in happier times began St. Pierre's famous parade on the 14th of July, Bastille Day. After the fall of France, the holiday was declared a day of mourning in St. Pierre, and flags were flown at half-mast. Women sit downstairs in this church; men occupy the galleries



Quincy Anderson

Truly French Are the Inhabitants of St. Pierre, Both in Language and in Customs

Here, at the edge of town, housewives come to kneel in the little wooden boxes by a "water hole" to wash and paddle their laundry, as in France. There are no springs on the island. This water is mountain runwater that has trickled down through the thick moss. Hunting is popular. The two men have just returned with a bag of birds, probably snipe. Frequently fires have ravaged the wooden homes of St. Pierre.



© Edouard Briand & Son

Wearing Berets, Islanders Dry Cod in the Rock-strewn Fields

Drying facilities at St. Pierre were taxed to the utmost in 1940 because of the large quantities of green fish brought by homeless French trawlers. The chief market for dried cod recently has been the West Indies.

Cafes are only for men, in practice, although nothing but custom prevents women from going to them, for they are respectable establishments which are usually presided over by the proprietress.

There used to be dinners and a dance at the Café Joinville, but with the war it was decided that festivities of this sort were no longer seemly, and the room where the dances were held was devoted to the preparation of war bundles for France. There was something most touching in the sight of these bundles, piled up since the collapse of the mother country had made it impossible for them to be sent.

From our first day at St. Pierre, everyone was awaiting the arrival of the capelin, small fish which, toward the end of June, come to spawn on the coasts of Newfoundland and this French archipelago in teeming millions (pages 762-3). The maximum size is but $7\frac{1}{2}$ inches.

They may be eaten fresh, but are used chiefly as bait (preserved at the cold-storage plant), or, in normal times, are dried and shipped to France in barrels. Capelin, dried or smoked, are delicious at breakfast or tea-time, just toasted on top of the kitchen stove.

Within a few days the capelin began to reach the islands. Soon their arrival in in-

creasing numbers became evident as children drove dogcarts loaded with them into town.

The proper moment had come, and we set off early one morning in a borrowed truck to a spot called Anse à l'Allumette (Match Cove). The waves were green with the swarming fish, and here and there where they were especially dense the surface boiled.

I picked up some that lay gasping on the shingle beach and examined them. The males were greener than the females and were also clearly distinguishable by the bolsterlike ridges running along their sides.

We scooped capelin out of the breakers with dip nets until our arms and backs were weary and trudged up the steep slope to our truck. By 9 o'clock we had all the capelin that could be used by the hotel and our friends, so we stopped for breakfast.

It now remained to prepare the fish. They were transported to a warehouse where they were rather heavily salted and stirred with wooden shovels. After salting for half an hour, each batch was carried out on a pier over the water and washed. By this time we had several aids, for the work involved is enormous.

After thorough washing in sea water, the females are discarded and the males laid out



© Edouard Briand & Son

Husky St. Pierre Dogs Must Work for Their Living

A youngster brings home a sledload of firewood behind a team of dogs. The nearly treeless condition of St. Pierre is not due alone to barren soil, but also to deforestation (page 761).

to dry on wooden frames covered with chicken wire. Three or four "suns" are required to complete the drying, and, since June is such a foggy month, the whole catch sometimes spoils.

Squidding Is a Messy Job

Shortly after the capelin season, the squid came. As along the New England coast, squid are valued highly as bait for cod. Fishermen may sell them to the cold-storage plant, and later, as they are needed, they may be bought back at a slightly higher price.

We decided to go squidding, not only for fun but for the table, since at St. Pierre, as in many parts of Europe, squid are considered a delicacy. We set off from the hotel one morning in rubber boots and waterproof trousers and coats, for squidding is the messiest of fishing. I was told of a former governor and his lady who went squidding in sport clothes. Their condition upon returning may be easily imagined, and their continued good humor was a marvel.

At the pilot station we borrowed a dory and rowed to the outer harbor, where other boats were already gathered. There was considerable merriment as the squid squirted sea water and ink over their captors.

These ghoulish-looking creatures are caught, just as on our eastern coast, with jigs, or lead weights about three inches long, shaped like a bowling pin and painted bright red, with a crown of barbs on the bottom. The jig is kept in constant motion up and down in the water, and the squid grabs at the barbs with its tentacles. The quarry was easy to catch that day, and after an hour or so we had filled two buckets.

If catching squid is a messy job, preparing them for the table is even more so. That night we pitched in with the others, around the large table in the kitchen. After the head has been pulled off and the insides removed, there is left an ink-smearred pouch four or five inches long. From this a grayish-brown skin must be peeled.

When the little sac has been well washed and is all white, in goes a stuffing of bread, sausage meat, onions, etc., and the open end is then sewed up. The next morning the squid were browned in butter and set to stew in a wine sauce. They proved good, but very rich.

On "ship days" at St. Pierre the quay becomes a busy place. For hours trucks ply back and forth, adding their noise to the sound of winches and the creak of tackle.

Especially picturesque is the arrival of



Foot 37101

Guess What These Grim Relics Are! Dead Eyes of a Vanished Ship

The vessel's sides have disappeared, but deep in the sand some timbers of the wrecked ship still support the iron bands or chain plates. Atop these are strapped flat wooden disks, called deadeyes. Shrouds and backstay's supporting the masts were set up by lines passed through the holes in the deadeyes (page 765).

schooners from Prince Edward Island, bringing cattle, which are unloaded in slings before taking their last walk up the stony road to the slaughterhouse south of the town.

Between boats the quay relapses into slumber, and workmen stand in groups talking or throwing sticks into the water to be retrieved by eager dogs.

Hardy Dogs Serve as Lifesavers

Dogs at St. Pierre live a Spartan life, and seem to thrive on it. Many are not fed at all by their owners, but are left to forage along the shore, eating scraps of codfish discarded as deit hands split the morning's catch. They live outdoors and even sleep in the snow.

The island's dogs are all powerful swimmers, and the more daring ones will jump into the icy water from a surprising height; for example, from the bowsprit of a schooner. For this reason the ships from France almost always have a dog on board to save members

of the crew who may fall into the sea (page 745).

From time to time a shabby dory from Newfoundland makes its appearance in the little basin beside the quay. These boats usually travel at night to avoid the Newfoundland coast patrol, which maintains an alert surveillance to prevent smuggling.

The trade carried on by these venturesome individuals is on a petty scale. They arrive with salmon, trout, chickens, spruce branches used to make a sort of nonalcoholic "beer," sometimes lobsters, or a few sheep whose feet are tied together. With the proceeds they purchase sugar, tobacco, articles of clothing, and perhaps a bottle of rum, which may be bought in the French colony in peacetime for thirty cents. They then steal homeward toward dusk.

As they leave the waters of St. Pierre, they stop their motors and rely on sail alone to avoid the patrol. Capture means confiscation

of the boat and a heavy fine that normally has to be worked off in jail.

Although the French writer Chateaubriand speaks of polar bears seen during his visit to St. Pierre at the end of the 18th century, there are no wild animals of any sort except rabbits.

No Snakes on These Isles

The islands are completely free of snakes. When not wearing rubber boots, however, it is generally best for the hiker to stick to the roads, for water seems to ooze from the ground, especially in the mountains.

To get a good idea of the mountains, one should climb the steep slope just back of the town and look down on the panorama of town and port (page 749).

One afternoon when near the top of this slope, we decided to follow the rough road that leads northwest to the Anse à Pierre (Pierre Cove), where the cable linking St. Pierre with the outside world plunges into the sea.

The Anse à Pierre gives a good notion of the rugged and uninhabited northern part of the island, and also furnishes an opportunity to see the "woods" one hears about.

These woods consist chiefly of scrub pine and spruce, at best only a few yards high, but they do seem to indicate that in former times the rest of the island may have been less bare. Severe weather and the pressing need for fuel accounts for the scarcity of trees.

Southeast of the town is a very different terrain. We hiked one day across these rolling lowlands to Pointe Blanche, where we poked about at low tide for crabs, and I later covered this whole territory with a friend hunting snipe. In their fondness for hunting and fishing, as in their deep-seated desire to have a small place in the country, the St. Pierrais are much like people in France.

In this part of the island there are some farms and two or three silver fox ranches. Agriculture itself is unprofitable because of the poverty of the soil, but the cattle grazing in the fields along the road are fat and sleek, and their milk yields cream that is nearly as heavy as cream in Normandy. Few cows are raised, however, because it is not possible to grow enough fodder to feed them through the winter.

Hay is usually sparse. Once when a farmer called out asking us not to trample his hay, we were rather taken aback; we had not realized we were walking in a hayfield!

North of St. Pierre is a double island some 25 miles long. Each part has its own name, Grande Miquelon in the north and Petite

Miquelon, or Langlade, in the south (map, page 746). Originally these were two islands, but the channel between them filled with sand, and they have been connected by an isthmus seven miles long for over 150 years. For a long time the dune, as it is called, was not indicated on maps and was the scene of many wrecks (pages 755, 765).

Langlade is the principal vacation spot of the archipelago. Just south of the isthmus is a small village which is called Anse du Gouvernement (Government Cove), presumably because the Administrator, or Governor, has a summer cottage there. A boat from St. Pierre makes the round trip once a week when weather permits, and many persons make weekend visits in their own boats, usually motor dories.

We visited Langlade on one of a number of excursions organized during the summer on Sundays for trout fishing or picnicking. The trip up the eastern coast of the island was memorable.

Two or three farms were seen in coves, and later that day, when we visited a farm on a bluff just south of Government Cove, we found a market garden which seemed to be prospering. The soil here is much better than at St. Pierre, and I have heard it maintained that if Langlade were cultivated to its capacity the islands could be nearly self-supporting in vegetables. Sheep herding also could probably be developed profitably.

The chief reason why these things are not done is that most of the inhabitants of the islands are fishermen by long tradition and do not turn to farming any more naturally than a farmer would turn to fishing.

When our boat reached the cove, we saw that there was no pier. Passengers are taken off in dories.

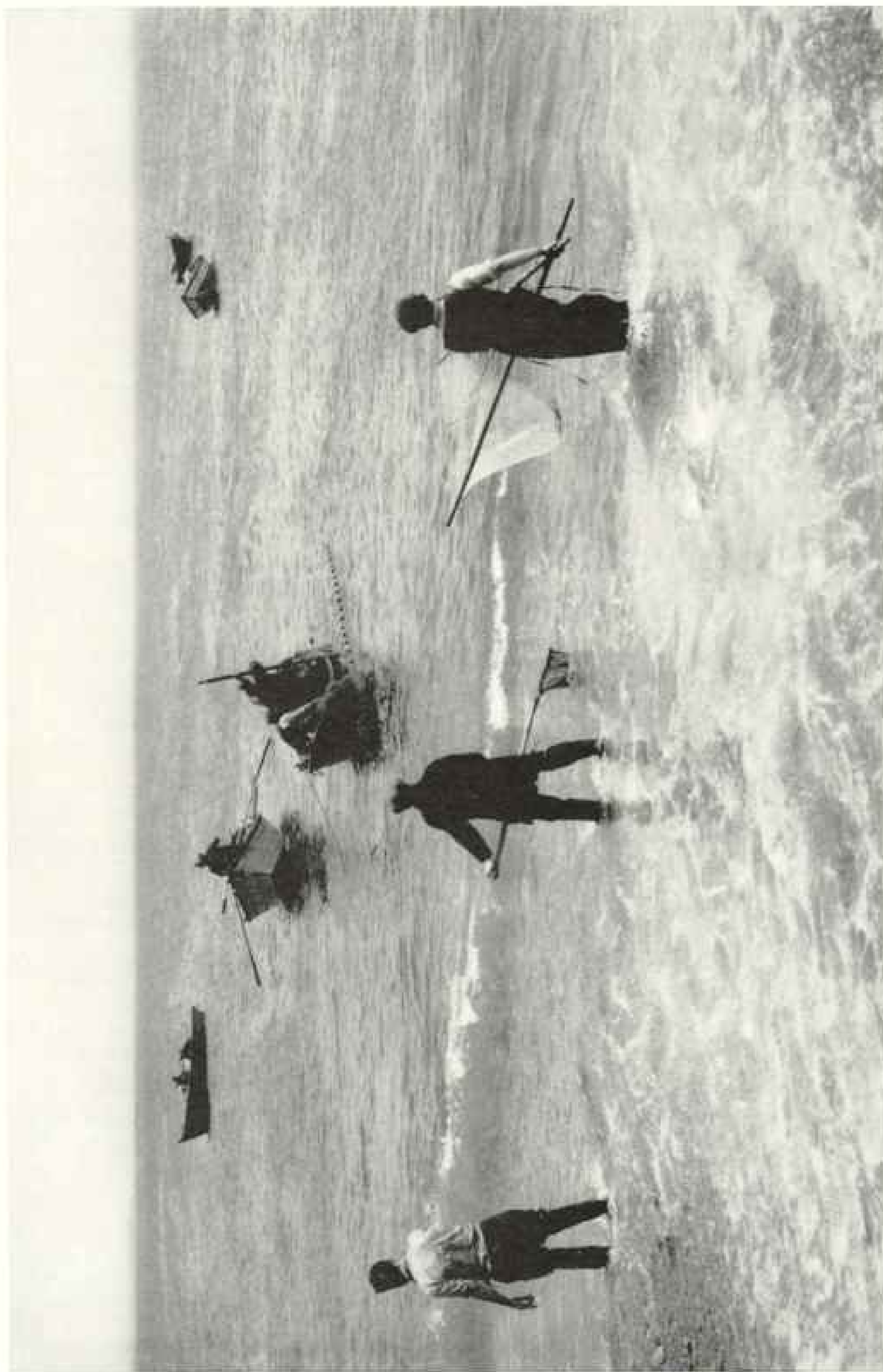
Priest Arrives by Outboard Motorboat

The settlement at Government Cove is very small, and few people live there all year round. In the little church, services are given during the summer by the priest of Miquelon, who comes down by outboard motorboat.

It is only a five-minute walk from the village to the isthmus, where we took a dip in the clear water. It is, of course, icy cold, although scarcely more so than along the coast of Maine.

Gathering firewood proved easy, for there was plenty of driftwood along the beach, and farther back, buried in the dunes, were heavier fragments of wreckage. One huge old timber served us nicely as a table.

After a picnic lunch of lobsters bought from a fisherman, we were glad to bask in the sun



© Tompkins & Co.

Men in Dories Close Their Nets Around Teeming Capelin While Others Dip Them from the Breakers

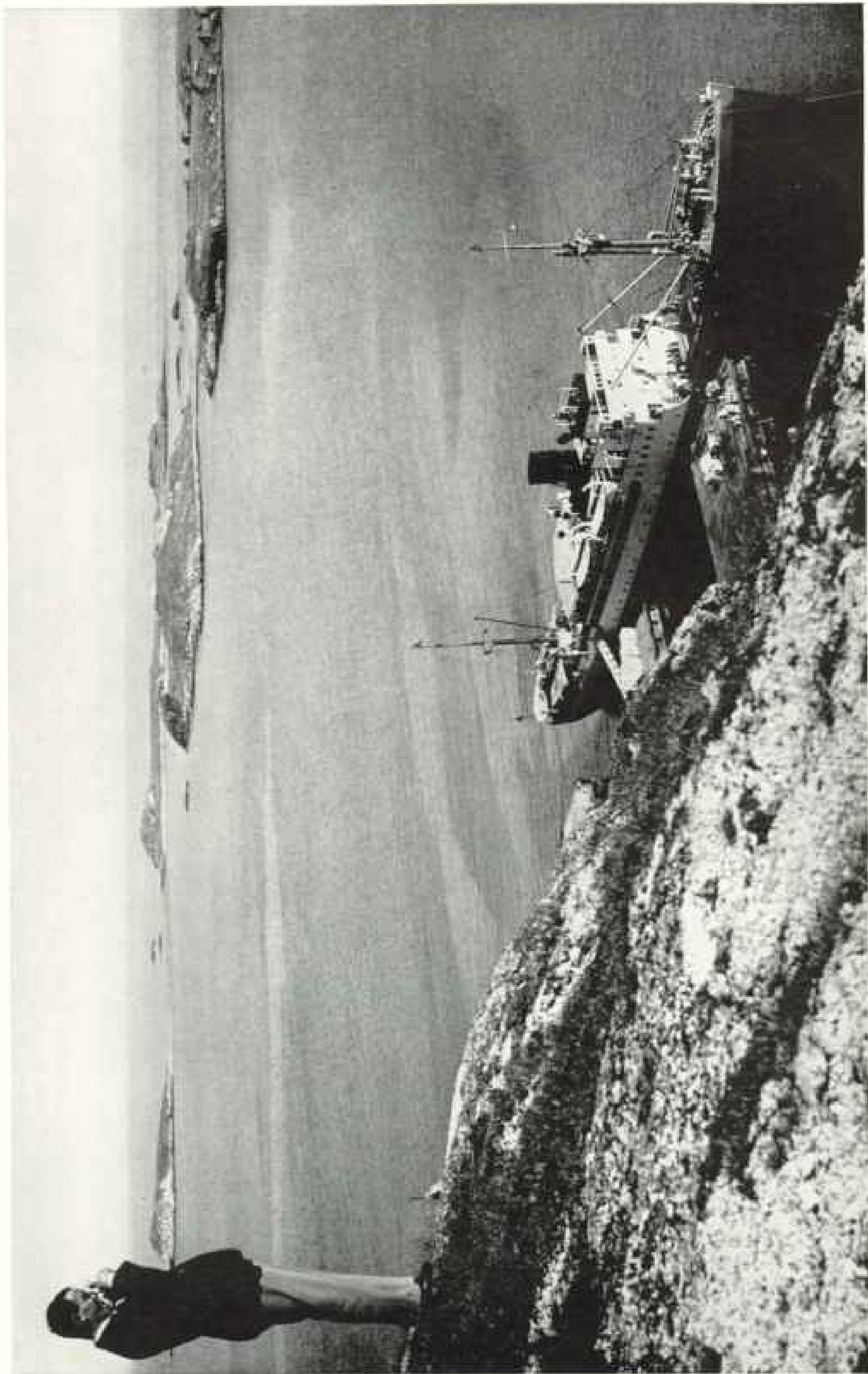
In late June millions of these small fish of the smelt family swim along the coast of the French archipelago to spawn in the shallows. Islanders eat them fresh, but most of the haul is dried, smoked, or frozen in the cold-storage plant for bait. So dense are capelin schools that the waters are green with wriggling fish (opposite and pp. 758-9).



© Linn Boyd A. Lee

War Has Curtailed This Typical St. Pierre Industry; No Longer Are Dried Capelin Shipped to France

These fish appear only in June, the longest month. As three or four good sunny days are necessary to dry the catch, sometimes a whole season's fishing may spoil. Female capelin are discarded; only the males, greener than the females, are salted and dried on these wooden frames.



(Courtesy Antarctic Photo Gallery)

The Cruise Ship *Fort Amherst*, at the "Frigo" Dock, Formerly Brought Visitors from New York and Halifax

In the summer of 1940, large vessels tied up regularly here because the French naval sloop *Ville d'Y* occupied the best pier of the inner harbor. A macadam road leads from these twin docks of the cold-storage plant to St. Pierre, about a mile distant. The hump on the Ile aux Marins (to the right) is the old fort where the author's family picnicked (page 766).



Point Bristol.

Iron Ribs Mark a Wrecked Ship Buried in the Sandy Isthmus between Miquelon and Langlade

Formerly there was a passage here, but sand piled around wrecked hulls closed it many years ago (pages 760, 761). At first charts neglected to show the new dune, and ships were frequently wrecked trying to pass between the islands. On the excellent beach fine sand packs so tightly that a horse and wagon may be driven across.

until the towboat whistle warned us that it was time to head back to St. Pierre.

Because of its rigorous climate, St. Pierre has no open-air market like those so typical of France, but twice a week fishermen from the Ile aux Marins set up rough tables at one end of the quay and sell fresh cod and had-dock.

One day when the weather was particularly fine, we arranged with one of these men to ferry us over to his island for a picnic. He entrusted our transportation to his son, a boy 14 years old, who handled the motor dory with skill. In ten minutes we had reached our destination.

This little island, which until ten years ago was officially the Ile aux Chiens, as it is still commonly called, has an area of only 120 acres. The village is small—there are only about 250 inhabitants, known as Iliens—and the houses are all of wood, mostly one story high like the older ones at St. Pierre.

Old Fort Overgrown with Grass

On a promontory at the north are the remains of an old fort, dating from the middle of the last century. It is now grown over with grass and provided us with an attractive place from which to survey the ocean as we had our lunch (page 764).

While we were finishing, a dory came into the little cove below, and we went down to ask if any mussels were to be found along the shore. A young fisherman greeted us pleasantly and said there were a few on the other side of the cove. He offered not only to show us the exact spot but to get them for us, since we were not wearing rubber boots.

It was only when we noticed that these mussels were found in one spot alone and that they were strangely unattached to the rocks that he admitted he had brought them from Miquelon for bait. He assured us, however, that he did not need them and would not hear of our refusing.

Everything here pertains to the hard life of those who follow the sea. In the wooden church a model of a sailing ship is suspended from the ceiling. From the church one walks to a little grotto representing the one at Lourdes, along a path lined with wooden crosses in memory of those lost at sea.

Usually below the inscription on each cross is a photograph of the missing one, sometimes so faded by the weather as to be completely indistinguishable.

Near the grotto a well-kept monument to those who fell in the World War shows how many who escaped shipwreck were taken. Later in the summer I was brought back here

by rough and simple sailors from France and saw that they were as deeply touched as I.

The morning we went to Miquelon the sea was like glass, and a heavy blanket of mist formed little beads of moisture on our clothes. The motor schooner had to feel its way along, which was difficult, for there was not even enough swell to make the bell buoys ring.

Lonely Miquelon Lives for Its Mail

As we continued, the fog began to lift and we found a friendly sun shining on the drab houses of the village of Miquelon (Bourg de Miquelon), lying on the hook which forms the island's northern extremity. On the wooden pier the whole population had crowded in the hope of mail from the capital.

Farther south Miquelon has green highlands like those of Langlade, but the village is flat and treeless. Very low, it seems completely at the mercy of the sea, which hems it in on both sides. The weather-beaten, one-story houses are strung along the single street.

Most typical of Miquelon are the high and close-set rustic fences which protect the poor gardens from the inroads of the horses, cows, and sheep that wander about at will.

Miquelon, like the Ile aux Marins, is a fishing village only. Commerce is limited to a couple of tiny shops. There is a little cafe-inn, but it can scarcely serve guests for lack of stores. Fortunately for us, we had once more brought our lunch, which we ate on the beach ridge on the west shore.

Afterward we visited in turn the comfortable homes of the physician and the representative of the civil government, who, together with the parish priest, minister to the needs of the isolated 500 inhabitants. Until the boat left we talked with these two men and their wives of life at Miquelon, of hunting in the *mornes*, or highlands, to the south, and of the long winters.

The fog had lifted, and on the trip back to St. Pierre we were able to survey the whole coast of Miquelon, from the rocky crag which tips the horn at the north down to the Grand Barachois, that great salt lake just north of the isthmus, connected with the sea by a narrow gut. Here fishermen come to get clams and mussels, while brown seals watch from the rocks (page 755).

As we approached St. Pierre, we found that it was still shrouded in fog.

Fishing at St. Pierre is now confined to the efforts of about 175 motor dories. The last of the schooners which used to be fitted out for the Banks are now rotting in the inner harbor.

The fishing season is not long—from the



Edouard Beland & Son

Many St. Pierrais Spend Their Week Ends "in the Country" roundabout Savoyard

To such summer cottages the wealthier families go in July and August. Behind the "villa" is a fenced tennis court; to the right, a frame for the children's swings; to the left, a henhouse combined with the garage. The enclosed "lawn" is a hayfield. Hillsides behind are covered with a thick, green mantle of scrub spruce and juniper.

end of April to the middle of autumn—and the profits are so low, despite government subsidies, that each year sees a decrease in the number of craft.

Codfisherman's Day Begins before Dawn

To see what the fisherman's day is like, I arranged with the man who had transported us to the Ile aux Marins to take me along. His name, Franchet, was well suited to his frank, friendly face.

We started at four in the morning, a half-hour later than usual out of deference to my sedentary habits. First we stopped out beyond the Ile aux Marins to jig for squid to be used as bait, then headed north for an hour. When we anchored to fish, we could clearly see the villages along the Newfoundland coast.

The hooks were copiously baited with both squid and clams. The homemade lead sinkers had been molded in the form of a fish, though

there appeared to be no reason for this that my fisherman knew.

Other dories from St. Pierre were anchored not far away, having followed us because of Franchet's reputation for big catches, but they did not seem to do so well as we.

Franchet stood near the bow and his son in the stern. Both held a line in each hand. With rhythmic sweeps of the arms, the lines were raised and lowered from time to time. The fishing proceeded well, and we caught many cod, the larger ones being brought over the side with a gaff.

Fishermen return home in the afternoon early enough to clean, split, and salt the fish. Often, too, they must set out a second time to provide the next day's bait.

After the day's work is over, the dory is hauled up on shore with a capstan to keep it safe from the sea and to prevent the ravages of worms (page 751).



Roy Flinney from Black Star

A Visitor from a Cruise Ship Inspects a Lucky Catch of Halibut

The big flat fish are occasionally caught by local codfishers and sold to the islanders for their own use. The cold-storage plant, the *frigo*, was built after the World War with the idea of sending fresh fish to France, but it proved too expensive to operate and is used now chiefly to store bait.

A dory's catch for the season now rarely exceeds 200 quintals,* which is generally sold "green" (undried) to a company which dries it. The price per quintal at the time of our visit was only 135 francs, or \$2.70, so that a "good" season yielded a maximum of \$600, to be divided between the owner of the dory and his assistant *after* expenses have been deducted.

One should fully understand this before saying that people at St. Pierre were spoiled by the short years of plenty during prohibition and are now too lazy to fish.

Isles Look to Canada and the United States for Help

Even in normal times St. Pierre and Miquelon were far from self-sufficient and continued to live only through subsidies from the mother country. Today, with the islands com-

* As in Nova Scotia, Newfoundland, and the United States, the quintal in these islands is standardized at 112 pounds.

pletely cut off from France, and with the sole industry virtually at a standstill, their plight is serious.

The task of the Administrator is a delicate one. As an officer appointed by the French Government, he is technically the representative of Vichy, but in fact the colony is completely at the mercy of Canada and the United States.

With the creation of United States bases in Newfoundland, the use of St. Pierre and Miquelon as a naval and military base seems less likely than before.

The islands might well serve such a purpose, but it may be that the chief consideration now is merely to keep them out of the hands of a hostile power, to which they would, of course, fall an easy victim.

The outlook for these 4,200 friendly, deserving people seems dark. Anyone who has come to know and like them cannot help wondering anxiously what the future holds in store.

Dogs of Duty and Devotion

BY FREDERICK G. VOSBURGH

In the following two articles, and the accompanying 20 color plates, the National Geographic Society brings to its members the fourth in a series of presentations depicting the Dogs of the World, with paintings from life by Edward Herbert Miner and detailed biographies of the various breeds by Freeman Lloyd, internationally known judge of dogs. Previous articles have presented the Terriers (February, 1936), Field Dogs (January, 1937), and Hounds (October, 1937). The series will be concluded in later issues with presentation of Non-sporting Dogs and Toy Dogs.—Editor.*

IN New York the other night I saw this: A shabbily dressed man ran out of the shadows, grabbed a woman's bag from her hand, and bolted. A policeman tried to stop him, but dropped in his tracks as the robber's gun spat fire.

Now another bluecoat appeared on the scene, and with him was New York's youngest policeman, only two years old—Boots, star of the police dog squad.

As guns blasted in a running duel, Boots leaped into action like a furry dart. The thief fired, missed, and tried to flee, but Boots dived through his legs and spilled him, with a combination of flying tackle and canine jujitsu.

The instant the man hit the ground the dog struck the gun from his hand. Then, until help arrived, he stood over the fallen footpad, who no longer wanted to fight.

This bit of melodrama was staged in a demonstration by New York's Police Department. But it typifies many a real-life drama of this and other cities' four-footed police.

"Seeing Eye" Trainers Taste Blindness

A few miles away, at The Seeing Eye, Morristown, New Jersey, I saw dogs being trained to lead blind men down life's dark road with all the gentleness, care, and patience of a mother with her child.

Ninety-five out of a hundred of these dogs are of the same breed as Boots—the versatile German Shepherd (page 775); but occasionally individuals of other breeds have been used. Among these have been the Doberman and Boxer (pages 787 and 798) and the Pointer and Labrador.

Guiding sightless masters through the perils of traffic in various parts of the country today are 650 dog graduates of The Seeing Eye, whose home is a collection of big green-shingle-and-white-clapboard buildings three miles from Morristown. Here and in the city's streets 150 dogs a year are taught their lifework in three months—but it takes about four years to train a trainer.

Throughout his whole first month a prospective trainer must spend his days in dark-

ness. With a heavy black mask over his eyes, he lives the life of the blind so that he may know to the full their needs and problems. He gropes for his food at table and learns to find it after going hungry once or twice. He stumbles into unseen objects. He discovers a strange new world, the black world of the sightless.

When at last the apprentice is allowed to work with dogs, he still must act like a blind man, though his mask has been removed. If a half-taught dog leads him too near a tree, he must walk directly into it so that the dog will notice and allow more room next time.

"I've had a trainer come in with a bad gash from hitting a tree he saw perfectly well," said Elliott Humphrey, in charge of training.

"Since you want to see some of the dogs in action, we'll go into town. Most of our training is done on the city's streets."

Dogs for the school are not raised here, but are bought from various breeders at ages of 14 months to two years. About three out of five are females.

"How do you pick your dogs for this work? What elaborate tests do you put them through to see whether they are suited for such a job?" I asked as we drove toward town.

"When I answer that," Humphrey replied, "you'll think I'm lying or hiding something. We tell by looking at them."

"There's no one thing you can put your finger on. It's the look in the eye, the bearing, the way a dog holds its head. It's all those combined and something more—something you feel rather than see."

"Yet the fact remains that out of ten dogs selected in that seemingly unscientific way, nine will make good. From the rejects we

* Members of the National Geographic Society will learn with regret of the death, on October 10, 1943, of Mr. Edward Herbert Miner, of Westbury, New York, accomplished painter of animals, whose finest work, over a period of many years, has appeared in the NATIONAL GEOGRAPHIC MAGAZINE. Besides his series of dog paintings, currently appearing, he will be remembered for his portrayal of the world's cattle and for his great series, "Horses of the World," considered the most authoritative presentation of the subject.



International News

At "Graduation" a 73-dog Team Pulls an Army Truck

Just before heading north with their sledge dogs for U. S. Army service last fall, soldiers who worked with them all summer at Chinook Kennels, Wonalancet, New Hampshire, hitched up "the longest dog team ever harnessed." Led by Waska, Siberian Husky, the team easily pulled a ten-ton truck carrying eight men (page 772).

would get maybe one successful dog out of twenty."

Candidates need not be purebred dogs. The Seeing Eye experts look at the dog, not its pedigree.

The only test given the four-footed enrollees is the firing of a cap pistol and a .32 revolver to make sure they are not oversensitive to noise; otherwise a back-firing car might make the dog jump and endanger its master.

Cat Killers Are "Flunked Out"

Chronic cat killers, the kind that approach their victims in deadly quiet, without bluster, are promptly flunked out of the school. The others quickly learn not to chase cats. Around the kennels are a dozen cats, so the dogs get used to them.

Cruising Morristown's streets, we soon saw two future Seeing Eye dogs with their trainers. The dogs strode along with tails aswing, obviously enjoying their work.

"You can't force a dog to lead a blind man," Humphrey remarked. "He does it because he likes it. A guide dog is a happy dog. All the time, 24 hours a day, he has the companionship of his master, and that's what a dog loves most."

The man holding the stiff leather handle attached to the harness of the leading dog suddenly stumbled and almost fell (page 775). The dog, in training only a month, had failed to stop before passing the curb.

As the trainer tripped and gave a reproving tug at her leash, she looked up doubtfully. But at the next curb she dutifully stopped. A soft "Thatta girl" rewarded her. The tail once more wagged happily.



A Birthday Cake for Zenta, "Seeing Eye" Dog Who Went to College

Twenty-five blind persons in New York gave this party on her tenth birthday anniversary, May 8, 1940. An aluminum feeding tray made by a blind craftsman was presented her by Freeman Lloyd (right), author of the article "Working Dogs of the World" on page 776. He was the only person present blessed with sight. Zenta guided her sightless master, Carl Weiss (left), to classes at Rutgers and Princeton. Thus, he says, she holds a half interest in his Phi Beta Kappa key and two degrees—though she promptly fell asleep at the beginning of each lecture and waked as promptly at the close.

These "freshmen" were learning their lessons on a wide residential avenue. Downtown, in a poorer neighborhood, two more advanced students were being taught in a much harder school. Littered streets were full of myriad odors most entrancing to a dog's nose, but all such temptations were passed without even a tentative sniff.

Here were many dogs, some yapping insults. But the Seeing Eye dogs ignored their tormentors and walked on about their business. Males often encounter the call of romance, but even that elemental urge proves less strong than the call of duty to a well-trained dog.

As the dogs and their trainers crossed a street, Humphrey suddenly swung his car straight at them. Instantly, but with no trace of panic, the first dog quickened its pace, the second stopped, and the car lurched harmlessly past.

Another lesson the dogs must learn is to gauge the height of signs or other overhead objects several feet above their own heads. This they do with remarkable accuracy, leading their master unhesitatingly under an object which would just miss his hat, but

detouring for one a bit too low. They are also expected to find coins, purse, or other articles which their blind master drops.

"Intelligent Disobedience" Taught

Not slavish obedience but "intelligent disobedience" is taught these leaders of the blind. If the master orders "Forward" when an oncoming car or an open manhole is directly ahead, the dog must deliberately disobey.

"Sorry, master," his manner says, "but in this case I know best."

Great care is taken to see that dog and master are temperamentally suited to each other.

"You can't just take a dog and put him with any master, any more than you could take a woman and assign her any man as a life partner," Humphrey explained.

"We're practically running a marriage agency here. Man and dog must live together happily ever after. We study the blind for three days and then we assign to each person the dog for which he seems best suited. If you match an unenergetic man and an energetic dog, the man is going to be mad all

the time because the dog is hurrying him.

"But it's not just a case of matching like with like. For instance, a flighty person may be made more calm by matching him with a deliberate dog."

The blind men and women who are obtaining dogs spend a month at The Seeing Eye. They study Morristown's streets by fingering a raised diagram, and then they walk about the city with their new companion. By the end of the month dog and master are attuned to each other in a comradeship which only death will end.

No dog's life could be more productive of good. In fact, many humans live ten times as long without accomplishing so much, for a handicapped man or woman has been given a new chance at life. He walks with men again. He earns his own living. He finds new self-respect, new hope, thanks to his Seeing Eye.

Humphrey tells of an eloquent incident. A blind man was at ease in his living room where four of his friends were playing bridge. At his feet lay his Seeing Eye dog. After a time the blind man nodded and dozed.

The dog looked up and cocked her head in obvious puzzlement. Then she left the room and soon returned. In her mouth were her master's pajamas. She laid them beside him on the couch as if to say, "All the years I have lived with you, when you went to sleep you wore these things. You must have forgotten to put them on."

Seeing Eye dogs are not given to the blind. A tuition fee, which includes the dog, his equipment, and board and lodging at Morristown, is assumed by the future master or mistress. The whole purpose behind the work of The Seeing Eye, a philanthropic organization, is to help blind men and women become useful, independent citizens. This purpose, it is felt, would not be served if they were made objects of charity.

Payments, often made in small installments from earnings made possible by the guide dog, give the owner a sense of responsibility and preserve self-respect.

Antarctic Dogs Go North for U. S. Army

Most important to geography and exploration are the dogs which have gone with adventurous men to the frozen ends of the earth. "The infantry of polar exploration," Rear Admiral Richard E. Byrd has called them.

High among the wooded hills of New Hampshire I talked to many a fine old soldier of Antarctica's treacherous trails, and some replied with the baritone howl that is the voice of the snowy wilderness.

Veteran explorers and suckling pups, the lame and infirm near the end of the trail, and the youngsters who have yet to feel the blast of a polar blizzard—all are here at Wonalancet, New Hampshire. Dogs for both of the Byrd Antarctic Expeditions (1928-30 and 1933-35) and for the recent United States Service Expedition to Antarctica were supplied by these big Chinook Kennels, run by tall, soft-spoken Milton Seeley and "Shorty," his vivacious sledge-dog-racing wife.

More than sixty dogs, largely Antarctic veterans, had just been delivered to the United States Army and shipped north for service at undisclosed points. All summer their soldier drivers trained here, "mushing" over snowless trails with their dog teams hitched to an Austin car and finally a truck (p. 770).

Even Cats Loved the Veteran Rowdy

In these pleasant surroundings many a doughty four-legged explorer has spent his declining years in peace.

Such a one was old Rowdy, who died in March, 1940, at the almost incredible age of twenty. The big Alaskan Malamute was a veteran of the first Byrd expedition, including the great trek to the Queen Maud Range.* Rowdy spent his last years at Wonalancet gravely shaking hands with visitors or getting his exercise by leading and tutoring teams of playful puppies.

Even the cats loved old Rowdy, and when he called for his trusty reindeer-skin sleeping bag promptly at 9 o'clock each night, three or four of them piled on his furry back or curled up beside him to go to sleep, too.

Unofficial greeter at the kennels today is 12-year-old Finn of Yukon, whose deep, rich malamute voice was heard by millions as the theme note of the Byrd broadcasts from Little America. Say "Speak," and he gives you his basso howl, muzzle pointed toward the clouds.

Another 12-year-old pensioner is Moody, a two-expedition veteran. Snow blindness in glaring Antarctic wastes robbed him of sight, but the blind old malamute seems happy as a pup and cavorts with cumbersome glee when he hears a familiar voice.

Blind for the same reason is Grizzly, a lead dog of doubtful ancestry but strong capacity for friendship. His bosom pal was Bill, a teammate, but now Friend Bill has gone north with the Army and Grizzly is desolate. He has struck up a friendship with another dog, but it isn't the same.

* See "Conquest of Antarctica by Air," by Rear Admiral Richard Evelyn Byrd, NATIONAL GEOGRAPHIC MAGAZINE, August, 1930.



James P. Whitkoman, Jr.

Treading Water, a German Shepherd Dog "Speaks" for a Stick

On a warm day in June few things could be more appealing to a dog than a good cool game of "Fetch."
Scene: a small pond at Peekskill, New York.

Some northern dogs have what Seeley calls "the Arctic eye," strange-looking but keen-sighted white or bluish-white eyes. Occasionally a dog has one orthodox brown eye and one white one, which gives him an oddly mismatched appearance, like a dog with a monocle.

Breeding White-eyed Dogs for Resistance to Snow Blindness

Though brown-eyed dogs often go blind from the glare of sun on polar snows, Milton Seeley says he knows of no case of a white-eyed dog's going blind for this reason. Accordingly, he is breeding many possessors of the pale polar orbs in the hope that in future fewer dogs will feel the sad scourge of permanent snow blindness.

Most of the dogs here are purebreds—lithe, fast Siberian Huskies; big, powerful Alaskan

Malemutes; and sturdy Eskimo Dogs. But in the veins of some flows the blood of the timber wolf. Explorers say the wolf blood gives stamina, but makes the dog a little less willing to work.

Old Coyote, a veteran of Admiral Byrd's first trip to Little America, was half wolf, offspring of an alliance between a timber wolf and a Siberian Husky. He lived to be 18. Even when well along in years, he was still agile enough to perform his favorite trick of appearing to drowse while a red squirrel played on a near-by tree, then suddenly leaping with spring-steel legs and catching the squirrel before it could whisk out of reach.

At mealtimes, too, Coyote showed his wolf ancestry, in the tremendous bone-crushing power of his jaws. Yet Coyote was no problem dog.

"The idea that the wolf-dog is mean has been much exaggerated," says Seeley.

Several wolf-dogs are now in the north with the U. S. Army. Still at home is Sheila, three-fourths husky and a quarter wolf. An escape artist, she delights in slipping her chain at feeding time, wolfing the other dogs' food, then going back to eat her own.

Wolf blood is sometimes introduced accidentally, through a mating between a dog and a wolf in the wild, but the two animals may also be mated in captivity. The Seeleys not long ago acquired a full-blooded timber wolf for stud purposes, but it died before maturing.

First Families of Antarctica

Many dogs here are natives of Antarctica, a distinction that no human can claim. Among them are the malemutes Fritz and Tintin, born at Little America on the second Byrd expedition. It was more than 40 below zero at the time, but the whole litter of seven lived. Five of them, with their own families, went back and served in their native land with the U. S. Antarctic Expedition which returned to the United States early this year.

Big dogs have usually been picked for the terrible grind of Antarctic service, but for this last expedition Seeley chose fifty dogs of the smaller, faster type best represented by the Siberian Husky (page 802), and a hundred of the larger Eskimo and malemute freighting dogs (page 799).

Upon their return, the explorers reported that the smaller dogs got them farther from camp per pound of dog food. Their speed and smaller appetites more than made up for their lower pulling power.

By the musher's rule of thumb, a dog can pull about twice its own weight on a sled, though of course this varies greatly with snow conditions and grades. The husky weighs about 50 pounds compared with the malemute's 85, but he can travel some 13 miles an hour under racing conditions while a heavier dog is doing 9 or 10.

Thus the Siberian Husky has become the racedog of the family, and often makes a splendid leader. Initiative and pep are qualities sought in a leader, as well as speed. Females often make good lead dogs, since they frequently have these qualifications without the headstrongness characteristic of some males.

Such a "leading lady" is Waska, lead dog of Mrs. Seeley's racing team and of the 73-dog team that pulled the Army truck (p. 770).

A surprise to the layman here is the gentleness of these big northern dogs. They are friendly and polite even to perfect stran-

gers, for they are well-treated and not forced to live the life of a wild animal to get their food, as are some of their relatives in the harsher environment of the north.

As I left these hillside kennels, some of the big malemutes were tuning up for their post-feeding, pre-sundown concert. Rich wolflike howls quavered in the afternoon air. In one enclosure fuzzy puppies were playfully chewing one another's ears.

I thought of the bronze Admiral Byrd Memorial near by: "to All Noble Dogs whose lives were given on dog treks during the two expeditions to Little America, Antarctica, to further science and discovery," and I wondered how many of these puppies would leave their bones in polar snows.

Dogs on Today's Battlefields

In warfare no less than in exploration, men have long trained their dogs for dangerous duty. Thousands of dogs were used in the first World War and many are being employed today on the battlefields of Europe. The Germans use them and so do the British and Russians. A recent newsreel shot showed dogs of war being used by the Russians against the Germans. Ironically, they were German Shepherd Dogs.

One provision in German secret orders in the 1914-18 war must have made dog trainers put their minds on their work. It provided that if the dogs failed to do their duty the trainers themselves should be used as couriers!

In the present war, despite widespread mechanization and the use of two-way radio, European armies still find plenty of work for dogs to do. They are used as couriers, as sentries, and for locating wounded men.

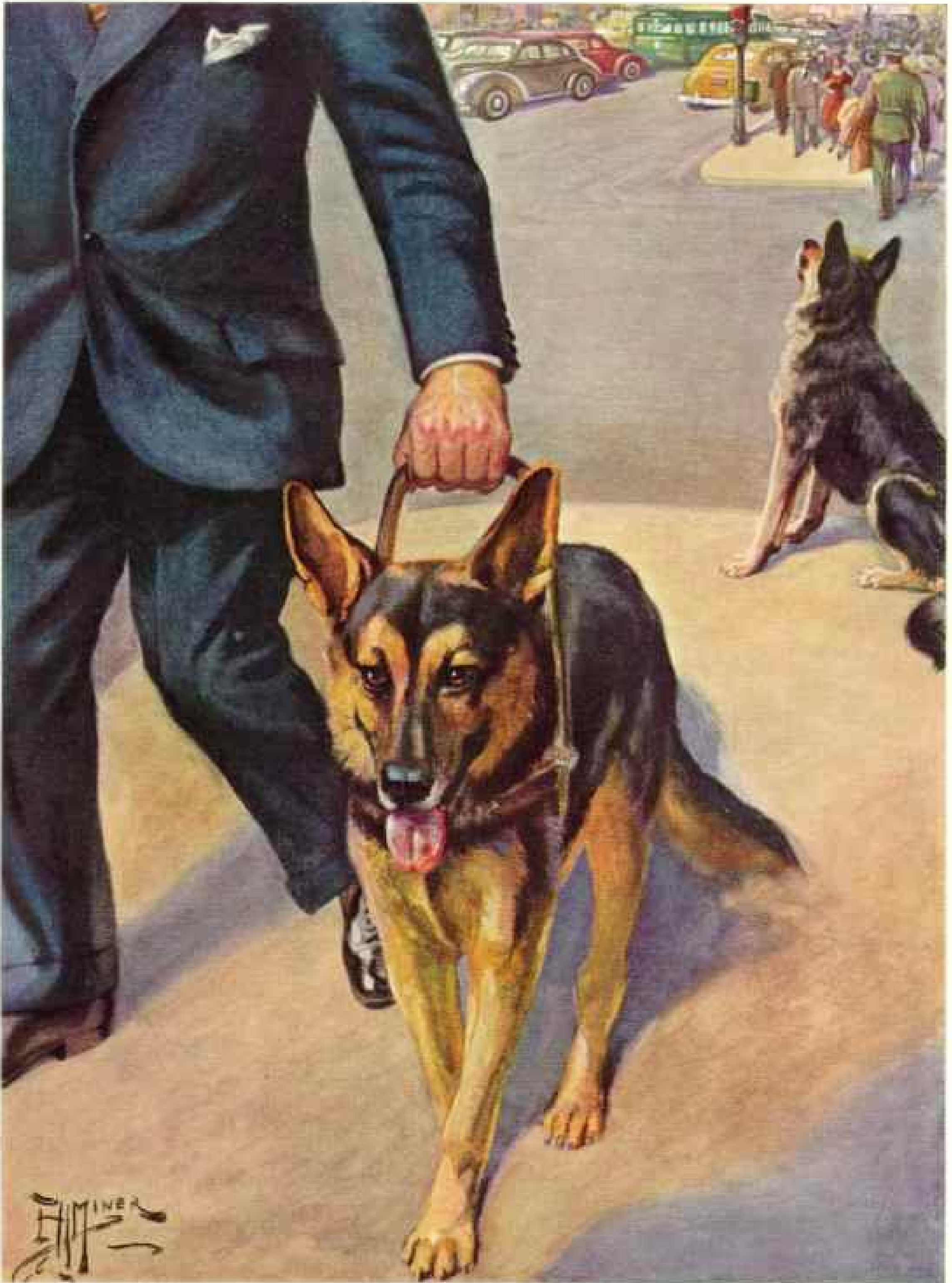
Although the United States Army has not gone into the matter extensively, many civilian trainers are schooling dogs for such service if they should be needed.

Sheep Dogs Perform Daily Miracles

Diametrically different from this warlike employment is perhaps the most widespread use of the working dog, as a herder and protector of sheep or as a driver of cattle (p. 776).

The world over, such dogs perform daily miracles. Many of them need no human companion. They take the sheep to the fields in the morning, and when the sun begins to sink they know, without being told, that it is time to take them home again.

Heroic duty in war or exploration, faithful service as "seeing eye," guard, or shepherd; pulling carts and saving lives—all these and more come within the meaning of "working like a dog."



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Painting by Edward Herbert Miller

Alert, Dependable German Shepherd Dogs Serve as "Seeing Eyes" to the Blind

Mere humans may be guilty of jaywalking, but not these four-footed guides and guardians of those who walk in darkness. Carefully they weave through rushing city traffic. About 650 dogs trained at The Seeing Eye school in Morristown, New Jersey, are now in use in the United States.

Working Dogs of the World

BY FREEMAN LLOYD

*With Paintings by Edward Herbert Miner**

AT a sheep-dog trial in New South Wales, Australia, I once watched a dozen or more sheep-herding dogs looking on while one of their rivals, with quick dashes and feints, rounded up three sheep unaided.

Instead of romping about or looking bored, these contestants awaiting their own turn to compete were observing the dog's every move with the keenest professional interest.

They were kelpies (pages 781-2), and their whole attention was centered upon their life-work, herding sheep. A group of doctors watching a great surgeon in action, or a football coaches' convention attending a big professional game, could not have been more intent.

Dogs at dog shows do not appear to be concerned with what the other entries in the same judging ring are doing. But any sheep dog of the working sort certainly is "all eyes and ears" when observing another of his profession in action. However, let it be borne in mind that a bench show dog may be every bit as observant and ready for "work" if given half a chance to enjoy the life of the great outdoors.

An "Educated" Corgi Handles a Sow

Every farmer knows the value of a good herding dog, and personally I like to think of a working dog as the opposite of one of the "white collar" kind. He knows his way around the farm.

A man may learn much from his sheep or cattle dog; often a dog's judgment may be quicker and keener than that of his master.

As a farm lad in Pembrokeshire, South Wales, I lived in the midst of the Corgi dog country (page 782). And it was one of those fox-headed, prick-eared, short-legged and short-tailed little demons that had the big job of handling the fend-for-themselves pigs.

When Fan was urged to drive one of those long-eared Welsh sows from a garden or other place, she seized her by the end of an ear and in that way avoided the bite of the enraged hog. But when ordered to drive a bull, cow, or ox, she nipped at a hind heel of the beast, then immediately dropped flat on her belly and so avoided the ensuing kick.

As for my fool town-bred spaniels, they went for the heels of both cattle and swine, and got kicked and bitten as the price of their white-collar background. The Corgis were country bred, and as farmers' working dogs they well knew the danger in the horns and heels of the beast and the teeth of an old hog.

Another instance of what appeared to be quicker and better judgment than that possessed by an ordinary man was observed while I was watching a black, white, and tan Scottish Collie named "Bob" on the late Tom Lacey's farm at Hoby, Leicestershire, England.

Noticing a lame ewe, the mounted master with his dog drove the flock to a corner of a thornbush-fenced field. While the foot was being examined, a full-fleeced ewe made a butting dash at the sitting dog sentinel and broke away. Turned aside, she swerved and ran head-on to a slight opening in the hedge, where she became entangled in the bush.

"Fetch her out, Bob," came the order. I thought the dog's best plan would be to get alongside of the ewe and force her out. But Bob already had thought of a more workable plan. He galloped about forty yards to a gate, leaped through the bars to reach and face the seemingly fast-held sheep, and began a terrific barking. With this incentive, the poor creature managed to release herself and rejoin the flock. Here was revealed the wonderful functioning of a working sheep dog's brain.

A friend of mine tells of an instance in which a collie was driving a flock of sheep through a narrow street in a Scottish town. The dog's bark, perhaps through over-use, had faded until it was almost gone, yet the sheep had to be driven on. Quickly the collie hit upon a plan. Choosing old ewes as his victims, he bit their ears so the bleatings would create panic among the leaders. The ruse worked.

Few things can so gratify a lad's pride as to give him a trained sheep dog, place him in charge of a flock of sheep, and tell him to drive them from pasture to pasture—especially if along a road which might provide a human spectator or two. A boy, a dog, and a hundred sheep—what a kingdom!

Sheep-dog trials on a grand scale have yet to be witnessed in the United States. These tests are popular, however, in Wales, and they take the form of a national pastime in Australia where wool may be described as the backbone of the Commonwealth.†

* For expert advice which greatly assisted the artist in the preparation of these paintings and assured their complete authenticity, grateful acknowledgment is made to Dr. Samuel Milbank, of New York, known to the dog show world as one of the foremost executives and judges of the Westminster Kennel Club.

† See "Sheep Dog Trials in Llanguollen (Wales)," by Sara Bloch, NATIONAL GEOGRAPHIC MAGAZINE, April, 1940.



A. E. Jury from Hartman, Kollak Co.

"Seeing Double"

This prize-winning amateur photograph, made by A. E. Jury of Winnsboro, South Carolina, caught two German Shepherd Dogs wearing almost identical expressions of slightly puzzled attention.

The larger and stronger the flesh-eating wild creatures of a country where sheep, goats, or other pasturing animals are bred, the bigger the breed of shepherding dog required. Thus in the wolf and bear countries of the European continent a larger dog than the collie was needed, and there developed the Briard of France (page 795), the Great Pyrenees sheep dog, also known as a wolf dog and bear hound (page 806); and the Kuvasz of Hungary (page 795).

A few miles south of Brandon, Manitoba, Canada, I once saw a farm collie running after a coyote. But it was evident that his was a love mission rather than one of aggression.

In that part of the Dominion prairie wolves were coursed, run down, and killed with an excellent strain of cross-bred Scottish Deerhounds and greyhounds. But in coyote coursing the sheep dog was left at home, for sheep dogs must be broken from any attempt or inclination to follow the natural hunting inclination of almost every breed of dog. The shepherd or herd dog must, like the cobbler, stick to his last. He's a tender of sheep, a worker rather than a sporter.

All dogs pay in full for bones, biscuits, and bed, if only by the boon of their companionship. But none renders a fuller accounting

than the breeds we call the working dogs. Some, such as the Great Dane (page 783), are wonderful guards and burglar insurance.

In the middle '90's of the last century, German bred and trained Danes were used as guards and protectors on one of the gold mining properties near Johannesburg, Transvaal. No firearms of any kind were carried by the white manager of the compound where more than 4,000 Kaffir laborers were fed and housed. His Danes alone gave ample security.

On one occasion three intoxicated natives attacked two white men with their fighting sticks. The dogs did not rush out until a voiceless order was given. The quick uplift of their master's right shoulder was the signal that sent them flying into the fray. Two of the aggressors were thrown to the ground, while the third escaped. Each dog then stood guard over his prone victim.

But Great Danes are not naturally savage. Their aggressiveness may be tempered according to the manner of their training.

Trainers of performing lions informed me they chose Great Danes as participants in their animal acts for the reason that the boarhounds' noble and statuesque appearance befitted the presence and grandeur of the king of beasts; moreover, the Danes were active



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Belgian Sheep Dogs Served as Couriers during the First World War

The long-coated black **Groenendael** (left) takes its name from the Belgian village where it was developed by selective breeding after the chance appearance of a handsome long-haired black female in a litter of lighter-colored sheep dogs. The **Malinois** (right), named for the town of Malines, bears a slight resemblance to the German Shepherd (page 775). Like that versatile dog, both of these Belgians have branched out from their original sheep-herding chores to perform important police and military duties.

Painting by Edward Herbert Moore



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A Vest-pocket Edition of Its Collie Comrades Is the Little Shetland Sheep Dog in the Center

The intelligent, richly coated Collie has come a long way in breeding and development since its origin as a herder of cattle and sheep in the English-Scottish border country. The forefathers of the **Smooth Collie** (background) specialized in herding cattle, while the **Rough-coated** variety (left and right) comes from a long line of wonderful sheep-handlers. The **Shetland Sheep Dog**, little more than half as high, is a miniature working collie evolved in the rugged Shetland Islands.

Painting by Edward Herbert Stuart

and would look out for themselves in case of trouble.

The duties of the working dogs, whose "breed biographies" follow, are many and immensely varied.

German Shepherd Dog

The German Shepherd Dog is intelligent and useful as well as good-looking. He serves man as a shepherd and cattle driver, as a watchdog, as an aid in the military and police services, and as a leader of the blind (pages 769 and 775).

After the first World War the German Shepherd, because of his growing use for running down and disarming criminals, became known colloquially as "police dog."

The motion-picture acting of the splendidly-trained Strongheart had its appeals—favorable and otherwise. But, truth to tell, the apparent savagery shown on the screen earned for the "police dog" a reputation for aggressiveness rather than friendliness. His real and best side as the shepherd's helper and the blind man's guide, or as a loyal household friend, was completely overshadowed. Today, however, the world is fully aware of this dog's usefulness.

The average height at the shoulder for males is 24 inches, and 22 to 23½ inches for bitches. All colors are permissible, from solid black to solid white, including varieties of brown, grays, and mixed wolf colorings; also brindles. White markings on chest and legs are allowed. The color of a puppy can be ascertained only after its outer coat comes in.

This dog in appearance is singularly alert, rather long in the body, but well built. He has an easy, striding gait and is very active as a leaper.

Belgian Sheep Dogs

The Belgian Sheep Dogs are of two principal kinds, the Groenendael and the Malinois. The Groenendael is long-coated and black. The Malinois is brindle-fawn with a black mask (page 778).

These Belgians were among the first of the modern dogs of war, having been employed primarily for carrying messages on the battlefield. During the World War thousands of them were trained for duty on the Western Front.

The black Groenendael strain is a product of selective breeding in the latter part of the 19th century. In the village of Groenendael, Belgium, one Monsieur Rose, who had bred sheep dogs for many years, discovered in one of the litters a long-coated black bitch puppy. After searching for almost a year, since blacks were very scarce in those days, M. Rose discovered a black male, bought it, and bred the pair. The new strain made its first bench show appearance in 1898 and received high praise.

The Malinois variety gets its name from the town of Malines (Mechlin), Belgium.

According to the rulings of the Belgian Sheep-dog Club of America, the height of the male

should be about 23½ inches and bitches 22½ inches; weight about 53 pounds. The coat of the Groenendael should be black, long, smooth, straight, and flat over the entire surface of the body except on the head, the outside of the ears, and the lower part of the legs, where it is short. The hindquarters and tail are "feathered," or fringed with longer hair, as are the forelegs. The coat of the Malinois is shorter and not unlike that of the German Shepherd Dog, which, in appearance, seems to be a not-very-far-off cousin.

Collie and Shetland Sheep Dog

Both the Collie and the Shetland Sheep Dog are considered as strictly of Scottish origin. The little Shetland may best be described as a Collie in miniature (page 779).

In my boyhood we spelled the word "colley," and this form still prevails in some places. Then, again, "coalie" or "coaly" (for coal-black) was employed and is still used among some of the farming peoples of the British Empire to designate a herd dog resembling the old and well-trusted, mostly black sheep dog of Bonnie Scotland. "Collie," however, is commonest, and it is not improbable that this is merely the diminutive and familiar form of "coll," for in many Scottish words the "ie" is thus used—Will becomes Willie, and lass becomes lassie.

The mating of heavily coated purebred dogs, as well as the rigorous climates in which their ancestors have lived for many years, seems to encourage a greater wealth of hair on all breeds. So it is that the profuse over and under coat of the Scottish, or Rough, Collie is considered highly desirable. One that is short of coat has little chance of winning a prize in good competition. The Scottish Collie is a popular dog and bred to a high perfection in the United States and Canada.

The Smooth Collie is a variety which may be described as a Scottish Collie minus his profuse coat. The hair is the length of that of a Pointer.

A Collie may be any color. Rough Collie males should stand about 24 inches at the shoulder, and bitches two inches less. Weight: dogs, about 60 pounds; bitches, about 50 pounds. The Smooth variety would run slightly less.

Like the native ponies and sheep of the Shetland Islands, the Shetland Sheep Dog is smaller than the Collies on the mainland of Scotland. The height at the shoulder should be not less than 12 inches or more than 15 inches.

Welsh Corgi

The Corgi's name comes from the Welsh "cor" meaning "dwarf" and "gi" meaning "dog." Hence it aptly describes the small cattle-, sheep-, and swine-dogs of southwestern Wales (page 782, also 776).

The earliest record of the Corgi breed appears to be about A. D. 900, when Wales was governed by Howel Dda, sometimes called "Howel the Good" and "the Great Law Giver." He drew up a code of laws at his hunting lodge near the



MUTUAL from BLACK STAR

Mutton on the Move: Australian Kelpies in Action

Two of these busy little herdsmen head off and hustle a stray at a pioneer sheep station. Kelpies take a real interest in their work (page 776).

village now known as Whitland on the border of Pembrokeshire and Carmarthenshire. These laws fixed the values of livestock, so that if a creature was stolen or killed proper redress could be claimed and given. The value of a good Corgi cattle dog was appraised as that of a first-class steer. Today the value of a prize-winning Corgi may be more than that of at least two or three fat cattle.

Strange to say, it was not until about 1925 that the Corgi varieties became known to the general dog show public. In that year the breed was accepted by the English Kennel Club as a pure-bred variety of working dog.

But everyone in north Pembrokeshire and Cardiganshire had long been aware of the usefulness of the little farm dogs colloquially known as "Welsh Curs." As a Pembrokeshire man, I can truthfully record that the term "cur" in the case of the Corgi was not considered a slur. It did not mean a mongrel but a short-legged, often long-bodied, collie-headed, prick-eared little cattle

or sheep dog which was much smaller than the red- or light-colored smooth-coated sheep dogs of that part of Britain.

Locally, we knew the Corgis as "heelers," since they bit at the heels of cattle. You must "drive" cattle, not "head" them.

In my youth the farmers' dogs accompanied their masters to the Sunday night religious services. It was the custom to count the sheep and the cattle in the fields and then go to chapel to offer up praises and thanks to Almighty God. On wet nights the dogs were admitted into the little sanctuary; in the summer they lay outside—unquarreling, silent, contented, tired dogs. Every day is a working day for the farmer's Corgi.

As a boy, I used to attend the country fairs in Pembrokeshire. There, of course, were Corgis by the score, some with short and some with long tails. I heard no distinction made between Cardigan Corgis and Pembroke Corgis. Both were bred, reared, and kept for exactly the same uses—



Welsh Corgis Chase Cattle by Nipping at Their Heels

Before the days of fences, the Corgi was used by farmers to drive away neighbors' cattle trespassing on their land. The **Pembroke Corgi** (left) is shorter-tailed and higher-bodied than the **Cardigan** variety (right).

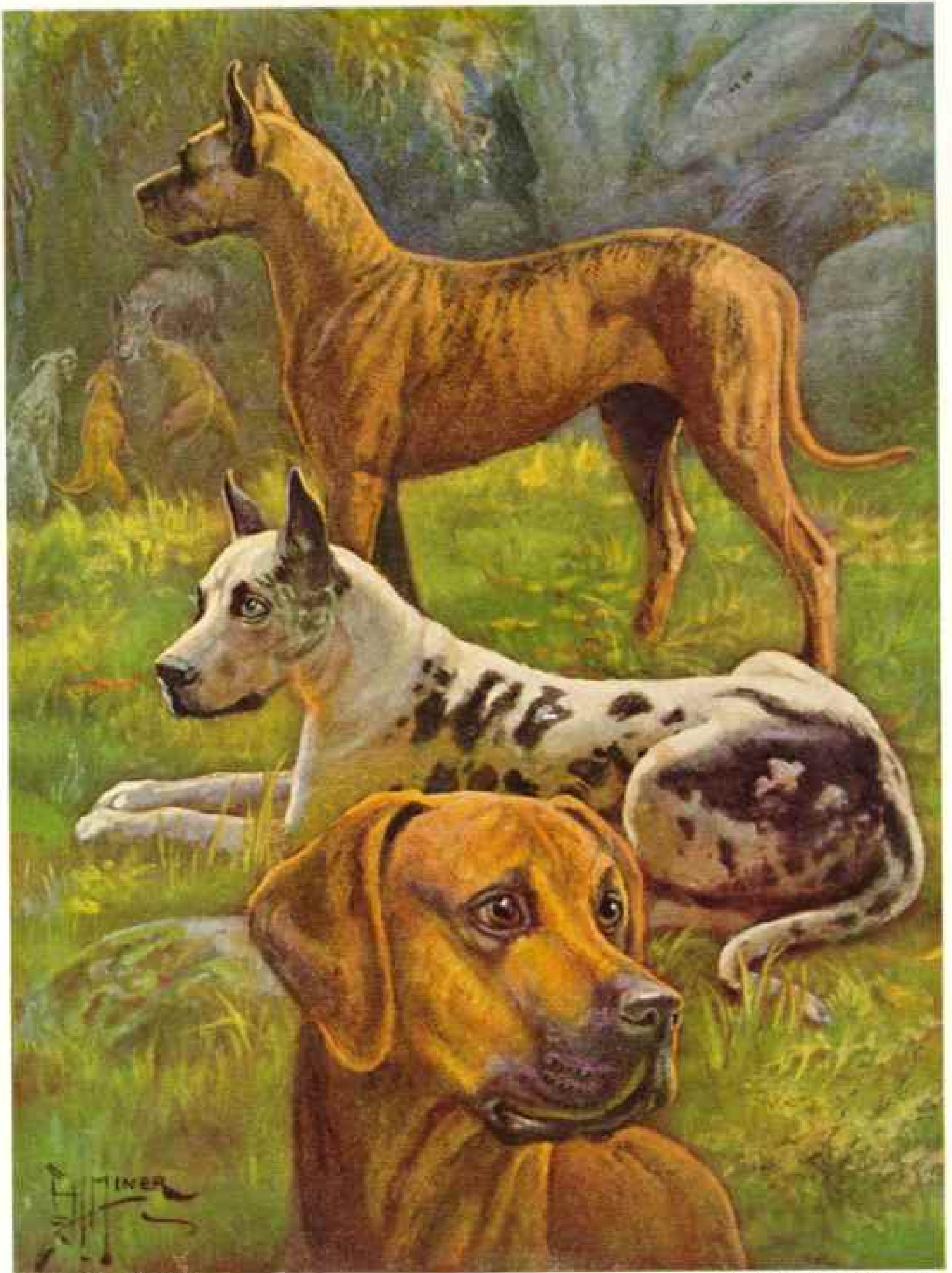


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Paintings by Edward Herbert Miner

One Australian Kelpie, Sheep Raisers Say, Can Do the Work of Six Men

The wholly black strain is called the **Barb**, in honor of a famed Tasmanian-bred performer in sheep-dog trials.



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Painting by Edward Heister Miller

Great Danes Were Developed in Germany for Hunting Wild Boars

In the background three of these giant dogs confront their sharp-tusked foe. Sometimes they were armored on chest and forequarters with wild hog's hide, and a metal collar protected the neck. Despite its name, the **Great Dane** is more German than Danish. Ears are cropped in some States and in continental Europe, but not in Great Britain (foreground).



A. S. Macdonald

A Little Dog with a Huge Fur Coat Is the Hungarian Puli

Shaggy Zsoka (left) and the puppy are Pulis, or Pulik, to use the Hungarian plural form. They are pictured with the daughter of Zsoka's owner, Mr. Louis Kiss of New York City. In its native Hungary the Puli herds sheep, sometimes actually leaping upon their backs. Recently the United States Department of Agriculture has experimented with Pulis at Beltsville, Maryland, in tests of inheritance of intelligence and temperament. Some of the little dogs made high scores in a "whistle test" of obedience and in sheep-herding, but individuals varied widely. Some were actually afraid of the sheep.

cattle and sheep herding, a little rabbit hunting, and vermin killing.

But today the Cardigan, as a show dog, usually is larger than the Pembroke and possessed of a full and sweeping tail. Both have prick ears and they are of similar color. Basically, they are brothers in blood.

The height of the Cardigan Corgi should be as near as possible to 12 inches at the shoulder and the weight 18 to 25 pounds; bitches, 15 to 22 pounds. The preferable weight of the Pembroke Corgi dog is 20 to 24 pounds, while bitches may scale from 18 to 22 pounds. Neither should exceed 12 inches at the shoulder.

Australian Kelpie

The Australian Kelpie, as seen in its own country where there are thousands, is a sheep and cattle dog smaller than the general run of the working sheep dogs in Europe (pp. 776, 782).

The heavily fleeced merino sheep and the full-fleeced "mutton" sheep of Australia and New Zealand are not fast of foot; hence the dogs do not have to gallop so fast and far as in Wales, for example.

"Kelpie," I was told, is a Scottish word signifying diminutive companion or helper; in short, Kelpie is synonymous with "helpie." Almost any kind of small shepherd dog might be classed as a Kelpie, and the term, during my stay in the Antipodes, was colloquially used to designate small sheep dogs.

From owners of dogs at sheep-dog trials I gathered that a black strain of sharp-faced, fairly broad-headed, prick-eared dogs was preferred. It was known as the Barb breed and originally had reached New South Wales from Tasmania. The first of this strain, a dog named the Barb, had come from Scotland. I was informed. This dog and several of his get greatly distinguished themselves at sheep-dog trials on the Island, and importations to the mainland followed.

Nowadays, as a bench show dog, the Barb may be as high as 24 inches at the shoulder and weigh around 54 pounds. He is sloe-black in color and alert in appearance. Australian flockmasters are practical men, and in no country are sheep dogs given more difficult working tests than at trials on the island continent. Therefore, the Kelpie has to be a working dog, first, last, and all the time.

Great Dane

The Great Dane, or German Boarhound, is the most statuesque in appearance of all the purebred dogs (page 783). He is at once powerful, brave, and possessed of considerable speed, considering

his weight, which may be as high as 120 pounds or over. His height is 30 inches or more.

His colors are attractive, whether of solid shade or partly so. He may be brindle, fawn, blue, black, or harlequin in color; the harlequin should have black patches and spots on a pure-white ground.

A noble creature, the Great Dane represents the results not only of careful breeding, but of generous feeding, and a rearing blessed with abundant exercise. Of all the larger breeds, the Great Dane is the soundest in body and limb and the freest of movement. In the United States the breed has admirers from coast to coast.

As the boarhounds of olden times, these dogs were used for running down the wild boar, impeding its course, and actually laying hold of the infuriated beast. Here was a superfeat that called not only for supreme courage but for great strength of jaws, holding powers, and activity, for the boar is a beast of great force. A slightly lighter type of dog than the average show-winning Dane of the present day was employed for boar hunting in continental Europe. The spears and swords of the hunters dispatched the quarry.

Sixteenth-century etchings of wild bull and bear hunting picture dogs of strictly Great Dane appearance, with strong jaws, powerful limbs, lithe bodies, and long tails. Their ears are cropped, and they wear metal collars. Thus the boarhound has been a pure and well-established type for four hundred years or more.

Old English Sheep Dog

What the Collie is to Scotland, the Old English Sheep Dog is to England, though he is not so generally distributed over his homeland (page 786).

The Old English Sheep Dog is commonly known as the Bobtail, since his tail is bobbed or cut off close to the rump. This dog carries an enormous coat, and a long hairy tail would gather so much mud as to impede the free movement of a hard-



PHOTO LAMM

A Great Dane Deigns to Mind the Baby

Guardian of little Barbara Woodworth of San Marino, California, is this Great Dane bitch, Olan of Ridgerest, owned by the child's grandmother, Mrs. J. F. Torrence. Here it looks as if dog and child were just becoming acquainted, but actually they are old pals and Barbara orders the giant around as if it were a kitten.

working farm dog. Many are born tailless or with short "bobs." For the last 50 years, to my own knowledge, this breed has been producing long-tailed, short-tailed, and tailless puppies, often in the same litter.

The Bobtail was and is popular for driving sheep and cattle from fair to fair or to other points for disposal or slaughter. His voice is sharp and loud—a valuable asset, since "noise" helps in keeping livestock on the move.

Shaggy and compactly built, the Bobtail frequently brings forth the remark, "Look, there's a dog like a bear!" He is very sagacious and makes a nice dog for play as well as work. Among the best-in-the-bench-show dogs of the day an Old English Sheep Dog is often acclaimed as the winner, and that highest of all exhibition attainments

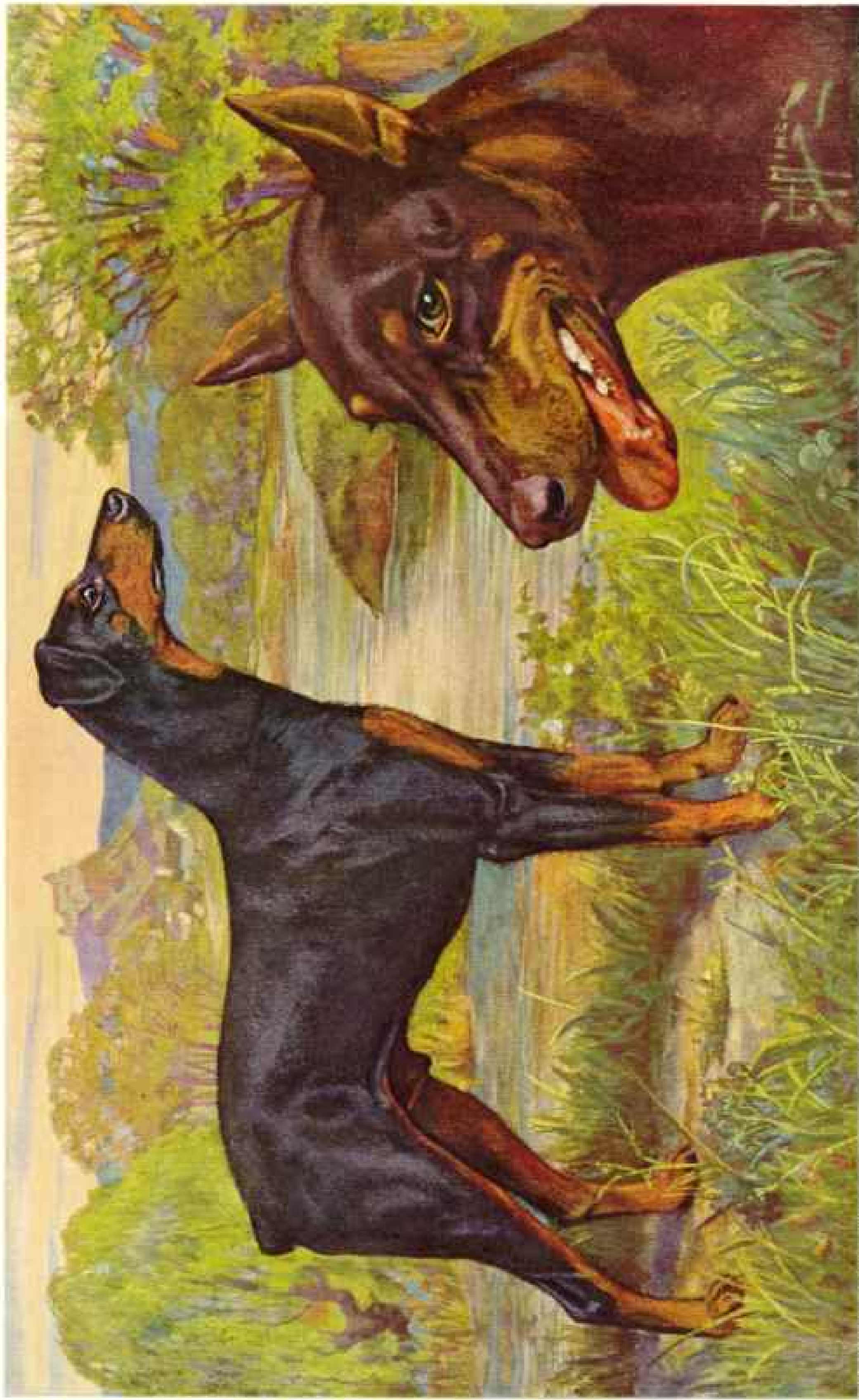


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Painting by Edward Heffernan Moore

Sturdy, Hairy Old English Sheep Dogs Can Gallop Fast, though They Move with a Bearlike Shuffle

“Bobtail” or “bob” they are affectionately called. Some are natural-born bobtails, but others are made so by docking the tail at the first joint when the puppy is three or four days old. Bobtails have thick rainproof coats, mostly of pigeon-blue color with white markings. Their bark is loud, their skull well formed and “brainy.” Through hair that all but hides their eyes they peer at the world with an air of dignity and wisdom.



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Painting by Edward Herbert Miner

One of the Newer Breeds Is the Doberman Pinscher, a Trim, Alert Athlete of Dogdom

Only about fifty years ago the first **Doberman Pinscher** was produced, by a German breeder, Louis Dobermann. Strangely, the dog's name ends in one "n"! The originator's in two. Tradition says the "ingredients" were short-haired shepherd dog, black-and-tan terrier, smooth-haired German pinscher, and Rottweiler (page 790). The result is a compact, well-built dog of bold outline and smart appearance. The Doberman can be used for herding cattle or sheep, for hunting, and for police or army work. As a home and guard dog, it is much employed in America and in its homeland. The tail is docked and the ears are often cropped (right).



Staff Photographer, Willard W. Carter

A Criminal Has Need for Speed with a Doberman in Pursuit!

Terrifically fast and agile, one of these lean athletic dogs demonstrates his leaping powers at Wilsonia Kennels, Rushville, Indiana, where various breeds are trained. The Doberman Pinscher, taught to run down and disarm criminals, becomes one of the best of "police dogs" (page 769).

should say much for the position that the Bobtail holds in the United States.

The color may be any shade of gray, grizzle, blue, or blue-merled, with or without white markings or in reverse. Brown and fawn shades are disliked. The outer hair should be long and free from curl, and the under coat of a lintlike or pile description. Dogs should measure at least 22 inches at the shoulder, bitches slightly less.

Doberman Pinscher

The Doberman Pinscher is a fast-moving, slim-outlined dog of such dashing appearance that he forces himself upon the notice of any admirer of animal beauty of form (page 787).

Although this German breed is only about 50 years old, it has become extremely popular in many countries including the United States. Among the elements in the making of the Doberman, it is recorded, were a smooth German sheep dog and a black-and-tan Manchester Terrier, of which there were some of the very best specimens in the Germany of four or five decades ago.

It was in Apolda, in Germany, around 1890,

that the first of the Dobermans were brought to public notice. The breed was officially recognized in 1900.

A few years ago a Doberman was adjudged best of all breeds at a New York show. As a consequence the breed in this country was made famous almost over night.

The Doberman is a good house dog and companion; a clean-cut, active, smart dog, generally black-and-tan in color. Occasionally a blue-and-tan is seen; and there are browns or light-liver-colored specimens. There may be a few white hairs on the chest, but for bench show purposes they are not desirable. The ears of a Doberman are cropped, while the tail is docked to a length of a couple of inches.

The official height of the Doberman male is given as 24 to 27 inches; the female, 23 to 25 inches. It has been noticed that the heights of these dogs are increasing, and as a consequence the builds, in some cases, are becoming more "greyhoundy," which is considered a fault according to the standard of points adopted by the Doberman Pinscher Club of America.

Giant Schnauzer

The Giant Schnauzer is another of the big, stalwart, active, and useful German breeds—dogs bred for a purpose. He is a rough-coated, hard-haired cattle dog, a herd dog whose place is on the land as the flockmaster's helper and the herdsman's friend (page 790).

Here in the United States the Giant is mostly kept as a guard dog in the countryside home and as a companion.

The Giant Schnauzer is another of those dogs which bear the hallmark of a needless cruelty—that of cropping the ears and docking the tails on the ground of improving their appearance. But the ears and tail of a dog provide an index to its ancestry. "Crop his ears, cut his tail, and call him a terrier," runs an old English adage that might apply.

A Giant Schnauzer may stand from 24½ to 25½ inches at the shoulder. His hard and wiry coat of pepper-and-salt, pure black, or black with tan gives him the look of a rough-and-ready dog fit for work in all seasons and countries.

Like all of the Schnauzer family, the Giant had its origin in Wurttemberg and Bavaria, agricultural regions. He was not generally known or distributed in Germany until the first World War. Sturdy, active, and brainy, he was easily trained and was used as a police dog.

There are not many of the breed in the United States; but those I have had the privilege to observe have been capital specimens of this rugged, yet active, intelligent, and highly useful dog.

Rottweiler

When I first saw a Rottweiler dog at an American bench show, I was fortunate in having a dog-loving Austrian as my companion.

"What's that dog used for?" I inquired.

"Oh, he's a butcher's dog," was the reply. "You know, the butcher that buys his meat on the hoof, drives it home, and kills it in his own slaughterhouse."

And that has been the work of the Rottweiler dog since the time of the ancient Romans (p. 790).

This breed takes its name from the township of Rottweil, in Wurttemberg, south Germany. They are descendants of the original cattle dogs brought there by the conquering Romans of the first century, who, it is written, followed the old military road to Rottweil.

In the Rottweiler of today we see the robust form of a useful dog as he may have been 1900 years ago. The smaller Rottweilers are employed as cattle dogs, while the larger are used as draught dogs between the shafts of milk, bread, and vegetable carts. Some are drafted as war dogs.

Your Rottweiler should stand from 23¾ to 27 inches at the shoulder; bitches about two inches less. Black, with tan markings on the cheeks, muzzle, chest, and legs, is the preferred color, the tan being of a rich mahogany-brown shade. The Rottweiler is a broad-skulled dog between the ears and is one of the few uncropped-eared breeds to reach us from Germany. His hair is short, coarse, and flat.

As would be expected from the hard lives lived by the ancestors of the present race, the Rottweiler is a dog of great courage. He should be ever-useful as a guard, companion, and "butcher's dog."

Norwegian Elkhound

Competent and sprightly, the Norwegian Elkhound is one of those engagingly beautiful northern dogs which proclaim by their appearance the latitudes of their origin (pages 791, 799, and 802).

But this so-called elkhound, in his make, shape, and breed characteristics, is more "dog" than hound. There is nothing in his build or voice that signifies the hound; he is a dog of the Norlands, of arctic and subarctic climes, where he serves as an all-around herder and hunter. His sharp muzzle, broad skull, heavy coat, and curled tail stamp him as one of the herd, sledge, and general utility dogs of the countries of the midnight sun.

The elk of Europe is the moose of America, and this splendidly nosed dog is well-equipped for locating that lordly animal, barking, and engaging it—just as a stand-off collie or other cattle dog barks at a bull in an ordinary herd of domestic cattle. Thus the elk becomes an easier mark for the rifle-armed hunter. An alert, active, and intelligent dog is quicker on his feet than an elk, and is smart enough to avoid the swinging antlers and the powerful stampings of the mighty creature's hoofs.

That, in short, is the work of the Norwegian Elkhound as a sporting dog. His homework is that of the ordinary farm dog—a tender of cattle, sheep, reindeer, or what have you.

As a show dog he is rightly popular, since in make and shape he shows the sturdiness and activity that have been his stand-bys down through the centuries. He breeds true to type.

One of the chief characteristics of the elk dog is his almost never-varying color. It is a gray with black tips which might be described as wolf color. There are no pronounced variations save in the lightness or darkness of the shades of gray. This, as I see it, points to the elk dog's long and strictly pure ancestry; he is not a dog of many colors.

Today the dictum of the Norwegian Elkhound Association of America is that these dogs should be 20½ inches and bitches about 18 inches from the top of the withers to the ground. Color: gray with black tips to the long covering hairs; somewhat lighter on chest, stomach, legs, underside of tail, and around anus.

Newfoundland

The Newfoundland Dog, whose nobility of character, imposing presence, and general good temperament have endeared him to millions, takes his name from the oldest of the English colonies, where his ancestors were brought by sailors and the earliest of settlers from Europe (page 794).



Giant Schnauzers Make Good Guards, Cattle Drivers, and Police Dogs

About 21½ to 25½ inches high at the shoulder, they are "giants" only by comparison with standard and miniature schnauzers.

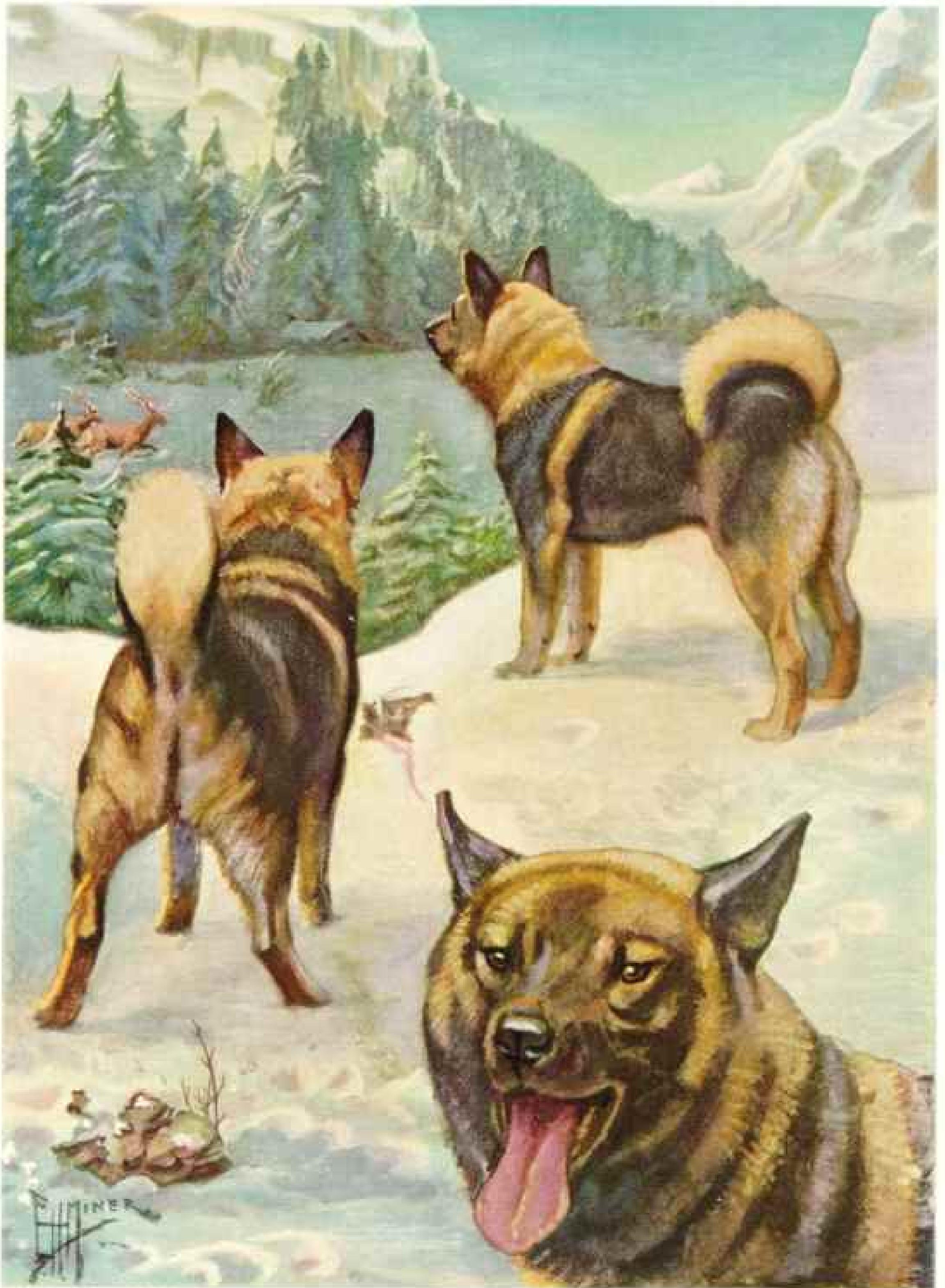


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Paintings by Edward Herbert Miller

Rottweilers Are Descended from the Cattle Dogs of the Ancient Romans

Their ancestors herded "beef-on-the-hoof" taken along to feed Rome's conquering legions, but their name comes from Rottweil, Germany, home town of the modern breed. Dubbed "butcher dogs," they sometimes pull small carts.

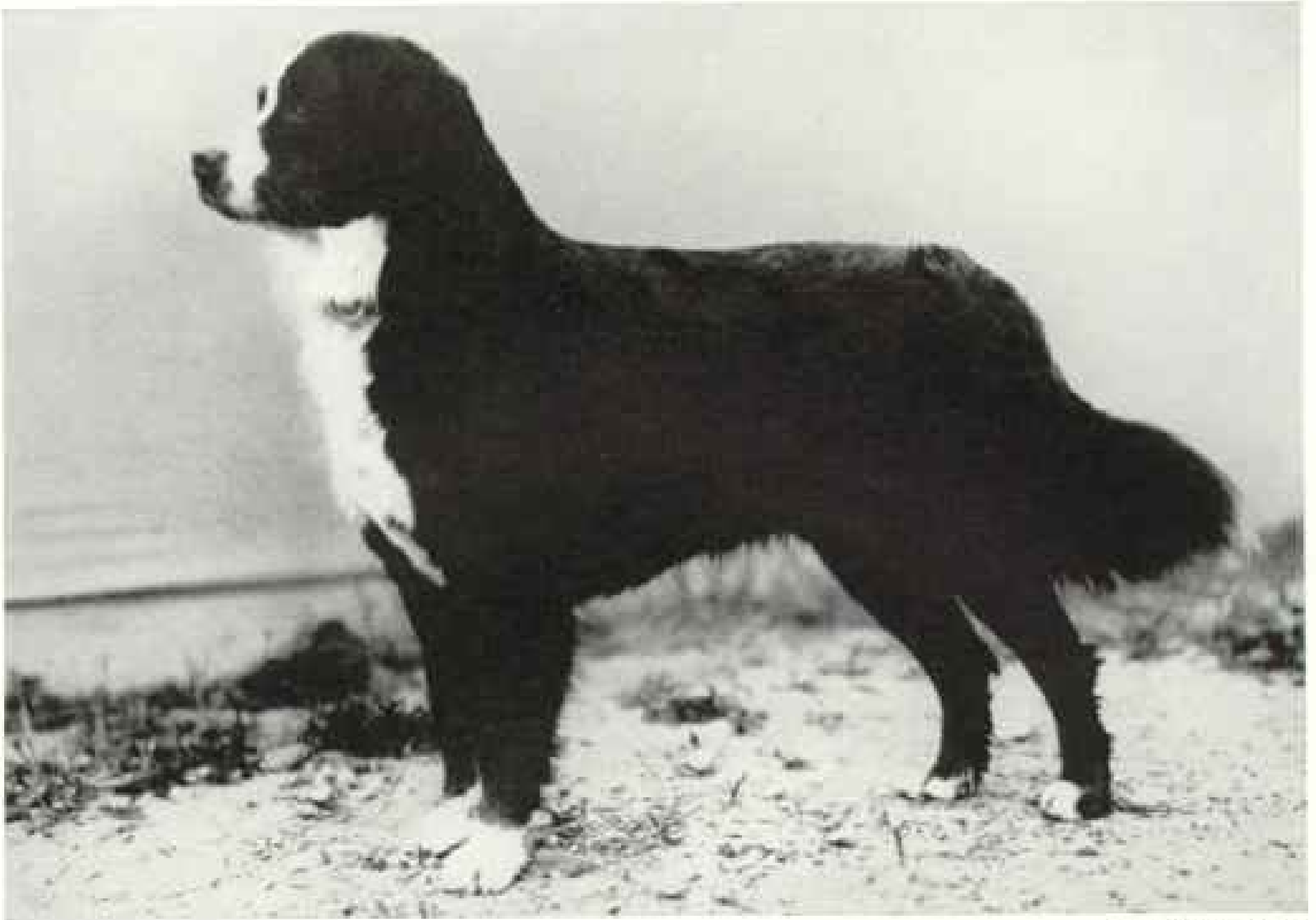


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Painted by Edward Herbert Miner

Norwegian Elkhounds, Dogs of the Vikings, Are Fearless Hunters of Big Game:

Sagas tell of these sturdy northerners; their remains have been found in Viking graves. Though not huge, they hunt European elk, bears, wolves, or American mountain lions. Versatile, they herd sheep and guard farms.



From Glen L. Shadow

A Handsome Newcomer to the United States—a Bernese Mountain Dog

This splendid specimen, Fridy V. Haslenbach, acclaimed the best of her breed in Europe, was imported from Switzerland by Glen L. Shadow, of Ruston, Louisiana, pioneer in popularizing the Bernese Mountain Dog in the United States. The breed was brought into Switzerland by Roman soldiers some 2,000 years ago and long was used by weavers near Bern for drawing carts. Its color is black with markings of white and rich russet or tan. Fridy has the white feet and white tail tip preferable, but not essential, in a Bernese Mountain Dog. The Bernese somewhat resembles the Newfoundland (below and page 794).

A ship's dog was taught to leap overboard and swim for shore, bearing in his mouth the end of a small, light rope. To this a heavier rope could be made fast and used as a safe means for human beings to reach land.

Thus the ship's dog became its lifesaving apparatus. With his four legs he could swim where men might founder; his grip on the rocks would be easier and firmer than that of a man. Ships' dogs were, and still are, taught also to rescue a "man overboard" (pages 745, 760).

Apparently the explorers' and codfishermen's retriever dogs which were left with the settlers in Newfoundland produced bigger and bigger offspring in their new homes. When these larger dogs were taken to Europe, they were given the name they now bear.

It is recorded that the Basque fishermen from northern Spain took their Pyrenees dogs (page 806) as ships' dogs to the Banks of Newfoundland; and it is surmised that these almost all-white dogs, when crossed with the black dogs of Newfoundland, produced the white-and-black-marked variety sometimes called the Landseer Newfoundland. It will be remembered that Sir Edwin Landseer painted a picture of a splendid specimen of a white-and-black-marked Newfound-

land Dog sitting guard over a child he had just saved from drowning. Needless to write, the painting widely popularized the Newfoundland Dog as a saver of human life.

In appearance as well as in his disposition, the Newfoundland is a dog of benevolence, kindness, and mightiness—a big fellow endowed with a good temperament.

Most dogs of the breed are wholly black. They stand 25 inches at the shoulder and some weigh up to about 150 pounds; females, of course, are somewhat smaller. Black dogs which have only white toes and white breasts and white tip to tail should be exhibited at shows in the classes provided for blacks. The color is of a dull jet-black, and sometimes a tinge of bronze may be observable. This is not objectionable in shows.

Let your Newfoundland Dog's upper coat be flat and the under coat of a close or lintlike texture. Above all, he is considered a good water dog. Once a working dog—even a lumber hauling and small-cart dog—the Newfoundland of our own day may be described as a house and companion dog of the nobler and less aggressive kind. Some of the world's best specimens continue to be bred in the United States.



"And Nothing but the Truth"

Red Dust, of malemute extraction, "testified" in a Los Angeles court on behalf of its master, Robert Williams of that city. Williams, charged with overtime parking, explained that the dog had been stunned by a passing car and while first aid was being given the 15-minute time limit expired. Red Dust backed him up. Result: suspended sentence.

Lord Byron's Newfoundland Dog, Boatswain, born in May, 1801, on the island, died at Windsor, England, in 1815. Part of the famous epitaph, written by his master, reads:

" . . . beauty without vanity,
Strength without insolence,
Courage without ferocity,
And all the virtues of man without his vices."

And that adulation of a man for his faithful dog remains in almost every human heart.

Bouvier de Flandres

The Bouvier de Flandres is one of the continental European herd dogs of great usefulness. He may be classed among the herd and drovers' dogs—hardy, country-bred-and-reared dogs as likely as not whelped in cowshed or stable. With cropped ears and docked tail, he carries no impedimenta; indeed, he is not only alert in appearance but quick in action. He would be useful as a coyote dog in any country, and his coat would suit him for cold and damp climates (page 795).

According to the Club National du Bouvier de Flandres, Belgium, the progenitors of this *bouvier*, or cattle dog, were found in southwest Flanders. They were dogs of considerable size, measuring about 26 inches at the shoulder.

In appearance, this farm dog is not unlike the Giant Schnauzer (p. 790). He is a hardy, active, and alert dog, a watchdog as well as a cattle driver.

Bouviere of today are fawn to black, pepper-and-salt, gray, and brindle in color. The coats are tousled and harsh to the touch. The dogs stand from 23½ to 27½ inches at the shoulder, and the minimum for bitches is 22¾.

In Belgium a dog of this breed may not be given the title of champion unless he has won a prize as a police, guard, or army dog. Before the present war, the Belgian Bouvier was gaining great favor as a cattle dog in the Netherlands.

As yet the Bouvier de Flandres is a practically unknown breed in America, but one of these days he will surely find his place.

Briard

The Briard is a French sheep dog, and a useful one (page 795). The sheep dogs of Brie (Berger de Brie) are of a very old variety and have been used for centuries in France by owners of livestock.

These shepherds are active and robust dogs and are well-protected against the elements by their long hair, slightly waved, stiff, and strong. A shake of the body, and moisture is quickly shed.

The Briard may be of any color save white; even a speck of white on the chest may dis-



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Painting by Edward Herbert Munn

Strong-swimming, Partly Web-footed Newfoundland Dogs Rescue a Shipwreck Victim from Icy Waters

Similar scenes have been enacted many times on the rocky coasts of Newfoundland, where these brave, powerful swimmers evolved from the ships' dogs of early fishermen. One ancestor is thought to have been the white Great Pyrenees (page 806), brought over by Basque mariners. Most Newfoundlanders are wholly black; the white variety with black markings is commonly known as the Land-seer Newfoundland. These dogs are devoted companions.



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Farmer-warriors of Belgium and France

Rough and ready as he looks, the **Bouvier de Flandres**, or "Cowherd of Flanders" (background), is well adapted to police and army duty. So is France's sheep-herding **Briard** (foreground), often stationed in listening posts in war because of its keen hearing. Heavy brows protect its eyes in brushy country.



Paintings by Edward Herbert Mingo

Hungary's Kuvassz, Palace Guard of Kings

Giant ancestors of these big dogs traditionally came from Tibet, and their name derives from a Turkish term meaning "armed guard of the nobility." In Hungary the **Kuvassz** served as bodyguard to Magyar monarchs and noble men or was used for hunting. Today many are breeders and watchdogs.



Song of the Snowy Trail

H. Armstrong Roberts

Ears back and muzzle toward the sky, a sledge dog in harness gives vent to the mournful, spine-tingling wolfish howl often uttered near the close of day. Some northern dogs are half or a quarter wolf (page 773).

qualify him as a bench show dog under the rules of the Briard Club of America. An upstanding dog, he may measure as much as 27 inches at the withers and scales around 70 pounds.

The Briard Club of America declares that "two dewclaws on each hind leg are required" and has laid down a rule stating that "a dog with only one (dewclaw) cannot be given a prize." But many practical sheep-dog owners feel that dewclaws are hindrances to any dog's locomotion, the claws being loosely joined to the insides of the lower parts of the hind legs and liable to be caught and injured.

The Briard's head is strong and covered with long hair, forming eyebrows, beard, and whiskers, yet the eye is not hidden by the hair. The ears are placed high and never pendulous; in France these are often cut. The tail is long and often bears an upward or sickle-shaped "twirl" at the

end. Altogether the Briard is of the rough-and-ready, always useful, and weatherproof style of sheep dog admired everywhere.

Kuvasz

A big, white, 26-inch-at-the-shoulder dog, the Kuvasz (page 795) is now classed as a working dog and used as a guardian of sheep, although centuries ago he served as palace guard and was hunted in pack by King Matthias of Hungary who lived about the time of Columbus.

The Kuvasz in appearance suggests the mountain dogs of the Pyrenees (page 806), but this Hungarian is smaller. As a guard dog he is of the first order. Tradition has it that the Kuvasz originally came from Tibet, in Asia, and as developed in Europe—especially Hungary—became the guard dog of kings and nobles. Surplus puppies were presented only to noblemen and visiting dignitaries, but presently the breed became more and more distributed, since peasants and shepherds were eager to own them as herd dogs.

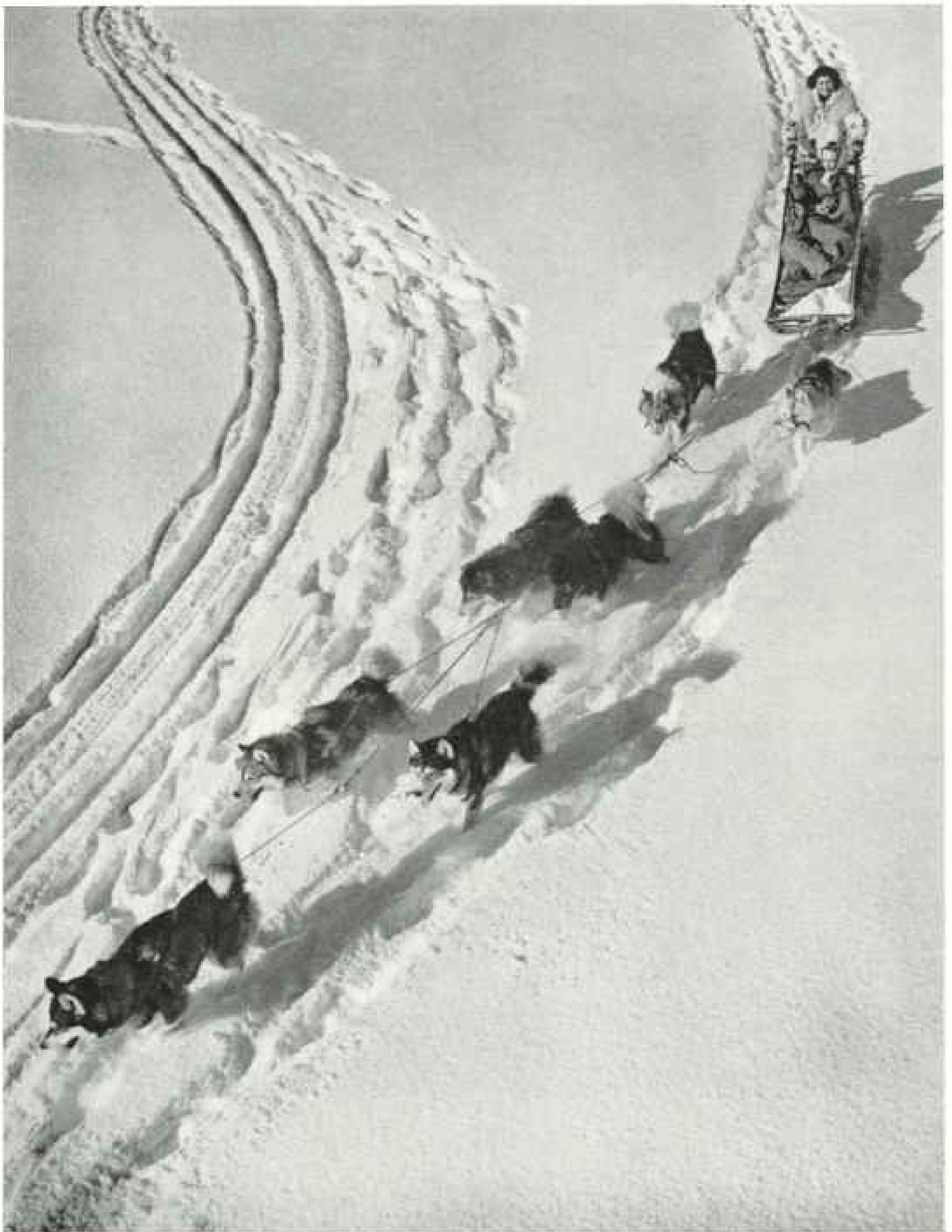
The few owners of this handsome breed in the United States are loud in their praise of his sagacity and devotion.

Mastiff and Bull Mastiff

The Mastiff is one of the oldest and most honored of the English pure breeds, while the Bull Mastiff is a strictly modern variety accepted as a pure breed for exhibiting at shows only during the last 15 years or so (page 798).

The Bull Mastiff has been welcomed by the public, since he is more active than the general run of the Old English Mastiff, which in many instances became rather too cloddily built and awkward in gait, especially in hind legs, to attain that best-in-the-show prominence so coveted by exhibitors of today. But with all that, the beauty and grandeur of the square-skulled, short-and-deep-muzzled, massive-bodied, sound-limbed-and-footed Mastiff of yesterday must have been without a peer.

History says the Romans of old took English



NORMAN T. JORGAN

"Gee!" Cries the Musher, and This Fast-running Team Swings Right

To start their dogs drivers usually shout "Yake," not "Mush." "Gee" means a right turn and "Haw" left. This team tearing along at about thirteen miles an hour at Sun Valley, Idaho, is driven by Miss Mary Joyce, young veteran of Alaska trails. Her seven-dog team is harnessed in the "gang hitch," with the dogs in pairs following a single leader and all attached to the "gang line." In the "fan hitch," often used in the Arctic, there is less danger of losing the whole team into a crevasse, since dogs are attached singly (page 799).



Mastiff (left) and Bull Mastiff Fear No Man or Animal

Old English Mastiffs fought in Roman gladiatorial rings. Bull Mastiffs (right) were developed in England to help gamekeepers break up poaching.

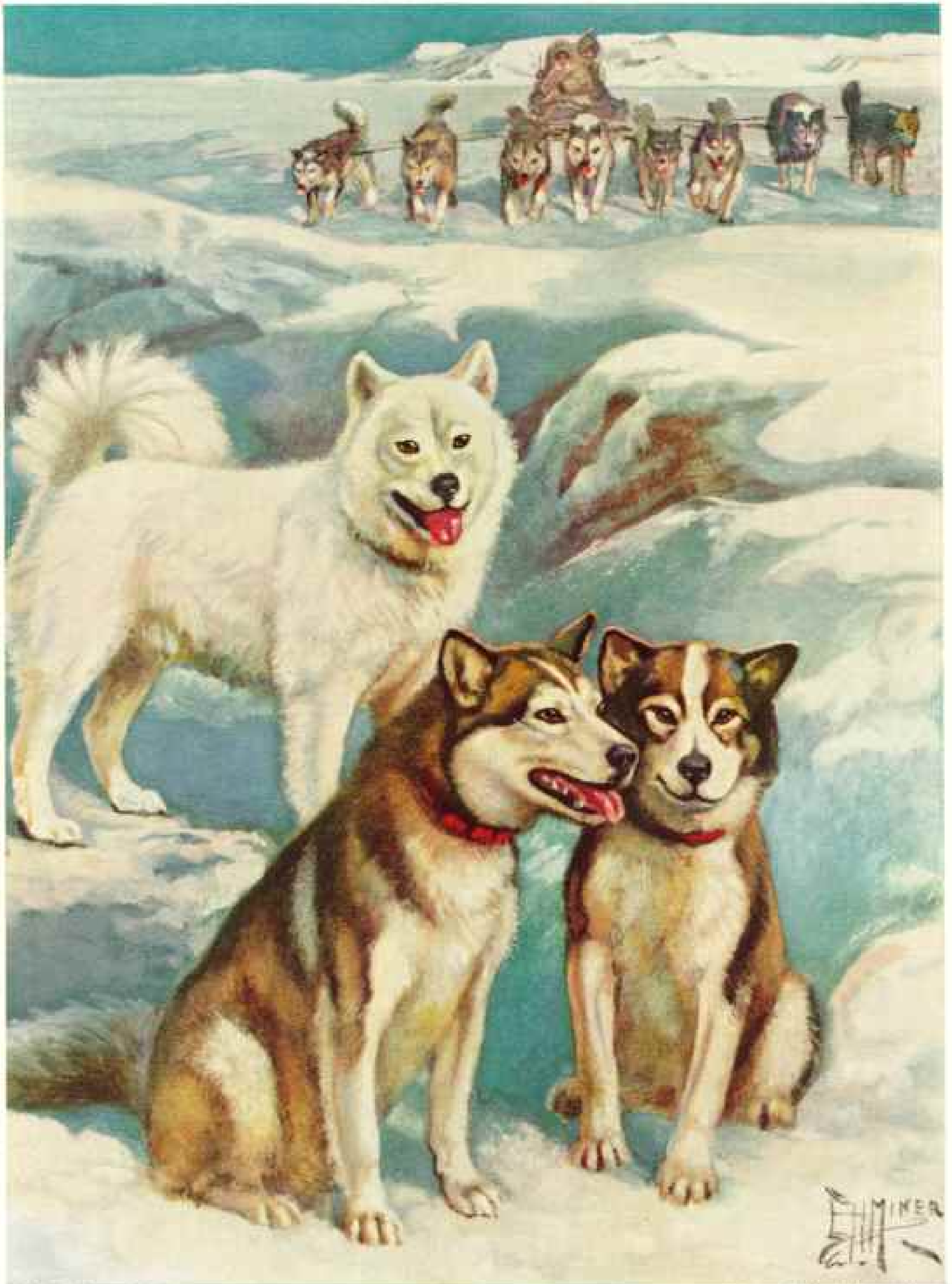


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Paintings by Edward Herbert Miller

Bulldog and Terrier Blood Give the Boxer Courage and Speed

This German breed is aptly named, for in a fight it handles itself with the agility of a boxer.



© National Geographic Society

Painting by Edward Herbert Miner

Four-legged Pioneers of the Poles—Eskimo (left) and Alaskan Malamutes

Centuries of evolution have marvelously fitted these dogs and their relatives (page 802) for life in the polar wastes. The plumed tail serves as muff or parka when the dog curls up to sleep in a snowbank. Fur is heavy, paws big and well padded. **Malamutes** get their name from Alaska's Malemiut Eskimos.



Wide World

Trying to Catch a Few Winks on "Judgment Day"

With his St. Bernard as a pillow, this three-year-old undertook to sleep away the hours before his pet's class came up for judgment at the Westminster Kennel Club show, Madison Square Garden, New York.

Mastiffs to Rome to fight wild animals in their amphitheatres. They are described by Caesar in his story of the invasion of Britain in 55 B. C. Certain it is that the Old English Mastiff as a "ban," or dog chained up during the day and loose at night, is among the oldest of the pure breeds of Europe.

From the true Mastiff and a bulldog of the bull-baiting, or pit-fighting type, the old bull-and-mastiff gamekeepers' dog was produced. This cross-bred was, and perhaps is still, used as a night dog on country estates in Britain where there is much game. These bull-and-mastiffs, of a cobbler build than the Bull Mastiffs of the present, were used not only as protectors of the keepers but as attackers of poachers. The cross-bred had much of the strength of the Mastiff combined with the pluck of the bull-fighting bulldog.

The colors of the Mastiff are apricot- or silver-fawn, or dark brindle. In any case, the muzzle, ears, and nose should be black. The male may measure 28 inches at the shoulder and weigh around 170 pounds.

The coloring of the Bull Mastiff may be any shade of fawn or brindle. Males should stand from 25 to 27 inches at the shoulder and weigh around 115 pounds. This breed has been described as 60 per cent Mastiff and 40 per cent bulldog.

Boxer

Here is a dog whose name proclaims his work or profession; in short, he is a fighting dog, but if kept away from the fighter's pit he may be trusted as a perfect gentleman (page 798).

Like all other dogs with a little bulldog blood in their veins, Boxers always are ready to take their own part; but the fact that this is one of the most popular dogs of the fashionable apartment districts of New York surely points to the contention that a Boxer may be kept anywhere and in the midst of the family circle. A dog's disposition may be tempered by its surroundings.

The Boxer is the German variety of the bulldog-and-terrier breeds which were produced for attacking bear, wild boar, and other dangerous animals after the beast was overtaken by hounds and brought to bay. The late Col. Theodore Roosevelt, as a mighty hunter, used to describe such dogs as "fighting" dogs rather than hunting dogs. The holding up of a hunted animal which might easily maim or kill a dog was the work of the German Boxer of olden times.

A Boxer is instantly recognizable: he's either fawn or brindle in color, has a distinct bulldoggy appearance about the head, cropped ears, and a short, docked stump of a tail. His body is beautifully formed and denotes strength, while his straight and well-built forelegs and his stalwart

hindquarters denote a powerful dog. He is quick on his feet, a hard-biting dog, brave in battle, but peaceful if kept away from such scenes.

The Boxer certainly is one of the best-built dogs that Germany has produced. He's a Gene Tunney sort of dog—a fighter and a gentleman.

The coat of the Boxer is short, glossy, smooth, and thickly set. His under jaw protrudes just a little. As a show dog, he must be fawn or brindle in color; a little white is allowed.

Dogs should stand from 22 to 24 inches from the withers to the ground; bitches 21 to 23 inches. The biggest dogs weigh over 66 pounds; bitches 62 pounds. A black mask is one of the chief characteristics of the Boxer breed.

Eskimo Dog

A true son of the Arctic, the Eskimo Dog is built, equipped, and clad to work in the coldest of temperatures. To dogs of this breed goes the distinction of having reached both Poles (p. 799).

The Eskimo Dog is estimated to have been in service as a draught or pack animal for 2,000 years. It is thought to have originated in eastern Siberia, but now is the more or less common dog of Alaska, northern Canada, Baffin Island, Labrador, and Greenland. Among the best-known are the Labrador and Greenland strains, from which has come many a redoubtable sledge dog to play its part in polar exploration.

All have bushy, curled tails, which are carried over or at one side of the hindquarters and are used to help the dog keep warm while sleeping in the snow. Each variety is equipped with a heavy double coat. The under hair is soft, woolly, and averages one to two inches in depth. The outer hair is long, harsh, closely set, and weather-resisting. Length varies from three to six inches.

The Eskimo Dog may be of any color—black, white, black and white, wolf-gray, blue-gray, and all shades of tan or buff. Gray seems most general.

The desired height for the male Eskimo Dog is from 22 to 25 inches at the shoulder; bitches, 20 to 23 inches. Weight for males is 65 to 85 pounds; females, 50 to 70 pounds.

Alaskan Malamute

The Alaskan Malamute is a big and strong dog with prick ears and double coat. He is broad-skulled, sensible in appearance, and of a rangy, powerful build that makes him an excellent draught dog (p. 799, also 772). Indeed, he is probably the strongest of the arctic dogs with the possible exception of the Labrador Eskimo breed.

Closely related to the Eskimo Dog, the Alaskan Malamute is very similar to it in many respects and is employed for like work—pulling sledges. The Malamute is named after the native Inuit tribe called Malemiut, which settled along Kotzebue Sound in northwestern Alaska.

In height male Malamutes are 22 to 25 inches at the shoulder; the bitches less. The dogs weigh from 65 to 85 pounds and the bitches 50 to 70. Usual colors are wolfish-gray or black-and-white.

Siberian Husky

The Siberian Husky is one of the smaller and swifter members of the great group of northern dogs. In appearance he is full-furred rather than shaggy (page 802, also 774).

He stands out as the racedog of the clan, and for that purpose a team of Siberian Huskies was imported into Alaska in 1909. These dogs, bred in Siberia, scored repeatedly in the All-Alaska Sweepstakes, a nonstop grind of 408 miles. The race, from Nome to Candle and return, was run each year for 10 years, and five times it was won by Siberian Huskies. The record of 74 hours, 17 minutes, was set by John Johnson with his team.

In the Border Cup Race at Nome—really a marathon, since the distance is 26 miles, 385 yards—the record is held by Leonard Seppala with his team of Siberian Huskies, the time being one hour, 50 minutes, and 25 seconds. Thus the Siberians have proved to be both fast and enduring.

The first American show champion of this breed was whelped in Fairbanks, Alaska.

Dogs measure 21 to 23½ inches at the shoulder; bitches, 20 to 22 inches. Weight for dogs, from 50 to 60 pounds; bitches from 40 to 50 pounds.

Samoyede

Of all the arctic varieties of sled dogs, the Samoyede has the most striking coat. Indeed, it would be difficult to imagine a more beautiful creature than an all-white, full-coated, gay-plumed dog of this kind (page 802). He is a reindeer herd dog, a dog for the sled and for other requirements of nomads and explorers. His origin was among the Samoyede people who now live in the vast tundra reaching from the White Sea to the Yenisei River.

Samoyedes as sled dogs have been much used by Russian surveyors, and served Nansen, Norwegian explorer, on his "Farthest North" adventure.

As a bench show dog the Samoyede is one of the most admired at European and American kennel club gatherings. The male stands from 20 to 22 inches at the shoulder and weighs 45 to 55 pounds; bitches, 18 to 20 inches, 36 to 45 pounds.

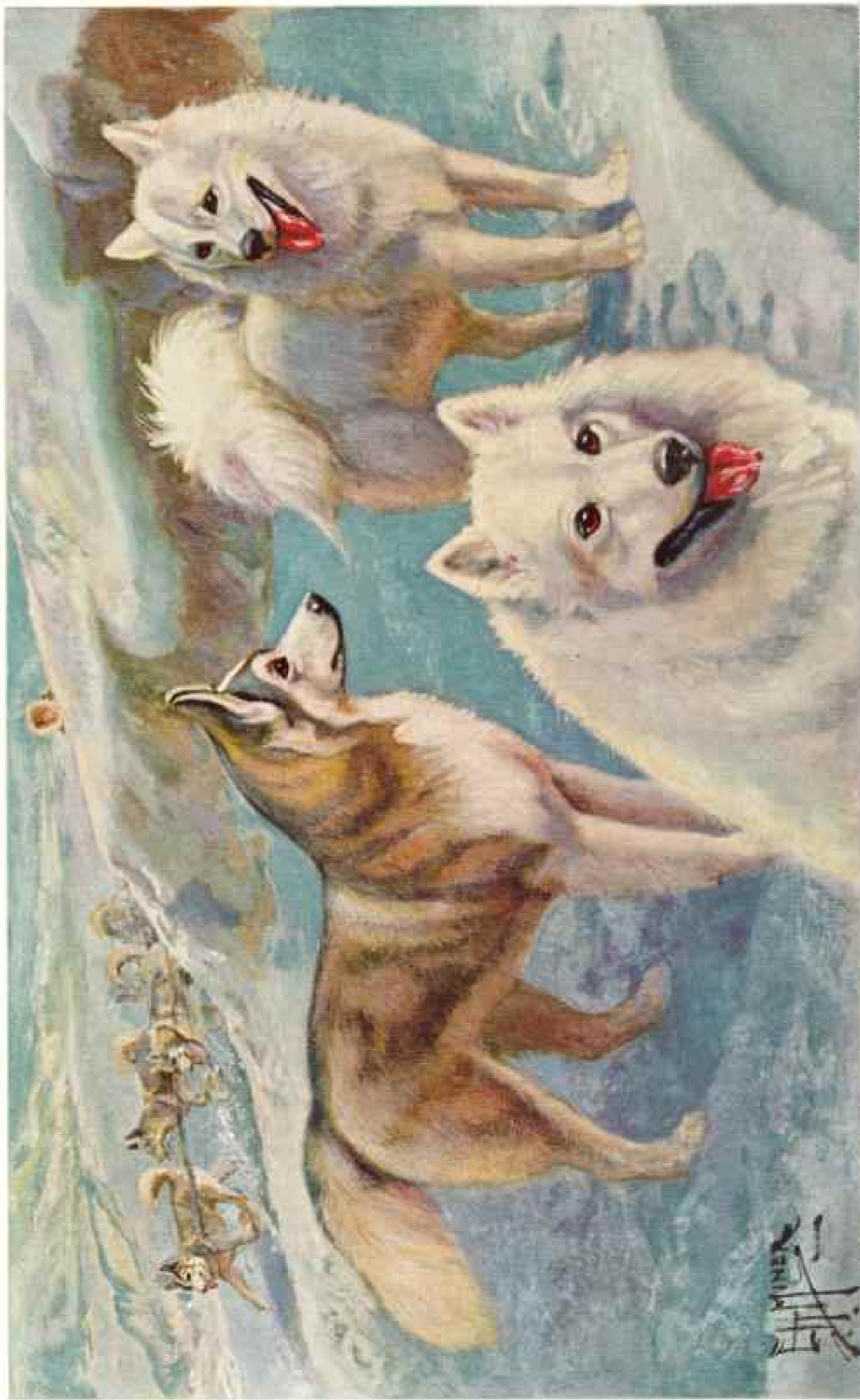
The colors: pure white, white and biscuit, cream. Black or black spots disqualify a dog or bitch for bench show purposes. The profuse coat should stand straight away from the body.

St. Bernard

The splendor of the St. Bernard's appearance, the benevolence of his expression, and his great height and weight give unique distinction to this heaviest of dogs (page 803).

The St. Bernard takes its name from the Hospice in the Swiss Alps which was founded by St. Bernard de Menthon nearly a thousand years ago. There the dogs were trained to search for travelers who might be lost in the snows.

St. Bernards at the height of their popularity, about 40 years ago, were sold at very high prices to Americans. Sir Bedivere was reported sold for 1,300 pounds sterling, \$6,500 in the exchange of that time. The actor Fritz Emmett was said to have given 800 pounds (\$4,000) for the hand-



Painting by Edward Herbert Misset

Fast-stepping Siberian Huskies (left) and Samoyedes, Which Match Their Native Snows

Both breeds hail from the northlands of eastern Asia. Although only of medium size, the **Siberian Husky** is one of the fastest of sledge dogs. Thus he has become the racer of the family, and the classic All-Alaska Sweepstakes of 408 miles has been won several times by these fleet and enduring dogs. The **Samoyede**, of long lineage and handsome white or creamy coat, has been much used by Russian explorers and serves as a herder of sledge reindeer on the Siberian tundra.

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St. Bernards, amid Alpine Snows, Now Help to Save Half-frozen War Refugees

Painting by Edward DeBenedictis, Mount

For centuries the gentle giants aided the monks of the Hospice of Great St. Bernard Pass in rescuing travelers overcome by cold on Switzerland's icy heights. Until the present war broke out, their work in recent years had been confined to saving an occasional lost skier. Now refugees from France and Italy once more are taking to the mountain trails afoot, so the dogs must go out on their errands of mercy again. In winter some carry small barrels filled with stimulants (right).



© E. Archer and Co.

A St. Bernard Looks Down on the Scene of Doggish Deeds of Valor

Far below monk, boy, and dog lie the buildings of the Hospice of St. Bernard and the historic pass that leads from Switzerland to Italy. Here St. Bernards for centuries have helped rescue winter wayfarers (page 803). In May, 1937, some of these dogs, normally gentle, disgraced themselves by fatally attacking a 10-year-old girl. An investigator sent to Switzerland by the St. Bernard Club of America reported that the victim skied suddenly into a pack of the dogs, which reacted instinctively and tragically. Some were sent to Tibet.



From Alfred Furness

Hungary's Big White Komondor Seems as Heavily Coated as the Sheep It Guards

This is Pusata, a female Komondor brought to the United States by Alfred Furness, of Bronxville, New York. She was born on a farm near Debrecen, Hungary. Her name, meaning "arid plains" or "steppes," is appropriate, for her ancestors came from Asia with the Magyars. Full-grown male Komondors, or Komondorok (Hungarian plural), are big dogs, from 25½ to 30 inches or more at the shoulder. In this article are pictured all of the working dogs listed by the American Kennel Club, including such exotic and comparatively rare breeds as the Komondor, Pull (page 784), and Bernese Mountain Dog (page 792).

some dark-orange and white Plinlimmon, the English champion of the late '80's and early '90's. Plinlimmon proved a great attraction in "Hans the Boatman," a play written around an old, yarn-spinning Dutch sailorman and his magnificent dog. Plinlimmon as a stage dog made the St. Bernard famous in the United States, just as the screen's Strongheart later popularized the German Shepherd in this country.

There are two varieties—the rough-coated and the smooth- or flat-haired. The monks, I have read, preferred the smooth-coated variety; but the public of all countries has been more responsive to the rough-coated, which generally is more attractive in its colorings. These are of rich orange-tawny shade, the ground color being relieved by distinct white markings on the muzzle, blaze up the face, chest, legs, feet, and tip of tail. The black shadings on the mask and ears are greatly admired.

Many admire the larger St. Bernard males which measure at least 30 inches at the shoulder, and bitches 27 inches. The weight of such a dog may be 170 to 180 pounds; of a bitch, 150 to 170 pounds. Today, however, smaller St. Bernards are frequently observed among the prize takers in the United States. Colors are red, orange, various shades of brindle (the richer the better), or white with body patches of either of those hues.

Great Pyrenees

These usually nearly all-white dogs take their name from the mountain range in southwestern Europe where they have long been used as drivers or tenders of sheep, as watch and guard dogs, and as bearers of packs and pullers of carts (p. 806).

The Great Dog of the Mountains, as he is sometimes called, is attractive and huge. The males measure 27 to 32 inches at the shoulder and the females 25 to 29 inches. Weights are from 100 to 125 pounds for males; females, 90 to 115 pounds. Acceptable color markings are patches of badger-gray, or varying shades of tan on the white ground color.

Here is another breed in which the double dewclaws on the hind legs are looked upon as highly characteristic by fanciers (page 796). These are regarded as a guarantee of true descent from early Pyrenees dogs which possessed them.

Although the Great Pyrenees was not classified among the working dogs by the American Kennel Club until 1933, it is on record that the first pair was brought over by General Lafayette in 1824. They were for a friend, to whom he recommended them as protectors of sheep from wolves and sheep-killing dogs.

The Great Pyrenees is fast becoming popular in this country as a gentle, well-mannered watchdog and companion for women and children.



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Painting by Edward Herbert Miller

Great Pyrenees Dogs, Huge and Courageous, Long Guarded Flocks from Wolves

Though gentle toward man, this big dog early won a name as a fearless fighter. In gladiatorial days some were fitted with spiked collars and pitted against wolf or bear. Today the **Great Pyrenees** serves in its home mountains as a shepherd, guard, or hauler of carts. The breed attracts growing interest in the United States.

Cannon on Florida Reefs Solve Mystery of Sunken Ship

By CHARLES M. BROOKFIELD

TODAY in the fine white city of Miami, with its luxurious hotels and towering skyscrapers, the days of stern-castled Spanish galleons, and of the square-sailed British warships that preyed upon them, seem far distant in the romantic past.

The unending stream of modern steamships slips safely past the lurking dangers of the Florida Reefs, warned clear by the powerful lighthouses with their red sectors and radio beacons.

From the decks of the southbound cruise ship the traveler enjoys the shimmering sapphire of these tropic seas, once the haunt of pirates and privateers. He sees only the splendor of sea and sky and the soft white breakers close at hand to starboard, in vivid contrast to the Gulf Stream's ultramarine. Beyond, the green and white shoals blend into the deep green of the distant Florida Keys.

Florida Reefs—Graveyard of Ships

To the voyager of the 1600's these reefs were the Cabezas de los Mártires—the "Heads of the Martyrs." He prayed for a safe passage and offered thanksgiving when past, for a storm meant certain shipwreck. If by some miracle he escaped drowning and reached the distant Keys alive, a fate far worse awaited him there at the hands of torture-loving savages!

Only the vast treasure of the New World induced the Spaniards, in their cumbersome galleons, to attempt the navigation of these dangerous reefs. Only the rich reward of the treasure ships' capture tempted the English to follow them. Small wonder then that the Florida Reefs are a graveyard of ships of that romantic day—British and Spanish, ships of the line and galleons, sea hawks and their prey.

Ledbury Lodge, my home on Elliott Key twenty miles south of Miami, looks out across the reef where I knew must lie the coral-covered wrecks of centuries gone.

For years I had dreamed of one day drifting over the fabled "coral ship" and looking down through the waterglass to see one of those ancient vessels whose shape had been preserved by a crust of coral, as pictured by Kirk Munroe in books of my boyhood. But when at last I saw amid the sea gardens on the rugged bottom of the outer reef the remains of such a ship, it was quite different from what I had imagined, although no less thrilling.

In December, 1938, two negroes poled a dilapidated fish boat alongside my dock. They were in distress, they said, and for good reason: no food, no gasoline, and very little ice left to keep their catch of fish. I agreed to take their fish to town in my boat the next day and bring back gasoline. Kemp, a negro in the joint employ of my neighbor, Wade Stiles, and myself, gave them some food. The distressed pair gave their names as Sam Lynch and Jacob Munroe of Miami.

Early next morning I was awakened by Kemp's voice, calling for me to come downstairs. He said he had learned something of great importance. Hurriedly dressing, I went to the back door, but Kemp would not speak within hearing of even the house walls. He indicated Sam Lynch, waiting out under the trees.

With great show of secrecy, Sam then repeated what he had told Kemp the previous evening: that he had seen a large number of cannon at a certain spot on the outer reef and would show them to me if I would see that he and Jacob were suitably recompensed.

Planning a Treasure Hunt in Davy Jones's Locker

At the moment I think I would have agreed to any terms, just to have a look at what might prove to be a Spanish galleon laden with the wealth of Mexico or Peru. But then came the thought of the expensive equipment required to raise heavy weights from the sea bottom thirty feet below the surface. I mentioned this difficulty to Kemp and Sam. Kemp suggested we include Stiles in the undertaking, to which I assented.

So the following day a party of six left Elliott Key aboard the *Manatee*, a sturdy little cabin cruiser, bound for the site of the old wreck. Besides the negroes, Stiles, and myself, the party included a young diver, Walter Williamson, hired for the job of determining whether the cannon were iron or brass. Brass or bronze guns, we believed, would indicate the wreck was Spanish; if of iron, she was more likely to be British.

The weather was none too calm for the diving operations, but our enthusiasm overcame our scruples. We passed through Caesar Creek, legendary haunt of pirates, past Caesar's Rock on whose jutting ledge the old barrel mailbox of the early Elliott Key settlers once



Charles H. Baker, Jr.

Up from Davy Jones's Locker Climbs the Diver

Excitedly he explained that the wreck must be British, because the guns are iron. Brass cannon would have indicated a Spanish ship. He brings with him a piece of coral crust, chipped from one of the guns. Examination showed unmistakable signs of iron rust on the under side (page 810).

stood, and then out between long protecting bars to the narrow channel entrance, where the *Hubbard* was wrecked nearly two centuries before.

To the north stretched the green shoreline of Elliott Key. A group of tall coconut palms marked the place where John Sanders found buried treasure while he was building a home on the Key about 40 years ago. Here, too, the snow * *Ledbury* was burned after strand-

ing in the hurricane of 1769 (page 815).

Coral Heads Threaten the *Manatee*

Then Sam directed us southeast across the reef. He kept a sharp lookout for coral heads, safely skirting some which were awash at low tide.

About twelve miles from Elliott Key we passed inside Carysfort Reef and Lighthouse, named for the British frigate aground there in 1770. For a mile or more we ran just inside the outer reefs, on which the surf was breaking heavily, until Sam and Jacob indicated a little passage between the shoal rocks. This led to the open sea, where we felt the full surge of the swells. Following the line of the reef, the two fishermen studied the bottom, distinctly visible in the crystal-clear water (page 820).

After a half hour of cruising back and forth, the guides motioning directions from the bow, we reached the last of this little chain of very shoal reefs. Sam and Jacob held a hasty conference, then waved toward the protected water. There we anchored, while the two negroes tried to

agree upon where the cannon lay.

The faces of Stiles and Williamson reflected my own thoughts—our guides probably had seen only a rock resembling a cannon, and had magnified it in the telling to a great number. Even behind the outer reefs the little boat rolled and tossed, and a rain squall bearing down suddenly helped to dampen our spirits.

* A type of vessel common in the 18th century.

But soon the sun came out, a good omen. Jacob agreed to let Sam do the guiding, so we circled back outside with Sam in the bows intently watching the bottom.

Suddenly came the cry: "Dere dey is!"

Sure enough, even without a waterglass the long shapes of cannon could be distinguished on the bottom, at either side of us.

The anchor went overboard in a hurry, holding the boat directly over a group of the longest guns. Through the waterglass it was a thrilling sight! Cannon, cannon, everywhere about.

A single gun lay across a rock, and from its upward-pointing muzzle a purple sea fan waved gently to the tide. Just beyond, three cannon stretched crisscross, all covered with marine growth.

Reconstructing a Sea Tragedy

A large piece of iron with a ring in the end protruded from a sandy patch, surrounded by mysterious shapes grown over by coral. Of the vessel's hull nothing remained, but from the number of cannon there could be no doubt that we were gazing down upon the last resting place of a great ship.

From the position of the guns, the sea tragedy could be reconstructed with reasonable accuracy. Cannon spread over the rugged bottom for about two hundred feet, in a rough line almost north and south. Just beyond the north end, a wicked-looking reef, smothered in white foam as the sea broke over it, marked the point where the vessel's bow had struck.

She must have filled and slipped back off the



Charles H. Baker, Jr.

Waterglasses Reveal the Wreck of a Mystery Ship!

The author looks on as Sam Fales, diver, and Commodore Hugh Matheson (with hat) peer through the glass-bottomed tubs at a thrilling undersea sight. Over a stretch of nearly two acres, coral-encrusted old cannon are strewn, some piled atop each other, some lying alone.

reef into deeper water. As she careened, she threw the heavy cannon through their ports on the lower side. The upper tiers of guns came battering and smashing down through the vessel's sides into the sea, where some fell across those already cast from the lower side.

The heavy swell made diving difficult, but Williamson decided to attempt it. His aims were to determine whether the cannon were iron or brass, and to estimate their size



Charles H. Baker, Jr.

Reclaimed from the Sea—Coral-covered Cannon Balls

They were found embedded in crust which was chipped from one of the guns salvaged off Key Largo.

and weight. Accordingly, the anchor line was slacked off and the boat dropped back, while a stern anchor was put out to prevent excessive yawing. Then, hauling up on the bow line, we were again in position over the cannon.

Taking advantage of a momentary absence of large swells, we lowered the diver over the side. One man placed the hood over Williamson's head, another pumped air, and the diver slid down a tight line to the bottom, right beside one of the guns.

The strong tide carried him about unsteadily for a few moments. Then, catching a firm hold astride the cannon, he chipped off a few fragments of coral growth, exposing the actual surface of the metal.

Brought to the surface and examined, the under side of the coral fragments showed unmistakable signs of rust, and proved the cannon to be iron.

Again studying the bottom through the waterglass, I seemed to see a design, or raised crest, beneath a thin layer of coral on one of the guns, but the uneven growth made it uncertain.

Tossing about in the sea on the edge of a reef is no pleasant situation, so the ground tackle was got up, the boat headed for the quieter water inside the reef, and then back to Elliott Key and Miami.

Salvage Operations Begin

After a futile search for suitable salvage equipment and diving gear, we consulted Charles H. Baker, Jr. of Coconut Grove, who suggested Hugh M. Matheson, Commodore of Biscayne Bay Yacht Club, as a man having the necessary outfit and public spirit. We made a second trip to the wreck

for the benefit of Baker and Matheson. Plans were laid to commence salvage operations immediately, with Samuel Fales as diver. The articles of agreement between the members of the salvage party contained this paragraph:

"It is also understood that the contemplated raising of these cannons is not primarily for monetary gain but for the love of adventure and the preservation of historical pieces."

Within the week, equipment was at the location and one cannon brought to the surface. Such was its weight that the derrick operator dared not raise it out of the water until his barge had been towed into quieter water. In the lee of a wrecked ocean-going barge, the *Charles W. Baird*, aground on the White Bank off Basin Hills, Key Largo, the

gun was finally hoisted onto the storage boat.

The cannon seemed more massive in its thick coat of coral than its actual length of nine feet would indicate. We estimated its weight at 3,800 pounds.

Identification Clues Come to Light

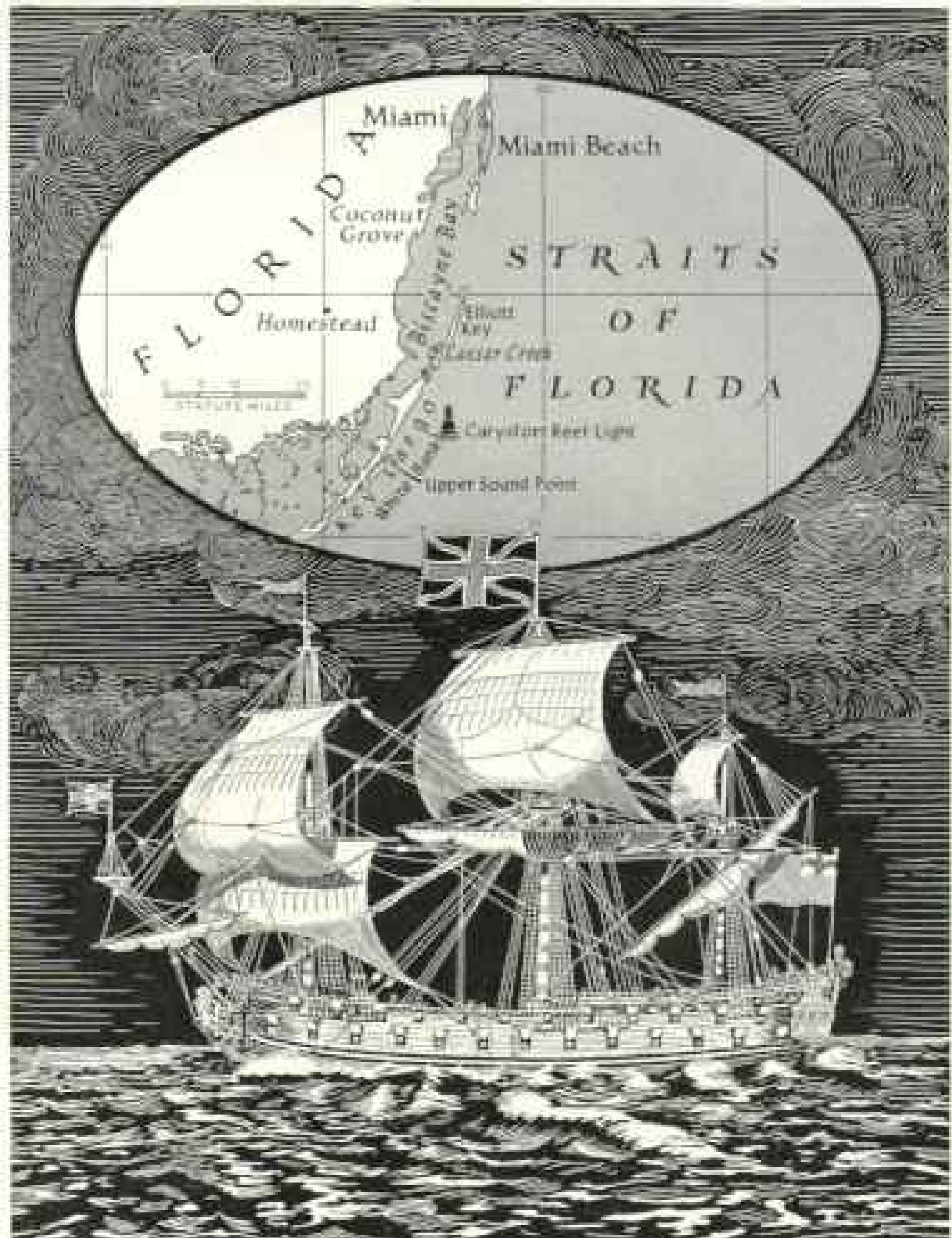
Someone started chipping coral at once, and soon exposed a crown, cast in relief, on the back of the cannon between the trunnions. Opinion was divided on the crown's nationality. Was it English, French, or Spanish? The letters T. W. and H. appeared on the cannon, together with certain numbers whose meaning has not yet been explained, and on the back was a broad arrow, evidently an official mark (pages 819, 823).

In the course of chipping the coral, fragments of wood, glass, and iron were found, together with bits of hemp rope, still retaining a smell of tar, and quantities of uncut flints (page 814).

At last came a most important find, a copper coin. It was so corroded that several alternate scrubblings with cleanser and lime juice were needed to bring out the heads of two monarchs and the inscription "Gulielmus et Maria." On the obverse were the seated figure of Britannia and the date 1694 (p. 819).

Here was definite information. The wreck could not have occurred before 1694. The condition of the coin, only slightly worn, gave the impression that it had not been carried long in men's pockets. Since it was British, it was another indication that the wreck might once have been an English ship of war.

Several weeks passed before the weather permitted further salvage. Then, in a suc-



Drawn by Harry A. Gardner, Jr.

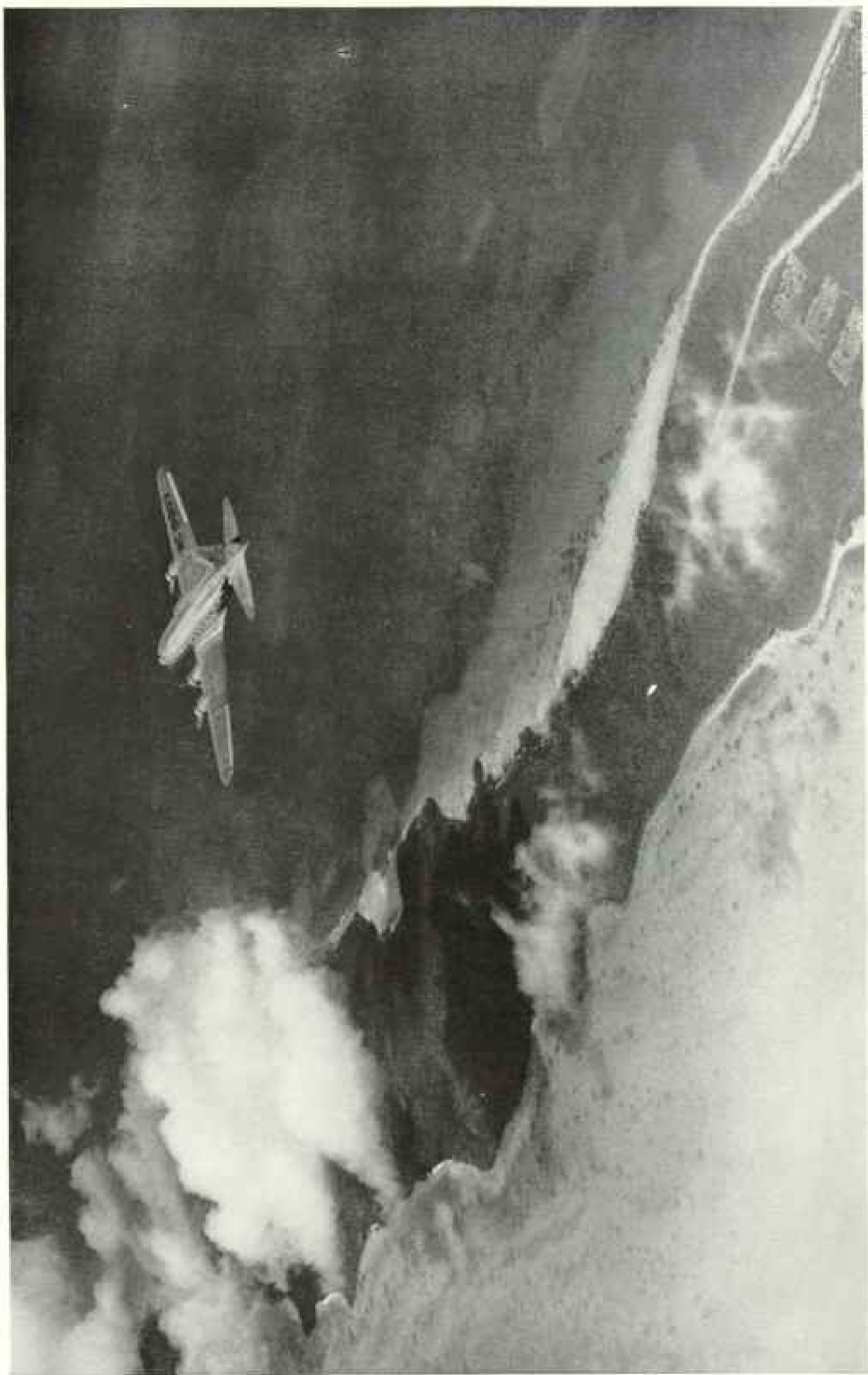
Sunken Guns Reveal a Sea Tragedy off the Florida Keys

Fishermen guided the author to a point a mile and a half south of Carysfort Reef Light. There he saw the astonishing spectacle of coral-covered guns on the ocean floor, five fathoms below. Was the wreckage that of a British man-o'-war or a treasure-laden Spanish galleon? On subsequent expeditions the guns were raised and the wreck identified as H. M. S. *Winchester*, British ship of the line, represented by the above drawing of a 17th-century "4th Rate" under sail.

cession of good days, we raised 28 cannon. We could see at least 20 more. Some had so taken on the appearance of the rugged coral rock that it was difficult to make them out.

We Find a British Crest

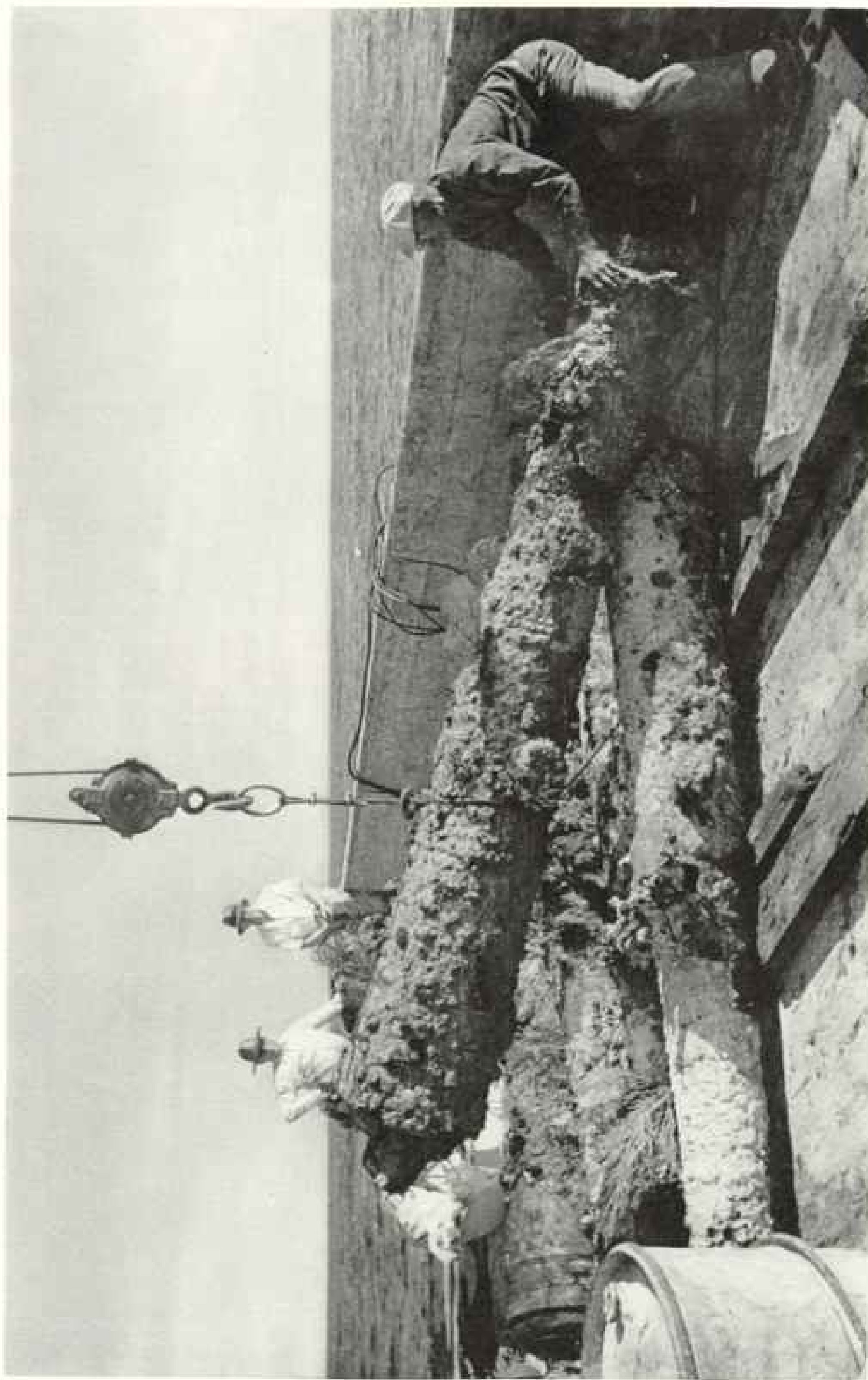
The large number of cannon was another clue to the ship's identity. I learned that war vessels of about 1690 were rated according to the number of guns they carried. First rates had about 100 guns; second rates 90, and so on, down to fourth rates of 50 to 60 guns. These were known as "ships of the line," because they were given a position in the line



Pan American Photo Service, Inc.

Above the Clouds, a Pan American Airways Strato-Clipper Wings over Elliott Key.

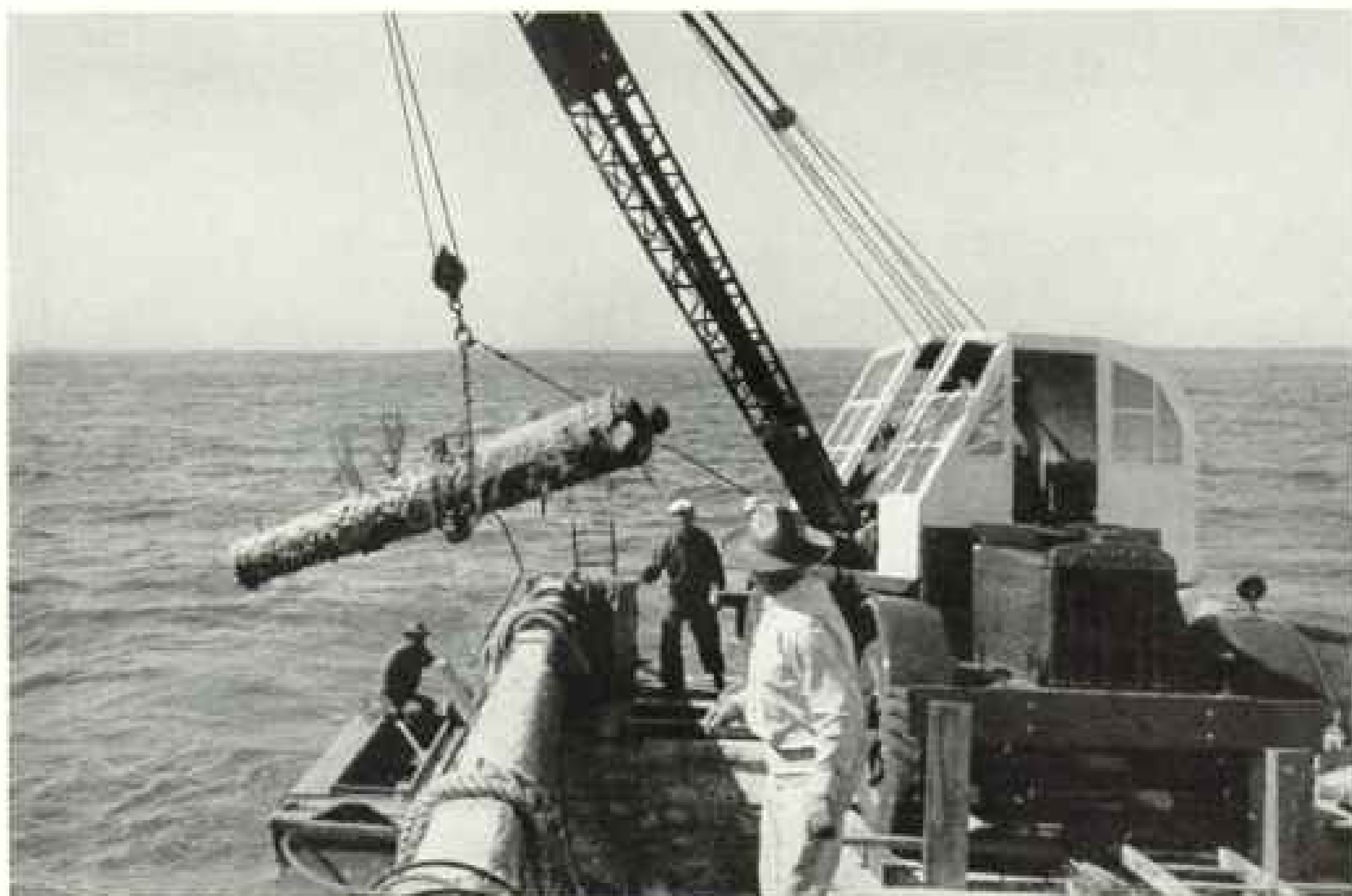
On this narrow strip, overlooking the reefs, is the author's home (page 815). Clearings in foreground, at right, are young lime and papaya groves. The rest of the key is covered with a dense tropical growth. On the beach to the left of the clearings, old-time wreckers celebrated when a richly laden vessel stranded on the reefs. The streak at right is a new road. Coral reefs extend (right) several miles out to the Gulf Stream; to the left is shallow Biscayne Bay.



Charles H. Baber, Jr.

Four More Cannon Hit the Deck of the Storage Barge

H. M. S. *Winchester's* full complement of guns was 60, and she was known as a "fourth rate." In the British Navy of the 17th century, a "first rate" was a warship carrying 100 or more guns. Second rates were armed with about 90 guns; third rates, between 60 and 80. All were "ships of the line." Vessels of fewer than 50 guns generally were not placed in the battle line (page 811).



Charles H. Baker, Jr.

Out of the Depths Swings a Dripping, Coral-encrusted Prize

Waving sea fans and sea plumes sprout from the cannon. They show how the gun lay on the bottom, for they always grow upward toward the light. Special U-bolts held Commodore Hugh Matheson's portable derrick to the barge deck. Without this precaution the derrick might have tipped overboard with its heavy load as the barge rolled to the sea. Some guns, with their sea-growth covering, weighed nearly two tons.



Charles H. Baker, Jr.

Even before the Hoisting Cable Is Released, a Gun Is Searched for Curios

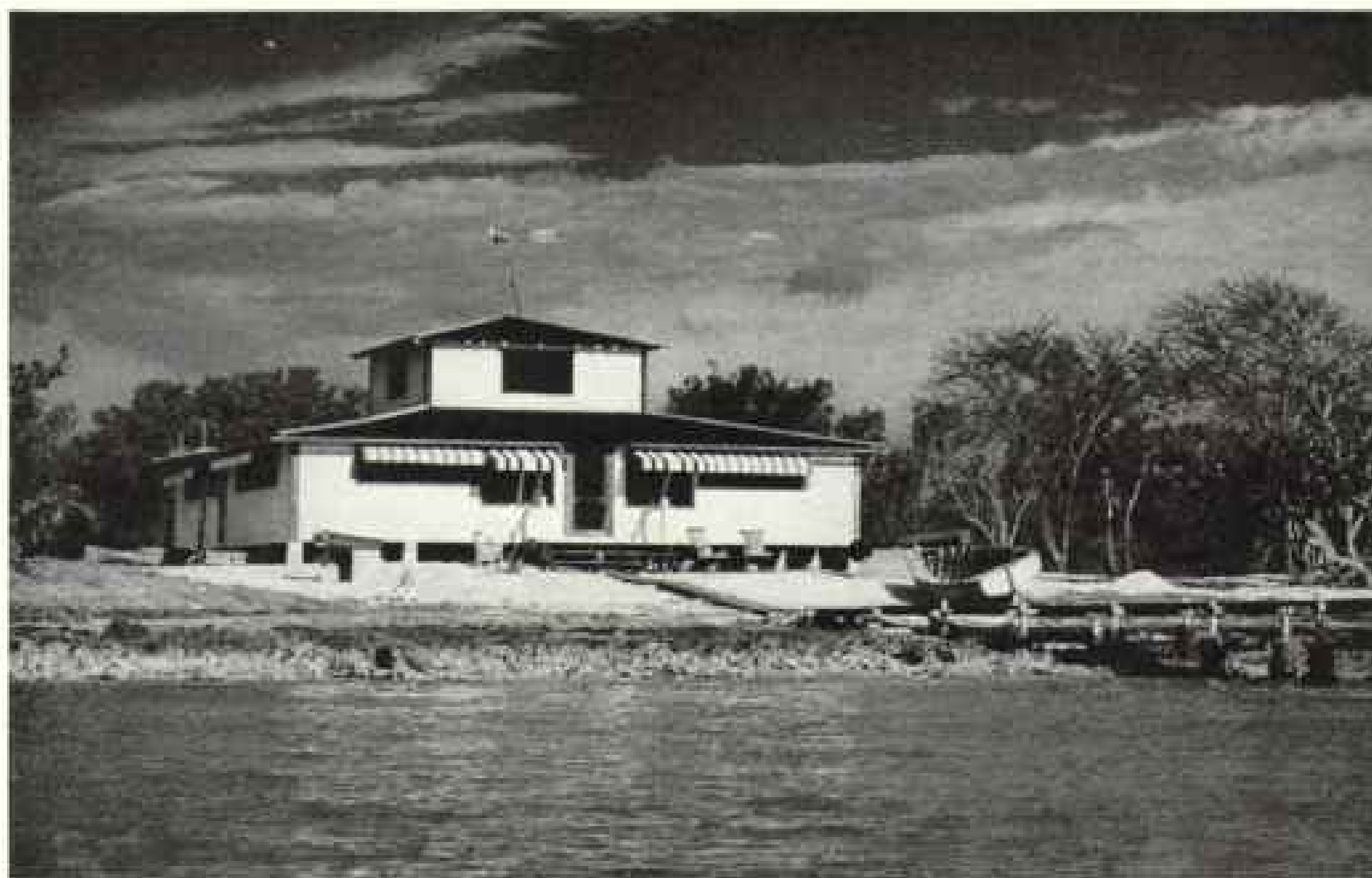
Diver Sam Fales, just up from below, leads the hunt for pieces of colored glass, musket balls, bits of rope, coins, or other objects embedded in the thick covering (page 811).



Charles H. Baker, Jr.

Haven for Fishermen Was the Wrecked *Charles W. Baird*

On the shallow White Bank, off Key Largo, the old hulk was sunk by fishermen and used as their sea headquarters. They cut a hole in her side (right) to admit their small craft and built steps from the water to the deck. Protected by encircling reefs, she weathered many a storm in this position. Later the barge was burned to the water's edge—probably by a careless fisherman (page 823).



Dan American Photo Service, Inc.

Ledbury Lodge, Author's Home on Elliott Key, Served as Base for Salvaging the Guns Named for a British vessel wrecked here in 1769, the Lodge faces the sea across coral reefs. Two mounted *Winchester* guns flank the house. *Flotsam*, the boat on shore, drifted in one day covered with barnacles.



E. Newton Hamilton

A British Cannon Finds a Home at the Biscayne Bay Yacht Club, Coconut Grove, Florida

On the salvaged gun the author points out the crest which, with other evidence, enabled Mr. Fales, through the British Admiralty, to identify the wreck as that of *H. M. S. Winchester*. She was "a 4th Rate of 60 guns and 935 tons" and was lost on September 24, 1695. (opposite page).

of battle. Our wreck then was a ship of the line.

One cannon seemed to be in better condition than most. The coral, when struck with a sledge hammer, fell away from it in big chunks, still retaining the shape and impression of the iron casting. A large curved section, cracked off in one piece, revealed a complete crest composed of Maltese Cross, Orb, Crown, and Tudor Rose (page 819).

There could be no further doubt that the vessel was British. Sam Fales was selected to write to the British Admiralty, requesting information. He enclosed in his letter pictures of the guns and coins.

Meanwhile salvage work continued. The mysterious iron ring was in the end of the shank of an anchor, off which both flukes had been broken. Another ring was attached to a large wrought-iron fitting, which rang like a gong when struck by the ring.

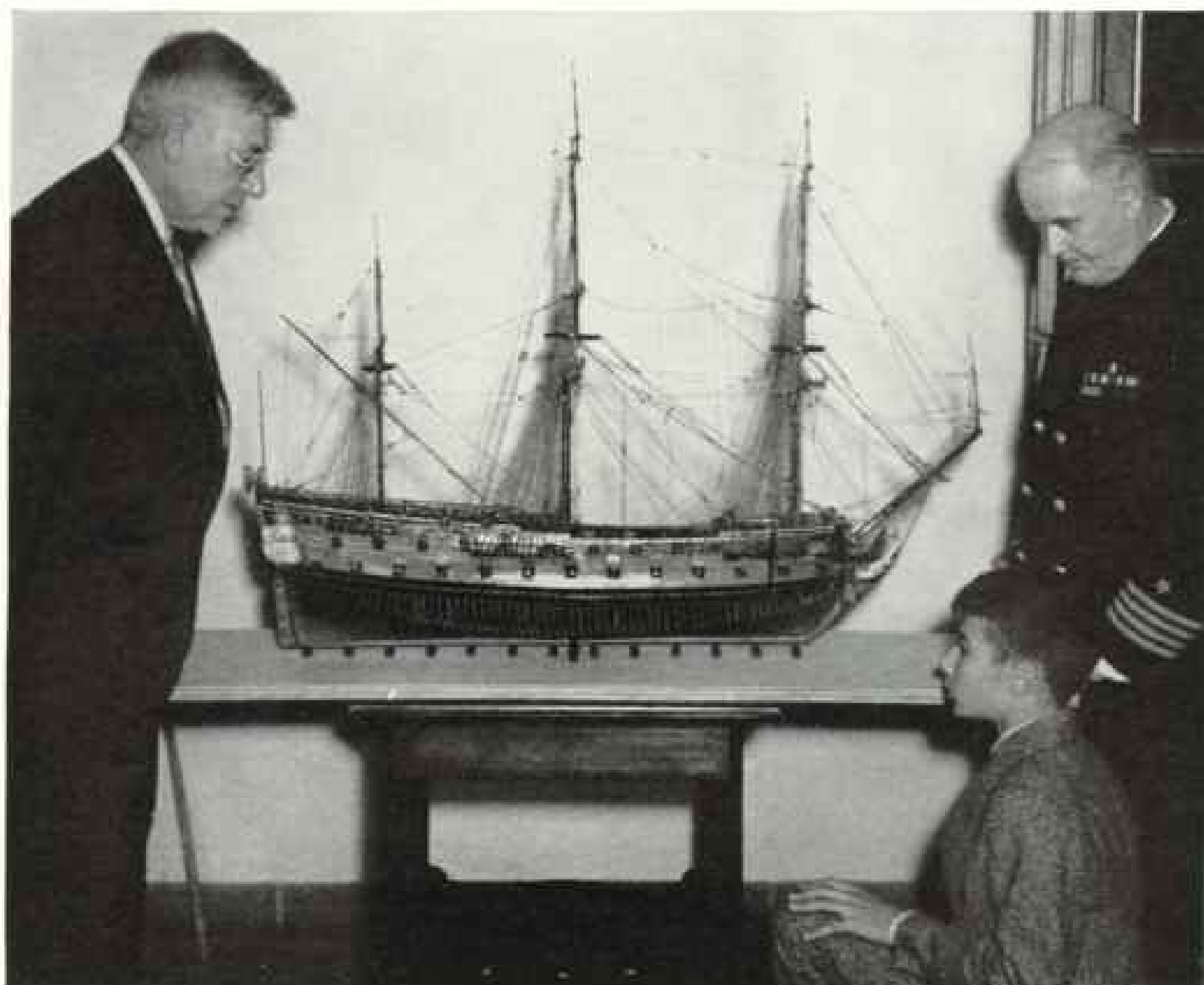
More coins were found embedded in the

coral with a few shreds of canvaslike cloth, a seaman's breeches or perhaps a moneybag. The oldest coin was a Scotch bawbee, or half-penny piece, engraved with the head of Charles II and the date 1672. One coin was French. They were mostly copper or bronze. A silver coin was so badly corroded as to be reduced to the thickness of a common tin can.

Numerous cannon balls were brought up, several in a lump, grown together in the coral. Some ancient bar shot, resembling large iron spools, were chipped out of the rock. Out of one coral chunk came the bowl and part of the stem of a clay pipe of the churchwarden variety, generally associated with Sir Walter Raleigh.

The Wreck of *H. M. S. Winchester*

It was nearly four months after we first sighted the cannon on the bottom when Sam Fales received a reply to his letter to the British Admiralty. The information it contained,



McVittie Doll Company

Was the *Winchester* Built from This Original Admiralty Model?

Now treasured in the U. S. Naval Academy Museum at Annapolis, Maryland, is this splendid miniature of a late-17th-century ship of the line, a Fourth Rate of 60 guns. Captain Harry A. Baldrige (right), director, and Mr. Fred Avery (left), model maker of the Museum, state that the little ship is of the same type as the *Winchester*. Underwater planking was omitted in the model so that the details of her construction could be easily inspected. Note the gaily carved and gilded bow and stern,

while not complete, bears witness to the remarkable system of records maintained through the centuries. The reply read:

Admiralty, Whitehall, 18th April, 1699.

Dear Sir,

Lord Stanhope has asked me to acknowledge your letter of the 11th February with thanks, and to say that after consultation with the Admiralty Librarian it seems possible that the wreck you mention is that of H. M. S. *Winchester*, a 4th Rate of 60 guns and 935 tons, commanded by Captain John Soule, which was lost off Cape Florida on the 24th September, 1695, returning to England from Jamaica.

As regards the founder's mark T. W. on the guns, it seems probable that these are the initials of Thomas Westerne who was carrying on a gun foundry at Ashburnham in Sussex in the years 1669-88.

Yours truly,

(Signed) E. A. Serl.

Samuel Fales Esq.

Cape Florida in that day meant any part of the lower east coast. Some early charts

give that name to the promontory known today as Upper Sound Point, off Key Largo, which fits our location perfectly.

Later we showed the photographs and our letter to Captain Harry A. Baldrige, director of the U. S. Naval Academy Museum at Annapolis. He became much interested, for in the Museum's collection of Admiralty models bequeathed by Colonel Henry Huddleston Rogers, of New York, is a handsome miniature of just such a ship (above).

Before the days of master drawings, ships were built from scale models in which every rib, gun, and block of the future vessel was reproduced exactly. Perhaps from this very model the shipbuilders of Bursledon fashioned our wrecked *Winchester* in 1695.

In treasured volumes in the Museum, Captain Baldrige also found references to the wreck of the *Winchester*. She was returning



© E. Newton Hamilton

Relics from the Wreck of H.M.S. *Winchester*

At top is a bar shot destructive against masts and rigging. Row below, left to right: cannon ball, lead bar, and plugged hand grenade. Next below: sheet lead roll, small cannon ball, brass candleholder, and bit of hemp cable. Bottom: two musket balls embedded in coral.



Photo American Photo Service, Inc.

From a Lump of Coral Came This Choice Find—a Silver Porringer

Clustered with it beneath the same protective covering were other relics of the wrecked H. M. S. *Winchester*—two brass candleholders, a broken green glass bottle, and four hand grenades. For centuries there has been a *Winchester* in the British navy. Today's ship of that name is an escort destroyer.



K. Newton Hamilton

Lime Juice Brings out Details on a Salvaged British Coin

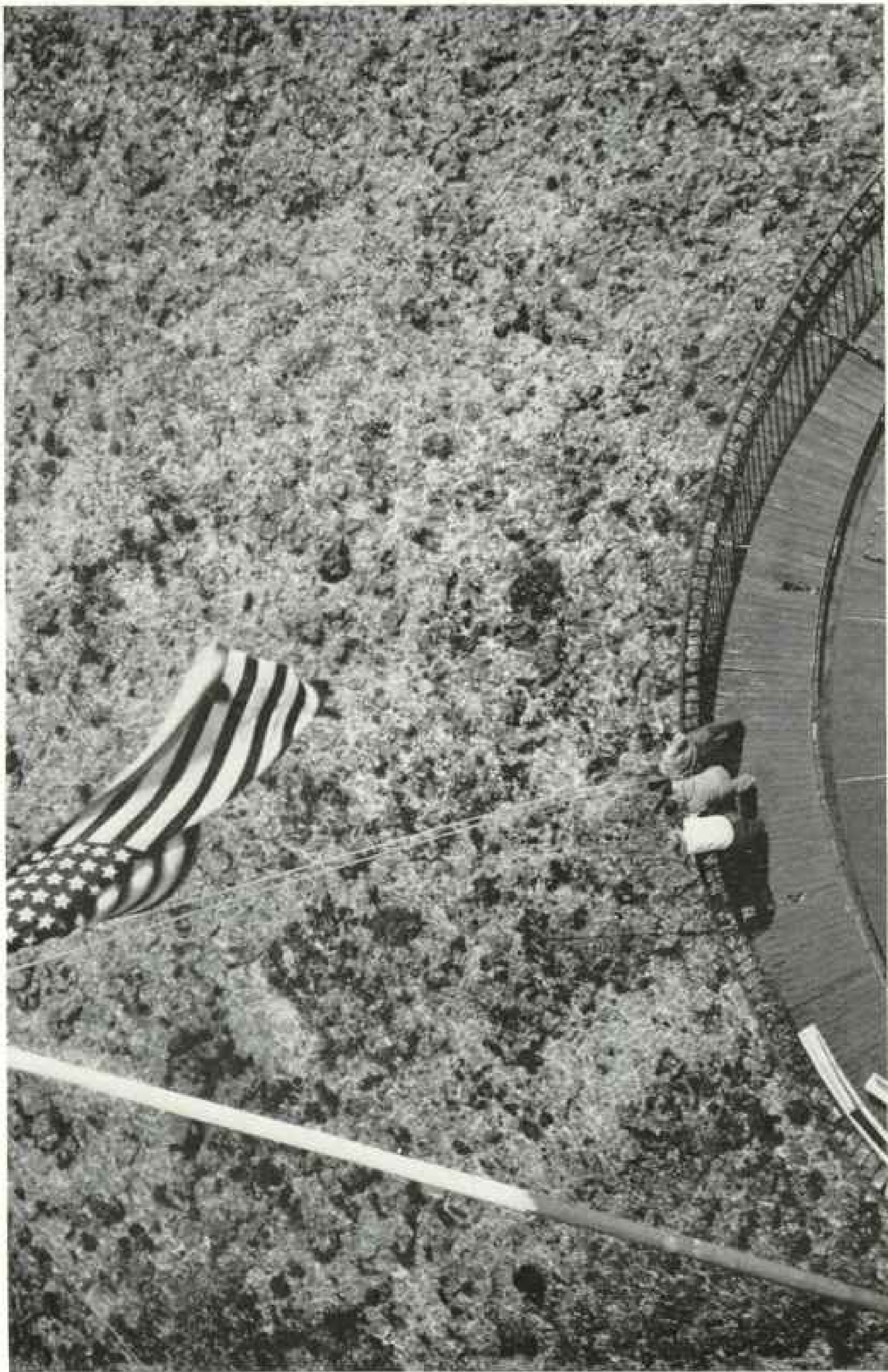
After the copper piece was rubbed briskly with this half lime and other cleanser, the date, 1694, and a seated Britannia appeared. Heads of King William and Queen Mary are on the obverse.



Charles H. Baker, Jr.

Maltese Cross, Orb, Crown, and Tudor Rose Prove This Cannon British

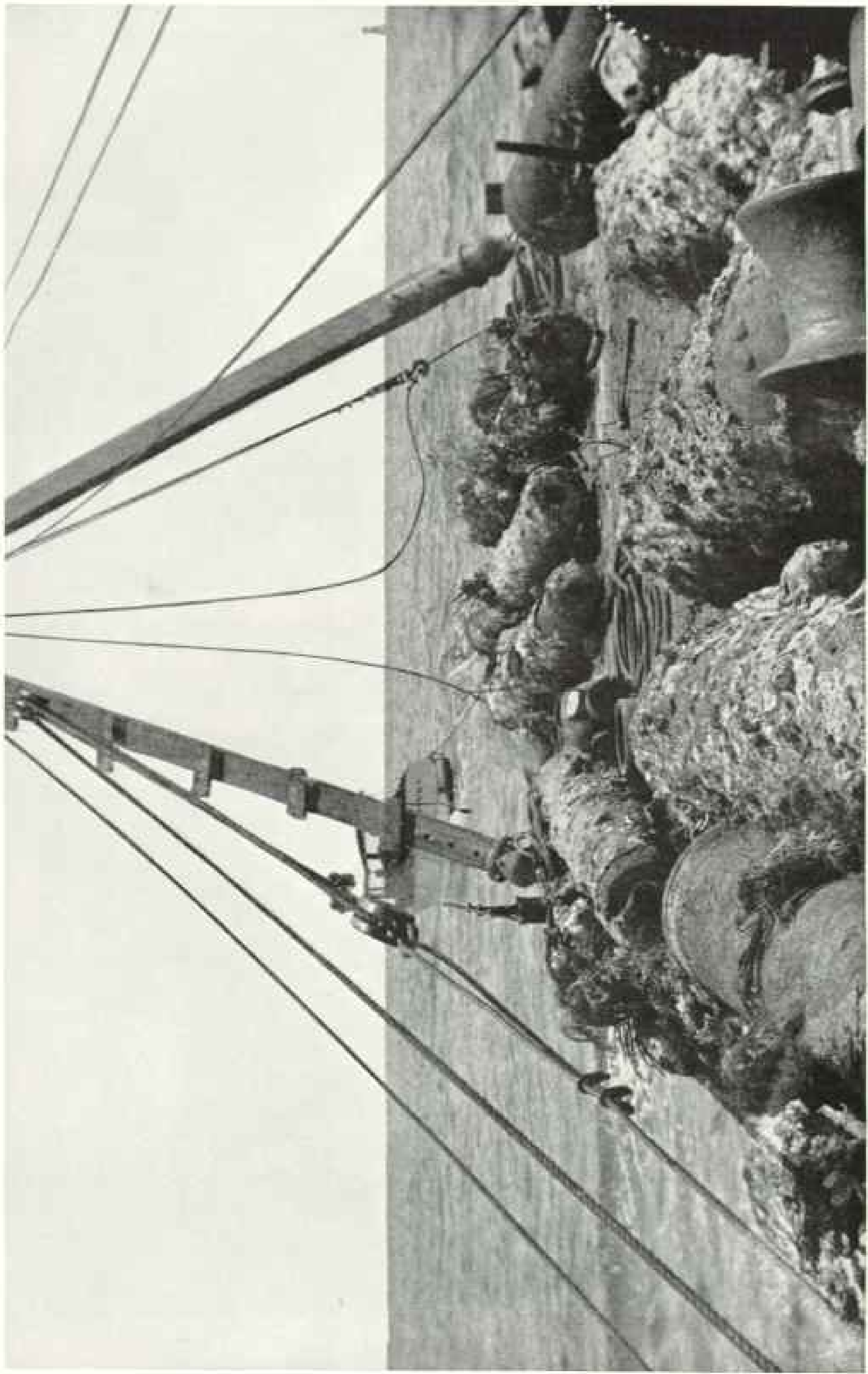
The broad arrow, right, has been a traditional Royal Navy marking since the days of Queen Elizabeth. Before the American Revolution, the broad arrow on trees in New England forests reserved them for naval masts and timbers. The colonists vigorously disputed this authority and few masts reached England.



Charles M. Brockhoff

Carysfort Reef, Covered with Crystal-clear Water, Seems Dry Land When Viewed from 100 Feet above

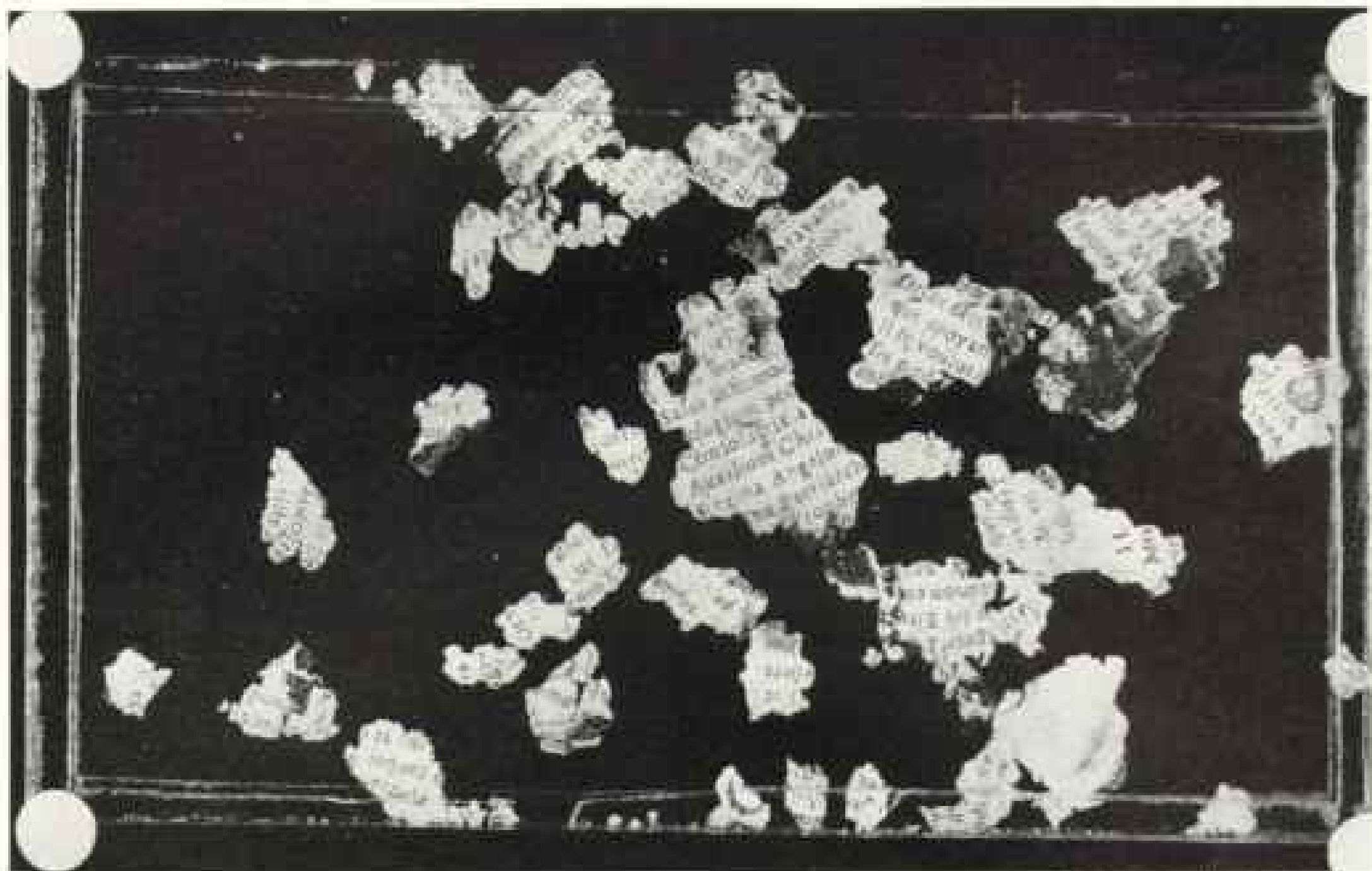
The photograph was made from the top gallery of Carysfort Light. Here the Florida reef exhibits a brilliant array of red, brown, and yellow staghorn and brain corals; purple sea fans; and bright blue and green parrot fish. The middle gallery, on which the visitors are standing, is about 50 feet above water.



Ellipsis M. Brookfield

Homeward Turn the Undersea Explorers, with a Cargo of Guns Lifted from a Forest of Stagborn Coral

These cannon, and others like them, made Britain feared and respected on the seas of the New World in the days of Sir Henry Morgan, two and a half centuries ago. In the distance, at right, stands Carysfort Light, about twelve miles south of Elliott Key (page 812). Today its powerful beams warn mariners from the treacherous reefs which sealed the doom of scores of ships in colonial times, including H. M. S. *Witchester*.



Pan American Photo Service, Inc.

After 245 Years on the Ocean Floor, Prayer-book Fragments Still Survive

On the largest remnant (center) appear the words in Latin from the Litany of Loreto: " . . . Health of the sick, Refuge of sinners, Comforter of the afflicted, Help of Christians, Queen of Angels, Queen of Patriarchs . . ." Other smaller scraps reveal both Latin and French words. The prayer book was protected in a coral covering under one of the smaller guns (page 824).



Charles M. Dowell

A Fish-eye View of the Author Clambering down to the Sea Floor

He is just passing the propeller of the boat. Air bubbles from his diving hood filter up to the surface.

to England via Jamaica after taking part in a successful expedition against the prosperous French colony of St. Dominique (now Haiti) in January, 1695. Off Florida the two-year-old ship became separated from Commodore Wilmot's convoy and foundered on the coral reefs where we found her guns. She was 146 feet, 2½ inches long and her beam was 38 feet, two inches.

The date of the wreck, September 24th, in the middle of the hurricane season, combined with the inability of the crew to save their money, tells the story of the vessel's fate.

When a fine modern steamship like the *Dixie* finds herself helplessly tossed onto the reef, as occurred in the terrible Labor Day hurricane of 1935; when one of the finest of the modern reef lights, 136 feet above the normal water level, is extinguished, what hope for a square-rigged sailing ship with no modern "aids to navigation"? Certainly there was no time

to remove cargo, no matter how precious.

Had the *Winchester* taken a prize? Who knew what might yet be concealed by the growing coral? Perhaps something more than "historical pieces."

These thoughts determined me to make a further search of the sea bottom on the Winchester reef, so I enlisted the aid of Charles Boswell, able diver and owner of a wrecking outfit.

In June, 1940, we anchored once more in the lee of the White Bank. Now there was no *Baird* to shelter us, for she had been burned to the water's edge (page 815).

On location, Boswell dived immediately to investigate some curious shapes in the rock



Samuel Falter

Clues to a Sea Mystery—Initials at Least 253 Years Old

Carved on either side of the cannon's touchhole are the initials of its maker, whom the British Admiralty identified as Thomas Westerne. He operated a gun foundry in Sussex from 1669 to 1688 (page 817). This muzzle loader was fired by applying a lighted match to a powder train in the hole.

formation. These could not be pried loose from the bottom without the aid of dynamite.

The many small fish killed by the explosion of dynamite always bring sharks, so we put off our investigation and decided to raise more cannon. The guns were scattered now, since so many had already been recovered. It took the balance of the day to bring up four, because the barge had to be moved to a new position over each gun. One was only six feet long, the smallest we had yet found.

Good weather continued the following day. Cannon, coral-encrusted and dripping, sprouting purple sea plumes and brilliant decorations of red and lavender sponge growth, came up regularly. Stuck fast beneath the

butt of one gun was a piece of bent and twisted metal, once a large serving platter or tray of pure old English tin.

A big chunk of rock broke from a cannon as it was hoisted on deck. What a museum collection it contained! We removed two brass candleholders, a broken green glass bottle, four ancient hand grenades with powder still kept intact by wooden plugs, and the choice piece of all—a small but well-shaped silver porringer (page 818).

Once Boswell came up with a piece of sheet lead, evidently used for temporary patching of the hull and then rolled up for future use.

At this point, lying flat on the barge, we searched the bottom painstakingly with the waterglass. Here must have been the vessel's stern cabins, where anything of great value would surely be. Boswell kept a sharp watch for pigs or bars of metal while diving, using a bar to chip and pry at any suspicious shape.

As the day wore on, clouds gathered in the east and a light breeze gradually increased until the sea became choppy. A swell arose, indicating stronger winds coming. The guns came up, swinging violently as the barge rolled to the swell. They had to be lassoed by Boswell's crew and hitched to deck cleats before being lowered to the barge. Dangerous work!

At last only one immense cannon remained. Boswell determined to raise it before giving up, for the sky gave every appearance of an indefinite period of bad weather. He dived, made the chain fast to the big gun, and slowly climbed the rope ladder.

I could see that he was struggling with some heavy object he held in one hand. A few feet below the surface he raised the object above his head—a metal bar! My heart skipped a beat. I took the bar from his hand and laid it on the deck, then quickly lifted the helmet as the diver's head came above the water. Boswell hastily scratched at the bar with his knife. It was bright below the surface, but much too soft. Just lead!

The big cannon presented a problem in the heavy sea now running. The hoisting cable, fast to the gun, threatened to snap with the sudden jerks of the pitching barge. Boswell, at the hoisting engine, neatly perched the

massive piece of iron on the edge of the barge and ended its mad capers. It measured 11 feet.

Back in Miami, the cannon were unloaded at Commodore Matheson's dock on the Miami River, and the writer began further chipping and cleaning operations. This work was aided by visitors and souvenir hunters, who took away pieces of coral and shells.

One small 8-foot gun, untouched by chipping tools, was the particular object of their attention. At length their efforts disclosed a good-sized piece of hemp cable, pressed tightly against the metal (page 818).

A Prayer Book from the Sea

This interesting relic induced me to take up work on the small gun. A few minutes of chipping yielded some remarkable objects: pieces of opaque blue glass, two lead musket balls, and finally, in the angle where a trunnion joined the body of the cannon, a small damp wad of soft material, small enough to be enclosed in one's fist.

What an unbelievable find! Here were the fragments of a book. A little of the binding remained. On the paper a few words of printing were faintly discernible (page 822).

After careful drying in the sun, portions of the leaves could be separated by a knife blade, and Latin words of a religious nature could be detected. A few French words appeared on one fragment, the title page no doubt, as evidenced by bits of printed decoration. Obviously this was a prayer book, perhaps obtained when the *Winchester* took part in the attack on the French in Haiti (page 823).

Speculation on the curious fact that this light object, a book, was beneath the great weight of a cannon, brings to mind the final scenes of the sea tragedy—the sudden terrific shock as the vessel strikes the reef; snapping spars, falling blocks, crunching timbers; great seas sweeping the decks. The howling of the hurricane drowns the screams of the injured and the despairing cries for help.

Amid the confusion, perhaps one man, preparing to meet his Maker, mercifully met death when the vessel careened, and a cannon burst from its tackles carrying him and his prayer book to rest in "full fathom five."

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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was founded fifty-three 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 consideration 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 conical dwellings in that region, The Society's resources 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 71,095 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 man.

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.

THIS LETTER is republished because so many wrote us last year in appreciation of its warm Christmas sentiment.

To Jim - for holding my hand tight the day we were married...

for seldom remarking, "That's what I had for lunch."

for sparing me those chilly trips to heat the 6 a.m. bottle.

for never opening my mail (though I sometimes do yours!).

for the things you didn't say the time I ripped off the fender.

for balancing my checkbook without grumbling or pitying.

for not having to be defrosted when I forget to send your suit to be pressed.

for treating my women friends as though you liked them.

for the way your eyes light up when our glances happen to meet at a party.

for being so eternally there for me to lean on!

for wanting a good watch for years and years, but being too unselfish to go and spend the money on yourself.

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Lockheed

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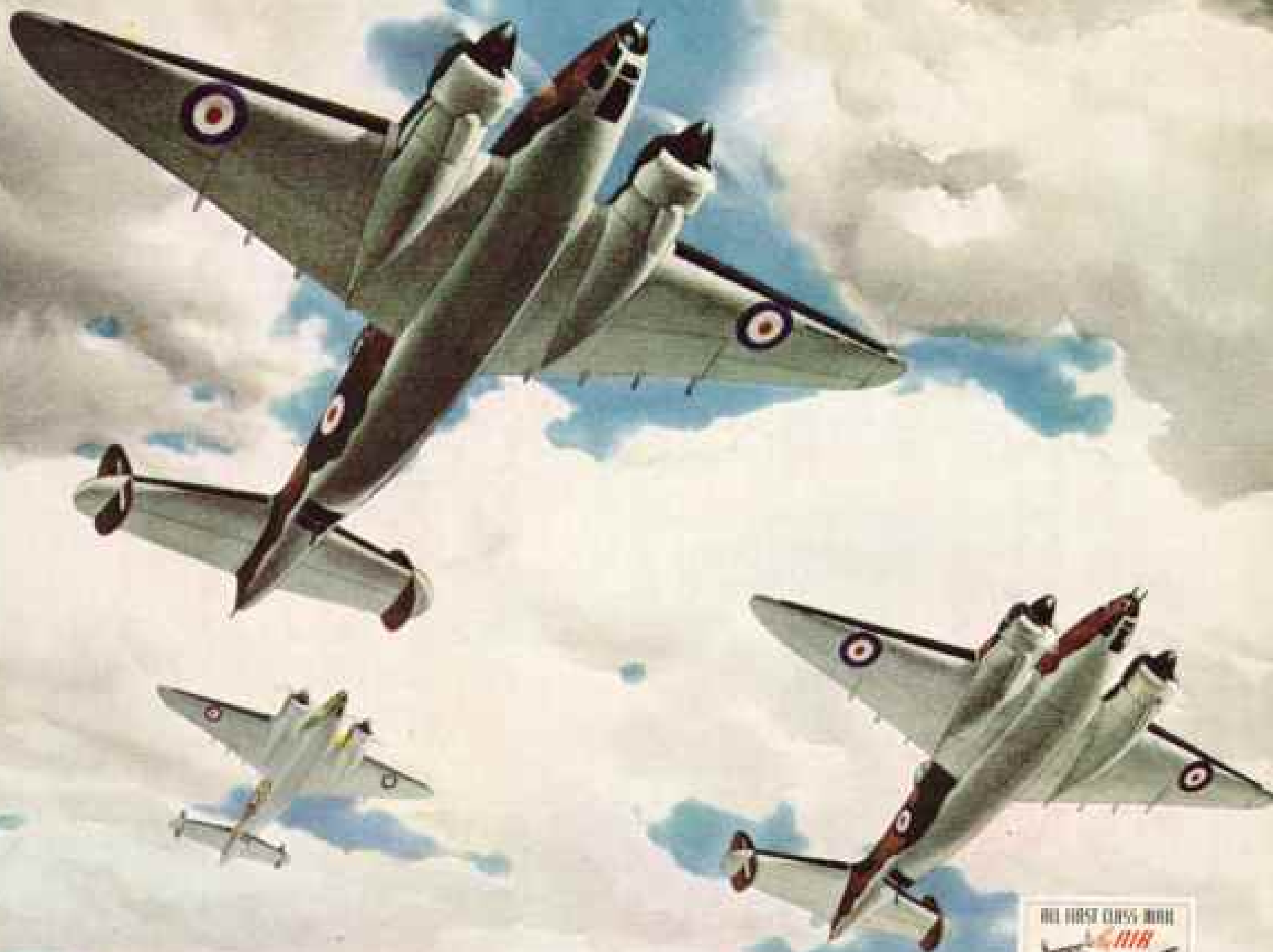
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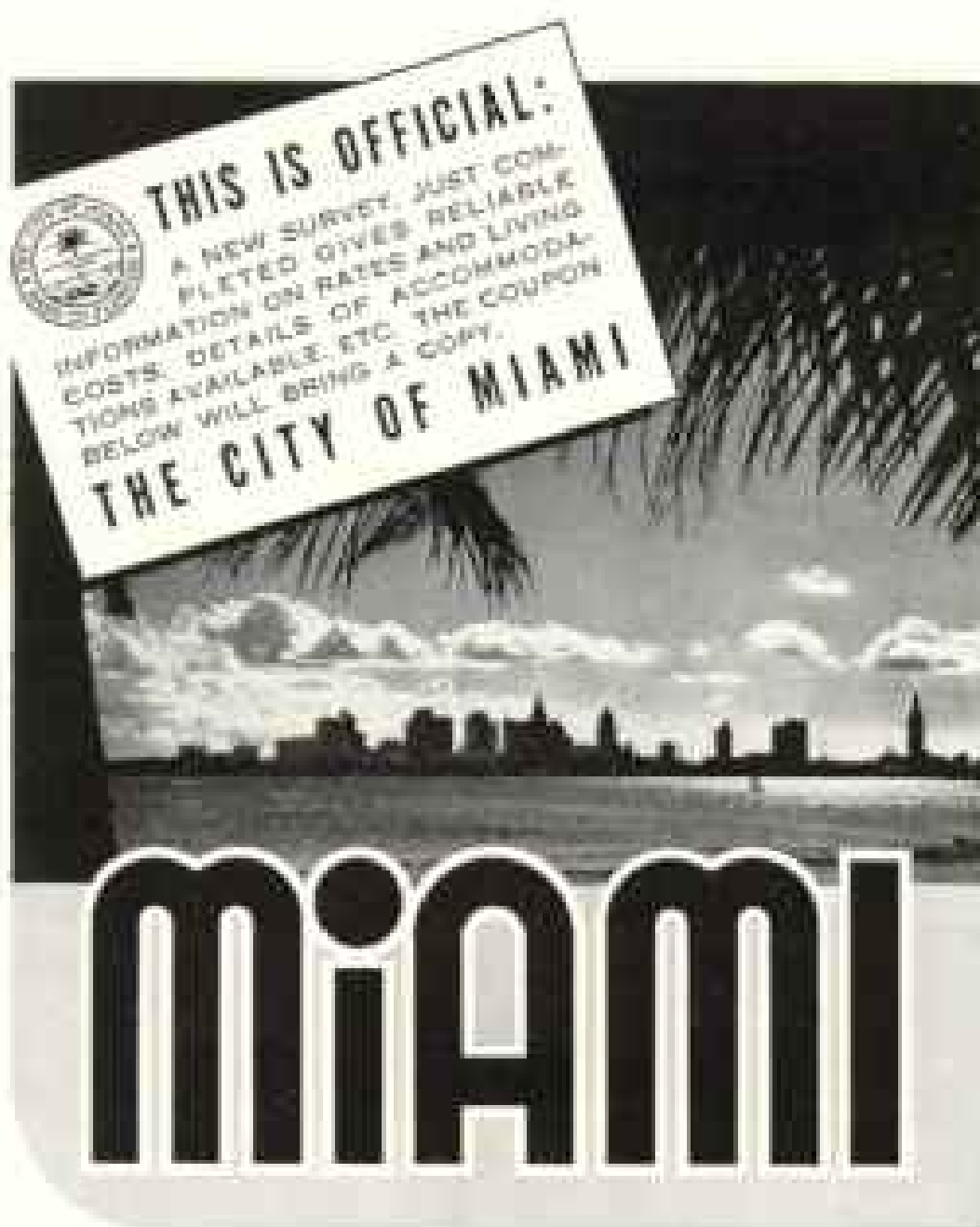
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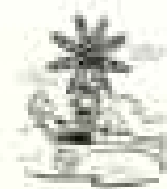
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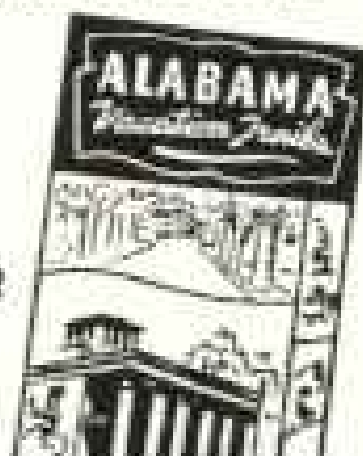
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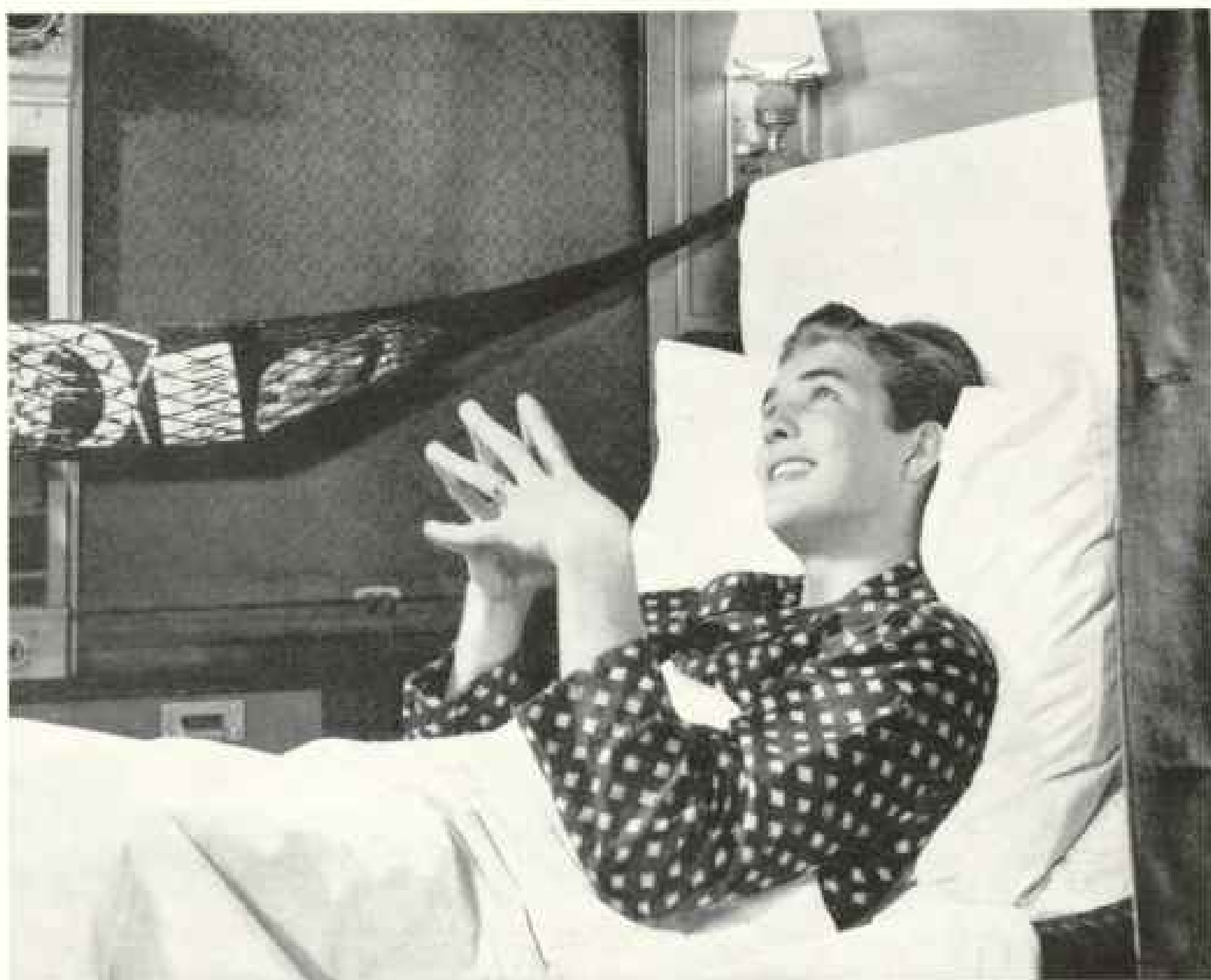
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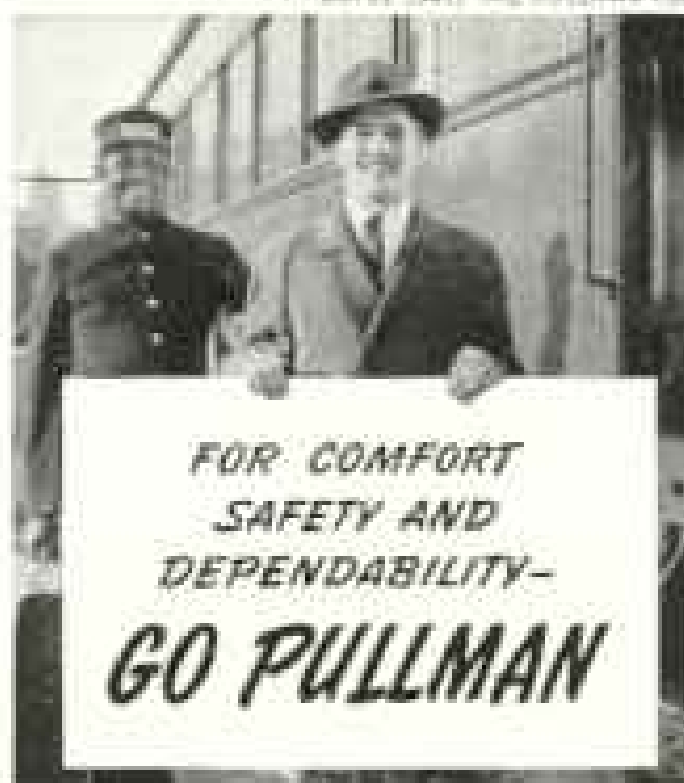
mock to put my clothes in. Even a private air cooler *in every berth!* (What won't they think of next!)

I saw a big league pitcher in the lounge! He gave me a great big smile, and we talked inside baseball to bedtime. The lounge car, you know, is just like a private club *that everybody with a Pullman ticket can use.* It's a friendly place, with big, lazy chairs, free magazines to read, and a porter ready to jump the minute you clap your hands!

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Winter invariably brings heavier tolls of traffic accidents. Despite the fact that there are normally fewer cars on the road, there are usually more than one and a half times as many accidents in December as in June.

Shorter days mean more hours of darkness. These shorter days bring with them stormy weather and other seasonal dangers in driving your car. These abnormal

burdens are placed on drivers every Winter—and particularly this Winter because rapidly accelerating defense activities are putting more and more men and cars on the roads.

The careful driver balances increased dangers with increased caution and precaution. Here are a few suggestions he remembers through the Winter months.



The careful driver makes sure that his lighting equipment is adequate and properly adjusted for longer hours of darkness, snow, sleet, and fog; also that windshield wipers and defrosters are working effectively.

His chances of skidding are reduced by having brakes properly adjusted, by using tire chains on snow, slush, and ice. The safe driver knows and practices safe driving technique on slippery surfaces. He is always on the alert for the unexpected icy spot.

The careful driver makes up his mind to travel habitually at speeds reduced in conformity with road conditions throughout this season.



He leaves more room than usual between his car and the car ahead, is more cautious than ever about passing cars when approaching hills or curves. On hills, he watches out for children on sleds.

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THE LARGE, colorful tail of the Gila Monster (*Heloderma suspectum*) is actually a storage place for food. That is why, when food is plentiful, his tail becomes thick and swollen. But when food is scarce, the Gila Monster calls on his reserve and his tail becomes thin and stream-lined.

Thus, Nature has thoughtfully provided this resident of the desert with an excellent means of riding himself over lean periods when food is hard to obtain.

Man, of course, must rely on his regular income to provide not only his food, but his home and all his other expenses of living. But man, too, may have his lean periods. An accident, for instance, can suddenly cut off his income for days or weeks. And to this will be added the burden of bills for medicine and treatment.

To guard against just such lean times as this, man is able to provide himself with Travelers Accident Insurance. Should an accident befall him, he knows that his hard-won savings will not be swept away suddenly by hospital bills.

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actually means *thunderstruck*

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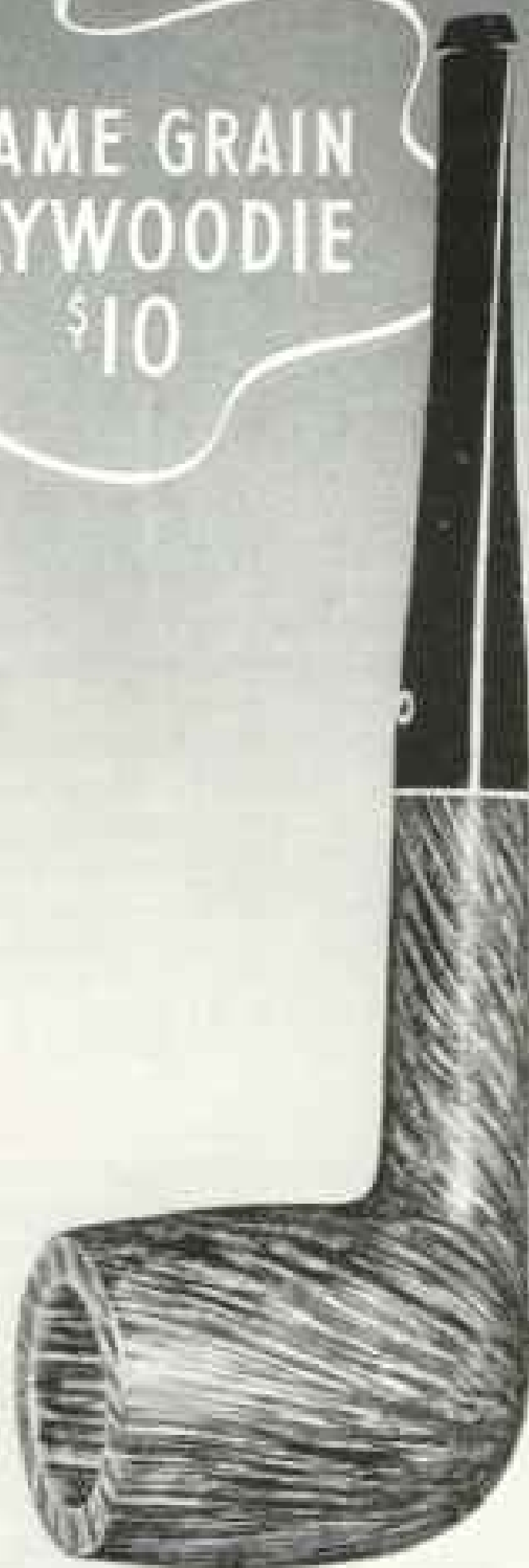
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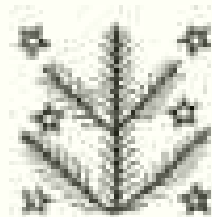


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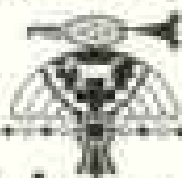
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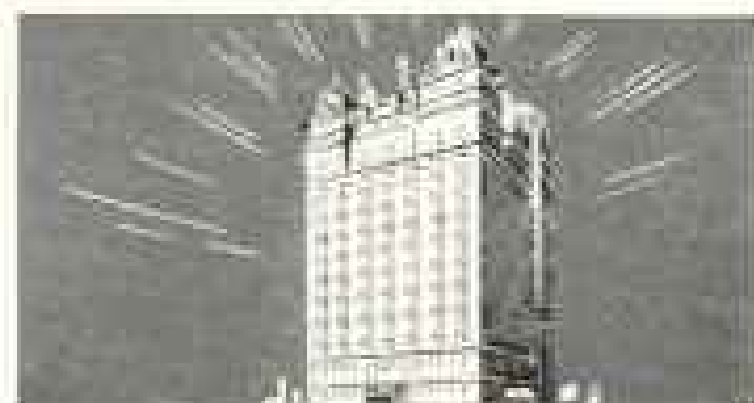
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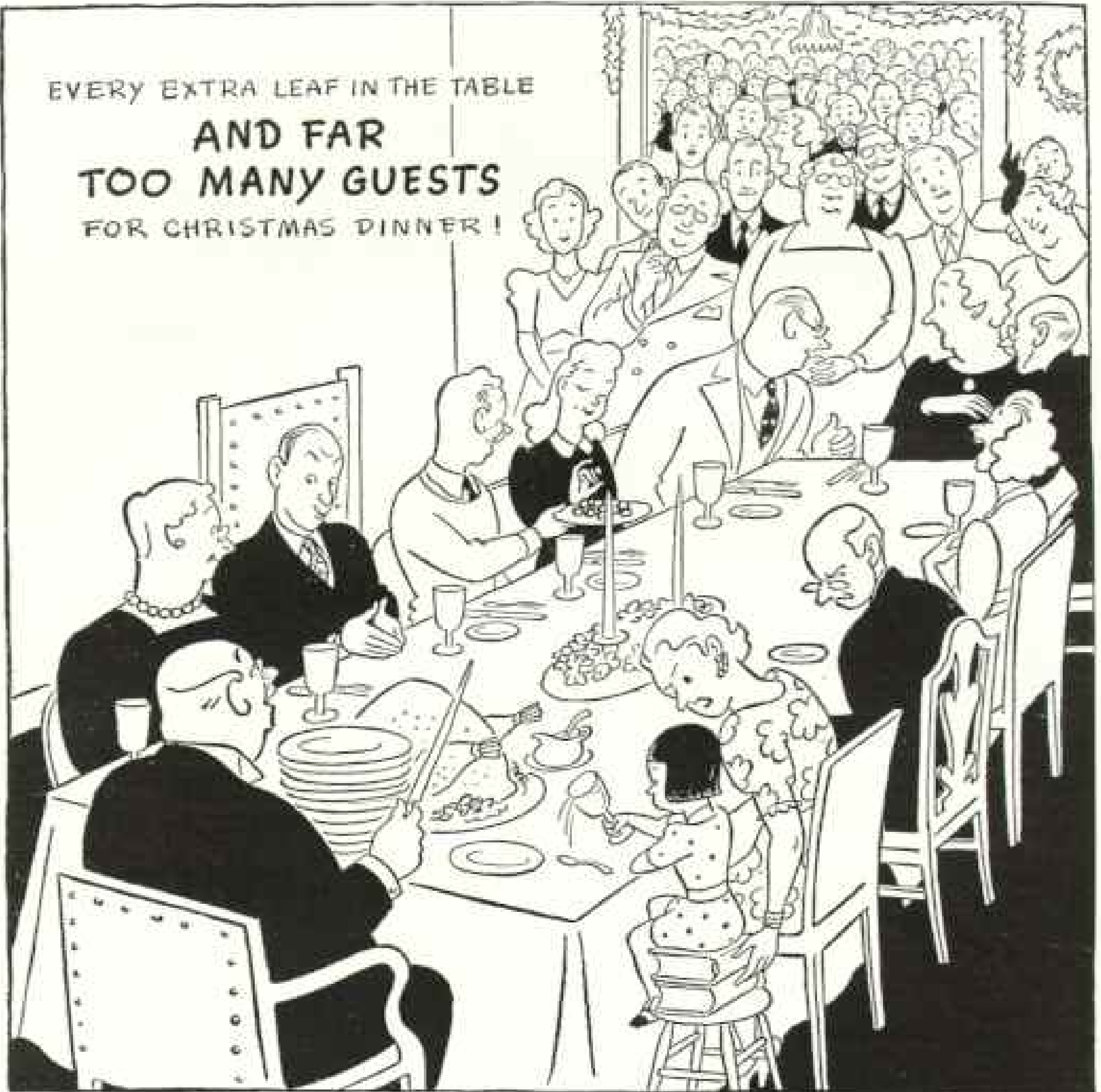
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