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THE NATIONAL GEOGRAPHIC MAGAZINE

HIGHLIGHTS OF THE VOLUNTEER STATE

Men and Industry in Tennessee Range from Pioneer Stages to Modern Machine Age

By LEONARD CORNELL ROY

With Illustrations from Photographs by J. Baylor Roberts

TENNESSEE, like the Gaul of Caesar, is divided into three parts. Ask a Tennessean where he hails from. His answer is seldom without an adjective; East, Middle, or West. Even the State flag symbolizes the divisions.* Three white stars adorn a blue circle in the center of the red emblem.

When the University of Tennessee holds its annual farmers' meetings, the East Tennessee meeting is held in Knoxville, the Middle Tennessee meeting in Columbia, and that of West Tennessee in Jackson.

Diversity of farm problems causes this. Farmers of East Tennessee, whose corn crops often cling to steep hillsides, are not concerned with methods of improving cotton acreage on the level lands of West Tennessee. And many cattlemen, dairymen, and horse breeders in the fertile basin of Middle Tennessee would be bored by a program devoted to corn or cotton.

The white line in the center of State Street in Bristol was my threshold to Tennessee. Bristol did not grow across the State line. It was a well-established settlement when, 38 years ago, the legislatures of Tennessee and Virginia decreed that the line should be in the exact center of Main Street, now State Street.

Here Daniel Boone and other early hunters traded skins for powder and lead, swapped stories of encounters with Indians, and brought news of settlers in the wild unknown region beyond the Cumberlands. Today Bristol's plants are selling products ranging from candy to caskets, including paper, leather, machinery, truck trailers, mirrors, mine cars, veneer, and drugs.

A "LITTLE RUHR OF AMERICA"

The "Little Ruhr of America," the East Tennessee Valley has been called. Here is a vast acreage of farm and timberland, but you cannot drive an hour over the smooth valley highways and not come upon at least one manufacturing town or city (map, pages 556-7).

Twenty-five years ago the site of Kingsport was largely a meadow. A weather-beaten yellow boxcar was the railroad station for its few hundred residents.

Despite the youth of this modern industrial community, it has no gaudy, untamed features of a boom town. Business and residential buildings exemplify the vision of men who, in 1915, planned it that way.

There you will find all the essential industries for the manufacture of books, from pulp to bound volumes. In a huge plant logs from the near-by hills enter one factory door and leave another as paper. When the paper passes through the latter

*See "Flags of the World," by Gilbert Grosvenor and William J. Showalter, NATIONAL GEOGRAPHIC MAGAZINE, September, 1934.

THE STORE THAT GOES TO THE CUSTOMER

Twice a week this mobile mart, stocked with household equipment and groceries, visits rural housewives in East Tennessee. Salt is the store's best seller. The poultry department is on the roof. Manufactured brooms fail to interest many families who still make their own.

door it is transformed by batteries of printing presses into pages of encyclopedias, textbooks, Bibles, catalogues, and popular fiction. Meanwhile another Kingsport plant is making book cloth out of raw cotton to bind the printed pages.

"We have produced 126,000 books in a single day," said the president of the Kingsport Press. "We can get out 2,000,000 a month."

Shortly after the World War, the Eastman Kodak Company of Rochester, New York, found the forest near Kingsport a suitable source of wood alcohol, used in the manufacture of film. Land and timber rights were purchased, a 20-mile logging railroad and modern sawmill built. The alcohol plant required only the tops and limbs of trees and waste from the sawmill. Thus the Kodak company found itself engaged in an extensive lumber industry.

In 1931 the Tennessee Eastman Corporation enjoyed a private boom. Growing popularity of home movies and the need of protection from fire demanded wider use of noninflammable film. Laboratory men in Rochester, after years of research, discovered that cellulose acetate was the answer.

Cellulose acetate is cotton treated with chemicals. Cotton was within economical reach, so the Kingsport plant was equipped to supply the substance.

TENITE, OF MANY USES AND COLORS

From cellulose acetate also is produced artificial silk yarn and Tenite. The latter, a thermoplastic, is sold to molders who fashion it into combs, fountain pens, costume jewelry, automobile steering wheel rims, gearshift knobs, ash trays, throttles, dash accessories, and door equipment.

In a file room at the plant you can see Tenite in more than nine thousand shades and combinations of color (Plate III). Made into plastic sheets, the acetate is sold to glass manufacturers who place it between plates to produce safety glass.

In the Borden Mills enough cotton is fabricated in a week to make 250,000 men's shirts and 114,000 women's dresses; a Kingsport cement plant ships 1,500,000 barrels of Portland cement annually; and a manufacturer of men's hosiery makes 1,300,000 pairs a month.

Johnson City in ten years has shipped enough hardwood flooring to build a board-

MOUNTAIN BOYS TAME A "TIGER OF THE AIR"

"Right friendly" these Great Smoky Mountain boys said of their pet, a great horned owl, although it is one of the most savage and fearless of birds. Two of the important north-south bird flyways of the United States cross Tennessee.

walk four feet wide that would girdle the world four times, and there would be enough left to build an 8-foot stretch from Boston to Miami. And hardwood flooring is only one of about 200 different articles made in the city.

During an afternoon drive out of Johnson City, I rediscovered the cradle of Tennessee. A few miles beyond the city's border William Bean built the first cabin within the present boundaries of the State in 1768.

Elizabethton, home of two big rayon plants, seemed to be too busy to recall that near here were drawn up the Articles of the Watauga Association, laws under which the settlers, far removed from North Carolina to which they belonged, agreed to be governed.

Of the association, Theodore Roosevelt, in his *Winning of the West*, said it was "the first free and independent community established by men of American birth on this continent."

Jonesboro, on the other hand, seemed to be in a reminiscent mood. Its old churches with their slave galleries, and its historic inn, the meeting place of many men who led the State through its early struggles, rose in dignity above their newer neighbors.

Here, in 1784, when North Carolina informed Congress that it wished to give up the isolated settlements "beyond the mountains," representatives of angered settlers met to discuss their plight.

THE STATE OF FRANKLIN

The debate was as torrid as the August days they met. Out of the meeting came the establishment of the State of Franklin, named for Benjamin Franklin.

Government officials did not accept North Carolina's offer of its wilderness counties, so North Carolina continued to appoint officers. And even in Franklin there was a strong faction opposed to the new State. After nearly four years of struggle, the State of Franklin passed from the scene.

In 1796 Tennessee was admitted to the Union. Its population, 28 years after William Bean built his cabin, was more than 60,000.

The old capitol building of the State of Franklin was a crude log cabin at Greeneville. The structure no longer exists. Better care has been given the tailor shop of

FAMILIAR TO MOTORISTS IS THE MAP OF THE VOLUNTEER STATE

Since the State's shape fits the proportions of an automobile license plate, Tennessee "tags" carry its outline as a frame for the registration numbers. The Commonwealth is widely known for mountain lore and "hillbilly" music, but the highlands cover only its eastern third.

Andrew Johnson, the boy who trudged with his father, mother, a cart, and a cow over the mountains from North Carolina in 1826, eked out a living making fine clothes, and then began a political career that led to the governorship of Tennessee, the U. S. Senate, and the White House (page 561).

The tailor shop is enclosed in a brick building. There you see Johnson's workbench, his top hat and coat, his goose and shears. The building was more than a workshop; it also was Johnson's schoolhouse. When he married he knew the alphabet, but could barely read or write. As he worked, his wife, Eliza, taught him the three R's.

Thirty years later, as Governor of Tennessee, his first message to the legislature dwelt upon the importance of public education, for which he labored throughout his political life. In Tennessee, Andrew Johnson is the father of public education.

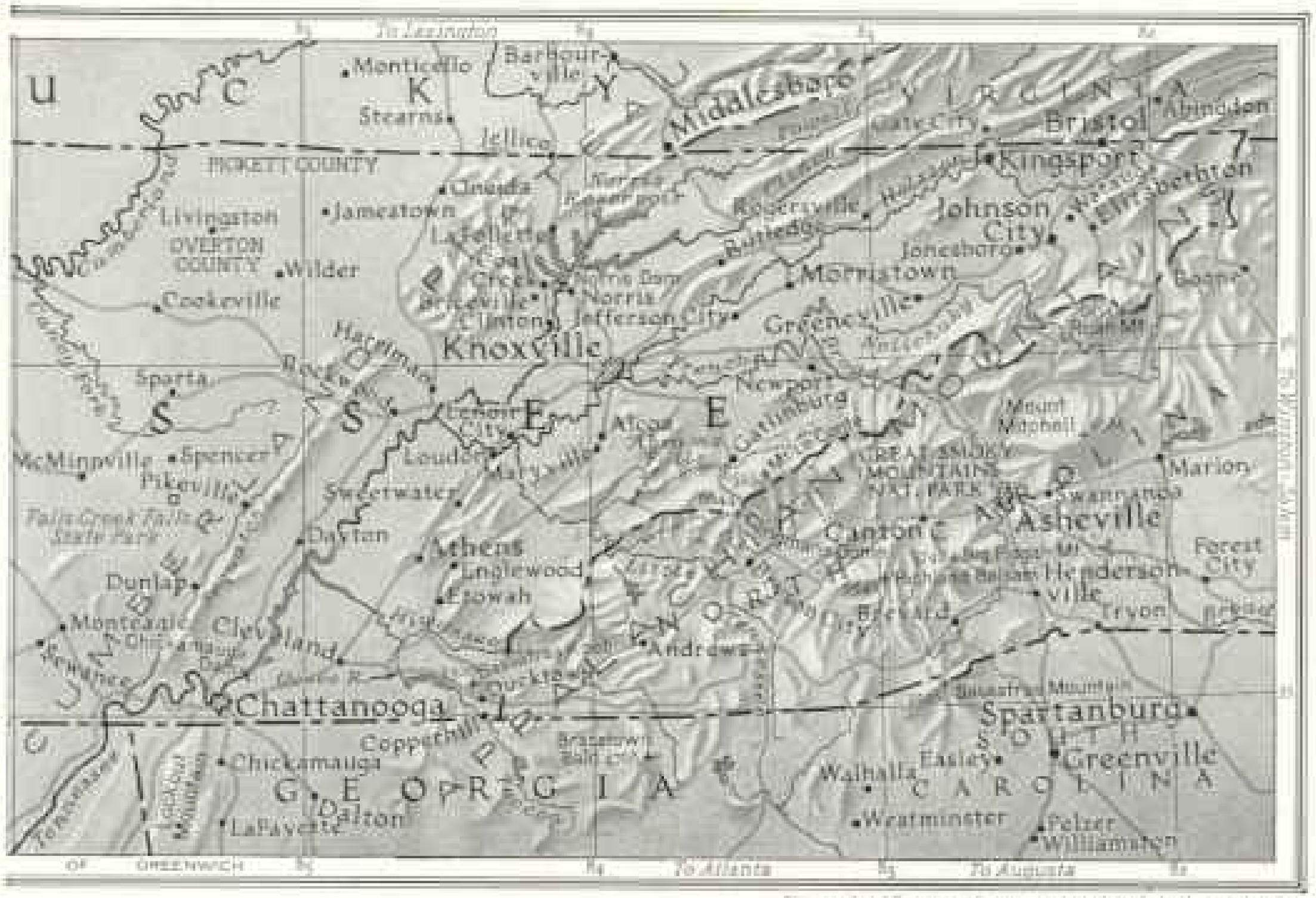
The fearlessness and assurance of the Greeneville tailor were clearly evident when, with the tempest of war howling about him, he stood in the United States Senate and announced his decision to stand for the Union. Later, when every other Senator from the South had left the Chamber or had been expelled, he stood alone.

As staunchly as he stood with the Union against secession, when President he opposed schemes to treat the Southern States as conquered provinces, a stand that caused the only impeachment proceedings against a President of the United States.

During the burley tobacco auctions, Greeneville warehouses ring with the unintelligible chant of the auctioneers selling nearly 18,000,000 pounds annually.

Thirty-six years ago, on a farm near Newport, two Stokely brothers cultivated tomatoes. Their mother canned them. As the quality of their product became well known beyond their own immediate neighborhood, other vegetables were added to their line.

The Stokely organization now has more than a score of packing plants in the United States and it still maintains one near the site of the old kitchen in Newport.



Drawn by Newman Bumstead and Ralph E. McAleer

EIGHT STATES SURROUND IT, FROM "SMOKIES" TO "OLD MAN RIVER"

Although industrial Tennessee has grown rapidly since the beginning of the century, it is still an agricultural Commonwealth. Since it was admitted to the Union, in 1796, its population has increased from about 60,000 pioneers who heaved the wilderness to nearly three million.

Over one of the finest highways in the State I drove to Knoxville. "Marble City" it is called by quarrymen, who need no invitation to expound the merits of Tennessee marble. "City of the Great Smokies" it is nicknamed by the travel-minded.

MARBLE CITY OF THE SMOKIES

Knoxville was the Marble City long before the Great Smoky Mountains National Park became a popular vacation rendezvous.

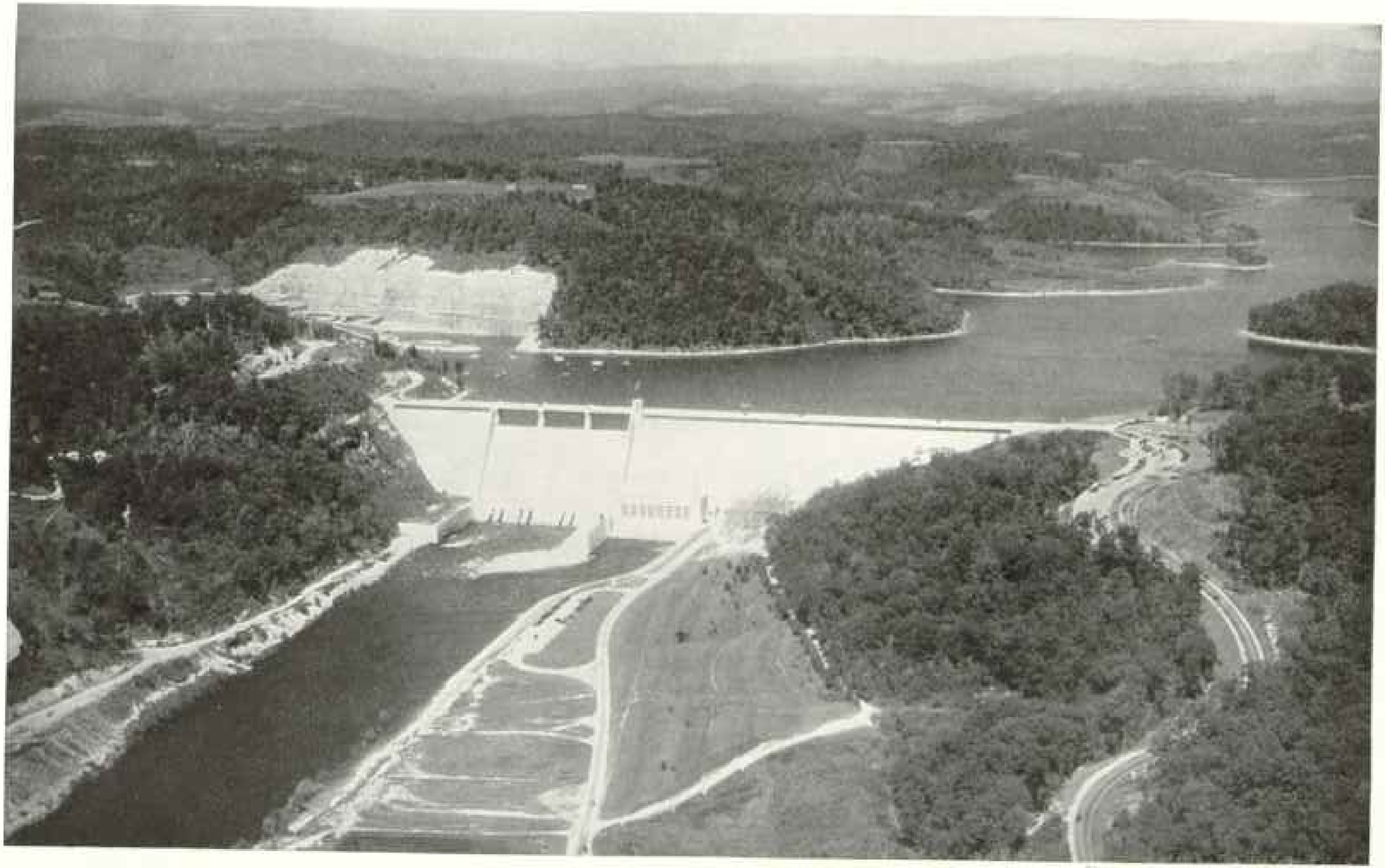
Within the city limits, and a short distance without, giant booms rise above man-made craters which have yielded marble for many of the finest modern buildings in this country.

I saw 20-ton blocks of marble lifted from a quarry and swung onto railroad cars (page 565). At one of the five plants operating in the Knoxville district, a huge block was set on a stage where gang saws cut it into slabs destined for the National Gallery of Art at Washington, D. C., a gift to the Nation from the late Andrew Mellon.

When I visited the 147-year-old home of William Blount, the first frame house built in Tennessee, I wondered what would be his impressions of the Knoxville of today. He could step in an airplane at one of the newest and most modern airports in the country and soar over the city, looking down on the site of the old stockade now occupied by imposing county and business buildings.

He could stroll down Gay Street where stores cater to visiting mountain people and the most fastidious of the city's shoppers. He probably would spend many hours at the University of Tennessee going over records of the promotion of agriculture. One of the University's men discovered an effective hog-cholera serum that saves farmers in the United States millions of dollars each year.

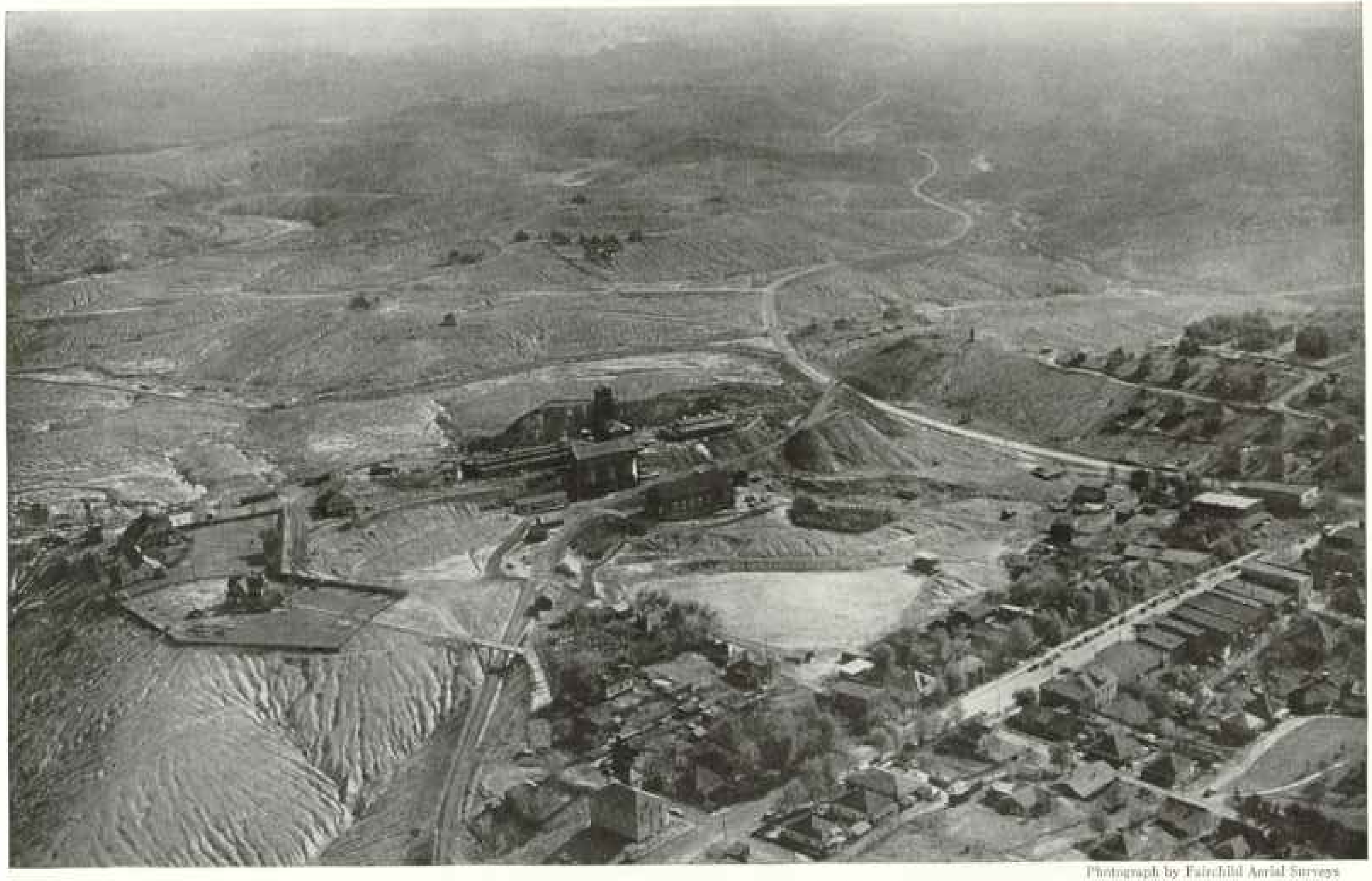
At the University stadium he would see Tennessee's football team in action. In twelve years the "Vols" have won 98 games, tied 8, and lost only 12. The team captured the Southeastern Conference championship last year undefeated and untied.



Photograph by Fairchild Aerial Surveys

MIGHTY NORRIS DAM IMPOUNDS THE WATER OF TWO TENNESSEE RIVERS

First of the Tennessee Valley Authority dams completed in the State, this barrier was built to provide flood control and electric power (page 566). Water backs up in the Clinch River for 72 miles and in the Powell for 56, forming Norris Reservoir, which is rapidly becoming a popular playground with fishing, boating, and camping. The dam is as high as a 24-story building and about a third of a mile long. The side of a small mountain was sheared to supply crushed rock for its construction (upper left). Anchored motorboats and parked automobiles (center and right) look like regimented insects.



Photograph by Fairchild Aerial Surveys

LIFE-CHOKING SULPHUR FUMES WREAKED THIS DESOLATION UPON A FERTILE COUNTRYSIDE

When copper smelters rose here in the Ducktown Basin in the extreme southeastern corner of Tennessee, the region was thickly forested. To feed hungry furnaces, the land was stripped of trees. Sulphur fumes destroyed the undergrowth. Soon only a desert of red earth remained and erosion left gullies deep and wide enough in some places to hide a two-story building. Now waste fumes are converted into sulphuric acid. Ducktown with its green trees rises as an oasis (page 567).

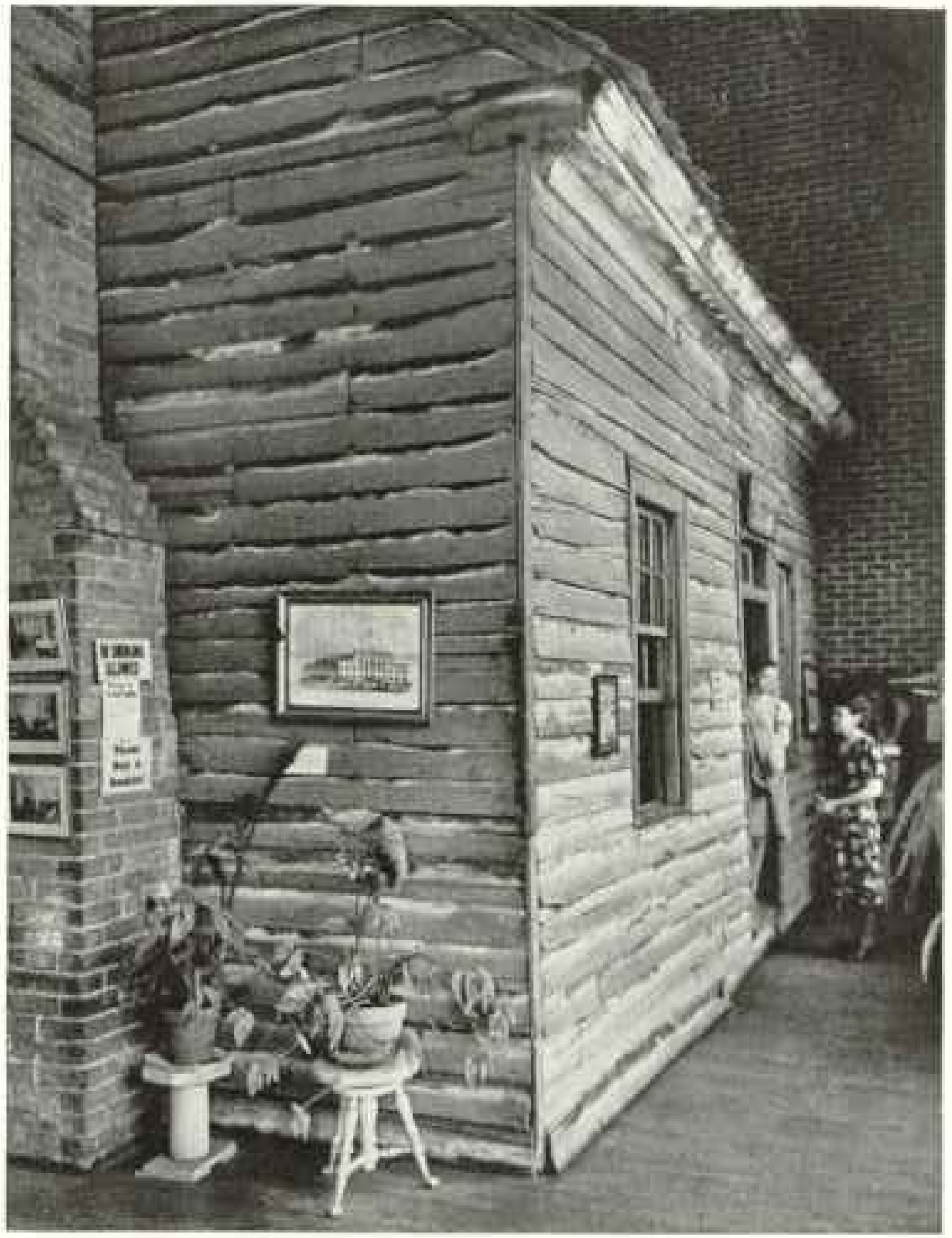
OVER 75 AND MOTHER OF 17 CHILDREN, AUNT VIOLET STILL HOES HER "TATER" PATCH

Magazine pages and newspapers used as wallpaper "to keep the wind out," a turkey-feather duster, handmade beds and chairs, and venerable clocks typify the pioneer Tennessee home. Since good roads are making the mountains more accessible to "furriners" and many mountain children are migrating to the lowlands, such homes are rapidly disappearing (page 577).

Photograph by U. S. National Park Service

FOOTPRINTS MARK THE TRAILS ON LOOKOUT MOUNTAIN

This path winds through the part of the Chickamauga-Chattanooga National Military Park given to the United States by the late Adolph S. Ochs, publisher of the *Chattanooga Times* and the *New York Times* (Plate VI).



ANDREW JOHNSON'S TAILOR SHOP WAS HIS SCHOOLHOUSE

As he toiled with needle, goose, and shears, he learned the three R's from his wife. He rose from a bench in this cabin at Greeneville to the governorship of Tennessee, the United States Senate, and to the Presidency (page 356).

Photograph courtesy Tennessee Dept. of Conservation

FOUNTAINHEAD OF TENNESSEE GOVERNMENT, THE STATE CAPITOL RISES ON NASHVILLE'S HIGHEST EMINENCE

Facing Memorial Square, it has been the meeting place of the State's lawmakers since 1853. Sam Davis, the boy hero of the Confederacy who was hanged at Pulaski for refusing to reveal military secrets, and James K. Polk, eleventh President of the United States, are buried in its grounds (Plate XVI and page 583). The World War Memorial Building (center) honors the State's casualties. Their names are inscribed in bronze on its walls (page 583).

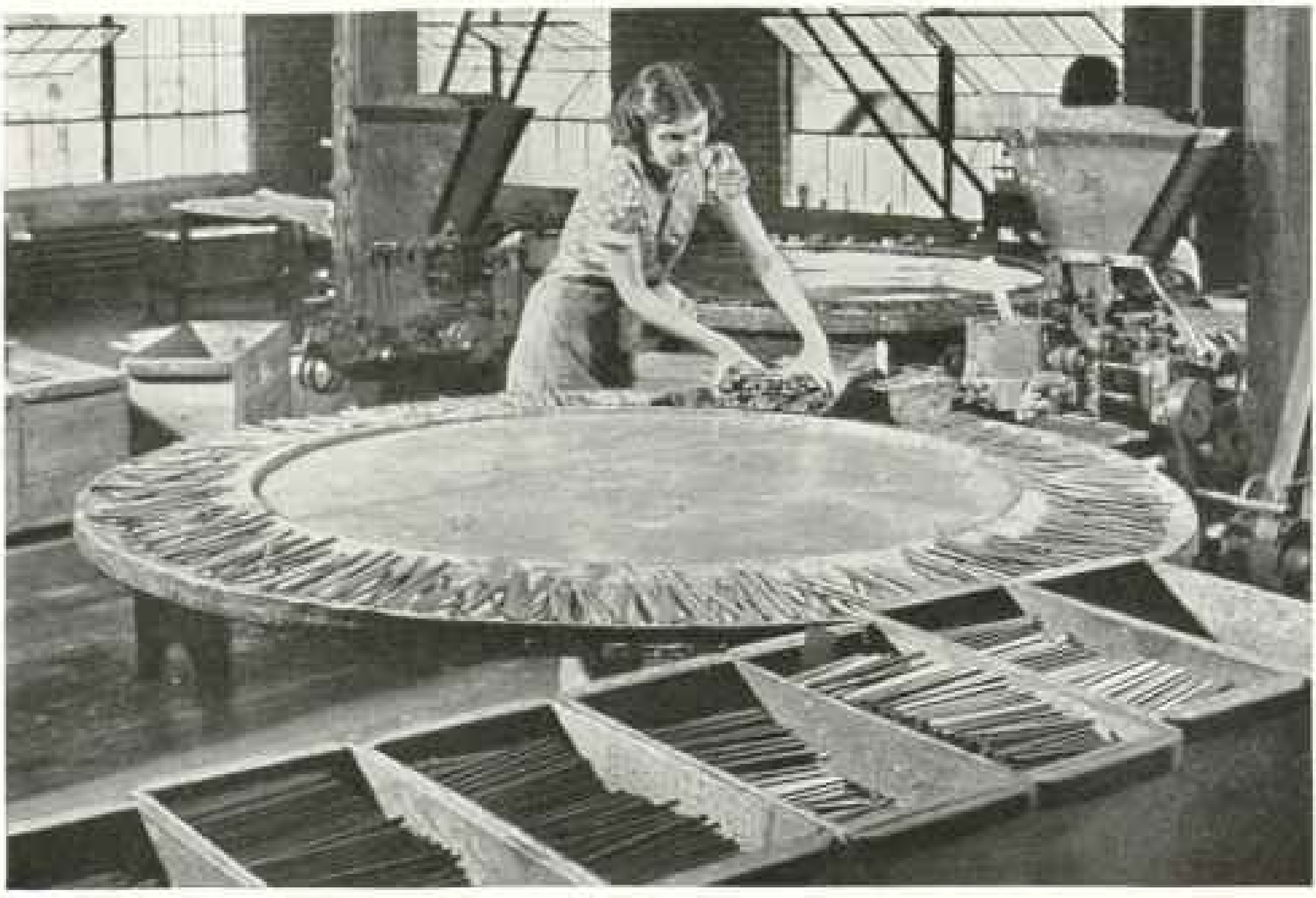
LIKE A FOAM-FLECKED SEA, COTTON COVERS THE PRAIRIELIKE DELTA COUNTRY NEAR MEMPHIS

Picking machines have been invented, but human hands still harvest nearly all the southland's crop. The first cotton grown west of the Allegheny Mountains was planted in Davidson County near Nashville in 1780.

Photograph courtesy Tennessee Dept. of Conservation

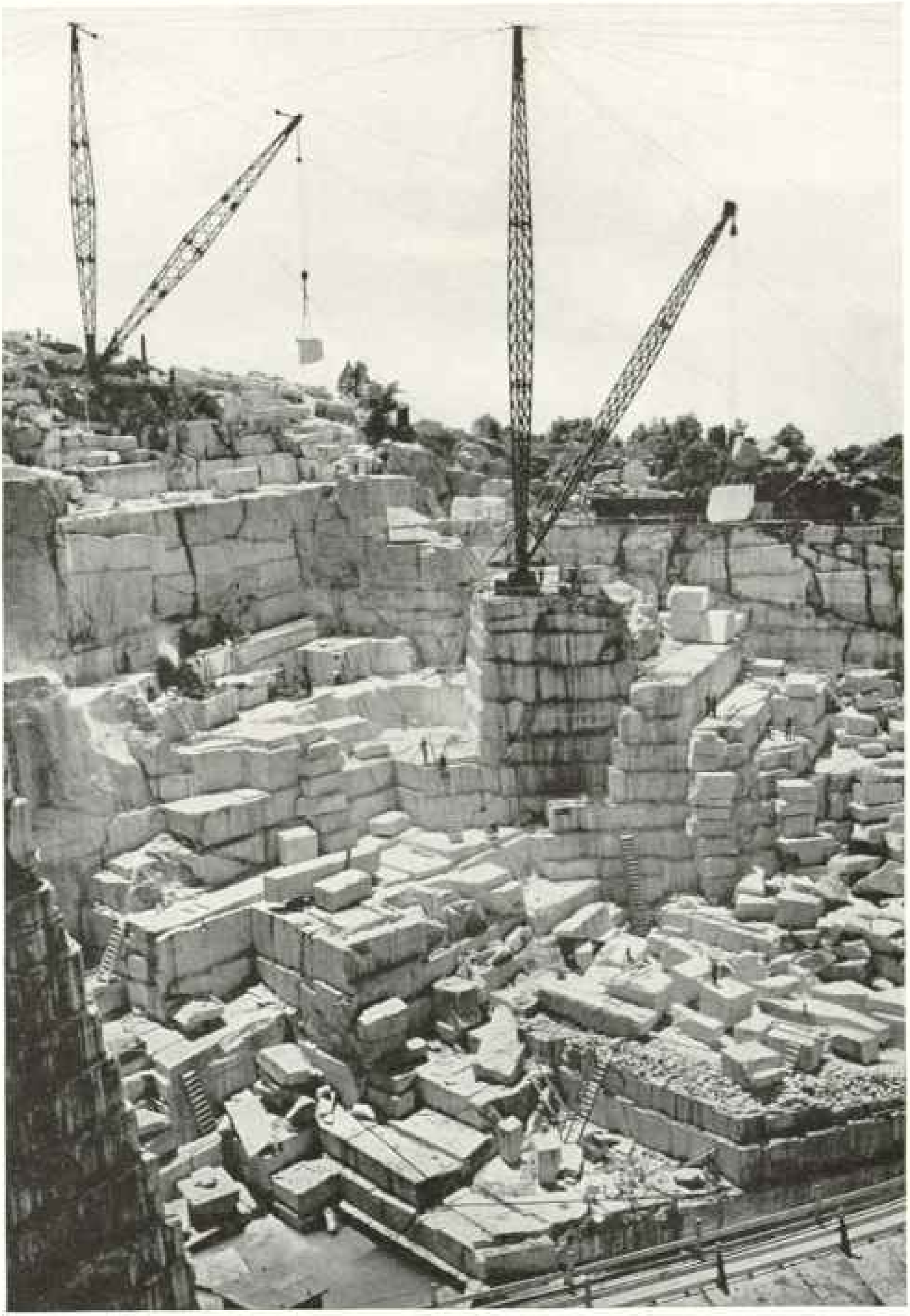
VACATION DAYS AT CHICKASAW PARK

Here bathers swim in one of two lakes of the 11,000-acre Chickasaw State Park near Henderson.



ONE REVOLUTION OF THE TABLE AND YOUR PENCIL IS DRY

Stacked in the hopper (upper right), pencils pass through an automatic painting device and are expelled onto the round drying table. This factory is one of three in Shelbyville, all producing more than a hundred million pencils annually. Because cedar is becoming scarce, manufacturers buy old rail fences and logs from deserted cabins for their wood supply (page 577).



IT TOOK FIFTY YEARS TO DRILL THIS MAN-MADE CRATER

Twenty-ton blocks of marble hanging from the booms are on their way to the National Gallery of Art at Washington, D. C., a gift to the Nation from the late Andrew Mellon. Marble underlies an area in East Tennessee larger than Rhode Island. This quarry is 180 feet deep, yet the layer extends another hundred feet down. Five hundred years' supply remains, at the present quarrying rate. Foreign marble for American construction is sent to Knoxville plants for shaping and polishing.

Elsewhere he would see long-staple cotton from Mississippi's Delta region fed to machinery in the mammoth mills that give this city high rank among the country's textile centers. In one plant thousands of spindles whirred in my ears. In another I watched 300 looms making cloth of many patterns for men's shirts, pajamas, and handkerchiefs.

A NEW NATIONAL PARK

Last year more than 700,000 people visited the Great Smoky Mountains National Park, seven of every ten entering by the Tennessee side.* On the David Chapman Highway, out of Knoxville, you see automobiles from every State in the United States, and many bearing foreign license plates, headed for one of the newest of our national playgrounds. Although the park will not be dedicated until this summer, it already ranks second only to Shenandoah in popularity in our national park system (Plates III, IX, XI).

Because Knoxville is the administrative center of the Tennessee Valley Authority, and T. V. A. current recently supplanted that of a private company in the city's power lines, you hear the famous "yardstick" mentioned often wherever politics and economics are discussed.

The work of the Authority is the first example in this country of planning for an entire watershed.

The area under control of the Authority is equal to that of Cuba, and while more than half of it is in Tennessee, it also includes portions of Virginia, North Carolina, Georgia, Alabama, Mississippi, and Kentucky. Five of the Authority's eleven dams will be in Tennessee.

Norris Dam was the first to be completed under the T. V. A. in this State (page 558).

Four thousand families lived on land now covered by Norris Reservoir. Their holdings were purchased by the Authority and aid given them to move to new sites.

"We found one home where the fire in the hearth had been burning for three generations, and moved fire and all," said an official. "In their new homes many of these people are using electric lights instead of kerosene lamps.

"The moving of 5,000 graves was one of the Authority's serious problems at Norris, involving studies of death records, getting in touch with widely scattered relatives, and close co-operation between the families, organizations, and churches in the area."

Seven miles northeast of Chattanooga men are pouring the Chickamauga Dam across the Tennessee, which will back the waters of the river for 76 miles. Chickamauga will be less than half the height of Norris Dam, but will be more than a mile long.

A short distance north of the Tennessee-Mississippi line, where the Tennessee River re-enters the State, is Pickwick Landing Dam, completed last year. About the same height as Chickamauga will be, it forms a reservoir 53 miles long to the Wilson Dam in Alabama.

While production of electric power, navigation, and flood control are the leading interests of the T. V. A., it also is establishing recreation areas, promoting soil, wild life, and forest conservation, and is experimenting with fertilizers. Fifty million trees already have been planted in the region controlled by the Authority.

The "yardstick" has cost approximately $250,000,000. When all construction is completed, T. V. A. officials told me, the cost will be twice that.

THE MAGIC OF ALUMINUM

Driving southward from Knoxville to Maryville, you see, above the treetops, the lofty chimneys of one of the world's largest aluminum reduction mills at Alcoa, a unit of the Aluminum Company of America.

From Surinam, British Guiana, and Arkansas, bauxite is shipped to plants in Mobile, Alabama, and East St. Louis, Illinois, for refining. White, powdery aluminum oxide moves into the Alcoa plant at the rate of 700,000 pounds a day and is reduced to metallic aluminum pig.

Pigs are remelted and cast into ingots weighing a ton, and a giant roller presses them into plates one-fourth inch thick and as long and wide as the side of a boxcar.

Sheet aluminum from this mill flies over the air routes of the world; it speeds over the western plains in streamline trains, sails the seas as nonslip flooring of ships, and performs other myriad services after it leaves Alcoa.

Iris, early roses, and spring wild flowers bedecked the road on the way to Ducktown

*See "Rambling Around the Roof of Eastern America" (Great Smoky Mountains), by Leonard C. Roy, NATIONAL GEOGRAPHIC MAGAZINE, August, 1936.

Photograph courtesy Tennessee Dept. of Conservation

HUNDREDS OF QUAIL PENS DOT THE BUFFALO SPRINGS FISH AND GAME PRESERVE

How to keep wild fowl wild is a problem at Rutledge. Breeding experiments are being conducted to prevent the birds from becoming domesticated while in captivity. When released in the spring, they must be able to forage for themselves. Each pen holds two pairs of laying quail. When completed, this farm will produce 100,000 quail and 5,000 wild turkeys annually. A fish hatchery is also provided in the plan.

Basin. A few miles below Etowah a sign marked the beginning of the Kimsey Highway, "Ducktown 38 miles."

"Over the crest of the Appalachians," it should have continued, I thought. The graveled highway led through a flat farming region for a short distance and then plunged into the beautiful gorge of the Hiwassee River. Swift waters, recently muddied by heavy rains, swirled around numerous wooded islands.

Two young forest rangers on Sassafras Knob invited us to view the mountains from an 85-foot tower. From above the surrounding treetops forest-swathed mountains rose and fell to the west as far as the eye could see.

Then, turning eastward, we gazed upon the Ducktown Basin below—a vast area of low, naked red hills gouged by many years of erosion. In the center was Ducktown; Copperhill, the metropolis, was hidden in smoke from a smelter (page 559).

THE FINDING OF COPPER

Nearly a hundred years ago prospectors found copper in the Basin. Only horse and bullock teams were available to haul ore, yet some of the early diggings were shipped all the way to Wales for smelting. The

first local refining was done in open furnaces with timber from the Basin's rolling hills for fuel. The hills were rapidly denuded of big trees, and erosion and sulphurous fumes from the furnaces destroyed small vegetation.

Thirty years ago a method was discovered of making sulphuric acid from the destructive "smoke" of the furnaces, and a destroyer of plant life in the Basin became a major support of human life there. Now the mills of the Tennessee Copper Company are operated on the basis of orders for sulphuric acid.

More than half a million tons of ore are dug out of the Basin annually. Men were blasting and digging copper ore nearly a half mile down under the surface of the Basin as molten copper poured from a huge converter to be made into 300-pound pigs for a New Jersey refinery. Impurities in those pigs amount to only one per cent; about ten cents' worth of the "impurities" in a ton of pigs is gold (Plate IV).

At Cleveland a sign atop a factory building read "World's Largest Manufacturers of Clothing from Raw Wool to Finished Garment." Inside, uncleaned fleece was sucked into a maze of machinery, made into thread, dyed, woven into cloth, and emerged from a sewing room as complete men's topcoats and suits.

Across the street stoves from tiny woodburners to huge electric models begin their existence in a molding room, and in the shipping room were stenciled on crated stoves the names of dealers in St. Louis, Denver, Buffalo, and Mexico, D. F.

When in Chattanooga you are seldom out of eyeshot of Lookout Mountain. The famous landmark runs north for some 80 miles before it abruptly ends here. Its contour is in striking contrast to the mountains of East Tennessee, which are thickly wooded from base to summit except where a mountaineer has carved himself a corn patch. Lookout rises gently from its base, then mounts in sheer rocky cliffs to a wooded plateau.

Throughout the year visitors read markers on trails and highways relating the movements of troops during the siege and Battle of Chattanooga (Plate VI).

Some stop to play on a pioneer Tom Thumb golf course that helped start a popular amusement. Some stroll, and now and then squeeze through the fascinating "streets" of Rock City, a tract of weird sandstone formations. Some drop more than 200 feet into the earth by elevator to a subterranean trail flanked with grotesque stalagmites and stalactites. It leads to a huge underground room from the domed ceiling of which Ruby Falls drops for 145 feet to the floor while a guide plays colored lights on the sparkling stream.

A tiny settlement was infant Chattanooga slightly more than a century ago. It grew to be a flourishing town with a railroad when the War between the States began, and later Federal troops occupied it for two months after the Battle of Chickamauga.

Today there is little evidence of the dark days of the siege. Men from the North who remained there and men from the South who belonged there united to rebuild Chattanooga.

BOILER TUBES FOR THE WORLD

It manufactures more than 1,300 kinds of products. In a mammoth steam-boiler plant men search for flaws in huge boiler tubes with the aid of a 400,000-volt X-ray machine. These workers have built boilers that help keep the machinery of a Detroit automobile factory going and produce light for many of the larger cities of this country and in South America, Australia, China, and the U. S. S. R.

Passing through the aisles of a hosiery plant, I saw deft fingers tending the whirring machinery that produces 2,200 dozen pairs of full-fashioned women's silk hosiery in a day.

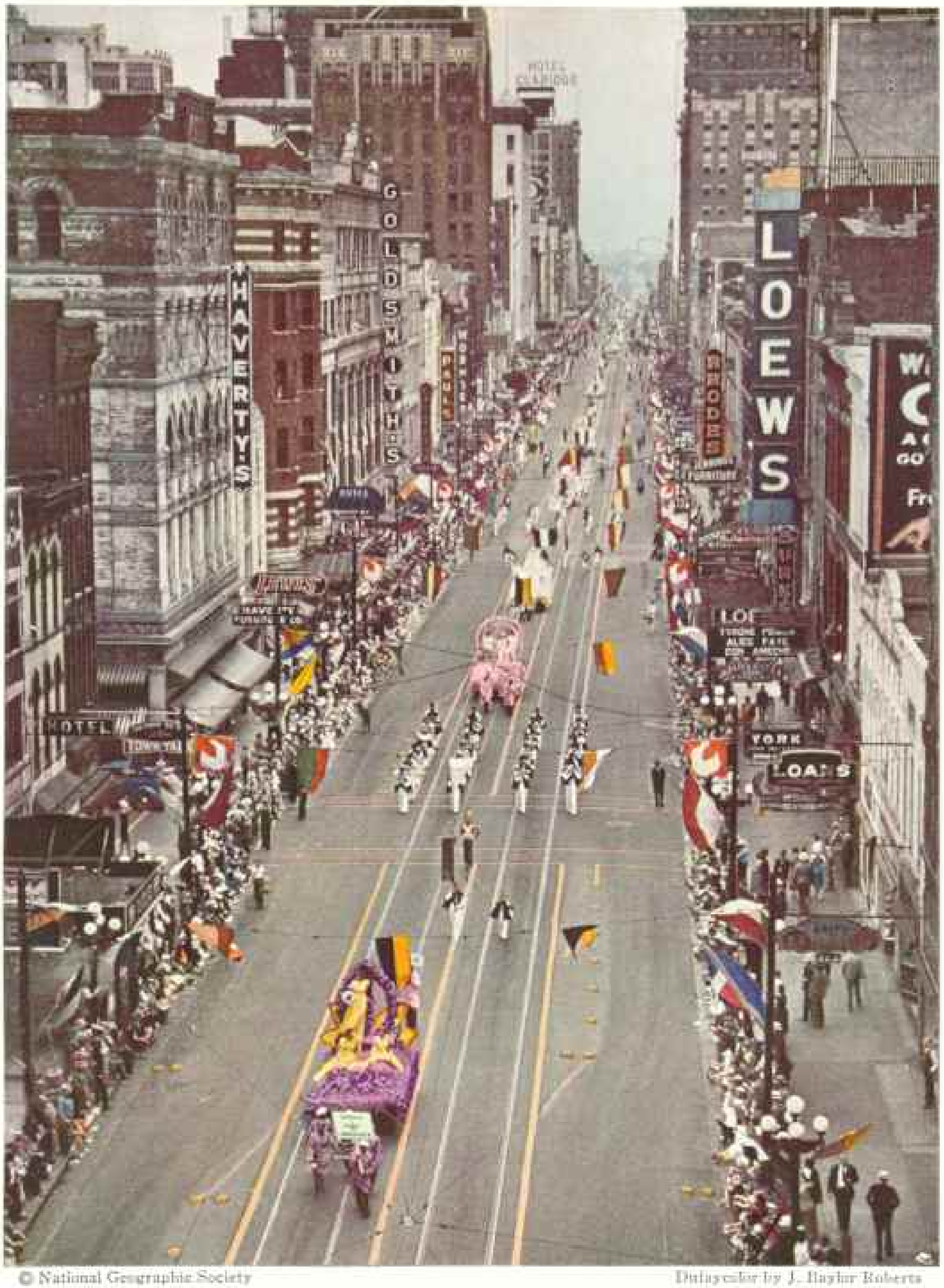
"We get our raw silk from one area in Japan," said the manager. "This makes for uniformity, we think."

"How much silk is used in a pair of hose?" I asked.

"About seventy-five miles of cocoon silk," he said. Japanese silk workers must therefore produce about 1,980,000 miles of silk from cocoons to supply a Chattanooga plant for a day.

All the way from Bristol to Chattanooga, one is impressed with the thickly wooded mountains that form the lofty wall between Tennessee and North Carolina.

From the Great Smoky Mountains National Park northeast to Virginia, and from the park southwest to Georgia, the mountains form the Cherokee National Forest. Excellent highways lead to its beautiful mountain vistas, to sparkling waterfalls, scenic cascades, and comfortable camping grounds.



 Dufaycolor by J. Baylor Roberts

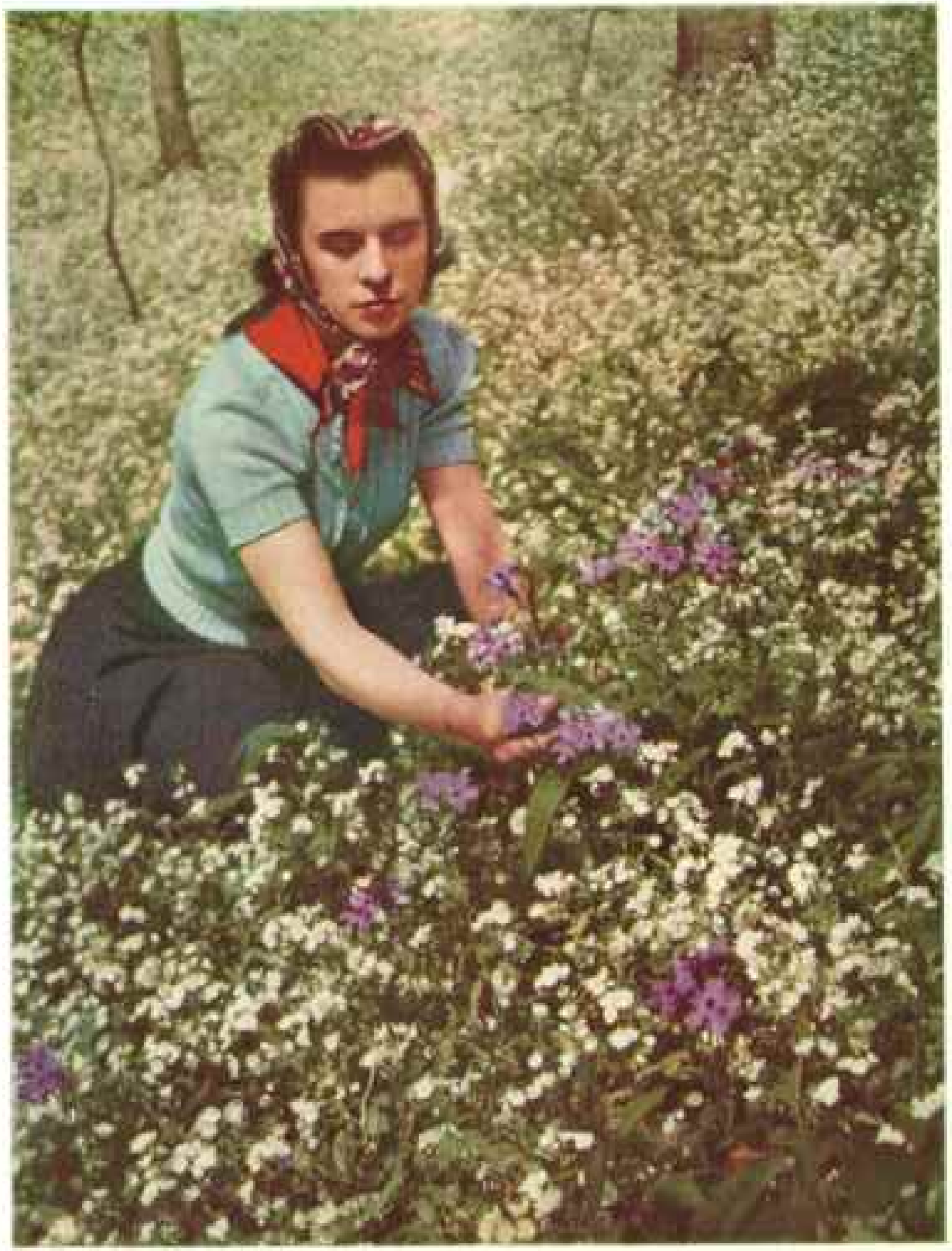
BUSY MEMPHIS TAKES TIME OUT TO HONOR KING COTTON

For four days in May the fleecy fiber of southland fields rules this Mississippi River metropolis with parades, pageants, and exhibits. First held in 1931, the Cotton Carnival is rapidly becoming one of America's most popular annual celebrations. While the white folk celebrate, Beale Street rings with merriment as negro Memphis puts on its annual Cotton Pickers' Jubilee.

Dufaycolor by J. Baylor Roberts

CRIMSON CLOVER ENRICHES TENNESSEE LANDSCAPES IN FERTILITY AND COLOR

It revives areas starved by careless farming and increases land values. This field is near Winchester, where European clover was first sown in 1892.



PHACELIA CARPETS A HIGHLAND GLEN

Because of the varying altitudes, plant life native to regions from southern Canada to Georgia thrives in the Great Smoky Mountains National Park.

Dufaycolors by J. Baylor Roberts

COLOR CHEMISTS MATCH HUES OF TENITE AT KINGSPORT

Out of this molding composition, made by treating cotton with acids, fountain pens, combs, costume jewelry, and many automobile accessories are fashioned.

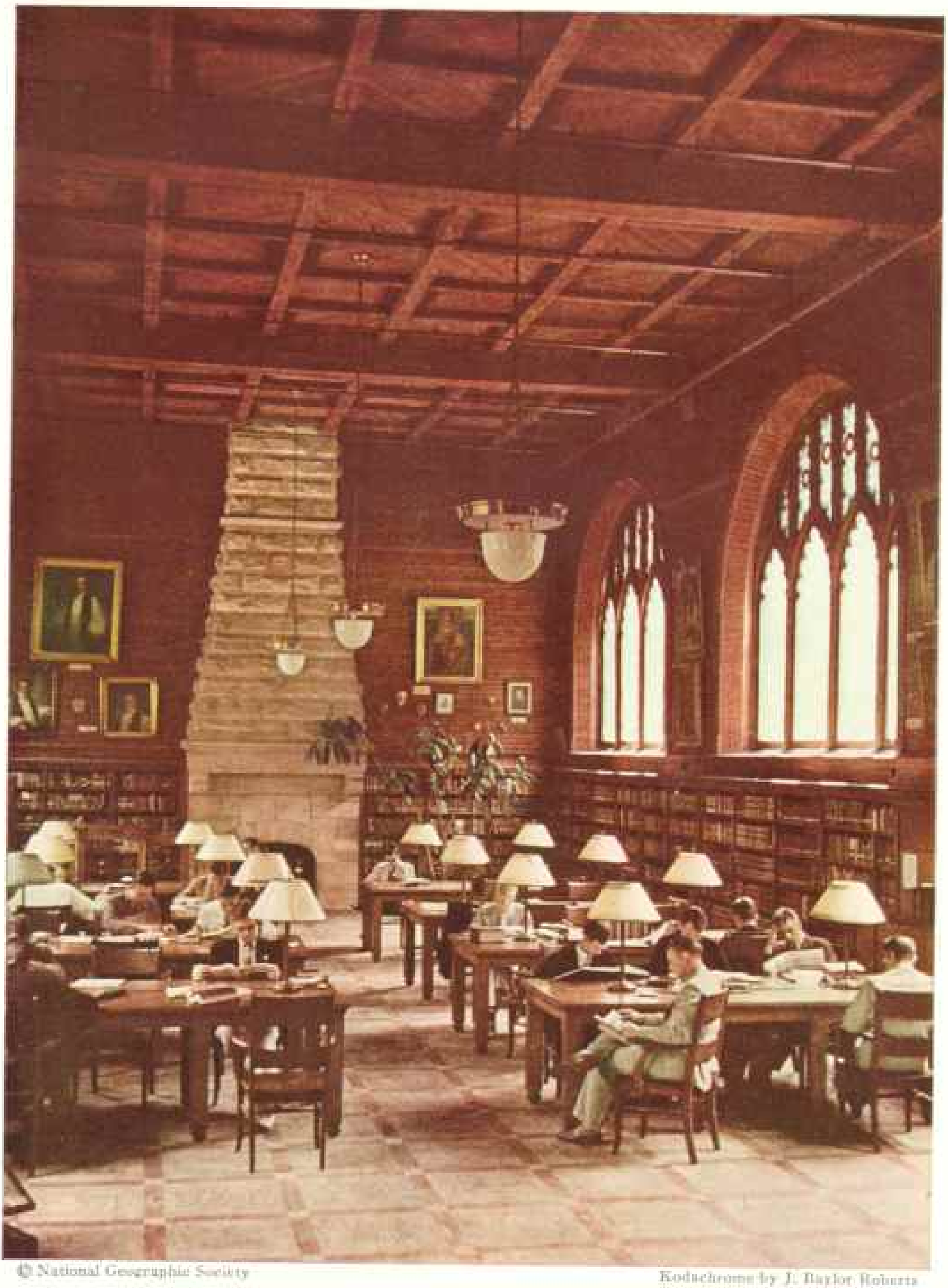
ART STUDENTS APPLY BEAUTY TREATMENTS TO TEXTILES

With stencils and special dye compounds, adept hands transform ordinary cotton cloth into gay napkins, card table covers, tea sets, scarfs, and aprons at the Memphis Cotton Carnival.

 Kodachromes by J. Baylor Roberts

"PIG" INSPECTION IN DUCKTOWN BASIN

More than a half million tons of copper ore are mined here annually. The molten metal pouring from the ladle in this Copperhill mill is 99 per cent pure. Gold is one of the "impurities." Waste fumes which formerly destroyed vegetation in the basin now are the source of sulphuric acid.



 Kodachrome by J. Baylor Roberts

SEWANEE'S AIR-CONDITIONED LIBRARY HAS 60,000 VOLUMES

High up in the southern reaches of the Cumberlands the University of the South (Sewanee), controlled by the Protestant Episcopal Church, has been training young men for 82 years. During the War between the States it was destroyed down to its cornerstone and was rebuilt largely by funds from Great Britain. Within fifteen minutes' drive is Monteagle, for more than fifty years a mountain resort and cultural center. The largest Chautauqua in the South is held here in a huge auditorium during the summer months.

Kodachrome by J. Baylor Roberts

VISITORS PEER INTO HISTORY FROM LOOKOUT MOUNTAIN

Decisive battles in the War between the States, described on the plaques (left), took place within this panorama. On the slopes below, Federal and Confederate soldiers fought hand to hand. In Chattanooga (right background) Northern troops were besieged for two months, until the arrival of Grant and Sherman. In this photograph three bends of the Tennessee River are visible.

Kodachrome by Tennessee Dept. of Conservation

SHEEP BROWSE AMONG CLUMPS OF RHODODENDRON ATOP ROAN MOUNTAIN

Bare spots on the mountains beyond are pioneer homesteads. Some are abandoned and are rapidly returning to the forest whence they came.

 Kodachrome by J. Baylor Roberts

HIGHEST IN EASTERN UNITED STATES, FALL CREEK FALLS DWARFS SPECTATORS ON ITS RIM

This broad crystal ribbon sweeps over a precipice 90 feet higher than mighty Niagara. From the craterlike basin the water dashes down the Cumberlands through a gorge 300 feet deep. It is in one of the three woodland areas reserved by the State as a camping ground for underprivileged children.

Crossing the Tennessee River at Chattanooga, I drove northward for 30 miles along the base of the Cumberland Mountains to Dayton. In a drugstore I sat at a small round table in the center of which a sunken glass-covered sign read: "At this table the Scopes evolution case was started."

John Thomas Scopes, a teacher in the local high school, and a few fellow townsmen met at the drugstore for a friendly, informal discussion. Someone announced that a nationwide "liberal" organization sought to test the legality of the Tennessee anti-evolution statute. A textbook that was generally used throughout Tennessee was singled out for the test case.

"Scopes volunteered to be the defendant in the case," explained the proprietor. "Scores of newspaper men descended on the town and every day thousands of visitors added to the excitement."

Only a few blocks from the old courthouse is the large frame dwelling where William Jennings Bryan, defender of the anti-evolution law, lived during the trial, and died.

In less than an hour out of Dayton, we passed through Pikeville to the Cumberland Plateau. Sewanee, where the University of the South has occupied vast acres on the plateau for 82 years (Plate V), Monteagle, summer resort and chautauqua, and the regions along U. S. Route 70 between Knoxville and Nashville long have been accessible. The remainder of the plateau, for the most part, was not opened by good roads until recent years.

The waters of Fall Creek Falls, highest in the United States east of the Rockies, spill over a 256-foot rocky precipice and swirl through a sheer, rock-walled gorge 300 feet deep.

Here is one of three areas in the State being developed as camping grounds for underprivileged children (Plate VIII).

COSMETICS, BUT NO TELEPHONES

One county in the Cumberlands has no telephone, others have only a few; yet in many miles of travel I met no mountain family beyond reach of a village where store clothes were available. Overalls are worn by most of the men, but near Spencer even the overalls had been abandoned for ready-made suits, and girls' complexions and lips showed that cosmetics have arrived.

Near Spencer I visited Aunt Violet Walding, 75 years old, mother of seventeen children, occupying a new cabin. The old cabin, "sixty-five years old but leakin' turr'bly," still stood, a few feet from the new abode (page 560).

The new cabin is larger, but it is modeled along the same lines—a combination living room and bedroom and a small kitchen attached. The walls and ceiling were papered with pages from magazines "to keep the wind out." Aunt Violet told me how her sons and "datters" were scattered from "Ideeho" to "Fleridy."

As I admired the scenic beauty of the Cumberlands, beneath my feet lay untold wealth in coal deposits. Coal is the State's most abundant mineral, and miners are taking four million tons annually. Veins lie under more than 4,500 square miles of the mountain area from the Kentucky to the Alabama border.

CEDARS FROM A NEW LEBANON

Near Wartrace I picked up a youthful hitchhiker, a farmer boy.

"Why do the farmers in this region use metal fences rather than the usual rail fences?" I asked him.

"The pencil companies over in Shelbyville buy all the wood fences that's cedar to make pencils with," he said.

That afternoon in Shelbyville I saw a painting machine "spit" pencils on a large, round drying disk (page 564).

"The coats of paint on a pencil depend on the color," the operator said. "A light-colored pencil requires more coats than a dark-colored one." A white pencil takes 12 coats, a yellow one 8, but a dark-red one has only 6.

A plant foreman explained the use of the cedar fence rails. "We buy cedar rails and cedar logs from the old mountain cabins," he said. "We also use western cedar, but we find Tennessee cedar more suitable. Cedar is becoming so scarce here that the State has set aside an area near Lebanon for the conservation and propagation of cedar trees."

The scarcity of cedar is not surprising when one learns that three large pencil factories in Shelbyville produce more than 100,000,000 pencils each year.

Leads for pencils also are made here. One plant imports clay from Germany, Japan, and Georgia; graphite from Ceylon and Mexico; gums from Spain and Iraq, and waxes from South America and Japan, to produce 200,000,000 leads annually for

NET REPLACES PARACHUTE WHEN A FIREMAN "BAILS OUT"

Jumping from an 8-story tower is a feature of intensive training of Memphis firemen. Fire department efficiency last year won for the Mississippi River metropolis first place in a national fire waste contest.

wood pencils and as many for mechanical pencils. My informant added, "And we also have a plant that makes enough cord for automobile tires in a year to wrap around the world at the Equator twenty-two and a half times."

Driving among the low hills of the Central Basin of Middle Tennessee, one sees larger farms and straighter highways than in East Tennessee. The size of the farms had much to do with the sympathies of Tennesseans in the War between the States. In East Tennessee were Federal sympathizers because the slave question meant little to them. But in Middle and West Tennessee slave labor was general on the big plantations. Naturally the plantation owners cast their lot with the Confederacy.

Here cities and towns reveal large rambling homes with wide verandas and spacious lawns shaded by trees of huge girth and luxuriant foliage. Yet around the corner there is always Main Street, animated by day but quiet and deserted shortly after dark except when a movie house disgorges its last-show customers.

McMinnville's ornamental shrubs and trees, fruit trees, and berry plants were shipped into 46 States last year, and even adorned landscapes in China, France, England, Panama, and South Africa.

"In 1935 we sold 150,000 peach trees to orchardists in Maryland," a nurseryman told me. "Only three weeks ago we sent 10,000 witch-hazel trees to France. We had one order for 840,000 pines for planting in several States. The largest tree shipped was a holly, 23½ feet high, with a trunk 10 inches in diameter."

BASEBALLS FOR ACRES OF DIAMONDS

Six hundred dozen baseballs are produced daily in Tullahoma, and orders at the plant show that our national sport is popular in Canada, England, France, China, Mexico, Brazil, the Philippines, Cuba, and Central America.

Covers are sewn on by hand, many by men and women in near-by rural homes who augment their farm incomes in their spare time.

Winchester perches in a bed of crimson clover. The soil-building herb, sown generously over the southern regions of Middle Tennessee, has added millions of dollars to the value of Tennessee crops since it was first introduced nearly a half century ago (Plate II).

Citizens of Pulaski would rather talk about the birth here of the original Ku Klux Klan, the hanging in its streets of Sam Davis, who preferred death to divulging Confederate military secrets, and the building of a new shoe factory, although clover also blankets acres of its near-by fields.

Photograph courtesy Tennessee Dept. of Conservation

BASEBALLS MUST BE COVERED BY HAND

Six hundred dozen balls are produced by a Tullahoma manufacturer daily. Many are covered by Tennessee farm wives in their spare time; experts can sew six in an hour. An uncovered baseball of good quality is a sphere of wool yarn tightly wound about a cork or rubber core. Horsehides for covers are imported from France, Germany, and Belgium. Finished balls are shipped to every State and eleven foreign countries, including China, the Philippines, Brazil, France, and Mexico (page 578).

Nine years ago a wealthy Chicago candy manufacturer sought a site for the breeding of show horses. From an airplane he looked down upon a 3,000-acre tract of rolling hills in Giles County and chose it for his farm. Show horses remained the owner's chief interest until he later switched to thoroughbreds. The colors of Milky Way now are familiar on American tracks.

More recently, cattle have been added to Milky Way interests. To the markets of Boston, New York, and Philadelphia more than 6,000 steers are shipped annually. The farm has pioneered in the importation of cattle from Texas, feeding them scientifically and shipping them to northern markets as prime beef.

A hundred men are employed on the farm. There are 60 dwellings, 30 horse and cattle barns, 50 miles of fences, a corncrib that holds 90,000 bushels, and a five-eighths-mile race track.

In Maury County you are in the heart of a region which ranks Tennessee second only to Florida in United States production

Photograph by Wiles

IN THIS PEACEFUL SETTING "OLD HICKORY" SPENT THE TWILIGHT OF HIS STORMY LIFE

The Hermitage, near Nashville, stands today as it was when Andrew Jackson died in 1845. On his plantation the seventh President built three homes: a log cabin which still stands; a brick house gutted by fire in 1834; and then this columned mansion (Plate X and page 584).

TENNESSEE IS IN THE LAND OF COTTON, BUT CORN IS ITS LEADING CROP

This parade to the gin at the close of the day is a frequent scene in West Tennessee, where most of the State's cotton is produced. Corn clings to steep mountain slopes and flourishes in the broad valleys of eastern sections.

REELFOOT OARSMEN FACE FRONT, PULL BACKWARD, AND MOVE FORWARD

Submerged tree stumps obstruct the lake and often puncture the light fishing boats (Plate XIII and page 584). So that he may see where he is going, the guide uses an ingenious rowing device which reverses the action of the oars. When he leans back pulling on the handles, the oar blades stroke in the same direction, thus propelling the boat forward (to the left).

of phosphate. You see huge steam shovels biting into phosphate rock. Tank cars of elemental phosphorus move out of Columbia to consumers who use it in the manufacture of matches, steel, fertilizers, and foodstuffs, including sugar and baking powder.

MULE IS KING FOR A DAY

Many farms in Tennessee have gone modern with motor-driven equipment, but the majority of farmers have not yet displaced the legs of the mule with pistons.

"For more than a century Columbia has been the meeting place of mule breeders and buyers," an editor explained. "About seventy-five years ago the first Monday in April was set apart as Mule Day."

Last year some 30,000 people from all parts of the State watched a mule play the lead in a parade. They applauded the long-eared animal that was crowned king for the day, and, in the evening at the country club, young Columbia introduced the "mule trot" (page 594).

A group of patriotic women keep open the old Polk home here where visitors enjoy viewing the mementos of our eleventh President (Plate XVI). During Polk's administration the Mexican War was fought and the Oregon Question was settled. Because 30,000 Tennesseans volunteered when Polk called for 2,800 to fight in the Mexican War, the State is called the "Volunteer State."

Near Murfreesboro the highways are flanked with broad acres of dairy farms where contented cattle graze on lush bluegrass. In the city you see milk-canning plants and hear men talk of their herds that have made Rutherford County a leading dairy region of the South.

Murfreesboro has the only red cedar bucket factory in the United States. Samples of cedar buckets range from the tiniest souvenir to the world's largest bucket, a 2,000-gallon container originally displayed at the Louisiana Purchase Exposition in St. Louis.

Near Murfreesboro the Stones River National Cemetery is a mute reminder of the result of three days of terrific fighting during the Battle of Stones River. It is the resting place of 6,177 of the 13,000 Federals

THERE'S ONLY ONE JUG, BUT IT'S CALLED A "JUG BAND"

Torrid tunes emanate from this second-floor-back "studio" in Beale Street, Memphis. Now and then musicians emerge for an impromptu curbstone concert where children, stirred by rhythm, jig and gyrate oblivious of spectators. Blowing into the jug at an angle produces a booming bass (page 593).

killed in battle. Two thousand of them are "unknown soldiers."

ATHENS-ON-CUMBERLAND

Long before you reach Nashville, highway signs invite you to the "Athens of the South."

From my hotel window I got my first glimpse of Nashville as a reminder of the city of classic Greece. Across Memorial Square rose the State Capitol, whose pillared portico has welcomed the State's lawmakers for 86 years. Also facing the square is the War Memorial Building, a Grecian temple on whose walls are inscribed in bronze the names of Tennessee's World War dead (page 562).

In Centennial Park a reproduction of the Parthenon inspires students of architecture, while visitors are fascinated by the art gallery within its sturdy walls (Plate XIV). Ten colleges and universities make Nashville a leading educational center of the South.

The founding of Vanderbilt, Professor G. R. Mayfield said, "reads like a romance. In the early seventies Bishop Holland McTyeire and his co-workers in the Southern Methodist Church planned an institution of learning. During a visit to New York he stayed in the home of Commodore Cornelius Vanderbilt, who expressed to the Bishop a desire to do something to benefit education in the South. One morning the Bishop found a check for half a million dollars along with his eggs and bacon.

"When the university was established there was not a preparatory school in the South with standards for admission to Vanderbilt. The University led in the organization of many splendid preparatory schools and thus raised the standard of education in the South."

Fisk University in Nashville, widely publicized by its famous Jubilee Singers, has for years been ranked high among negro educational institutions in this country.

Down on the banks of the Cumberland, in the shadow of busy warehouses, a rugged log reproduction of Fort Nashborough recalls Nashville's beginnings. Standing in the small enclosure, I visualized the happiness of James Robertson and his small band of empire builders when John Donelson and

his party on the barge *Adventure* arrived from eastern Tennessee after several months of hardship in navigating the Tennessee, Ohio, and Cumberland Rivers. Incidentally, Rachel, the daughter of John Donelson, was to become the wife of Andrew Jackson.

Nashville-made barges ply the Cumberland, Ohio, and Mississippi Rivers. In modern factories you see men and women making shoes, hypodermic needles, false teeth, fertilizer, stoves, cosmetics, insecticides, suspenders, vending machines, floor wax and soap, chewing gum, and golf-club shafts. Publishers of religious literature here produced 117,136,629 pamphlets and tracts and 1,300,000 hymnals and religious books in a single year.

At near-by Old Hickory, the du Pont Rayon Corporation, occupying a huge plant built during the World War to make gunpowder, contributes rayon and Cellophane to Nashville's generous list of manufactured products.

NASHVILLE'S IRIS FESTIVAL

Nashville gardens are world-famous for their varieties of iris, the State flower of Tennessee. Each year in May the city holds an Iris Festival and thousands of visitors see the spectacular garden displays and the civic ceremonies (Plate XI).

I drove between spotlessly white fences enclosing flocks of browsing sheep. A sign directed me to the Hermitage, the home of Andrew Jackson (Plate X and page 580).

Just inside the gate I could see the lower portions of the large pillars of the Hermitage portico, the rest of the mansion hidden behind tall cedar trees beneath which the master of the Hermitage enjoyed walking.

The peaceful setting and hospitable atmosphere seemed unlike the fiery leader who once occupied it. Yet, as I entered the great hall, I recalled how Jackson played his flute so his neighbors' children might dance on the highly polished floor.

Furniture, draperies, and lace curtains, portraits of the general and his wife, a pianoforte, bric-a-brac, and several hundred books are in the mansion as the general left them. His lounging robe drapes a chair beside his big four-poster bed.

Beside the mansion is the garden planned and cared for by the mistress of the Hermitage. On the eve of a celebration in Nashville of Jackson's election to the Presidency, that garden became the burial place of Rachel. Beside hers now is the tomb of Old Hickory, and, near by, that of Uncle Alfred, the general's faithful body servant.

I have mentioned only three names Tennessee has contributed to America's hall of fame—Andrew Jackson, James K. Polk, and Andrew Johnson. To these should be added Sam Houston, first President of the Republic of Texas and later governor of the State of Texas; David Glasgow Farragut, first admiral of the United States Navy, and David Crockett, of Alamo fame. Cordell Hull, the Secretary of State, is a native of Pickett County, Tennessee, and Alvin York, a hero of the World War, lives near Jamestown.

TOBACCO FOR EUROPEAN SMOKERS

Ninety-nine per cent of Clarksville's 10,000 residents are native born. The city now is a leading market of the United States for dark-fired tobacco. Between 25,000,000 and 30,000,000 pounds of tobacco change hands here during the annual sales.

"We shipped tobacco to Italy eighty years ago, and other European countries have since become good customers," an editor told me. In factories here you see tobacco ground into snuff, leaves greased the way Mexican farmers like it, and nicotine for use in insecticides made from cheap grades and stems.

In East and Middle Tennessee farmers are partial to raising corn, the State's leading farm crop. Corn also thrives in West Tennessee, but when I arrived there I felt that I was entering the Deep South without changing latitude, for cotton predominated in the fields on either side of the highway (pages 563 and 581).

Reelfoot Lake is startling at first glance. Its site was a forest when, in 1811, during an earthquake, the earth rose, shivered, and fell, and the waters of the Mississippi ran backward, sweeping into the sunken area (Plate XIII and page 582).*

Clusters of cypress and willow thrust their full-leafed boughs above the surface of the water, and straggling groups of naked stumps recall once healthy forest giants. Scores of herons and egrets and myriad other birds feed here. Because the lake is on the Mississippi flyway and food is so abundant, ornithologists find here a bewildering variety of winged creatures.

* See "Reelfoot—An Earthquake Lake," by Wilbur A. Nelson, NATIONAL GEOGRAPHIC MAGAZINE, January, 1924.

 Kodachrome by J. Baylor Roberts

ON HOMEMADE FLUTE, PAN PLAYS TO HIS HIGH-SCHOOL DRYAD

Outing clubs are numerous in cities and towns near the Great Smokies. These students from Knoxville are out for a Saturday's hike along mountain trails. Bad weather failed to dampen their spirits; it was raining when the picture was taken.

Dufaycolor by J. Baylor Roberts

PILGRIMS TO THE HERMITAGE STUDY GREEK MYTHOLOGY ON FRENCH WALLPAPER ANDREW JACKSON CHOSE HIMSELF

Young neighbors danced in the hall to the tune of "Old Hickory's" flute. Rooms are furnished just as the hero of New Orleans left them.

 Dufaycolor by J. Baylor Roberts

IRIS IS THE TENNESSEE STATE FLOWER

In May these blossoms fleck private lawns and public parks of Nashville and are honored by a city-wide celebration. Development of new species is a hobby of many residents of the Tennessee capital.

Kodachrome by James E. Thompson

HIKERS PAUSE FOR FOOD AND FROLIC AT ABRAMS FALLS

Such clear streams, teeming with trout, dash down the slopes of the Great Smoky Mountains National Park into the Tennessee and ultimately flow into the Gulf of Mexico.

Kodachrome by J. Baylor Roberts

THE BEARDED "SWAIN" IS 84; HIS PARTNER, 16

In the Cumberlands store clothes have taken the place of homespun, and mountain girls are becoming as familiar with cosmetics and curling irons as their city sisters.

Kodachrome by J. Baylor Roberts

SWING HAS NOT DISPLACED OLD MOUNTAIN MUSIC

This songbird of the Tennessee highlands sings: "Yonder comes puppy with sack on his back, ba-by. Got all the crawdads (crawfish) he can pack, honey, baby of mine."

Dufaycolor by J. Baylor Roberts

"SATURDAY EVENING" IN THE CUMBERLANDS

Blond hair and blue eyes indicate the Anglo-Saxon strain among descendants of Tennessee pioneers. This family, near Spencer, has deserted its log cabin for a new home of milled lumber.

Kodachrome by Tennessee Dept. of Conservation

CYPRESSES SHADE ANGLERS ON REELFOOT LAKE

An earthquake shook the Mississippi Valley in 1811, sinking this site. Then Old Man River flowed backward, flooding the area. Abundant marine vegetation makes the lake a natural fish hatchery.

Kodachrome by J. Baylor Roberts

NASHVILLE, "THE ATHENS OF THE SOUTH," IS A FITTING SITE FOR A REPLICA OF THE PARTHENON

When the Tennessee Centennial Exposition opened here in 1897, the Parthenon, built of laths and plaster, attracted such interest that this permanent structure exactly like the Grecian temple was built in 1911. Australian black swans in the foreground.

 Dufaycolor by J. Baylor Roberts

LUSCIOUS STRAWBERRIES AND A LOVELY QUEEN

In May when the western Tennessee crop is ripe, Humboldt stages a festival in honor of the fruit that is sent by carloads to northern markets. This Queen Hostess of 1938 sits in the cleft of a huge strawberry on a float.

Kodachrome by J. Baylor Roberts

A TENNESSEE HUCKLEBERRY FINN

Proud of his catch of spotted channel catfish in the Tennessee River near Knoxville, the lad is one of thousands of anglers who fish in the State's numerous lakes and watercourses.

 Dufaycolor by J. Baylor Roberts

A FAN OF YESTERDAY FASCINATES FAIR LADIES OF TODAY

Mementos of the life of James K. Polk are preserved in his home at Columbia. The fan, which belonged to Mrs. Polk, is embellished with carved ivory miniatures of the Presidents from Washington to Polk. The top of the table in the foreground is black Egyptian marble inlaid with the coat of arms of the United States and thirty-six stars, representing the States then in the Union. Portraits of the former President and Mrs. Polk hang on the walls.

Here are more than 60 kinds of fish, many of which are planted in other waters of the State. Bream, lured to a line with live black roach, crappie, and bass, outnumber all others in the fishermen's creels.

All spring and summer the natives guide fishermen. When the fishermen thin out in the fall, there is a wave of duck hunters. A resident of Samburg said he had seen ducks so thick that they "hid out the sun."

Before the State set a limit on the hunting bag, a neighbor brought in 377 ducks in a day and another "can prove that he bagged 286."

Southward from Reelfoot, West Tennessee varies in topography. An area of rich farmland, forest, and sluggish streams, it has scores of miles of highways that resemble those of the flat plainland of Nebraska.

STRAWBERRY FESTIVAL—AND 17 BANDS

I arrived at Humboldt during the annual strawberry festival. The town's main street was ablaze with banners. The first day of the festival nearly 25,000 people saw young West Tennessee, on gay floats, pass in review, and on the following day applauded adult West Tennessee emulating the youngsters amid a riot of color and the music of 17 bands (Plate XV).

Gibson County ranks high in crop diversification. Farmers raise from three to ten different crops on a single farm. The county ships annually about 1,800 carloads of cabbage, 1,500 of tomatoes, 750 of sweet potatoes, and 25 of string beans. And the cotton yield is about 45,000 bales.

A half hour out of Humboldt I drove into Jackson. "Hub of West Tennessee," Jacksonians like to call their city. Five important highways and five railroads meet here. It is the northern railhead for the Gulf, Mobile and Northern Railroad, which runs a famous streamline train, "The Rebel."

In a few hours I visited factories where veneers, store and bank fixtures and church pews, mop and broom handles, skewers and dowel pins, wooden candy sticks, and cottonseed oil employ the city's citizens.

Just across the Jackson city line is Bemis, described as "a town without a mayor, governing body, or jail." Forty years ago Judson Bemis, a successful cotton-bag manufacturer, founded Bemis. The Bemis plant produces weekly nearly a million yards of cloth for cotton bags.

A porter and I had to elbow our way through a throng listening to a 100-piece band to reach the front door of Memphis' Peabody Hotel. It was cotton carnival time (Plates I and IV).

Day and night, from May 10 to 14, athletic events, pageants, visits to gardens, and tours of the city occupied residents and more than 75,000 visitors.

The "lid was off" in Memphis from the time the king and queen of the carnival, with scores of attendants resplendent in colorful costumes, stepped off their gorgeous royal barge at the water front and received the keys to the city, until the grand carnival parade broke up in a din of excitement.

While white Memphis was hilariously enjoying itself, on a less gorgeous scale negro Memphis was staging a cotton pickers' jubilee on Beale Street (page 583). Down the street made famous by W. C. Handy with his "Beale Street Blues" moved a parade headed by a high-stepping dusky band. Then came the royal coach with the negro king and queen of the carnival.

Their formal crowning in Handy Park was the signal to negro Memphis to celebrate. For three days Beale Street was in a happy mood.

In the street, amid the odor of charcoal used in barbecuing pork and the greasy smell of frying catfish, jug bands made junglelike rhythm from washboards, earthen and glass jugs, and saws while pickaninnies jigged and shimmied.

Men still live who recall Memphis as an overgrown river town where bewhiskered gentlemen sat on spacious verandas and talked of plantations, packet boats, and "damyankees."

MEMPHIS COMES OF AGE

The town kicked off its boots caked with Mississippi River mud shortly after the War between the States, systematically improved its health, augmented its plantation income with factory pay rolls, and today looms on the Chickasaw Bluffs, high above tawny Old Man River, as a giant of commerce and industry in the South.

Smooth-worn cobblestone levees recall the golden age of packet boats and gambler dandies, but skyscrapers, broad thoroughfares, spacious parks, both "uptown" and along the Mississippi banks, present a more modern aspect.

The picturesque packet boat has gone and in its place is the twin-screw, oil-burning towboat which can handle more freight

Photograph from Wide World

"WHY DO THEY DO THIS TO ME?"

For 75 years Columbia has celebrated Mule Day, when a strapping five-year-old mule is crowned. To the accompaniment of bands, the mule king is hauled in a royal chariot by twenty of his "subjects" in a two-mile-long parade. As a climax to the celebration, a crown is placed on his head by two lovely ladies (page 582).

tonnage in one trip from Memphis to New Orleans than ten ornate twin-funneled steamers such as the famous *Robert E. Lee* or the *Kate Adams*.

The packets had a capacity of 1,800 tons. Present-day tows move 16,000 tons at one time. Six to eight barges in one tow are not unusual, and such tows carry annually 2,000,000 tons of Memphis freight a year, valued at approximately $140,000,000.

BIGGEST INLAND COTTON MARKET

Memphis is the world's largest inland cotton market. In a broker's office, high up in the cotton exchange building overlooking the Mississippi, I saw row after row of tables piled high with samples of cotton.

In the aisles buyers pulled bits of cotton from the samples, expertly fingered them to determine the staple, and, if impressed, pulled the samples apart and noted printed cards. The cards bore the numbers of the bales, the samples represented, and the warehouses where they were stored.

While sales of such bales are made in Memphis, the bales may never reach there, but move directly from the warehouses to the purchasers, perhaps in Boston, Seattle, Paris, Berlin, Praha, or Tokyo.

In spite of the encroachment of machines on the Tennessee economic panorama, agriculture remains the State's leading industry. There still are 273,000 farms actively producing an astonishing variety of products.

In more than 7,000 miles of travel in the State, I learned that nearly every vegetable and fruit that can be grown in the United States outside the citrus fruit belts thrives here; that an abundance of nearly every mineral necessary to sustain life lies imbedded in Tennessee soil and rocks, and that timber still blankets more than half the area of the State.

GENTLE FOLK SETTLE STERN SAGUENAY

On French Canada's Frontier Homespun Colonists Keep the Customs of Old Norman Settlers

By Harrison Howell Walker

With Illustrations from Photographs by the Author

SAGUENAY, Quebec's northern fringe of civilization, is a rough land of gentle folk.

From glacier-gouged Lake St. John to rocky Tadoussac, the Saguenay River, which gives the region its name, flows through fjordlike country to meet the broad St. Lawrence almost 120 miles northeast of the city of Quebec * (map, pages 598-9).

Montagnais Indians, only inhabitants until a hundred years ago, called it "The Kingdom of the Saguenay." As early as 1535 their stories of gold and copper mines tempted Jacques Cartier to explore the land that he discovered. But the savage Saguenay River, the realm's ancient highway, discouraged him after he almost lost a ship in the treacherous currents.

Survivors of "The Kingdom" have concentrated on the Indian reservation at Pointe Bleue on Lake St. John. Their chief, Joseph Kurtness, chatted with me one day.

"So you're from the States, eh? New York?" he asked.

"No, I'm from Washington, D. C."

"Washington. I used to guide Colonel Theodore Roosevelt on hunting trips up here. I believe he came from Washington."

The chief spoke English well. I asked where he learned it.

"I picked it up when I was in France with the Canadian troops, and then I was a streetcar conductor in Bridgeport, Connecticut, for several years."

INDIANS LIVE IN TENTS ALL YEAR

Most of the reservation's 75 families are engaged in fur trading, the Dominion's oldest industry. The Hudson's Bay Company trading post stakes them to grub and equipment early each autumn when they leave for hunting grounds several hundred miles west and north of Lake St. John. All winter they live in tents, working their trap lines and braving 40-below-zero weather. With spring they return to sell their furs, pay back the trading post, and spend the rest of their money on a few necessaries and many good times. Next autumn they start all over again from scratch.

I found Montagnais Indians living under canvas and in small wooden houses at Pointe Bleue, their summer quarters. One family invited me into a tent where father was shaping a snowshoe frame with a jackknife, mother and daughter were stripping moose skin for laces, and little brown children were crawling over the floor of balsam boughs (Plate XII). I offered tobacco to the man; the woman licked her wrinkled lips. Her eyes twinkled as she, too, filled her pipe.

TRAPPER TAKES TAXI TO WORK

I watched one Indian pack up for his long winter of hunting and trapping. Contrary to custom, he was going alone. Into a hired car he put five 100-pound bags of flour, canned foods, a slab of bacon, a hunk of pork, a tin stove, some canvas, two pairs of snowshoes, a gun and ammunition. A canoe was lashed on top (page 597).

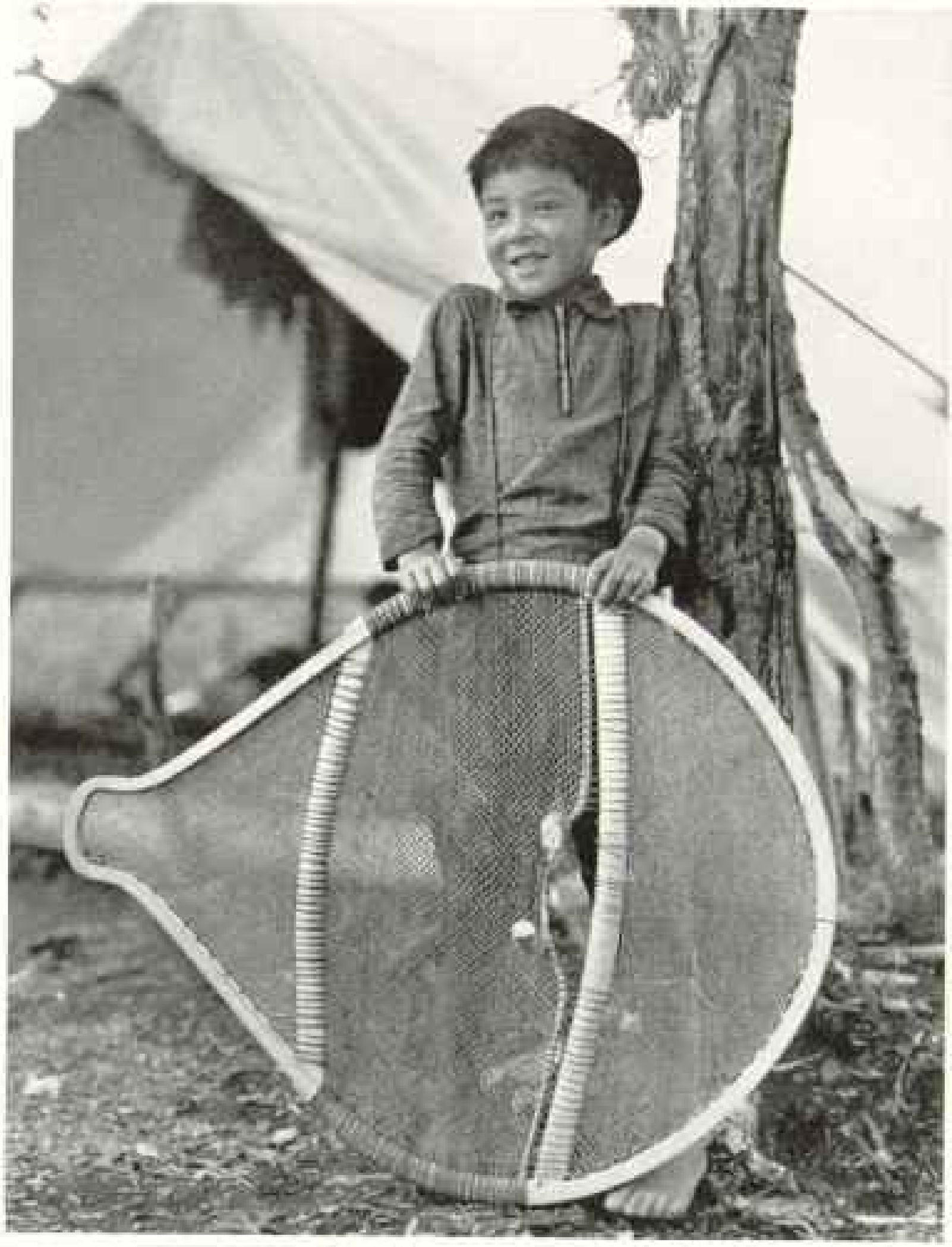
The automobile taxied him round the lake to the Péribonca River. Here he loaded his canoe and started upstream on his long, hard, lonely journey. Each portage meant several trips. Perhaps in two months he would reach his hunting ground. And then his work would begin!

Not until the spring of 1838 did colonization of the Saguenay begin in earnest.

White men from La Malbaie (Murray Bay) sailed up the river aboard the schooner *Sainte Marie* (page 610).

At Grande Baie, about sixty miles from the Saguenay's mouth, they disembarked, cleared land, built log huts, set up sawmills. That autumn their families joined them (Plate II).

* See, in the National Geographic Magazine, "Old France in Modern Canada," by V. C. Scott O'Connor, February, 1935; "Gaspé Peninsula Wonderland," by Wilfrid Bovey, August, 1935; and "Quebec, Capital of French Canada," by William Dow Boutwell, April, 1930.



"DAD MADE THIS SNOWSHOE," SMILES A MONTAGNAIS BOY

Life was hard in a wilderness of long winters and mosquito-infested summers. Their lumber industry was failing, and there was constant talk of abandoning the country.

In 1842 the first colonists sold out completely to William Price, Saguenay's original timber tycoon. The pioneers remained on the land, however, as his employees.

William Price had come to Canada in 1810 to buy masts for British ships. He saw the timber possibilities of the Saguenay, and so left his London lumber company to establish his own sawmills in eastern Canada. This was the beginning of Price Brothers and Company, Limited, now known all over Quebec.

Price was more than a business man. He was an adventurer and colonist. With his sawmills up and down the Saguenay he did more than any other one man to open the country. Men with their families moved in as his employees. At the same time they came as colonists.

On a hill behind Chicoutimi, overlooking Saguenay River, a monument is inscribed:

> In memoriam
> William Price
> Died in Quebec
> 14 March 1867
> Aged 78 years
> "Le Père du Saguenay"
> (The Father of the Saguenay)

PIGS AND COWS FLY OVER WILDERNESS

I had reached the Saguenay from Quebec by good gravel roads along the St. Lawrence River's north shore.

My map showed a highway encircling Lake St. John's 100-mile shore. So I started out in a northwesterly direction from the Indian reservation at Pointe Bleue to make the tour.

In St. Félicien I stopped a boy and his dog-drawn milk cart.

"Can you tell me where Mr. Harvey St. Martin lives?" I asked, fingering my letter of introduction.

"Yes, monsieur," he answered quickly.

Commanding his furry dog to lie down and wait, he led me to Mr. St. Martin's house.

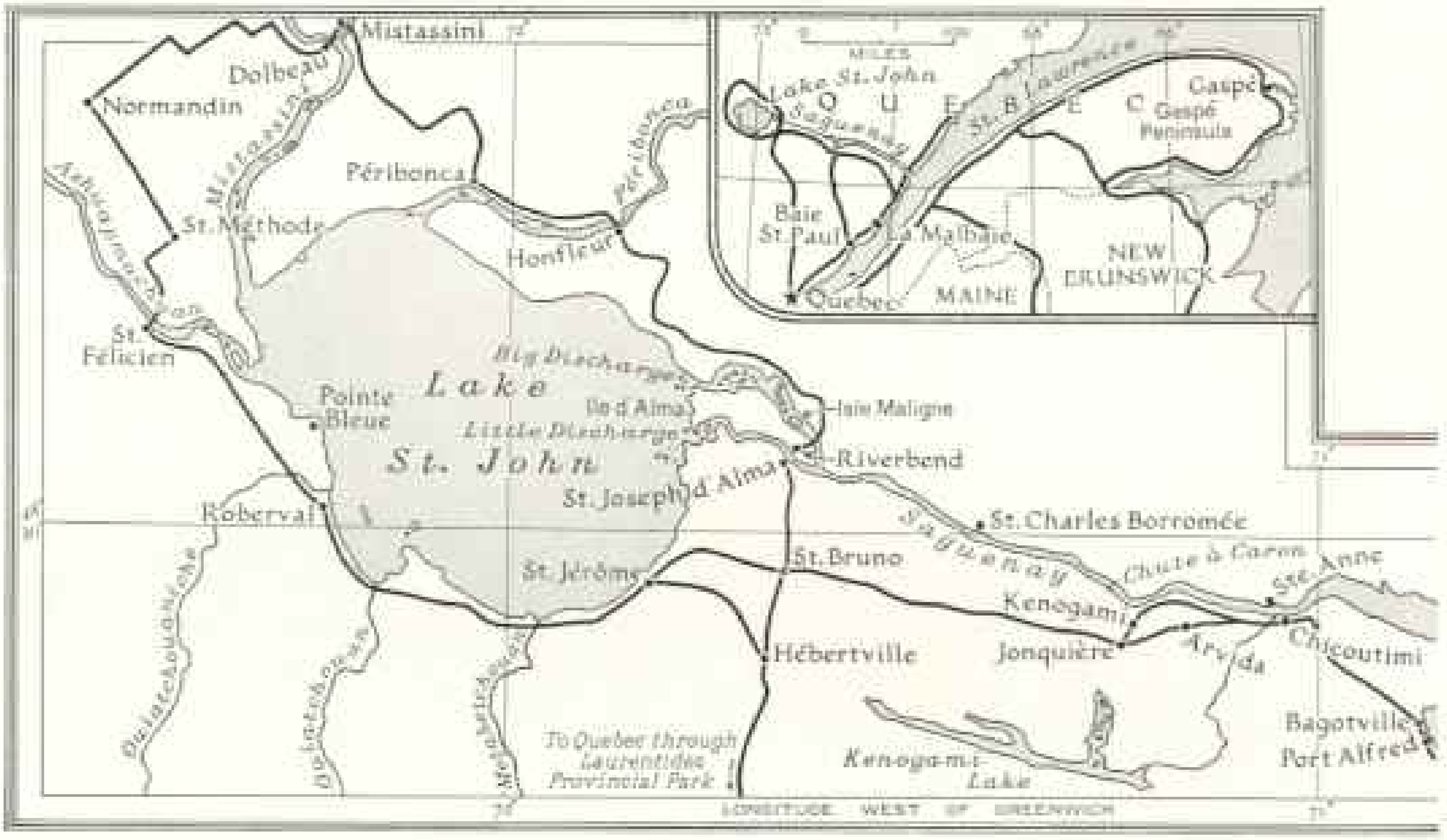
Harvey St. Martin started the operation of an airport for flying passengers and baggage to Lake Chibougamau, a mining district 120 miles northwest of Lake St. John.

A 1938 TRAPPER BEGINS HIS JOURNEY TO THE NORTH IN A TAXI!

Friends of a Montagnais hunter and clerks of the trading post at Pointe Bleue help him load up for a long winter. The automobile will carry him about 50 miles to a river where he will transfer to a canoe, then paddle several hundred miles to the hunting grounds. Hudson's Bay Company stakes the Indian to grub and equipment which he pays for with furs in the spring.

PROUD OF THEIR WHISKERS, PLEASED WITH THEIR PIPES

Dressed in their best clothes, two Grande Baie veterans discuss the centennial.



TO THE ST. LAWRENCE THROUGH "THE KINGDOM OF THE SAGUENAY" FLOWS THE FJORDLIKE RIVER THAT GIVES THE REALM ITS NAME

After circling Lake St. John, the author canoed down the Biz Discharge in the wake of Montagnais Indians to Chicoutimi. From here, over unmapped roads which were mere ruts, he motored along the north shore to isolated Descente des Femmes to live for a time with the *habitants*. Visiting Grande Baie for the centennial celebration, he continued to L'Anse St. Jean where he stayed in a farmhouse. When a road from Tadoussac abruptly ended, he made a "forced lodging" in a small, hospitable home on the banks of the Ste. Marguerite River.

Unless you choose to walk with a pack on your back, there is no other way to reach this region.

St. Martin's planes transport everything from eggs to hardware—flour, sugar, bacon, lard, gasoline, oil, grease, and steel rods. He told me of a trip with three live pigs. Another time he flew a plaintive cow in.

Besides mining concerns at Chibougamau, the planes supply the Hudson's Bay Company at James Bay, fire rangers, and fishing and hunting expeditions. They also take volunteers to forest fires.

In his snug little house on the banks of the Ashuapmuchuan River, which flows into Lake St. John and serves as his take-off, St. Martin maintains an amateur radio broadcasting station to keep in touch with his three planes.

FLOWERS FLAME WHERE FORESTS BLAZED

In the dry spring of 1870 a terrific forest fire "galloped like a horse," as the old records put it, from St. Félicien to Grande Baie, eighty miles to the east. When the ravaged land ceased smoldering, Nature nobly attempted to cover up disaster with lavender blankets of blooming sally, or fireweed. Many stalks raise their pinkish-blue petals as high as four feet, trying to hide charred stumps and black trunks.

Where blooming sally fails to blossom, blueberries conquer the burnt-over land as avidly as fire once did.

So fond are Saguenayans of the delicious bush fruit that "bleuets" (blueberries) is a synonym for "natives." When it is blueberry time (usually August) whole families forsake their homes for picking grounds. And they never return till they have filled their large pails. Blueberry pie is their favorite, as well as national, dessert, and enough *confiture* (jam) is made to last all winter.

Raspberries, too, are gathered in their season, but not with the same spirit.

I rumbled away from St. Félicien over a red, wooden, covered bridge more than two hundred yards long, and drifted into water-bound St. Méthode, the "Venice of Lake St. John." From a distance the hamlet seems to be floating on a placid pond.

The lake in its natural state had a rise and fall of 17 feet. Heavy spring floods came rushing in after long winters of frozen watersheds.

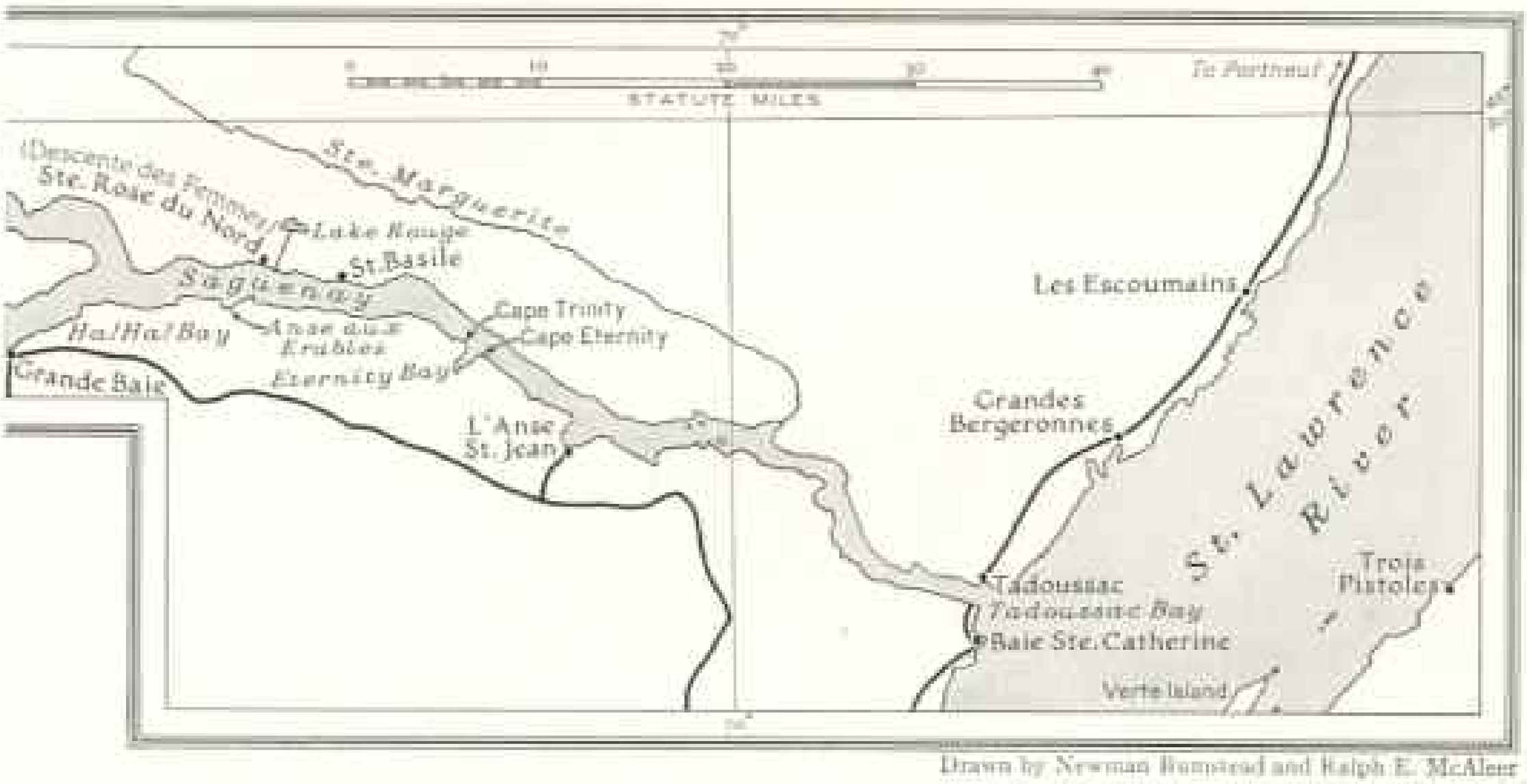
Saguenay River, outlet of Lake St. John, was dammed in 1925 for hydroelectric power. Now the lake's level can be controlled. For power purposes it is kept at maximum elevation. Consequently, St. Méthode's low-lying land, once arable after spring floods, is now saturated throughout

Life began again at the Foyer Maria Chapdelaine. Maria Chapdelaine is number one character in a novel named for her. The story tells about life in the Péribonca country.

Over a glass case containing many postcard portraits of author Louis Hémon, a fine-looking woman sold me a copy of his masterpiece.

"If you wish, I'll sign it," she said.

"Thank you," I replied, wondering why



Drawn by Newman Rumstead and Ralph E. McAleer

the summer. Bridges are often used for connecting pastures and farm lands, and rowboats serve the same convenience as on tidewater farms.

The power company that built the dam bought property affected by high water, or else paid farmers for flooding rights. The parish continues prosperous, its inhabitants satisfied.

In contrast to the precipitous country east of Lake St. John, land to the west looks like Kansas transplanted. Near Normandin a Government station experiments with crops and stock.

Proprietor Hébert led me to Normandin's hotel attic to appreciate better the vast expanse of farm land. As we turned to go downstairs, the old gentleman paused by a spinning wheel and said: "My wife likes to come up here to spin and think and look at the church spires in St. Félicien."

St. Félicien is 13 miles to the south.

A solitary white-throated sparrow's sad call underlined the forest loneliness between Mistassini and Péribonca.

she would write her name in Hémon's book.

I understood when she wrote in French inside the cover: "Souvenir of your visit to Péribonca, Eva Bouchard (Maria Chapdelaine)." This was her gentle way of telling me that she was leading lady in the story.

At Honfleur I stopped for gasoline.

"Red or green?" asked the attendant, like a Parisian restaurant waiter taking orders for red or white wine. Red gasoline is high test, green is regular.

SAGUENAY RIVER, "WHITE COAL" MINE

Near Lake St. John's discharge I abandoned my black Ford with green gasoline for a green canoe with a yellow paddle.

An island nine miles long divides Lake St. John's outlet into the Big Discharge and the Little Discharge, which meet to form the Saguenay River.

I paddled alone down the Big Discharge. Fifteen years ago this would have been suicide because of dangerous rapids. With the construction of the dam and power

plant at Isle Maligne, the Big Discharge has become a big lake, dotted with islands.

"The annual output of the Isle Maligne power plant in kilowatt-hours is among the highest in the world. The constant flow of such a great volume of water makes this possible," said the superintendent.

Twelve generators, developing 540,000 horsepower, supply the paper mills and aluminum plant of the Saguenay region. One-third of all the power developed goes to the city of Quebec (page 627).

Homes for hydroelectric operators form the model village of Isle Maligne. A brick town hall in American colonial style includes a fire department, general store, barber shop, post office, assembly room, and offices of the powerhouse executives. A church under construction and a school completed the neat community.

At the school superintendent's home I watched his Irish wife prepare a delicious dinner, while four little blond heads bobbed in and out of the kitchen.

"Our wedding was in June, and all our children were born in June," he told me. Then, with a thrifty look in his eye, "Only one family feast a year, you see!"

Early one morning I left Isle Maligne to continue my canoe trip down the Saguenay. Never wider than three-fourths of a mile, the river wound through deep, silent forests and lonely, rocky hills. Scarcely a house appeared before I reached St. Charles Borromée hamlet at noon.

Thirsty, I walked up the hill to the general store and asked for a Coca-Cola. With a look that told me I might as well ask for champagne, a woman said:

"We have no Coca-Cola." Then proudly, "But we have some chocolate cookies."

For no reason at all I bought the chocolate cookies, my parched lips cracking into a smile.

"Caution! Dam one mile ahead," warned a big sign as my canoe approached Chute à Caron, near Kenogami.

Here another power project checks the Saguenay. Although the present plant develops but half the horsepower of Isle Maligne's, the barrage itself is more spectacular. So swift was the river at this point that it was necessary to construct a cofferdam before laying the principal foundations. In this instance the cofferdam was built like an obelisk on land. Standing thus on one end, it reached a height of 92 feet. Dynamited, it fell, swinging on a tremendous hinge, and settled within one inch of its predicted position. It diverted the flow from the river bed to a previously prepared by-pass channel.

CANADIAN FIRS MAKE NEWS

Kenogami's skyline of pulpwood piles, tall chimneys, and a huge water tower initialed "P B" is the essence of Saguenay industry (page 613). Here is one of the Price Brothers' largest pulp and paper mills.

Mr. Shanly, assistant superintendent, finished his morning mail, then led me from his office on a half-mile walk across tracks, under trestles, over bridges and boardwalks to the mill's mouth, into which men with poles were constantly stuffing pulp logs by the hundreds.

Pretend you are a pulp log, even if it hurts. After a pretty hectic ride down a river, you are fished out and none too gently put through the mill. In a revolving drum you lose your nice brown bark, and in your nakedness are roughly washed and mercilessly steamed. Ground up like hamburger, your remains go into a tank as big as the Heidelberg cask, where, for quality's sake, you cook in a sulphite liquor.

Then, resembling dough, you are pressed, sprayed with water, and pressed again. You look and feel like a wet blanket. Another pressing and you're thin as a sheet. Exposed to terrific heat, you dry out quickly and actually appear to be paper. With lightning speed you are wound on a 20-foot spool and cut into varying dimensions. Packed, weighed, and addressed, you may travel to Buenos Aires, New York City, or Melbourne, Australia.

Eventually you become a newspaper, and after one big day of breakfast tables, city streets, subway trains, and office desks, spend the rest of your life in obscurity or else go up in smoke.

It was lunch time when Mr. Shanly and I re-entered his office. He invited me to dine with him.

Walking toward his house, we passed along a street of small, neat dwellings.

"Price Brothers company rents 140 houses to its married employees in Kenogami," Mr. Shanly informed me. "Unmarried workers can live at a staff house which is a sort of hotel."

We entered a cottage no larger than many others rented to company employees. Mrs. Shanly greeted us. After lunch I had opportunity to ask questions and hear

 Dufaycolor by Harrison Howell Walker

CAPE TRINITY IS SO STEEP AND THE WATER SO DEEP THAT STEAMERS CAN COME WITHIN A "STONE'S THROW"

Stewards aboard excursion boats provide buckets of pebbles so that passengers may prove the statement. Pierrette has climbed 400 feet to the first of three steps that give Cape Trinity its name. This spectacular promontory thrusts its rocky mass 1,500 feet above the fjordlike Saguenay.

 Dufaycolor by Harrison Howell Walker

THE SAGUENAY HAS ITS "PLYMOUTH ROCK"

"Here debarked the pioneers of the Saguenay June 11, 1838," reads the monument's inscription at Grande Baie, in the heart of the region

Kodachrome by Harrison Howell Walker

A BIT OF OLD ENGLAND AT ARVIDA

Completion of an aluminum plant brought foreigners a dozen years ago. These English twins call to playmates in French, the common language

Dufaycolor by Harrison Howell Walker

SEVEN LITTLE SIT-DOWN STRIKERS BASK IN THE SUN ON A SPLIT RAIL FENCE

These brothers and sisters—Rita, Lygette, Françoise, Vital, Colombe, Marc, and Germaine—are supposed to be driving the cows home for evening milking. Printing on Germaine's dress indicates the cloth once served as a sugar or flour sack. Behind the young herders, mountains enclosing L'Anse St. Jean slope away to the Saguenay.

"HOW," HAILS THE INDIAN CHIEF, WHEN PRESENTED TO THE PRINCE OF WALES

In 1860 Edward VII visited Canada for the inauguration of Victoria Bridge at Montreal. The 1938 pageant at Grande Baie re-enacted his warm reception by Montagnais tribes of the Saguenay.

Kodachromes by Harrison Howell Walker

WHITE STOCKINGS, YES—BUT NO SISSIES ARE THESE CHOIRBOYS

They are students of Saint Alphonse Academy at Grande Baie, the Eton of the Saguenay.

CHEER UP, MR. BRIDEGROOM; IT'S ONLY A MAKE-BELIEVE WEDDING

Of thirty-odd episodes in the pageant celebrating Saguenay's centenary at Grande Baie, an old-fashioned bridal scene caused most merriment. After the ceremony everyone joined in a square dance.

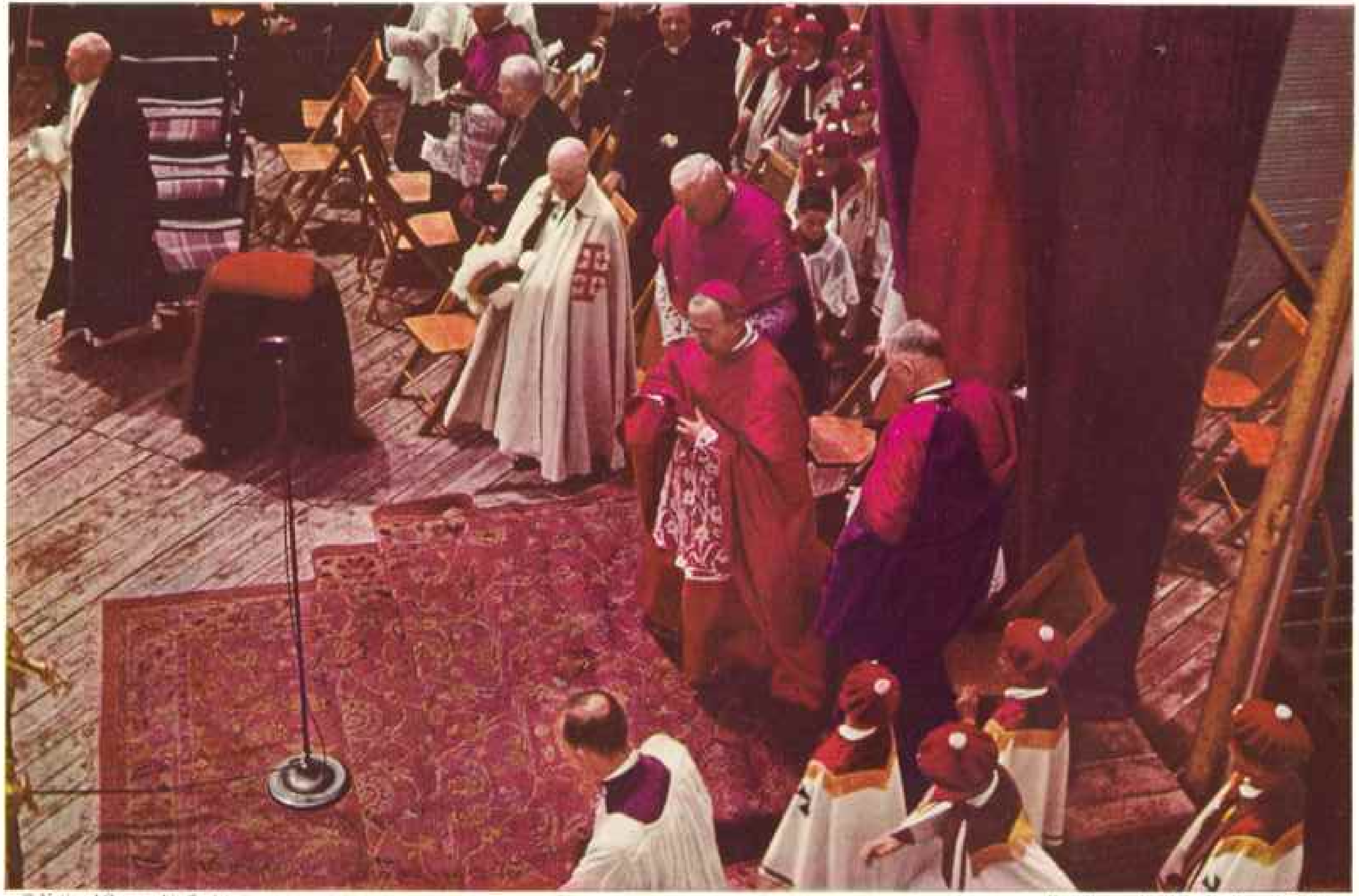
Kodachromes by Harrison Howell Walker

SAGUENAYANS LEARN EARLY TO SWING THEIR PARTNERS

Louis Hémon wrote the novel *Maria Chapdelaine* while living in a farmhouse here at Péribonca.

Dufaycolor by Harrison Howell Walker

BEHIND A MOTORCYCLE ESCORT, TRAPPERS WITH SNOWSHOES, AND AN OX-DRAWN PLOW MARCH THROUGH BAGOTVILLE



Kodachrome by Harrison Howell Walker

CARDINAL VILLENEUVE ROSE FROM A RED THRONE TO ADDRESS HIS SAGUENAY FLOCK OVER THE MICROPHONE

In brilliant robes and exquisite lace and silver-buckled shoes, the only Prince of the Catholic Church in Canada assisted at opening Grande Baie's centennial festivities. He recently took part in the election of a successor to the late Pope Pius XI.

 Kodachrome by Harrison Howell Walker

THOUSANDS THRONGED GRANDE BAIE TO CELEBRATE THE CENTENARY

From every hamlet in the region came descendants of the original settlers and newcomers, many with children in tow. Uniformed students and costumed women and girls brightened the gray day with colorful dress. White-helmeted policemen, looking like British bobbies, journeyed from Montreal to keep order, but gentle Saguenayans gave them little to do. Beyond the houses acres of pulpwood spread like a carpet over Ha! Ha! Bay, so called by explorers who were fooled into thinking it the river's main course.

answers. At the mill, rumblings of logs or clanking of machinery prohibited conversation.

Kenogami's pulp and paper mill, built in 1912, has under normal conditions 830 employees. It consumes about 200,000 cords of pulpwood (balsam and spruce, generally) a year, and can produce 650 tons of newsprint a day, enough for almost two million copies of the Washington *Evening Star*.

The last leg of my canoe trip took me to Chicoutimi. Head of navigation for steamers and terminus of the Canadian National Railways, it has developed into the region's largest town. Slightly smaller than Alexandria, Virginia, it is the New York City of the Saguenay. Its Indian name, still significant, means "up to here the water is deep."

A fad for imitation brick and boxlike buildings has swept—is sweeping—through Chicoutimi and its environs like a wild forest fire. Only a few old French colonial houses remain. Therefore I was doubly delighted to be asked to one of the oldest homes. Peter McLeod, onetime timber partner of William Price and original pioneer of Chicoutimi, built it between 1840 and 1844.

78 PARISHES POOL FOR A PAGEANT

Saguenay centennial celebrations lasted all summer. Each of the 78 parishes had its own one-day fete, but major festivities took place from July to September at Grande Baie (Plates II, IV, V, VII, VIII, IX).

On the spot of the very first Saguenay settlement was built an outdoor theater to seat 10,000. Here once, and sometimes twice, a week a thousand actors presented a pageant that told the authentic story of the Saguenay and its people. To see a performance was to visualize the region's history from Jacques Cartier's arrival to the present day.

I attended the "first night." All respectfully awaited the arrival of delayed dignitaries. The big red velvet curtain hung motionless across the stage. Accommodatingly enough, a local glee club sang "Darling, I Am Growing Old."

From everywhere in the Saguenay district came the thousand actors. In actual life they were farmers, millworkers, loggers, clerks, mechanics, superintendents, chauffeurs, salesmen, butchers, bakers, and barbers. But they left their responsibilities behind as they came to Grande Baie in buses, buggies, trucks, boats, and wagons. For performances and occasional midweek practice some had to journey 120 rough miles.

One off day I had an appointment to photograph the queen of the pageant. I found her in full regalia behind the counter of a combined hot dog, soft drink, candy, and cigarette stand. She sold a Coca-Cola to a customer, gathered up her train, and, calling to her younger sister to keep shop, walked "in state" to the village green with me.

Pageant days at Grande Baie were gay. Colorful centennial banners decorated homes, shops, and streets. Square dancing here, singing there, feasting everywhere, attracted crowds of people from other villages, remote farms, even from distant parts of the Province. Women and girls in their parish costumes (each parish had a different one), escorted by husbands or beaux in their Sunday best, milled through the town, laughing and chatting in true holiday spirit.

Grande Baie village took its name from the large bay upon which it is situated. A seven-mile-long, two-mile-wide cul-de-sac of the Saguenay River, it so completely deceived explorers who thought it was the river's true course that they, not losing their sense of humor, called it Ha! Ha! Bay. Stretching along the water's edge, Grande Baie village runs into Port Alfred, which in turn adjoins Bagotville, all three within two and a half miles of each other.

To Port Alfred's modern docks transatlantic freighters bring bauxite from distant British Guiana, petroleum coke from Gulf of Mexico ports, and cryolite from Greenland. These raw materials feed Arvida's aluminum plant, twenty miles away in a region supercharged with hydroelectric power. To Bagotville's wharf each summer evening comes a cruise ship from Montreal and Quebec (Plate VI).

At Bagotville I met a papermill worker who invited me to Sunday dinner. I ended up by staying three days in his house. Although I had a chamber to myself, one big room served as parlor, kitchen, dining room, bathroom, and bedroom. Eleven-year-old Laura slept on the sofa. And on the most conspicuous piece of furniture, the well-polished stove, potatoes boiled, pork sizzled, and tea simmered every day.

Barefoot boys, driving cows down Bagot-

HE SOWS THE SEEDS OF SAGUENAY

Twenty-one names appear on this monument at Grande Baie to commemorate the first colonists (page 595). Called the "Society of the 21," these pioneers arrived in 1838. For two years they fought the forests and severe winters before they could harvest their first crops.

ville's dusty main street, delayed my departure for Arvida. Once on the main highway, only paved road in the Saguenay district, I quickly reached my destination, six miles west of Chicoutimi.

Twelve-year-old Arvida is a model town built around, and because of, the huge aluminum plant. Tiny model houses in good taste snuggle close on the several streets. Although French Canadians predominate, children of Poles, Czechs, Irish and English, Finns, Americans, Ukrainians and Germans, Italians, Swedes, and Norwegians play together, calling to each other mostly in English and French.

A former member of the Royal Canadian Mounted Police showed me through the aluminum plant. While he discussed bauxite, cryolite, and petroleum coke, chief raw materials, my eyes strayed to such signs as "A crutch supports a man but not a family."

"To obtain one ton of aluminum, it takes about seven tons of raw materials and an amount of electric energy equivalent to that from 16 tons of coal," recited my guide mechanically.

Crucibles cruising on cables and filled with molten aluminum which looked like cream of tomato soup swayed close to our heads. A man with a coarse canvas apron poured the fiery liquid into molds on a revolving disk. And aluminum as we know it was born as it cooled.

ALUMINUM TO JAPAN

We entered a room where hundreds of ingots were neatly stacked, awaiting shipment.

"Most of these go to Great Britain and the United States," said a foreman, sweeping his arm toward the heaped-up aluminum bars, "but Japan is next best customer."

"I thought Japan had her own aluminum plants."

"That's true, but at present she can't produce enough to meet her needs, and so buys from Arvida."

MERRYMAKERS SPIN LIKE TOPS TO TUNES FROM A SQUEAKY FIDDLE

Skirts swirl and big boots beat a tattoo as villagers celebrate a friend's birthday with a square dance at Descente des Femmes (page 615). In the Province of Quebec, French Canadians prefer old-fashioned steps to modern "jitterbug" contests. Parties begin early and seldom last after midnight, for cows must be milked at daybreak.

The plant has a tremendous washroom for its 2,000 employees. We looked in at noon when it was filled with nude and semi-nude men under showers and at a large central fountain. Some were cleaning up for lunch; others, their shift ended, were bathing before going home.

Roberval shines. Neat streets and freshly painted houses make it one of the most attractive towns on Lake St. John. Many homes patriotically prefer red-white-and-blue color schemes. Annually from May 1 to 15 signs on every corner gently demand a general town-cleaning and house-painting.

Just six miles from gay Roberval a ghost of a mill town rots away. Once 80 working families lived happily there in homes supplied by a busy pulp and paper company. But depression left its mark in timber, too. Idle Ouiatchouan River, in its abrupt 275-foot fall, shouts to the grave village that cannot answer.

FOUND—A LOST COLONY

Of Saguenay north-shore settlements, St. Basile, a four-family hamlet, is most inaccessible. Having no road connections, it can be reached only by boat or foot. Being virtually self-sufficient, it has little need for communications (Plate XIV).

Eight mountainous miles from St. Basile, Descente des Femmes loses itself in a "lost" valley (Plate X and page 628). Only since 1936 have automobiles dared the doubtful ups and dangerous downs of the one road to this fairy-tale village. Nor can every machine negotiate the heartbreaking, gear-straining grades. I was even advised to

THE BOUDREAU FAMILY MEETS FOR PRAYERS AT TWILIGHT

Those who live far from a church use a corner of the kitchen as chapel for vespers. In most French-Canadian houses all cooking, dining, receiving of guests, and reading takes place in one main room (page 629).

leave my car at the bottom of a mountain that walled in Descente des Femmes and walk the rest of the alpine way.

On a second attempt in first gear I made the final grade, a veritable cliff. Halfway up I had passed a car standing on end in the ditch. Its driver, stretched out on the bank in absolute resignation, slept as he waited for helpful horses.

Easing down in low gear, I caught a glimpse of Descente des Femmes, looking like a toy village that goes under a Christmas tree. So steep was the mountain that, if my automobile had tumbled, I would have almost expected it to fall directly on one of the tiny homes below.

The National Geographic Society's car, the first with a United States license ever to enter Descente des Femmes, stopped by a neat white house with a colorful flower garden. Friendly smiles and a bowl of freshly picked blueberries welcomed me into the family Villeneuve. Yes, of course I could stay the night there; I could stay many nights, many days.

Descente des Femmes (Descent of the Women) owes its name to three Indian squaws. Because of misunderstandings with their husbands, they stole away one night from their camp in the north. With great difficulty they succeeded in descending to that Saguenay River bay which was to be called after the occasion.

"But now the post office name is Ste. Rose du Nord," said my guide and friend, Charles Villeneuve.

"Why?" I asked.

"Because a former curé didn't think Descente des Femmes sounded religious enough. We still speak of it as Descente des Femmes, however."

MUSIC IN THE WILDERNESS

Nine families, all related, live in nine houses. There's a little red church, and a presbytery, too; a one-room schoolhouse, and a busy cheese dairy. The Villeneuve home closets the post office. There are no doctors, but old Louis Auguste Villeneuve (Plate XI) has brought many a cousin into his world. Lawyers are unheard of in this congenial community.

Each evening a different family would invite me into their home. After polite conversation on how I spoke French, music provided the real entertainment. Every

FROM KENOGAMI'S MILL, NEWSPRINT GOES HALFWAY AROUND THE WORLD

On a diet of four-foot spruce and balsam logs, this factory, one of Saguenay's largest, can produce 650 tons of paper a day, enough to supply the Washington *Evening* and *Sunday Star* for about two weeks (page 600). The high tank provides water for a fire-sprinkler system.

HOUSE, FENCE, BOY'S CLOTHING—ALL MADE IN FRENCH CANADA.

house had its piano or fiddle, and musicians never failed.

Charles and I walked up the hill to his sister's house after supper one evening. Sitting in the kitchen, chatting, and watching her children, I remarked:

"All your children are good-looking."

"Not exactly handsome, but healthy enough," she spoke simply. Then, changing the subject, "Come into the parlor for some music."

Just a trifle shy, 12-year-old Marguerite Marie sat down to the piano. Long fair hair, gleaming in the mellow light of a kerosene lamp, hung far down her red dress. She played gently and well. Seven-year-old brother Jean Marie took his turn, playing a short piece unhesitatingly. Marie Marthe, 10, had her opportunity. And finally, with mother for accompanist, tiny Céline, who was scarcely as tall as the keyboard, sang in her baby voice.

The grandest concert was held at the old Villeneuve house. The curé was invited, and, of course, his sister, Pierrette, an excellent piano accompanist. Almost everyone contributed his or her share to the musical evening. When dainty Marie Vianny, 17, finished a touching song about faithful love, gawky, lumbering, hay-making Otto sat down and softly played "The Maiden's Prayer."

Reluctantly brother Charles, the forest ranger, rose in response to a general request. In hobnail boots he strode over to Pierrette's side, spat in a vase, and began in a strong, clear voice. For a man who roams the woods alone, he sang with exceptional expression. Even I stumbled through a solo in French, and was rewarded with over-polite applause.

Almost as sociable as the parlor with its concerts, Henri's *fromagerie* (cheese dairy) attracts everyone with a taste for good Canadian cheese. When I entered, Henri and two helpers were bending over a vat slightly larger than a double bed. With arms and hands they churned and turned curdled stuff and packed it hard against metal sides. While cheese was being steamed under a cover made from old flour sacks, the cheese master resumed a

game of checkers (draughts) with his cousin.

Village folk came in, nibbled, chatted. Even the curé, wearing red bedroom slippers, reached long fingers into the vat, licked his lips. Young bucks tested their strength on the scales. Paul Grenon braced his shoulders on a crossbeam of the building and pushed with his feet against the scales—520 pounds. Everyone cheered heartily. Henri dispersed them when he came to weigh a mold of cheese. He told me that an average mold tips 85 pounds and sells at 15 cents a pound.

Children were constantly in the cheese maker's way and played pranks on him. They poured water down his neck, ate handfuls behind his back, and once or twice nearly fell into the vat. But Henri, always patient, continued to smile, for he liked children and the prices that Montreal markets paid for his molds.

EACH MOLD WEIGHS MORE THAN MARIE

Canadian cheese is made in 85-pound blocks and much is shipped to Montreal markets. Creamy in color and firm, this cheese goes particularly well with the homemade bread of the Saguenay (page 614).

SWING YOUR PARTNER! MILK YOUR COW

Everyone in Descente des Femmes and the surrounding parish was invited to Madame Tremblay's birthday party, a square dance (page 611). She and her husband received guests in the great room where daily meals were cooked and eaten, and where the family spent most of its life. In an adjoining room a fiddler and an accordionist played lively tunes for the dancers. Those not dancing sat close to the wooden walls under religious pictures and plaster crucifixes.

All chatted happily, ate nothing, drank nothing, for nothing was proffered. Often they paused to watch girls' swirling skirts, or men's heavy boots, spinning around like propellers. Pierrette, the curé's sister, was my partner in the first square dance I ever attempted.

A flashlight picture brought everything to a standstill. Terrified dancers stood motionless, and musicians almost dropped their instruments. Such a "silent explo-

sion" was a new experience for them.

Toward midnight guests thanked each other as well as their hosts, and disappeared into a black, rainy night. Wearily they went to bed, thinking of cows to be milked at daybreak.

Awakened earlier than usual by voices under my window, I looked out to see the Villeneuve family carrying deep pans of dough to the big stone and earthen oven, some 20 steps from the house. I dressed hurriedly, rushed down to learn just how the best bread in the world was really baked (Plate XI).

Taking a slice bigger than a dinner plate at lunch that day, and spreading some of Eva's homemade butter on it, I enjoyed a feast.

Skipper Sylviou agreed to take me to Capes Trinity and Eternity, 12 miles down the Saguenay River. His 35-foot *chaloupe* (motor launch) was ready early of a bright morning. And so was the curé with his sister and two nephews, who proved happy company.

Cape Trinity rises 1,500 feet in three big steps, which account for its name.

Landing at its rocky base, we climbed the first step, 400 feet above the water. Here a statue of the Blessed Virgin 36 feet high stands witness to a storm-torn winter traveler's gratitude for safe deliverance from the frozen "river of death." We watched a freighter and a passenger ship glide silently below us like toy boats at our feet. One came so close to the sheer cape that it seemed possible to drop stones on its deck (Plate I).

KITCHENS BECOME CHAPELS FOR VESPERS

Near by, 1,400-foot Cape Eternity, equally steep, helps Trinity form the tremendous portals of Eternity Bay. Cruise ships enter the bay and whistle for echo effects which stir even the most blasé bridge players from luxurious lounges. Feeling as ants might in a bathtub, we anchored in the cliff-walled bay for lunch.

Local motor schooners, loaded with pulpwood, a long, black freighter from England, and one little pleasure boat waved to us on our homeward trip.

Old Louis, his son Charles, and I were smoking our after-supper pipes on the porch. Well filled with brook trout and a kind of hash paté, we were content in our silence. A hermit thrush in the forest close by called sweetly, sadly to no one.

Almost frighteningly the chapel bell called to vespers.

"To prayers," was all the old gentleman said, knocking out his pipe and rising from his chair.

Some of his family accompanied him along the lane to church. Charles remained on the porch (page 632).

"Aren't you going to prayers?" I asked.

"No," and he puffed all the harder on his pipe.

In the stillness that followed I could hear a humming, almost a drone.

"What's that buzzing sound, Charles?" I questioned.

"Those who didn't go to chapel are saying their prayers in the kitchen," came his casual answer (page 612). But Charles was thinking of the hermit thrush.

FIRST COUSINS FREQUENTLY MARRY

Father Villeneuve sat beside me, picture-reading the NATIONAL GEOGRAPHIC MAGAZINE for August, 1938. He paused to study an Arctic view by Sir Hubert Wilkins.

"Have you ever read of Sir Hubert Wilkins?" I asked.

"No—no," he replied slowly and thoughtfully. "I read only the flowers in my garden, the trees, the mountains, the sky. I care only for the beautiful things around me. It is enough to try to understand them without bothering about other worlds."

Descente des Femmes is a world in itself—perhaps better, to itself. Except for the river, its only connections with other parts of the Saguenay region are one difficult road and a single strand of telephone wire. The *habitants* (natives) are great-grandchildren of the original settlers. They do not want to leave, even to marry. Old-fashioned farming tools, kerosene, homespun, and a four-day-old Quebec daily satisfy most of their humble needs. The weekly visit of the soft-drink truck from Chicoutimi will bring them excitedly from their houses, however.

Once I asked 45-year-old Charles why he never married.

"Because," he answered simply, "there's no one here to marry."

All his cousins were wed, and his two spinster sisters cooked for him, anyway. He would have liked to marry Pierrette, the curé's sister, but she was a city girl and did not want to live on a farm. He never thought to leave the village in search of a likely wife.

SAGUENAY HOLIDAY PUTS SPRING IN THEIR STEPS

Strutting like a bandmaster, the youngest son leads his family to "hundredth birthday" festivities. They will sing, square-dance, parade, and feast on "hot dogs," candy, ice cream, and soft drinks.

Kodachromes by Harrison Howell Walker

"O CANADA, GLORIOUS AND FREE! WE STAND ON GUARD FOR THEE!"

Lustily sing the girls of Ste. Anne's Parish at the conclusion of their centennial exercises. Here in the Saguenay the Dominion's anthem "O Canada" is rendered in French.

Dufaycolor by Harrison Howell Walker

IN THIS MINIATURE "CHRISTMAS TREE VILLAGE" DWELL NINE FRENCH FAMILIES—ALL RELATED

The author stopped at the Villeneuve home (lower left). So isolated is Descente des Femmes that the villagers rarely meet strangers.

WHERE MOTHER'S BREAD IS REALLY HOMEMADE

At the community bakery in Descente des Femmes, Eva and Marguerite make bread for the village. When a wood fire has heated the oven, coals come out and dough goes in. An hour and a half later, big brown loaves that smell as good as they look are shoveled out.

Dufaycolors by Harrison Howell Walker

"DOCTOR," POET, AND POSTMASTER—LOUIS VILLENEUVE

The grand patriarch of Descente des Femmes sits in his red rocking chair by the three-deck stove. In this doctorless village, he has brought many a cousin into the world. Fond of his garden, he typifies his French forebears portrayed in Millet's "The Angelus" on the wall.

PLAYING TUG OF WAR. SQUAWS STRETCH MOOSEHIDE TO MAKE IT PLIABLE

After a long winter in snowbound hunting camps hundreds of miles north of the Saguenay, Montagnais Indians prepare skins to make moccasins, snowshoe laces, and mittens.

 Kodachromes by Harrison Howell Walker

MOTHER SNIPS STRIPS OF MOOSEHIDE, WHILE FATHER LACES SNOWSHOES

In their tent with its fragrant balsam carpet, a Montagnais family of the Indian reservation at Pointe Bleue prepares for a winter of trapping and hunting (Plate IV).

COVERED BRIDGES WHICH SAVE SNOW SHOVELING ARE LONG LIVED

Even kitchen chores are made pleasant when taken out in the summer sun. The housewives, heating water and "peelin' spuds," are proud of their view of St. Félicien, across the Ashuapmuchuan.

© National Geographic Society Dufaycolors by Harrison Howell Walker

DOG POWER MEANS MORE THAN HORSEPOWER IN THE SAGUENAY

In carts or sleds, big, sturdy dogs haul anything from firewood to bread. The youngsters are stealing a ride on the dairyman's milk wagon.

Kodachrome by Harrison Howell Walker

ROUGH, WOODED MOUNTAINS AND A SNUG ROCKY COVE HIDE ST. BASILE FROM THE OUTSIDE WORLD

Whoever visits this hamlet arrives on foot over a hilly trail, or comes in a boat small enough to enter the tiny harbor. In winter sleighs use the frozen Saguenay for a highway. The four-family village has remained virtually unchanged for almost a century.

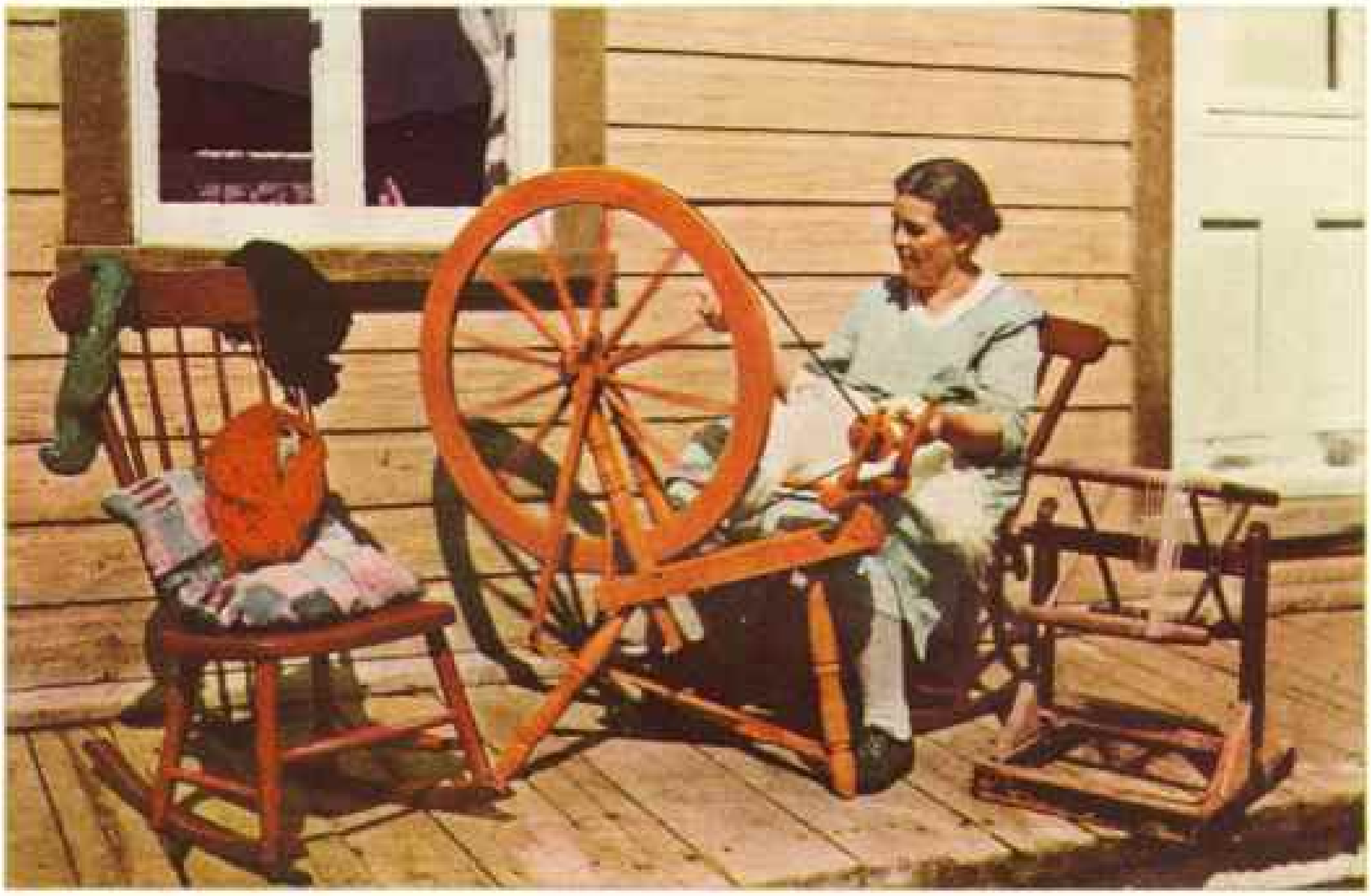
GIRLS OF ARVIDA WEAR SAGUENAY COLORS

Describing their dresses, the Mayor's daughters said, "Green is for the forest, red for faith, silver for industry, and yellow for agriculture."

Dufaycolors by Harrison Howell Walker

ALL DRESSED UP FOR THE BIG DAY

In most Saguenay parishes men and boys wore no special attire except caps and ties, but at Isle Maligne everyone donned village costume.



MOTHER BOUDREAU COMBINES SPINNING AND SUNNING

Using grandmother's wheel, she spins yarn for family socks, sweaters, and mittens at L'Anse St. Jean.

 Autochromes by Harrison Howell Walker

LIKE SCOTTISH TARTANS, THE FABRIC SHE WEAVES IDENTIFIES HER FAMILY

Father wears red- and blue-checked "woollies" that match the tablecloth. Little sister's dress and brother's blouse, and the bedspreads, too, all show the same check.

Father and mother Villeneuve spent much of the summer in a one-room house at Lac Rouge (Red Lake), two miles behind the village. Despite the prevailing quiet of Descente des Femmes, the old gentleman sought still greater peace alone with his wife in the wilderness.

Accepting an invitation to dine with them one day, Charles and I set out on foot for Lac Rouge. Two miles from Descente des Femmes we found men clearing ground for a 70-mile highway to connect Chicoutimi and Tadoussac.

"Bonjour," greeted Charles, as he lifted his hat to a road worker.

We rested on a recently felled tree.

"I hate to see a road go through here," I remarked. "It will alter the simple character of Descente des Femmes and of other hamlets and the countryside."

"Correct," replied Charles. "You won't find our folk working on this highway. We like to live as we always have."

The Saguenay region has its unemployed, too. This proposed highway along the river's north shore is a relief project.

DINNER AT 10:30 A. M.

An early breakfast of tea and bread crust doesn't last long in Saguenay circles. And so we sat down to dinner at 10:30 A. M. with the old Villeneuves. First, of course, came thick soup, made from *gourgane* beans, a veritable meal in itself. These beans somewhat resemble the kidney variety, but are bigger and better. Then came boiled beef and the inevitable potatoes, bread by the square foot, tea, milk, raisin pie, and cake supporting a load of wild strawberry jam. Finally, just to banish any lingering pangs of hunger, came deep bowls filled with fresh raspberries.

I was dizzy when I finished a pipe of rural, non-cured Canadian tobacco, but not too dizzy to go fishing. At noon, supposedly the poorest hour for the poorest fish, we took turns with one rod and caught nine brook trout on two flies.

When Charles and I returned to the village that evening, we found six visitors from Quebec at his house. The strangers were banqueted, feted with a concert, and sincerely begged to stay the night. Next morning I saw blankets spread on hall floors. While guests slept in comfortable beds, Eva and Janette, Otto and Abel were busy with morning milking after a few hours' rest on hard wooden planks.

The flower garden of the Villeneuve house told me to stop there when I first arrived in Descente des Femmes. Never tiresome, it became even more alive when Marguerite Marie in a colorful frock entered to pick pink phlox or dahlias, crimson gladioli or delphiniums. Busy as these farm folk were, they always had time for flowers. And when Janette or Eva, under broad sunbonnets, disappeared behind gourgane vines in the vegetable garden close by to emerge with red pails filled with beans and peas, beets and carrots, they lingered to delight in the colors and fragrance of their flowers.

With difficulty I said goodbye to my friends at Descente des Femmes. My car crawled up the steep mountain road and paused before plunging over the top into another world. Far below me the village looked like a color page in the National Geographic Magazine (Plate X).

What a page of simple beauty, of gentle life in a harsh land! Involuntarily I looked toward the garden. Marguerite Marie was waving farewell.

Back at Grande Baie, I spent a few days with the Deshiens family, friends of my recent hosts, the Villeneuves. Madame Deshiens made wild strawberry tarts as colorful as the old automobiles which her husband repainted. And daughter Marie, when not too busy with 17 music pupils, played Handel's *Largo* and sometimes a bit of Chopin especially for me.

One rainy afternoon I was in the parlor changing photographic films, with my arms deep in a black tent which I use for the job. The family sat about watching interestedly, expectantly.

THE VICAR'S ANNUAL VISIT

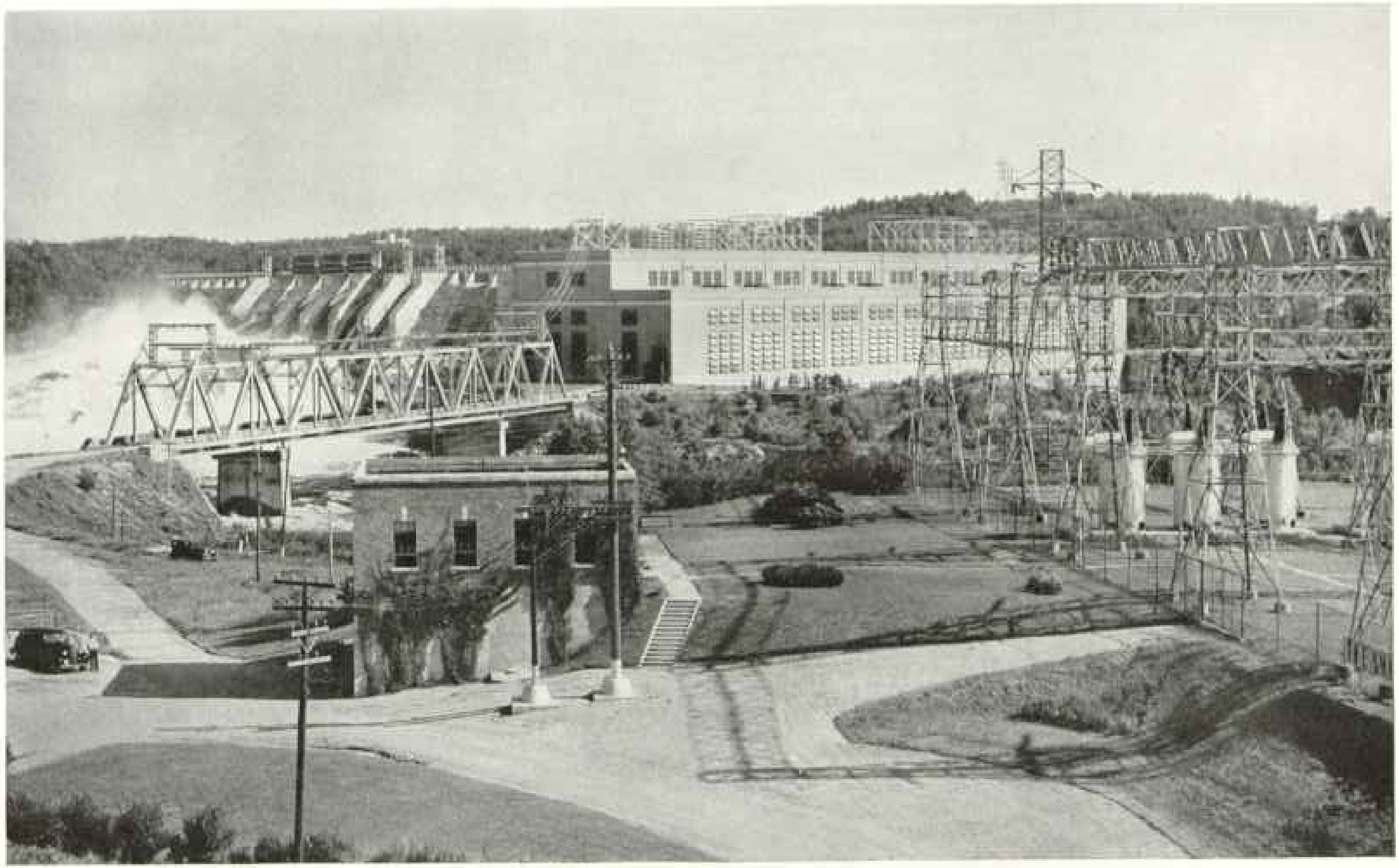
A knock at the front door. On a yearly visit of business the vicar entered and blessed us all. Everyone dropped to his knees. Awkwardly I, too, genuflected, but, because my arms were engaged in the tent, I could not properly cross myself.

Feeling strangely in the way, I continued changing films while the vicar asked Yvonique whether he had been a good boy.

On my way to L'Anse St. Jean, 35 miles below Grande Baie, I left the main road in favor of a little byway. It was dark when I came to a building which proved to be the post office and apparently the only house of a hamlet called L'Anse aux Erables

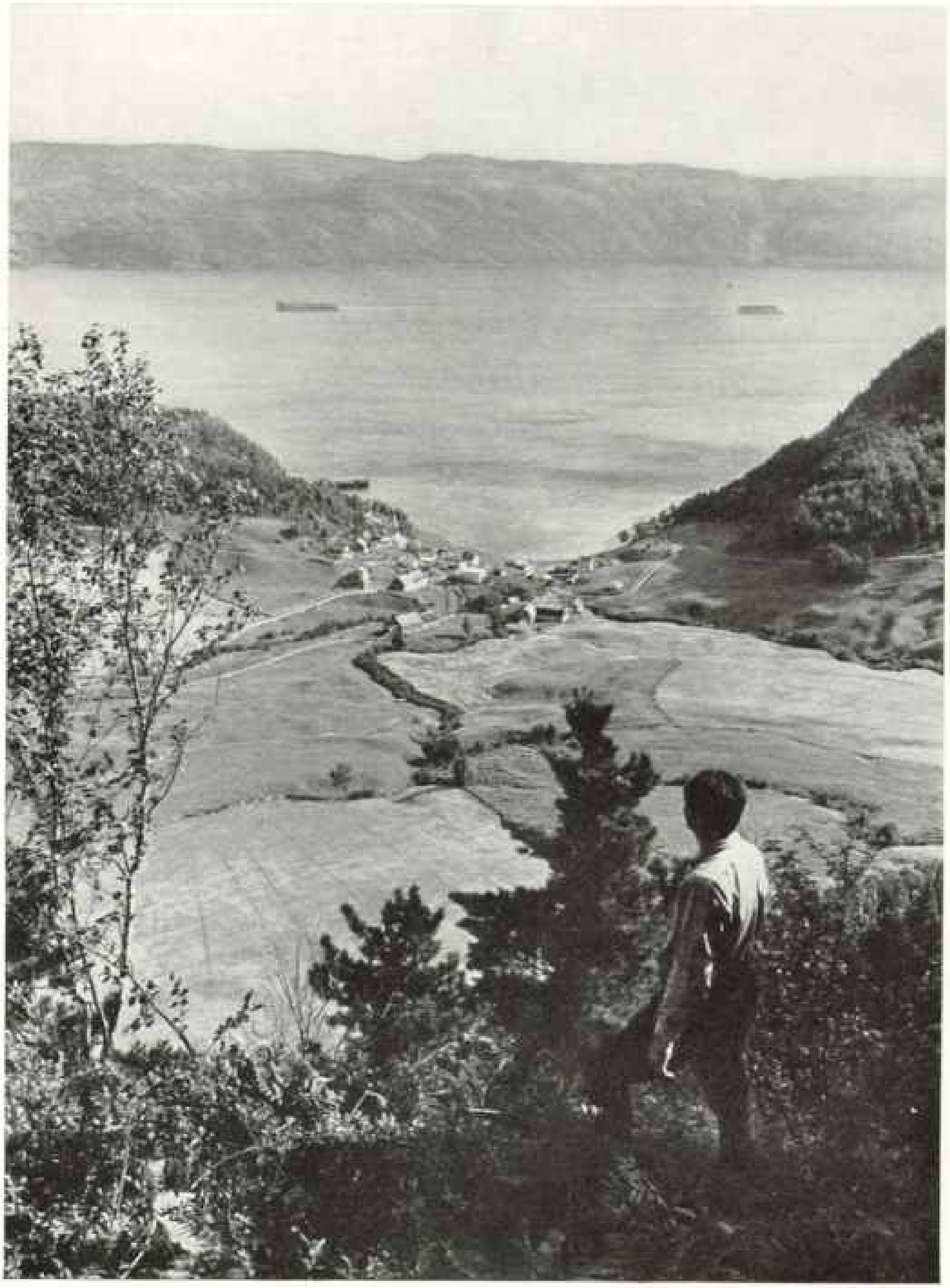
HERE JACQUES CARTIER FIRST SAW THE SAGUENAY WHERE IT EMPTIES INTO THE BROAD ST. LAWRENCE

At this junction of the rivers the French explorer found an Indian rendezvous called Tadoussac. With the coming of white men in 1535, the settlement developed rapidly and for two centuries was one of Canada's foremost fur-trading centers. Now, twice a day in summer, steamers bring visitors to the chapel, built in 1747.



TURBINES TURN NIGHT AND DAY TO MAKE "WHITE COAL" FOR QUEBEC AND THE SAGUENAY

Much of the power produced by this hydroelectric plant at Isle Maligne is sent through 150-mile transmission lines to Quebec City. The remainder lights near-by homes and runs industrial machinery. Unused water rushes through spillways (left) to continue as the Saguenay River.



WORK STOPS AT DESCENTE DES FEMMES WHEN BIG SHIPS PASS ON THE RIVER

Liners and freighters on the Saguenay, closed half the year by ice, are always a welcome sight to the isolated villagers (page 611 and Plate X). Sometimes a cruise boat coasts into the tiny bay. Then everyone rushes down to the wharf to wave to the passengers and to marvel at their strange clothes.

(Bay of Maples). I had passed the church without seeing it.

Postmaster-farmer Joseph Claveau invited me in and eventually I came to the point: Could I stay the night there?

Spreading my sleeping bag on a cot in the small room which served as office, I hung my clothes on a huge pair of moose antlers and fell asleep with the family's evening prayers humming in my ears.

Next morning after a big breakfast, I asked farmer Claveau how much I owed. He looked surprised, and replied:

"Why, nothing at all. It was our pleasure to have you here."

I insisted.

"Oh, well, fifty cents, then. Business is business, I suppose," he laughed, and I knew that he really didn't want to take any money, no matter how much he may have needed it.

When I first drove into the village of L'Anse St. Jean, I saw a white yacht, about 22 feet long, bobbing at anchor in the blue bay.

"Who owns that boat?" I asked the next man who came along.

A few minutes later I had arranged with skipper Tremblay for a trip to Tadoussac, at the mouth of the Saguenay, 25 miles away.

The river doffed its hundreds of whitecaps to us, and a strong, fresh, west wind generously waved us on our way. The sun gleamed on a white patch of sail against a sky whose reflection was exaggerated in the blue-black water.

When we moored at Tadoussac's dock (page 626), late afternoon sun played softly, warmly on gayly painted pleasure craft. The ferry from Baie Ste. Catherine across the Saguenay grunted at gray fishing boats in Tadoussac Bay. A colossal white hotel, bulging under a red roof, crowded the village into near obscurity. Crimson-topped cottages spotted a hillside like red paint spilled at random on a dark-green carpet.

WHITE PORPOISES SPORT WITH SEALS

We ate our supper of bread and cheese on deck as the sun set behind the hotel horizon.

Skipper Tremblay slept aboard, but I found my way to modest Boulianne Hotel. I registered in a book signed by guests since 1902. The proprietress was a Boulianne before she married a Norwegian. The Boulianes for generations have been famed seamen and fishermen of this region.

We left Tadoussac for L'Anse St. Jean, but I knew that I would return to these rocks where the Saguenay meets the St. Lawrence, where Jacques Cartier landed in 1535, where Basques fished in the early seventeeth century, where Indians used to raid a Hudson's Bay trading post, where sea gulls drifted above our boat just as they had hovered over Champlain's ship.

Playful white porpoises, puffing and plunging, and timid, sleek seals, black as beavers, entertained us all the way home. Yet we never were close enough to photograph them. Frightened, one seal slithered swiftly from the rocky shore and disappeared into the river as I focused.

FROM POST TO PILLOW

A farmer of L'Anse St. Jean opened a gate in a split-rail fence, and said:

"Cross this field and take the road up the hill through the woods and you'll come to that waterfall I was telling you about. It's not much now. You really should see it in spring. Anyway, the water falls as far in August as in May."

And it was a long fall, over a cliff as high as Hudson River Palisades. I sat on a steep, rocky slope and smoked my pipe. A slight breeze sometimes blew spray from the falls against my cheek. Water, rushing over rocks, made a busy sound, not like the music of a brook, but more like the drone of a hydroelectric plant.

I forgot about it as I looked out over the broad green valley and hamlet of L'Anse St. Jean, still as a Millet landscape. A field-stone church climbed out of a colorful cluster of French colonial houses. On the edge of a shallow vast blue bay, old-time schooners, now engine-equipped, loaded lumber at a toylike wharf four miles away.

Farther around the bay, apart from the community, was a neat but old yellow farmhouse one-third the size of its long white barn. The solitary settlement attracted, invited me.

I crossed a plank bridge and drove over a road so narrow that I knocked down a gatepost in entering the farm. To a man near the barn I apologized for my destruction. He politely dismissed the incident as quickly as it happened. Fifteen minutes later I sat at his supper table.

When farmer Boudreau (page 612) and I had smoked for a bit, we walked around the farm. At a rail fence dividing oats

THESE NEIGHBORS COVET ONLY CONVERSATION

With fine weather ahead, and only one more load of hay to put away, farmer Bouchard of L'Anse St. Jean pauses to smoke and chat with Madame Gagnon. Blueberry pies are baked and the chicken stew is ready, yet woman's work is never done—she must knit socks for her family.

from pastures, he paused to tell me proudly that he owned 28 cows, 3 horses, 15 sheep, 10 pigs, and some chickens he never counted. Also, the village cheese dairy belonged to him.

With farmer Boudreau's family I walked to church along the stinted strip of dirt road through precious pastures generously guarded by crazy split-rail fences. At a red covered bridge I stopped to pound down a protruding plank nail with my boot.

"This bridge is called Pont de Boudreau because I built it," my friend stated proudly. "But from now on it will be Pont de Boudreau et Walker" (Bridge of Boudreau and Walker).

Hiding cold pork that was all fat under a boiled potato, I syrup-dipped my way through Sunday dinner. Ever present on the table was a panacean pitcher of molasses with the viscosity of grade 40 motor oil. When all else failed, I could always dunk my bread. And so could others. Sticky collisions were frequent at the fountain of goo. But often molasses was forgotten when there were salads of chopped lettuce and onions swimming in cream, or fresh blueberry pies, or wild strawberry jam.

During my stay in the 90-year-old farmhouse, I had become particularly fond of a stunted red rocking chair (Plate XVI).

"Will you sell it?" I asked Boudreau.

"I'd rather not," he replied sincerely. "I made that chair for my mother 45 years ago. It is a souvenir of her, and I wish to keep it."

"You could make another," suggested his wife.

"Yes, I could, but it would not remind me of my mother."

"But you would make Monsieur Walker happy," she insisted.

"Well, then, would two dollars be too much?" Boudreau asked apologetically.

The chair is now in my room at home.

To return to Grande Baie and take a cruise ship down the river seemed the best way to reach Tadoussac.

With my car aboard, we churned away from Bagotville shortly after six of a rainy morning. Clouds hung in valleys and gulls appeared from misty nowhere to follow the ship like winged phantoms.

Excited passengers crowded the decks to thrill to the capes swathed in ethereal gauze, and to marvel at the muffled but many echoes from a single blast of the steamer's siren. So close to Cape Trinity's walls cruised the boat that stewards seriously provided stones to see who could strike the great rock face.

SAGUENAYANS GROW, ROLL, AND SMOKE THEIR OWN

In almost every vegetable garden of French Canada a section is reserved for tobacco. Plants lift pink blossoms well above the head of the 14-year-old boy. In his left hand he holds dried leaves, ready for a pipe. This tobacco makes a strong smoke.

Near Tadoussac huge dunes hump upon a desertlike stretch that reminded me of Syria. As late as July, snow and ice can be uncovered in these sand hills. And it is uncovered with a practical hand for packing salmon shipments.

Even before the seventeenth century Basque fishermen used Tadoussac as a fishing base because it was in the heart of salmon waters. Here a scientific salmon and trout hatchery operates today. On near-by Ste. Marguerite River a fishing club attracts sportsmen from New York City.

It is possible but not advisable to motor to Ste. Marguerite River from Tadoussac. As I edged down a steep hill, I wondered whether the Ford could return. But I forgot to worry as a delicious green valley spread out below me. Snakelike Ste. Marguerite River charmed me on.

Abruptly the road came to an end for autos. With four farmhouses to choose from, I began to look for a place to stay the night. I approached the smallest, and perhaps the oldest.

"May I get some supper here?" I asked the woman who came to the door.

"Is that all you want?" She seemed sur-

IT'S GOOD TO BE ALIVE—IN SUMMER!

Children of Descente des Femmes like to hear Uncle Charles' yarns. They usually catch him when he is smoking an after-dinner pipe on the porch and beg for "just one more story."

prised. Her white head was cocked, and bright blue eyes twinkled above healthy pink cheeks.

"Well, I'd really like to spend the night, too, if you have room."

She opened the door for me.

"Do you like eggs? That's all we're having tonight."

Actually the eggs were incidental. Deep bowls of gourgane soup (enough by itself for any man's supper), fried potatoes, freshly baked bread with butter, tea, milk, blueberry pie, and raspberry preserves so stuffed me that I went outside to walk myself back to normal. Raoul, an elder son, came out, too.

Breaking off a rhubarb stalk, he brushed his teeth violently with it.

"I don't like the feeling of my teeth after eating blueberry pie," he said.

At 5:30 o'clock next morning everyone was astir. We breakfasted on blueberry pie, raspberry confiture, and tea.

After smoking some of Raoul's rural tobacco, I reeled dizzily from the kitchen into fresh air. French Canadians prefer their own leaf, which is strong. Occasionally, for variety's sake, they accepted my mild English mixture. That meant I had to accept theirs, and also that I was going to be sorry. Farmers grow their own. "Curing" is simply a matter of hanging big leaves up in the barn to dry (page 631).

FERRY CAPTAINS ARE GENTLEMEN, TOO

I knocked at Madame Languedoc's door in Tadoussac. She had asked me to call on her, for she thought I would like to hear some legends of the region. Over roast Tadoussac lamb and cranberry pie she told me that for 75 summers the first boat of the season brought her here from Montreal. She always stayed till the last autumn sailing.

Instead of just having lunch with Madame Languedoc, I was her guest for a week. And when I left, she even accompanied me on the ferryboat to Baie Ste. Catherine, first step in my departure.

I stood on Baie Ste. Catherine's wharf and waved farewell to Madame Languedoc aboard the ferry returning to Tadoussac.

When the boat was so far out in the river that my friend seemed a speck, a truck with a pleading horn rattled down to the dock. The horn was still pleading as I drove away and stopped on a hilltop for a last glimpse of the Saguenay.

From its midriver position the ferry was turning back for the truck.

EXPLORING FROZEN FRAGMENTS OF AMERICAN HISTORY

On the Trail of Early Eskimo Colonists Who Made a 55-Mile Crossing from the Old World to the New

By Henry B. Collins, Jr.

Leader of the National Geographic Society-Smithsonian Institution Archeological Expedition to Bering Sea

With Illustrations from Photographs by the Author

CHILL spray blew in our faces as our tiny boat tossed in the choppy, treacherous waters of Bering Strait. We were heading straight for the westernmost point of the North American mainland, Cape Prince of Wales, marked by the gray granite mass of Cape Mountain, looming like a giant beacon out of the sea.

Two thousand years ago, or more, in exactly the same kind of boat and heading for that same landmark, the first Eskimos came to the New World.

It was a rare thrill to realize that I was re-enacting the Eskimos' first voyage to America—a voyage which took place many centuries before Leif Ericson or Columbus reached the continent's eastern shores.

The re-enactment had its anachronistic touch, however. For though our 25-foot *umiak* of walrus hide stretched over a driftwood frame was unchanged from the type used by the earliest Eskimos, it was propelled by a droning outboard motor, which seemed as out of place as a Diesel engine in one of Columbus's caravels!

That did not worry my Eskimo crew, however. Returning to the Alaskan mainland from a visit to Little Diomede Island, in the middle of Bering Strait, we were covering the 25 miles in three hours instead of paddling laboriously for an entire day as had their ancestors, and they found no fault with that!

AGE-OLD CROSSROAD OF WORLD TRAVEL

We were sailing in a region that for uncounted ages has been a true crossroad of the world. Through this "bottleneck," where Asia and North America are only 55 miles apart across Bering Strait, humans have dribbled from the Old World into the New for more centuries than we probably will ever know (map, p. 638, and p. 642).

The earlier comers, ancestors of the American Indians, may have crossed on dry land between the two continents, when the sea was shallower than now because of the enormous quantities of water tied up in the great glaciers of the Ice Age.*

Later arrivals, like the Eskimos, crossed in small skin boats, as we were doing, using the two Diomede Islands in the strait as stepping stones (page 637).

Those who came by boat must have landed at or near Cape Prince of Wales, since it is the first land in North America seen by anyone crossing the strait. Earlier migrants, crossing on the land bridge, also would have entered America somewhere in the Bering Sea region.

Therefore this area is a strategic place to search for traces of early man in the far north, and also to study the problem of the origin of the Eskimos, who were comparatively late comers to North America. In recognition of this fact, the National Geographic Society and the Smithsonian Institution jointly sponsored our summer expedition to this region.

MYSTERY OF THE "FROZEN PEOPLE"

The Eskimos, northernmost inhabitants of the earth, are a fascinating and mysterious people. Though numbering now under 40,000, they are scattered over 7,000 miles of territory from northeastern Siberia along the northern fringe of the American Continent across Alaska and Canada to Labrador and the east coast of Greenland.

The Eskimos are perhaps the world's best example of a people who have made good under handicaps. They live in a land which offers little in the way of comforts. Through the long winter there are almost continuous darkness and bitter cold.

* See "America's First Settlers, the Indians," by Matthew W. Stirling, National Geographic Magazine, November, 1937.

Photograph by Harrison Prindle

CAPTAIN PETE POULSON, NAVIGATING "BLIND," STEERED HIS SHIP STRAIGHT TO FOGBOUND WALES

Taking the expedition members north in the schooner *Trader*, he piloted them expertly through fog and ice floes with no sight of land until their destination. Cape Mountain (background), suddenly loomed dead ahead! Fog is often thick in this region. Vitus Bering, on his voyage in 1728 through the strait now bearing his name, failed to see the Diomede Islands and the Alaskan mainland because of the mist.

Yet so clever and ingenious are these people in making the most of their limited resources that they not only exist but even live with some degree of comfort in one of the most inhospitable regions on earth.

No less remarkable is the fact that throughout the vast region where the Eskimos' sparse settlements are scattered there are a common language, a uniform social and material culture, and even to some extent the same physical type. Such a uniformity over so vast a territory is found nowhere else in the world.

Whence came the Eskimos? Once it was thought they were native to America and had spread from the vast Northern Plains northwest of Hudson Bay westward to Alaska and eastward to Greenland. But when archeologists began digging on the sites of ancient Eskimo villages, they found conditions that pointed in a different direction.

Therkel Mathiassen, a Danish archeologist, began the process of unraveling Eskimo prehistory in 1922-24 when he excavated at old village sites to the north and west of Hudson Bay. There he found relics of an old and formerly widespread Eskimo culture, or mode of life, which he named the "Thule" culture. It differed from that of the Eskimos now living there, and clearly had originated far to the west, in Alaska or Siberia.

Two years later a still earlier chapter of the story was unearthed by Dr. Diamond Jenness, of the National Museum of Canada. Digging at Cape Prince of Wales and on the Diomede Islands in Bering Strait, he discovered the first traces of the "Old Bering Sea" culture, still older than the Thule and dating back to about the beginning of the Christian Era.

THE ESKIMOS' "GOLDEN AGE"

This had been the Eskimos' golden age. Eskimo art then rose to its greatest heights. Weapons, tools, and implements were richly decorated with elaborate and sophisticated designs. Flowing lines, circles, and ellipses, deftly incised on walrus ivory, were com-

TEACHER MAY SMILE, BUT TO HER PUPILS IT'S STILL A SERIOUS WORLD!

Mrs. Carrol E. Black, shown here, and her postmaster husband were the Government teachers at Wales and played host to the expedition. Eskimo children go to school until they reach their teens. They speak both English and their native language. Miss Emma Stauffer, Presbyterian missionary, was the only other white resident at Wales.

bined to form decorations of rare grace and beauty.

Later excavations which I conducted on St. Lawrence Island, 150 miles south of Bering Strait, brought to light still more remains of the Old Bering Sea culture and intermediate stages leading up to the Eskimo culture of the present time. Though the origin of the Old Bering Sea culture remains to be determined, its roots seem definitely to lie in the Old World.

Such is the main outline of Eskimo prehistory. Our expedition sought to fill in more details of the picture.

AN ICY DAY IN JUNE

The ice still lingered along the northern shores of Bering Sea when our party, consisting of James A. Ford, of Louisiana State University, Harrison Prindle, of Washington, D. C., and I, arrived at Nome early in June. It was still too early for large vessels to get through to Bering Strait, but we chartered Ira Rank's little schooner, the *Trader*, for we could ill afford to waste a single day of the short Arctic summer (page 634).

Captain Pete Poulson, our skipper, seemed to have the instincts of a homing pigeon. Soon after leaving Nome, we lost all sight of land, a dense fog settled down, and we found ourselves threading our way among heavy ice floes. But the captain, using only the roughest of dead reckoning, charted his course so expertly that the first land we saw, through a rift in the fog, was our destination, Cape Mountain!

Below the mountain on the shore huddled the low wooden houses of the little village of Wales, westernmost town on the North American mainland. As soon as we were sighted there was a bustle of activity on shore, for ours was the first boat to come to Wales since the previous fall eight months before. In a few moments an umiak was launched and the Eskimos came out.

On the beach we were greeted by Mr. and Mrs. Carrol E. Black, the Government teachers, Miss Emma Stauffer, the Presbyterian missionary, and what seemed to be the entire native population of Eskimos, large and small.

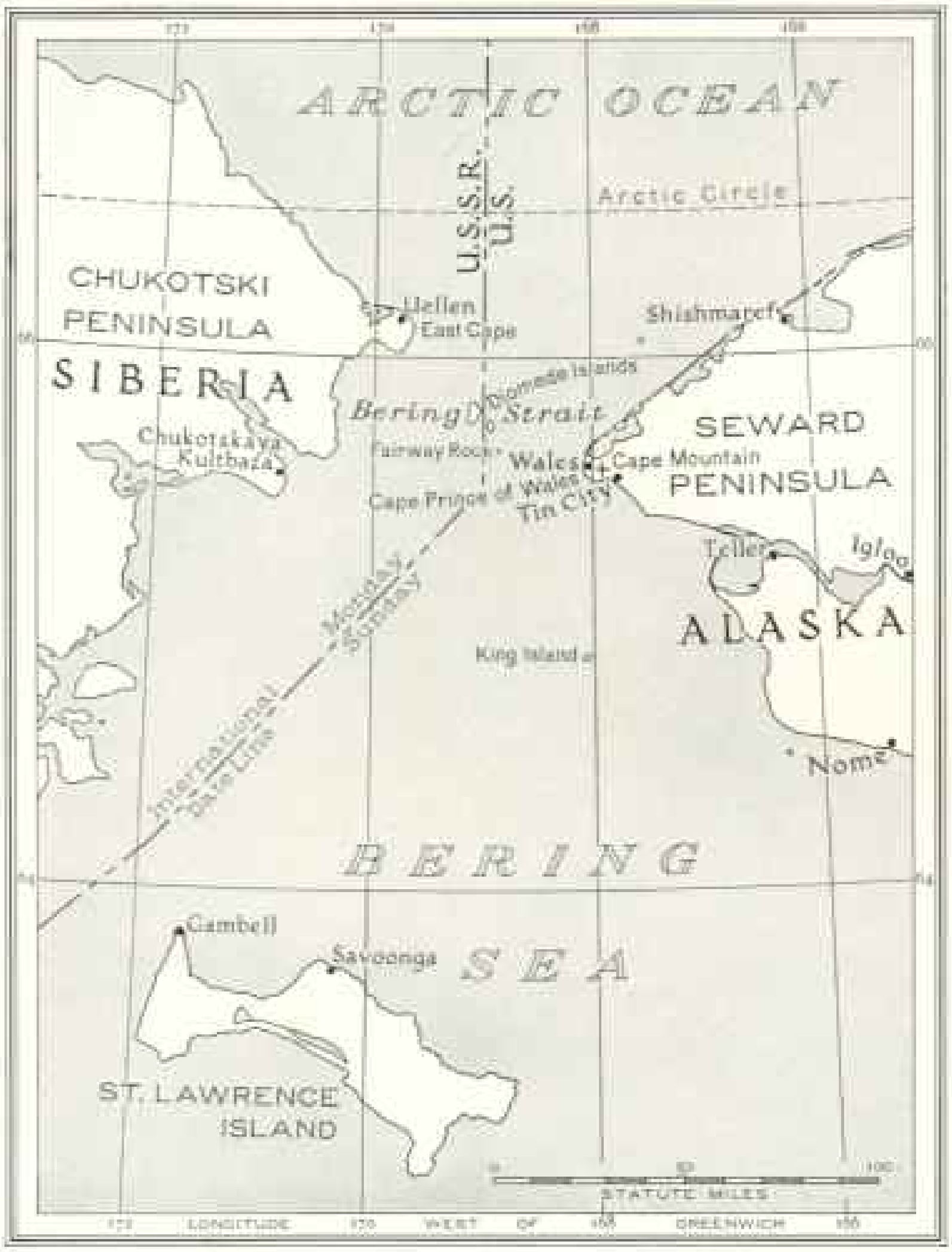
Mr. and Mrs. Black kindly arranged for us to use the schoolhouse for our living

BITS OF POTTERY, THROWN OUT FROM A FOX HOLE, GAVE THE FIRST CLUE THAT ANCIENT ESKIMOS HAD LIVED HERE
This small sand mound yielded human skeletons and traces of a camp site dating back to the Birnirk stage of prehistoric Eskimo culture.

ICE LINGERS AT WALES IN JUNE, AS SUPPLIES ARE LANDED FROM THE EXPEDITION'S SCHOONER, THE "TRADER," OFFSHORE

WALRUS-HIDE BOATS LIKE THESE, UNCHANGED FOR 2,000 YEARS, BROUGHT THE FIRST ESKIMOS FROM ASIA TO AMERICA

Models and fragments of *umiaks*, dug up in prehistoric refuse heaps, show that the boats are made the same today as in the time of Christ, with quarter-inch-thick walrus skins stretched over driftwood frames (page 633). But outboard motors now replace paddles! The boats are always placed on racks to dry to prevent rotting.



Drawn by Ralph E. McAfee

BERING STRAIT WAS THE ESKIMOS' ROAD TO AMERICA

First members of this hardy Arctic race to come to the New World probably crossed by boat from Siberia to the vicinity of Cape Prince of Wales at least 2,000 years ago. Ancestors of the American Indians came much earlier, by a similar route, but possibly used a "land bridge" since submerged. The National Geographic Society-Smithsonian Institution Expedition did its archeological work in this region because as an ancient "crossroad" for migrating peoples it seemed to be a strategic place to search for remains of early man. North America and Asia at this point are only 55 miles apart (page 642).

quarters, an arrangement that greatly facilitated our work during the summer.

ESKIMO HOMES—NEW STYLE

With a population of 180 or so, Wales is one of the moderately large Eskimo settlements in Alaska. In the old days the Eskimos lived, not in snow houses, which are unknown in Alaska, but in houses built of large whale bones and driftwood and partially sunk in the ground.

Today these old houses are fast being replaced by small frame structures, which, however, are designed on the old plan, with an outer room, used for storage, and an inner one which serves as combined living room, bedroom, dining room, and kitchen (page 652).

The Wales Eskimos never go hungry, for their village is at the narrowest part of Bering Strait, where walrus, seals, and other sea mammals are plentiful. In former times, until the latter part of the 19th century, Wales was the center of a brisk trade between the Eskimos of Alaska and the Eskimos and Chukchi of northeastern Siberia.

DIGGING AT THE DANCE HOUSE

After the formalities of appearing before the village council of Eskimos to explain our purpose and obtain permission to excavate, we began our digging in an isolated mound on the flat tundra back of the village (p. 640). This mound is the site of an old Eskimo village known as Kurigitavik, the "place where there is a kurigi," or dance house. Dr. Jenness also had excavated here in 1926, performing the first systematic archeological work in northern Alaska.

This mound, appearing outwardly as a grass-covered knoll, is really a treasure-

GIRLS WATCH A REINDEER ROUNDUP FROM A PERCH ON THE CORRAL FENCE

After the menfolk have slaughtered the deer, it will be women's work to skin and cut up the carcasses, cook the meat, and dress the hides (page 649). Wales Eskimos dress only in reindeer skins and sell all their furs to the outside world. These girls are wearing bright-colored gingham garments over their deerskin parkas. Several wear gloves for warmth, even though it is summer.

house of Eskimo history in which are preserved the "documents" that tell the story of how the Eskimos lived in the past. It is an accumulation of soil and rubbish, gradually piled up through the centuries by generations of Eskimos who lived on the site and threw away or lost all kinds of materials—tools, weapons, utensils, ornaments, and everything else imaginable.

Before the summer was over, this old mound, or "kitchen midden," had provided us with valuable information concerning the development of prehistoric Eskimo culture in this region.

To excavate the whole mound would have been impossible, even had we so desired. The soil was permanently frozen and we had only three months of summer in which to work. Consequently, we sank pits of uniform size in various parts of the mound to obtain material that would be representative of the entire site and at the same time leave most of the mound intact for future investigators.

We laid out a number of 12-foot squares and began by removing the upper 12 inches of solid, heavy turf within each one, to get at the refuse beneath. As soon as this was reached, shovels and picks were abandoned and digging was done with trowels, so that no small or fragile object might be injured or lost.

NATURE'S COLD STORAGE PRESERVES ANCIENT HISTORY

After digging only 16 inches we came to frozen soil. Though it makes digging slow, this natural cold storage actually has aided very greatly in preserving the ancient history of the Far North. It has discouraged

GROUND FROZEN FOR CENTURIES YIELDS SECRETS OF THE ANCIENT PAST

A prehistoric Eskimo village once stood on the site of this mound of rubbish. Harrison Prindle, right, and helpers are beginning to excavate a pit, removing a few inches of dirt each day as the exposed earth slowly thaws. Tools and other objects uncovered reveal how Eskimos lived centuries ago. Spades were used only to remove the top layer of soil, then trowels were employed to avoid injuring delicate relics.

promiscuous digging which might have destroyed many of the most important archeological sites in the Arctic and it also has kept intact many articles of wood and baleen (whalebone) that would have disintegrated in a warmer temperature.

The frozen soil, when exposed to the air, thaws from one to three inches a day. So we worked each pit every other day, going down layer by layer, removing the three to five inches of soil that had thawed since the previous digging (page 641).

All the objects found in the digging were carefully segregated according to location and depth. Working in this way, we reached the bottom of the mound in all the pits before the summer was over, though some of them were nearly nine feet deep.

We were very fortunate in our three principal Eskimo helpers, Walter Atuk, Dwight Tevuk, and Bob Tokianna (page 648). Dwight and Walter both were members of the village council, while Bob was a reindeer herder and one of the best hunters in the village. One could not have wished for more intelligent workmen, or better companions, than these three.

HOW EARLY AMERICANS LIVED

Realizing that the objects we were excavating were those of their remote ancestors, whose mode of life had not differed essentially from their own, they soon developed a genuine antiquarian interest in the work. New or unusual types of implements we unearthed intrigued them, and there was much speculation as to how such objects might have been used.

IN THE TIME OF WILLIAM THE CONQUEROR AN ESKIMO BUILT A HOUSE HERE

The driftwood logs and huge jawbones of the bowhead whale (left) formed roof beams for the ancient dwelling, which was partly underground. Its ruins, long since buried in rubbish, were uncovered when the expedition dug into the ground. Alaskan Eskimos still use such homes. Thawing of long-frozen earth made the pits wet and muddy.

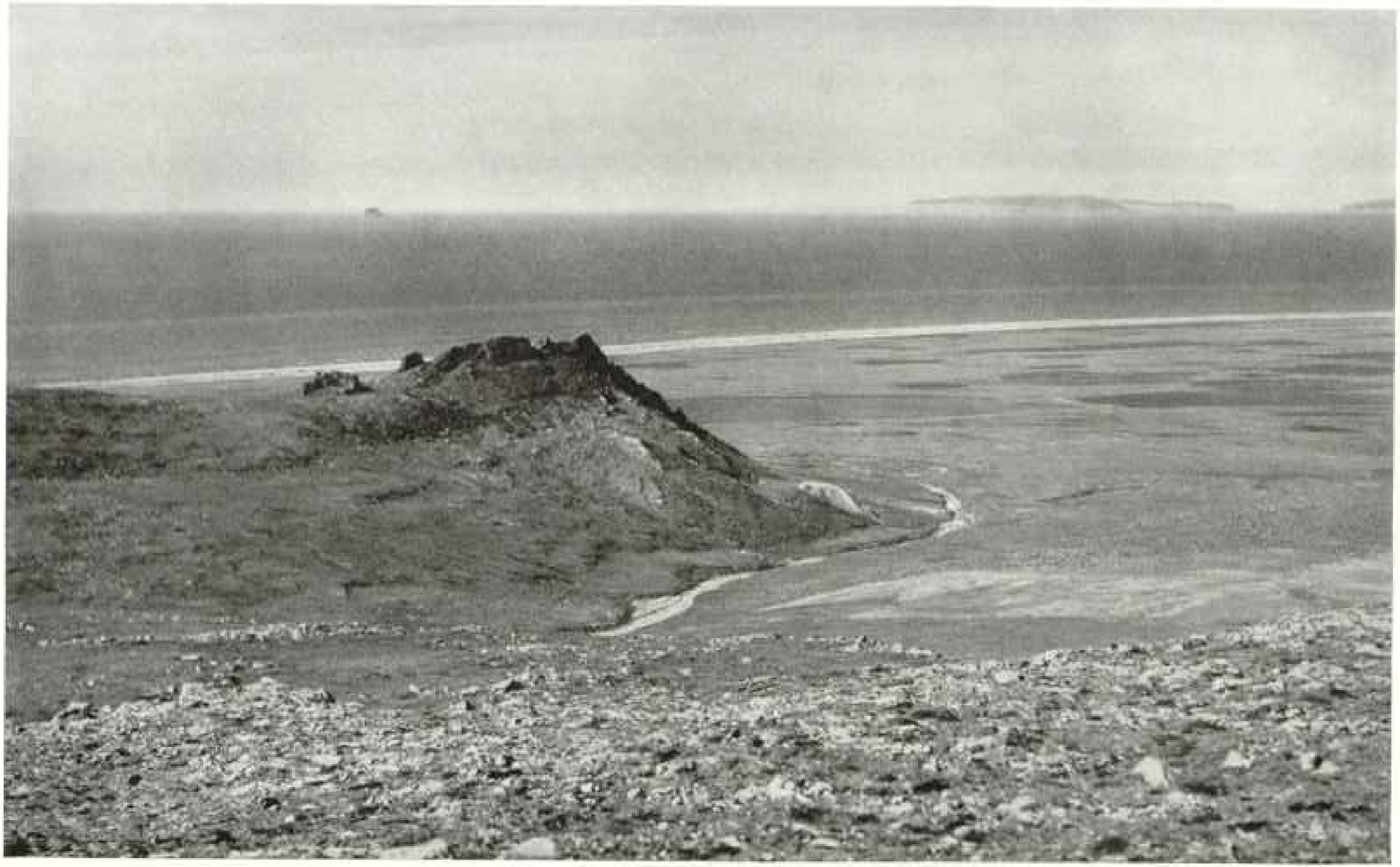
In the Kurigitavik mound we found remains of old houses, built of driftwood and whale jawbones as much as 10 feet long. There were also innumerable bones of seals, walrus, caribou, birds, and fish; fragments of wood and baleen, and many implements, utensils, and ornaments made of bone, ivory, pottery, wood, and stone.

From all this material, bound together in a frozen mass of soil and rubbish, we can reconstruct in considerable detail a picture of the life and customs of the ancient inhabitants. Several thousand objects from this and other mounds were excavated and brought back to the U. S. National Museum in Washington for exhibition and study.

They show us that the people who lived in prehistoric times at Wales had a mode of life in general like that still prevailing in northern Alaska, although in few instances are the implements identical with those in use today. As we dug down into the mound we found that some of the implements gradually changed in type and decoration from one level to another. These changes enable us to trace the different stages through which Eskimo culture has passed from prehistoric times to the present.

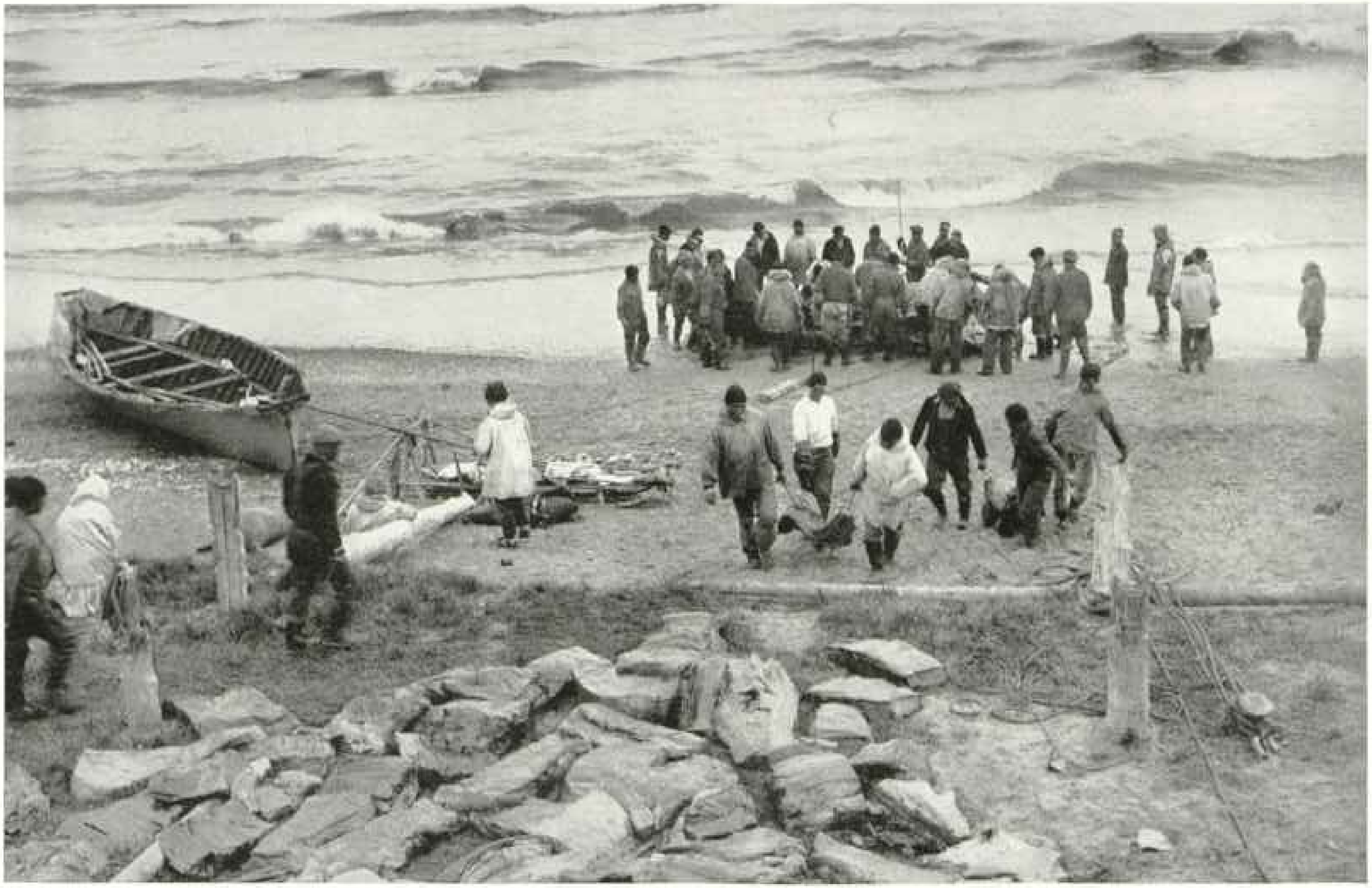
BONE ARMOR AND PREHISTORIC GOGGLES

The objects in the mound showed that the prehistoric Wales Eskimos, like their modern descendants, hunted the seal, walrus, and whale with harpoons. For hunting birds they used the bow and arrow, the bolas (cords with weights on the ends which are thrown to entangle the bird's wings), and the bird dart, hurled with a throwing stick to increase the leverage of the arm. Symmetrical, plummet-shaped



HERE YOU CAN SEE ACROSS BERING STRAIT, FROM NORTH AMERICA TO ASIA, WITH THE DIOMEDE ISLANDS BETWEEN

The Alaskan mainland, near Wales, is in the foreground. On the horizon are, from left to right, Fairway Rock; Little Diomede Island, in United States territory; Big Diomede Island (with snow on it), easternmost outpost of the U. S. S. R.; and at extreme right, the mainland of Asia, 55 miles away. Probably the first Eskimos to come to North America crossed here by boat, using the islands as stepping stones.



A WELL-STOCKED LARDER, ESKIMO STYLE! ONE WHALE YIELDS BLUBBER ENOUGH TO FEED THE WHOLE VILLAGE FOR MANY DAYS

Three men are needed to carry the huge chunks of fatty material which forms a layer just under the creature's outer skin. It is used as food and melted into oil to burn in lamps. All the 180 or so people in Wales received a share of the pile in the foreground (page 651).

TOSSED ON A WALRUS HIDE, HE HAS JUMPED OVER THE INFLATED SEALSKIN IN MID-AIR

Independence Day is the big holiday of the year at Wales, and white miners and their children from near-by Tin City join in the celebration. This Eskimo version of blanket tossing is a favorite sport, and formerly was used in religious ceremonies. The man tries to land on his feet. In the background are drying racks to keep meat out of reach of dogs.

FOUR BUDDING ESKIMO BEAUTIES—AND ENOUGH WHALEBONE TO STREAMLINE A WHOLE "GAY NINETIES" CHORUS!

The girls are standing behind the jaw of a dead bowhead whale. The hairlike material is baleen, or whalebone, once widely used for corset stays and buggy whips. The bowhead lives on small sea creatures strained out of sea water by the baleen in its mouth. Modern corsets use no whalebone, so the bowhead now has a chance to recover from near-extinction.

TWO PROMINENT CITIZENS OF WALES

Louis Tungwenuk (right) is a member of the National Geographic Society (page 650). His companion, George Oetenna, was one of the herders who in 1897 drove 300 reindeer from Seward Peninsula to Point Barrow, 400 miles away, for the relief of whalers who had been shipwrecked on the Arctic coast.

fishline sinkers, made of walrus ivory, and net gauges of bone show that fishing was important.

They made knife and adz blades of stone, snow shovels of walrus shoulder blades, mattocks of sections of whale rib, and heavy bone and ivory picks. They had buckets and trays of baleen with wooden bottoms, and lamps and cooking pots of earthenware. We also found wooden snow goggles with only a narrow slit to see through, worn to protect the eyes from the blinding glare of the snow in spring; wooden ceremonial masks, bone and ivory combs, decorated brow bands, and ivory labrets which were worn in holes in the lower lip.

Armor, made of rectangular bone plates lashed together in rows, showed that the prehistoric Eskimos at Wales sometimes had engaged in war. This armor is found in Alaska only around the Bering Strait region, where there has been more or less constant conflict between the Eskimos and the Chukchi of Siberia.

This type of armor has been used as recently as 75 years ago. It is basically similar to the plate armor of Japanese feudal times and to Chinese armor that came into use following the Han Dynasty (206 B. C.-A. D. 220).

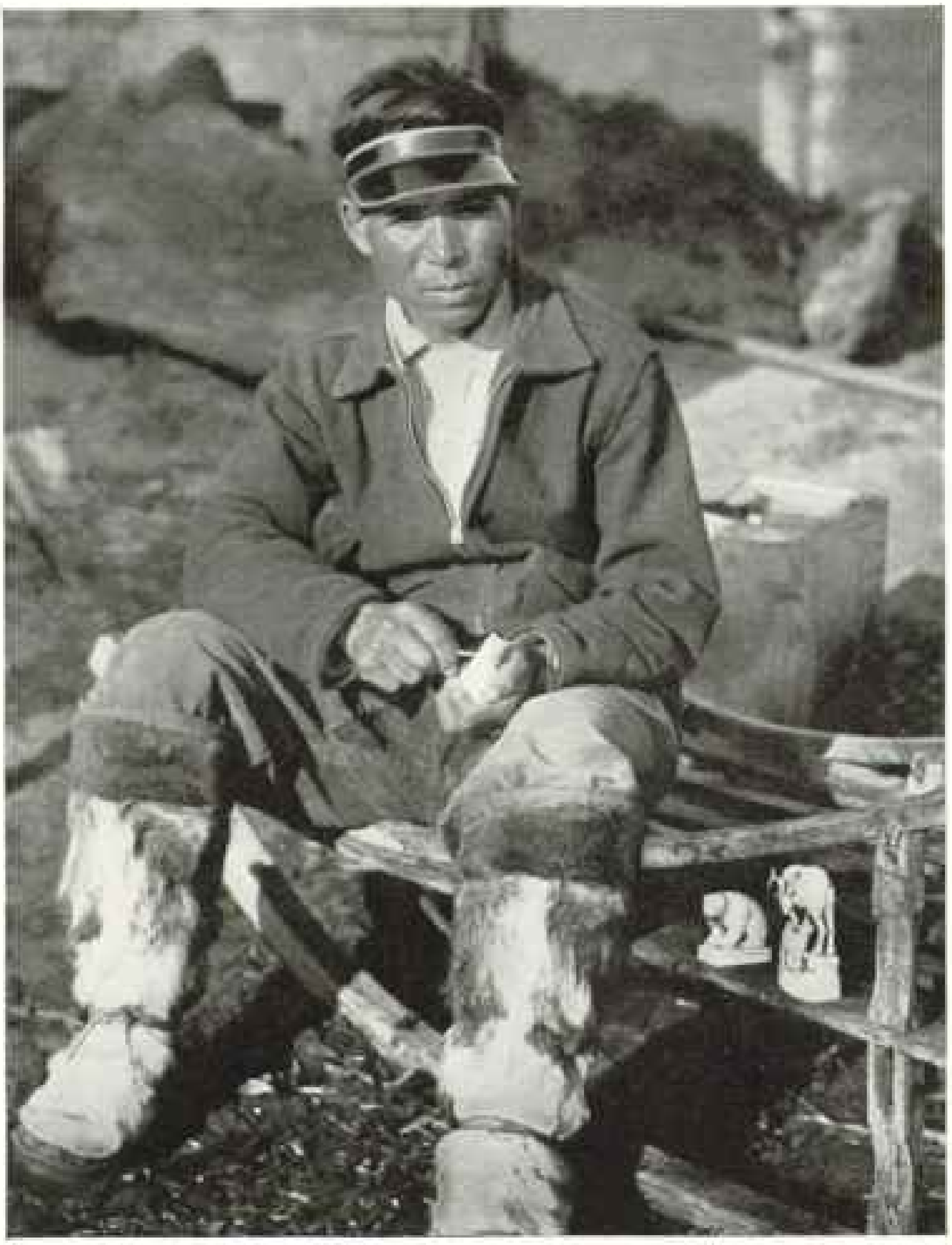
The most important fact about the Kurigitavik mound to archeologists is that the stage of culture it represents is closely akin to the Thule stage of Eskimo culture, which existed far to the eastward throughout northern Canada and Greenland in prehistoric times. We know that the Thule culture spread eastward from Alaska and that it dates back probably 1,000 years.

In our work we were handicapped by almost incessant wind, rain, and fog. Nature seems determined that the Eskimos shall enjoy even their all-too-short summer as little as possible. Bering Strait seems to

act as a funnel through which the wind is diverted, so that for an average of three out of five days throughout the summer it blows incessantly from either the north or the south, bringing bad weather with it.

Since our time was short, we had to work on stormy days as well as fair ones. Even when there was no heavy rain, the fog and mist, driving before the wind like smoke of a burning building, would drench our clothing and convert the soil in which we were digging into heavy mud.

But finally the good weather would come. Suddenly the wind would die down, the sun would come out, and the village would spring to life. Children scampered in play and the adults resumed their outdoor activities—hunting, fishing, repairing skin boats, scraping and drying seal and walrus hides, picking berries, gathering clams, and cooking over open fires in front of their houses.



EXQUISITE IVORY FIGURES ARE CARVED BY ESKIMOS

Mark Weohok, with images of a polar bear and reindeer which he has fashioned from walrus tusks, is one of the best ivory carvers in Alaska. With his fur boots, or *mukluks*, unchanged from ancient times, he wears a modern zipper windbreaker and an eyeshade, both popular in the north.

The Eskimos' life in summer is far different from their winter life, so often thought of as typical. In fall and winter they are busy hunting seals and walrus on the sea ice and laying in supplies of meat, blubber, skins, and oil to be used throughout the year. Summer, on the other hand, is by contrast their vacation time.

Seeing so little of the sun, they appreciate it more than we do. In summer there is so little darkness at Wales that one can read all night by "daylight." The Eskimos stay up late at night to enjoy the sun, sing and dance, then often sleep until noon!

A favorite summer occupation of the women and children is collecting whortleberries and edible plants.

Few people think of Eskimos as eating salads or greens, but actually there are two edible plants that form an important part of their diet. These are the green sorrel and mountain sorrel, both of which grow in profusion around Wales. The plants

IT'S SUNDAY WHERE THEY SIT, BUT MONDAY ON THAT OTHER SHORE!

Henry B. Collins, Jr., leader of the National Geographic Society-Smithsonian Institution Archeological Expedition, sits with an Eskimo boy on the shore of Little Diomede Island in Bering Strait. Beyond is Big Diomede, territory of the U. S. S. R. The International Date Line passes in the strait between, so that a day is gained in traveling from one island to the other.

OFF TO DIG UP SOME ESKIMO HISTORY, FROM ORIGINAL SOURCES!

Setting out for a day's work excavating a prehistoric village site are (left to right) Bob Tokianna, Dwight Tevuk, Harrison Prindle, a member of the expedition, and Walter Atuk. Note the absence of shadows. The sun shines at Wales infrequently even in summer. The guns were taken in hopes of a shot at ducks or geese (page 640).

THEY LIVE IN THE U. S. S. R., ONLY THREE MILES FROM THE U. S. A.

Eskimos of Big Diomede Island in Bering Strait, easternmost outpost of the Soviet Union, dwell hardly more than a stone's throw from Little Diomede, westernmost land of the United States in this region. The three girls at the left are daughters of Chief Riley, who represents the Soviet Government on Big Diomede (page 655).

are boiled, preserved in oil, or eaten raw, like salad.

Eskimo food habits are changing, however, and with tragic results. Increasing contact with white civilization and use of "civilized" foods is bringing rapid deterioration of their teeth, especially among the children. Originally the Eskimos had probably the finest teeth of any race of people in the world, and even today many of the older people have excellent teeth. But unfortunately this heritage is being lost: the Eskimos are veritably paying for their civilization with their teeth.

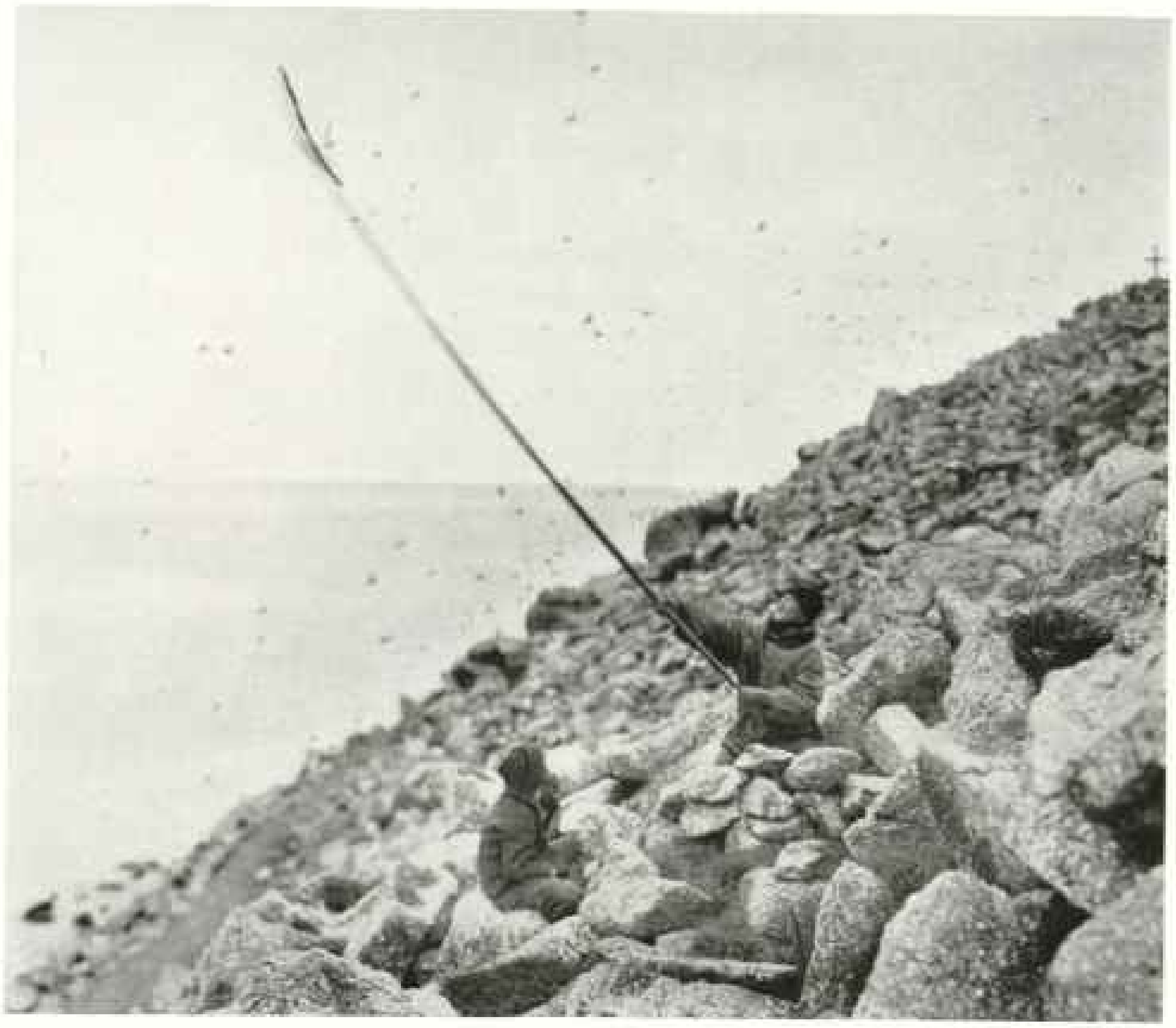
During several seasons in Alaska I have studied the teeth of some 300 Eskimos, and it is clear that dental decay has increased materially since they came into contact with civilization. Those nearest the white settlements have the poorest teeth.

Undoubtedly the diet is primarily responsible for the increasing prevalence of dental decay among the Eskimos. As long as they adhered to their native diet, consisting mainly of the flesh of whales, seals, walrus, and fish, rich in the essential food elements and requiring hard use of the teeth and jaws, decay and crowding of teeth were practically unknown. Deterioration of the teeth begins when the native diet is supplemented by soft carbohydrate foods and increases in direct proportion to the extent that these are consumed.

The teeth of the Wales Eskimos show comparatively little deterioration. Seals and walrus today, as in prehistoric times, provide most of their food. During the summer they kill birds, and salmon and whitefish are caught in nets in the shallow water along the beach.

Sealskins are made into boots, trousers, nets, dog harness, and ropes. The walrus provides the heavy hide essential for making the skin boats, or umiaks, and its ivory is used in fashioning implements and carvings.

Reindeer also have become important to the Wales people. The deer were introduced



SCOOPING SUPPER OUT OF THE AIR

Not butterflies but crested auklets are caught in a long-handled net by this Eskimo boy on Little Diomede Island in Bering Strait. About the size of a quail, the birds make a tasty dish. Countless numbers of them breed on the island, and the Eskimos catch thousands for food with such nets (page 654).

into Alaska from Siberia by the Government as an experiment between 1891 and 1902.

Today the Wales people own several thousand reindeer. They are branded with an identifying nick on the ear, but remain half wild and are allowed to range at will in the hilly country back from the coast (page 653).

At the annual roundup, early in August, the deer are driven into the corral about two miles from the village. Practically the entire population moves to the scene and camps in tents. In a large community cook tent several women are kept busy preparing large quantities of hot coffee, stewed fruit, and boiled reindeer meat for the herders and others engaged in the work.

Even in Alaska the unbranded animals are known as "mavericks." The deer are driven through a chute, and as each one emerges it is lassoed or grasped by the horns and thrown to the ground to be either slaughtered or branded. In branding, the mark of the Wales herd is nicked on one of the ears with a quick, deft knife stroke. Then the deer scrambles quickly to its feet and sets off at a curious swinging canter back to the hills again.

THE GEOGRAPHIC'S WESTERNMOST MEMBER

The Wales herd belongs to the Cape Reindeer Company, an organization of Eskimos, with officers elected by the stockholders, who share in the ownership of the herd. For the past several years the presidency of the company has alternated between two men, Louis Tungwenuk and George Oetenna. Tungwenuk, incidentally, is a member of the National Geo-

CLOWNS ARE FAVORITES EVERYWHERE—AND ESKIMOS LOVE TO LAUGH

Despite living in one of the most inhospitable climates on earth, Eskimos are a gay, lighthearted people. Bob Tokianna here stages a bit of horseplay with a wooden mask, much to Dwight Tevuk's amusement. Masks have been made and used here for centuries, though this one happens to be of modern manufacture.

graphic Society, the westernmost member on the American Continent (page 646).

In years past the Wales Eskimos were famous whalers. With nothing but skin boats and hand harpoons they hunted down the bowhead whales that followed the ice floes north through Bering Strait every spring. But in 1915 most of the expert whalers died in an influenza epidemic and whaling disappeared at Wales.

Thanks to the fact that the current through Bering Strait flows north in summer, however, the Wales people still can have an occasional feast of *muktuk*, the thick black skin of the whale, of which they are so fond.

The Eskimos of St. Lawrence Island, 150 miles to the south, still hunt whales, and some of the animals wounded by these hunters later die and drift ashore near Wales. Even if a whale has been dead for several months, it still tastes good to these Eskimo epicures, for in their opinion whale blubber, like good cheese, is none the less palatable because of the aging process!

One morning news came that a dead whale had been discovered about 12 miles down the coast. Five umiaks, carrying about 40 people, set out to tow it back. We found the carcass partly submerged at the water's edge, and there was no mistaking the fact that this particular whale had been dead for a long time!

The whale was towed home by a tandem arrangement of the umiaks (page 656). With the outboard motors of all five boats working together, it was all they could do to pull the heavy carcass through the water. Back at Wales, the whale was hauled up on the beach and in a very short time was cut

SUCH IGLOOS OF EARTH HAVE BEEN USED IN ALASKA FOR CENTURIES

The dwelling, half under ground and covered with sod, is warm and comfortable in winter. The door leads to an outer storage space, beyond which is one room used for living, sleeping, and cooking. It is windowless, but has a skylight of parchmentlike walrus or whale intestine. Most of the Wales Eskimos now live in frame houses, but a few of this old style still are occupied. Alaskan Eskimos do not build snow houses (page 638).

up completely and the meat distributed throughout the village.

The whale's arrival was celebrated that night by a dance held in the village dance house, which is always jammed to capacity on such occasions. The Eskimos greatly enjoy their native dances, and these are now encouraged by the Indian Office.

A SIT-DOWN DANCE

The women are the principal performers in the dances at Wales, and, contrary to the usual custom, they dance sitting down. About eight of them sit in a row on a high, narrow platform at the far end of the room, with one leg drawn up beneath them and the other hanging down over the edge. An orchestra of five or six older men sits on the floor, beating large flat drums like tambourines and singing a complicated refrain in which the audience joins.

The women, all facing to the left, perform the movements of the dance with arms, hands, and shoulders. As solemnly and precisely as Javanese dancers, they open and close their hands, extending them now forward and upward, now downward and to the rear. Their movements are so perfectly co-ordinated, and follow so closely the rhythm of the song and the drumbeats, that they seem almost like a group of marionettes.

Though some of the Eskimos now have phonographs and are fond of our modern music, this is not taken very seriously, and there seems little likelihood that it will supplant their own native form of dancing and singing.

Almost exactly in the middle of Bering Strait, and only a short distance apart, lie two islands, Little Diomede, which is nearer Alaska and belongs to the United States, and Big Diomede, which is in the territory of the U. S. S. R. The International Date Line, as well as the American-Russian boundary, runs between them (pages 642 and 648).

A 2,000-YEAR-OLD VILLAGE

On Little Diomede Island there is only one small Eskimo village, but since it is almost certain that Eskimos have been living on this same spot for probably 2,000 years, I was very anxious to examine it.

WHEN IT'S ROUNDUP TIME IN ALASKA "REINDEER BOYS" DO THEIR STUFF

Each Eskimo village owns a herd of semiwild reindeer. Once a year the animals are rounded up for slaughtering or branding with a distinguishing nick on the ear. They were introduced from Siberia by the United States Government about 45 years ago (page 649).

We started on a day that seemed ideal save for a light fog out in the strait. For once the sea was undisturbed by the slightest ripple. Puffins and other sea birds, swimming away as we approached, appeared like toy boats as they glided along the glossy surface. Our umiak was pushed along rapidly by the outboard motor, and soon we found that the fog, which from shore had seemed so light, was much thicker than we had supposed.

We could see hardly 50 yards ahead. When we came to the place where the island should have been it was not there! We began steering a zigzag course in hopes of finding it. Finally, out to the left we heard the report of a shotgun and turned in that direction, but so dense was the fog that before we were able to see the island itself we could hear distinctly the twittering of the sea birds that nest in countless numbers on the rocky cliffs.

The cliffs around Little Diomede Island rise almost vertically from the sea, at some places more than 1,000 feet. Only at one point, where a low spit of land extends out a short distance from the talus slope, is there a place suitable for human habitation, and this is the site of the single village.

Only a few families remained on the island, most of the people having gone to Nome to spend the summer working and carving ivory for sale, as is their annual custom. Through the kindness of Tom Anayah, the Government teacher, I was able to stay in the schoolhouse while I was on the island.

The adults on Little Diomede spoke little English, but some of the boys, who promptly volunteered their services, proved to be accomplished linguists. Besides their own language, they understood English and even some Chukchi and Russian. They were bright, happy youngsters, not at all timid or shy.

Whenever I emerged from the schoolhouse they appeared as if by magic, arguing among themselves as to who should have the privilege of carrying the camera, and bombarding me with questions and suggestions as to what we should do and where we should go.

They guided me all over the island, which is almost a solid mass of granite, roughly oval in shape and about two miles long.

There are no indigenous mammals on

THESE HOUSES PERCH ON A RUBBISH PILE 2,000 YEARS OLD

Beneath the village on Little Diomede are buried the ruins of Eskimo dwellings, implements, and relics accumulated since prehistoric times. The stone walls are typical of the older type of house. Big Diomede Island, Russian territory, is visible through the fog in the distance.

either of the Diomede Islands. Field mice, ground squirrels, and shrews, which are common on both the Alaskan and Siberian mainlands, are entirely absent on these rocky midway islands. Polar bears, foxes, and occasionally rabbits reach the islands over the ice in the winter. In striking contrast to the dearth of mammals is the abundance of bird life. These are two of the most famous bird islands of the north, the breeding place of vast numbers of auklets, murres, kittiwakes, guillemots, cormorants, and other sea birds (page 650).*

On the western side, where the granite cliffs have disintegrated and fallen rocks are strewn along the slope, the auklets hold undisputed sway, with an occasional puffin intermingled. Early in the morning and again in the evening the rocks all around the village are alive with auklets, sitting primly upright like little tin soldiers.

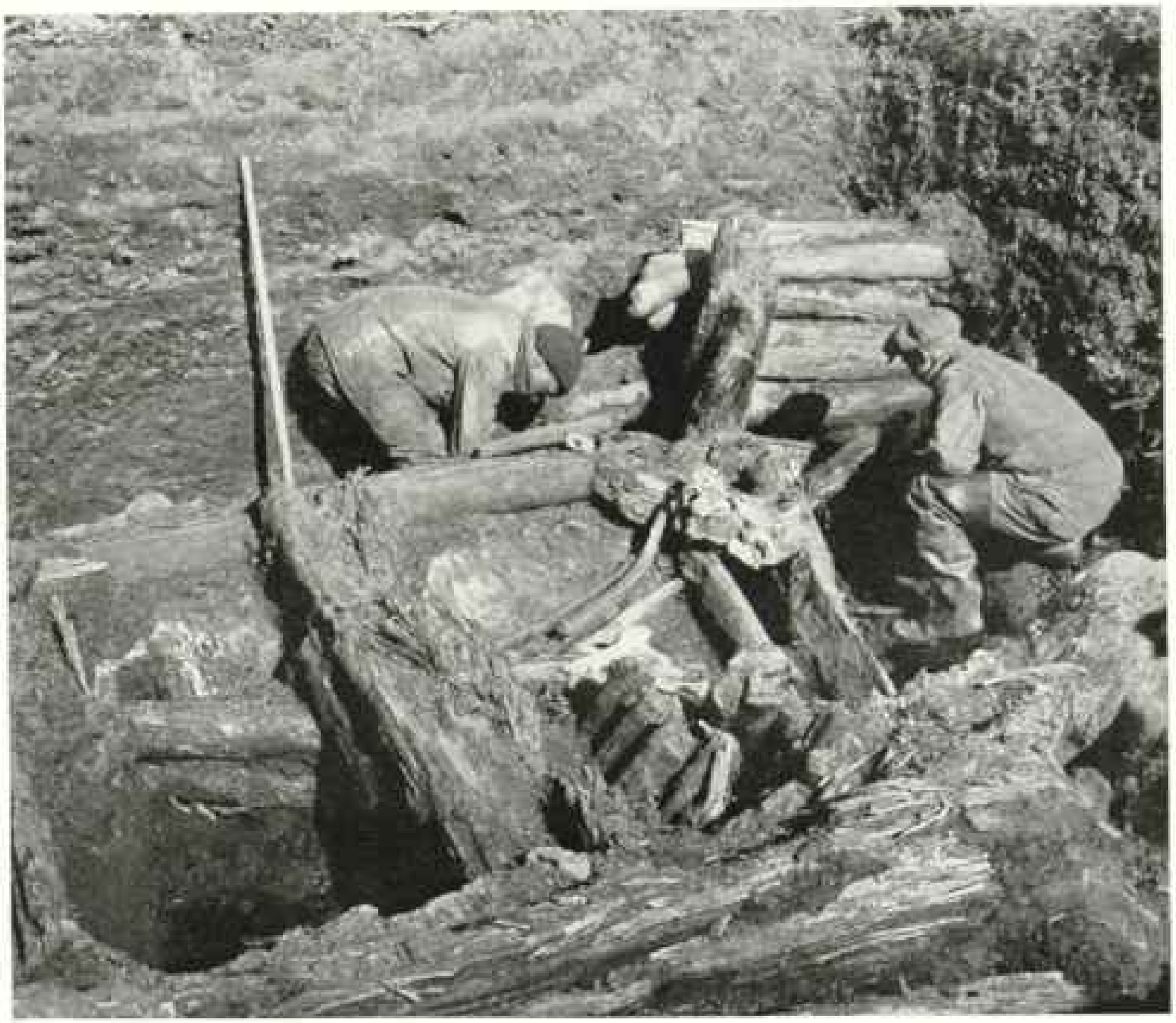
CATCHING BIRDS WITH NETS

The Eskimo hunters pile up rocks to make blinds along the hillside, and sit concealed within them. The auklets fly back and forth in flocks, and as they pass over a blind the hunter makes a quick sweep with his net, often catching several at once.

The village of the Little Diomede islanders sets squarely on top of its 2,000 years of Eskimo history. It is what archeologists call a "living kitchen midden." The villagers are still adding to a mound of refuse that has been growing for centuries.

Valuable information concerning the prehistory of the Eskimos would be obtained if it were possible to excavate the refuse

* See "Birds of the Northern Seas," by Alexander Wetmore, NATIONAL GEOGRAPHIC MAGAZINE, January, 1936.



IF THESE ANCIENT LOGS COULD SPEAK, WHAT A STORY THEY COULD TELL!

Forming the walls and roof of a prehistoric Eskimo house, they were preserved in the frozen soil of a refuse mound at Wales, until uncovered by the expedition. The logs came originally as driftwood from distant regions of North America or Siberia, perhaps before the time of Columbus. No trees grow in this part of Alaska.

on the site of the village, but this would be difficult because pits would have to be sunk very near to occupied houses. Some digging was done here in 1926 by Dr. Jenness, who found the first traces of the Old Bering Sea culture, but his pits have since been filled in.

A DAY GAINED—AND LOST

About three miles to the northwest of Little Diomede Island is Big Diomede, which is Russian territory. It once had a population of several hundred Eskimos, but now only four families remain in the single occupied settlement.

We rowed across on the morning of Friday, July 31. Although the trip required only about an hour and a half, it was Saturday, August 1, when we reached our destination, for we had crossed the International Date Line and gained a day. Then, recrossing the line on the return trip, we were back again to Friday, July 31, all in the same day!

At the village on Big Diomede we were hospitably received by Chief Riley, the official Government representative at this easternmost outpost of the U. S. S. R. He speaks little English, but his daughter, who had been educated at the mission school at Igloo, Alaska, was a good interpreter. We talked as we drank Russian coffee and ate doughnuts fried in seal oil (page 649).

Far to the west we could see the Siberian coast. East Cape, easternmost point of the Asiatic Continent and site of a large Eskimo settlement, loomed up clearly at a distance of about twenty miles. It is a promontory about 2,800 feet in elevation.

THEY'RE "BRINGIN' HOME THE BACON"—TEN TONS OF WHALE MEAT

Smiles of the Eskimos show they are anticipating a feast on a young bowhead which they are towing back to their village (page 651). The boats are the foremost of five in tandem, driven by outboard motors, which were needed to haul the whale. The lines in the foreground, of walrus hide, lead back to the other boats. In the background is Cape Prince of Wales, westernmost point of the North American mainland.

In all probability it was from there that the first Eskimos to visit North America set out on their historic voyage. When I returned to the Alaskan mainland a few days later I saw the New World just as they must have seen it for the first time—the rugged mass of Cape Mountain rising out of the sea—and I have already described the thrill that the sight brought to me.

Besides excavating the mounds at Wales, our expedition made a careful search for traces of settlements of pre-Eskimo peoples, ancestors of the Indians, who presumably came to North America long before the Eskimos themselves, but perhaps through this same region. We made a thorough search of the stream valleys and lowlands between the beach and mountains for some distance up and down the coast, but found nothing but fairly recent Eskimo remains.

If pre-Eskimo remains exist at or in the general vicinity of Wales, they are completely covered over. While we may still assume, on theoretical grounds, that man first entered the American Continent somewhere around Bering Strait, it should be recognized that no traces of these earliest migrants have yet been found.

We now know that a highly developed and highly specialized Eskimo culture has existed around Bering Strait for at least several thousand years, and it is improbable that any important Indian migrations took place after the Eskimos became established. On the contrary, all the evidence indicates that the Eskimos were among the latest of the Old World peoples to enter America.

AS SÃO PAULO GROWS

Half the World's Coffee Beans Flavor the Life and Speed the Growth of an Inland Brazil City

By W. Robert Moore

With Illustrations from Photographs by the Author and Luis Marden

"THERE'S a bit more to Brazil than the Amazon and steaming jungles and more to São Paulo than snake and orchid farms, isn't there?" remarked my companion as we looked down from the roof terrace of São Paulo's 26-story skyscraper (page 684).

Below us reared an uneven pile of bank buildings, commercial houses, and shops. The irregularity and contrasts of the building blocks reminded me of an awkward youth rapidly outgrowing his suit.

Swiftly in the last few years new structures have risen in an ever-widening circle. Trade has been carried beyond the "Triangle" (page 665). A number of buildings scattered through the district have not yet shed their cocoons of wooden scaffolding. Modern office space is difficult to find.

Every street we could see was filled with people. Trading clerks and tired shoppers gathered in slender queues at bus stops; others dodged horn-blowing automobiles at intersections. Guardrails on open-air tramcars that shuttled out the Avenida São João were festooned with men (page 669).

Beyond this business and shopping hub of the city extends a mosaic of rooftops and park areas, the uniformity broken by tall, gleaming apartment houses, some so new that tenants have not yet moved in.

From Bush to Modern Homes

From our lofty vantage point, however, much of present-day São Paulo still was concealed by a wide cycle of low-lying hills that until fairly recently was largely open country. Beyond the crests residential sections have been rapidly expanding. Sections that five years ago were smothered in bush now are completely covered with attractive homes and gardens.

The city's growth averages approximately two buildings an hour for every 8-hour working day throughout the year. Yet São Paulo is no boom town. Its progress has been well sustained.

Though one of the oldest established settlements in Brazil, it was slow in acquiring momentum; yet in the last sixty years it has increased its population fortyfold to reach the total of some 1,200,000 inhabitants.

Coffee Stimulates Prosperity

Coffee, of course, has afforded São Paulo continuous stimulation—and few touches of nerves. Heavy immigration, beginning in the seventies of the past century, gave the impetus. For here came thousands of people, principally Italians, Spanish, and Portuguese, a large portion of whom were given State assistance for migration. In 1895, the peak year, 139,000 newcomers came to the State of São Paulo.

The majority of these immigrants moved to the interior to provide labor for the coffee plantations and other agricultural enterprises. Some, of course, remained in the city.

"The best way to picture the growth of São Paulo is to think of it as at the constricted neck of a funnel, with the wide flaring mouth facing inland," said the President of the American-operated Mackenzie College, as he scrawled a rough picture in my notebook.

Into one side of the mouth he marked "raw materials, southern Brazil"; into the center "São Paulo State, richest agricultural section of Brazil—coffee, cotton, citrus fruits"; and on the opposite rim a long line pointing in from "Minas Geraes, nearly the size of Texas" (map, page 660).

More miles of railway spread fanwise into the interior from São Paulo than from any other place in Brazil, so that it is essentially a clearinghouse for the wealthiest part of the country.

As a corollary to its service as a trade center between the fertile hinterland and world marts, purse-fattened São Paulo has set up manufacturing plants to supply many of its ever-growing demands. Thus, fringing the city and tucked in the folds of the outlying hills, are smoking chimneys and humming factories of both Paulista and foreign concerns.

IN SÃO PAULO THE CUP THAT CHEERS IS FILLED WITH COFFEE

Like this friendly quintet in the Cafe Paraventi, thousands of Paulistas sip the beverage between meals. Coffee trays appear in many business offices in mid-morning and in the afternoon. Drinkers may sit down, stand up, rest their elbows on a bar, or sip the beverage in any way that suits their fancy merely by walking to one of the hundreds of cafes (page 673).

But to complete the picture of the funnel simile one must consider the tip of its spout, the port of Santos (page 667).

CITY OF WORLD TRADE IS NOT A PORT

São Paulo is not a port; it has not even a large waterway. The Tietê River, which twists and loops through a marshy corner, serves for scarcely more than a week-end playground for rowing small boats.

Instead, the city is situated on a plateau some 2,700 feet above sea level and 35 miles inland from the Atlantic. All its trade has to travel by rail or road over the plateau to Serra do Mar and then drop down a steep half mile to steamy Santos.

For years Santos had an unsavory reputation because of yellow fever, malaria, plague, and heat. All that is past history now except its summer heat.

Nearly forty years ago a development company cut extensive drainage canals, piped in a good water supply, deepened the harbor, and erected modern docks. Hotels fringing its landscaped beach attract holiday crowds from São Paulo and other towns.

In its own right Santos has little beyond the large banana plantations which sprawl over the jigsaw, sea-channeled marshlands that fringe the coast at the base of the Serra (page 663).

Its lifeblood is the stream of produce that flows down from São Paulo and the cargoes that are hoisted up the mountains from incoming steamers.

Coffee dominates the lives of the Santistas. Some buy, some sell, some ship, some carry, and the others—well, most of them, too, live from it in one way or another (page 669). The place even smells of coffee, except at night when the pungent odor of "flower of midnight" hangs heavily in the air.

From the billion and a half coffee trees in the interior come more than half of all the beans the world brews. Every year some 9 to 10 million bags (even more in 1938), each weighing 132 pounds, go out from this world's largest coffee port, and from 12 to 15 million from all Brazilian ports.

In its warehouses Santos maintains a constant stock of more than 2,000,000 bags. One morning I called on a large American

CHAIN LANES KEEP RUSH-HOUR CROWDS IN LINE AT BUS STOPS

When office buildings and stores in São Paulo's business triangle disgorge workers and shoppers late in the afternoon, traffic problems are acute. Before single-file lanes were established, chaos reigned at bus and streetcar loading stations. Mappin (right) is one of the large department stores.

corporation that ships from 25,000 to 30,000 bags a week, and followed coffee from sampling rooms to ship's hold.

Small sample cans of lots offered for sale are examined and graded: the grading determines the defects in each sample.

Unripe beans of bitter flavor; sticks, stones, and hard, black berries that are useless weight, and broken pieces that burn up in roasting—all are counted, and the coffee classified.

Type 2, for instance, has only four defects, while type 9 has twenty. Type 1 is purely theoretical, as no sample is without imperfections. Only types 2, 3, and 4 are purchased by the better exporting firms.

All samples are judged both by the odor of the raw berries and by the cup testing after roasting. Testers become connoisseurs of coffee as the French are of wines (page 668).

"Do you still get pleasure from a cup of coffee?" I asked the man who showed me around. He had spent years tasting coffees for his firm.

"Certainly. Would you join me in having a cup now?"

I was curious about its effects on him.

"Has it ever given you nerves or kept you awake?"

"Never."

As we drank the heavy, sweetened Brazilian brew, he told me of a time in New York when he was examined for life insurance. In filling out the blank he put down his occupation as coffee tester.

"Just what is a coffee tester?" asked the doctor.

C. T.: "A man who drinks coffee to see if it's worth buying."

Dr.: "How many cups of coffee do you drink a day?"

C. T.: "About 600 on a busy day."

Dr.: "Six hundreds cups! Good heavens, man, it's a wonder you're not dead!"

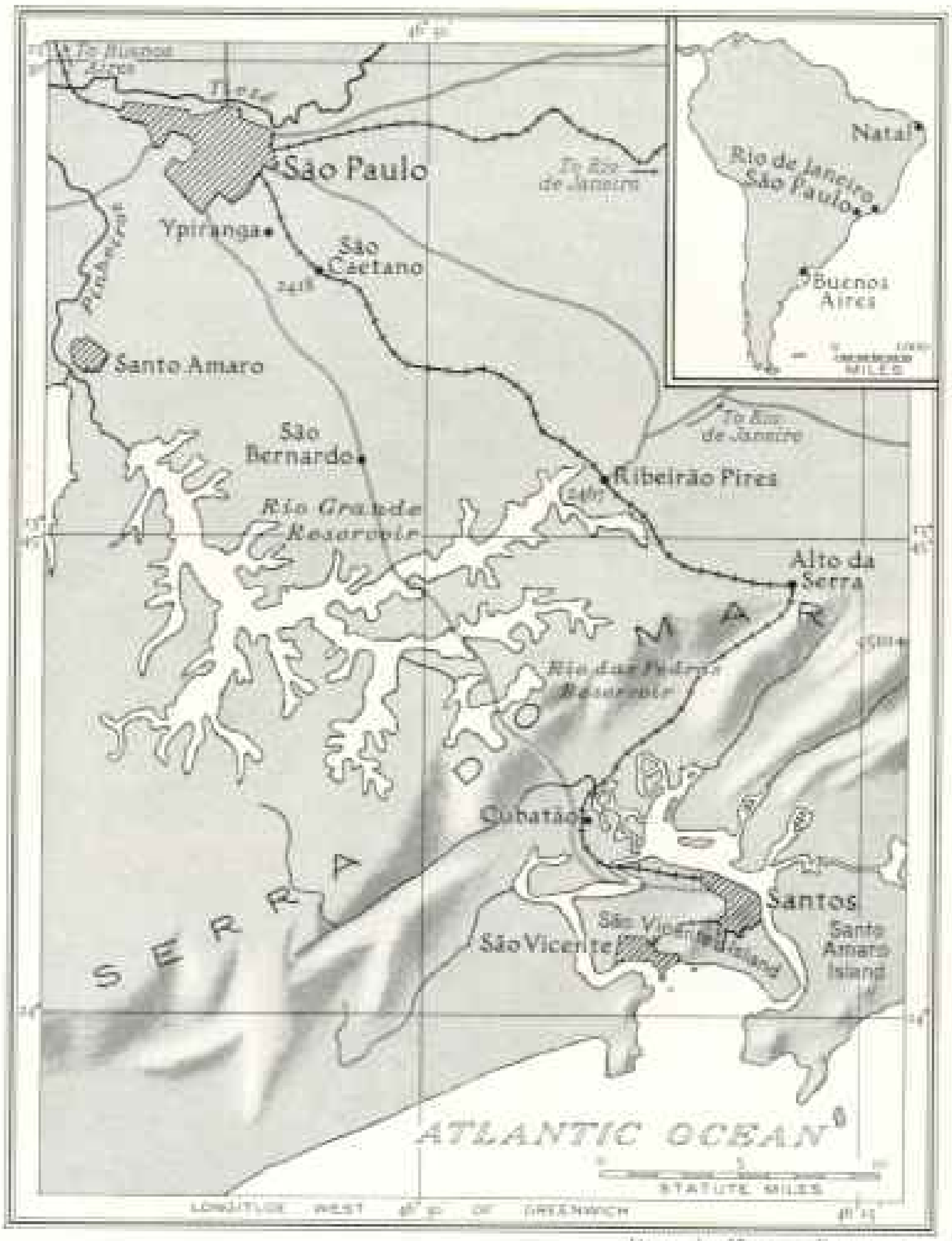
C. T.: "But we don't swallow it, we only taste and then spit it out."

THE SOUNDS OF SIPPING

In an adjacent room we heard the testers begin work.

I use the word "heard" advisedly, for the noise of their sipping is audible for a considerable distance.

The sample coffees are roasted, ground, and brewed in the testing room.



Drawn by Newman Bumstead

IN SÃO PAULO, BRAZILIAN STATE LARGER THAN NEW ENGLAND, COFFEE IS THE CREAM OF THE CROP

More than a billion and a half fragrant coffee trees bloom in the upland area surrounding its capital of the same name, 35 miles from the sea. Sharp-rising mountains separate this higher ground from the coastal lowlands where the port of Santos stands on São Vicente Island. The steep slopes of Serra do Mar, between the two cities, have been conquered by railway and motor-road builders so that the vast inland crops can be transported to waiting ships.

Bowls are then placed around a circular rotating table and the tester takes a large spoonful from one of the bowls, sips it with a vigorous inhalation of air to atomize it against his palate, then expels it into a tall brass cuspidor conveniently placed between his knees. A checker stands at his side, and if he clicks a bowl with his spoon the sample number is recorded, and the lot is refused should the other testers hold the same opinion.

At the warehouses I saw various individual lots being mixed to produce a uniform blend, then sacked and carted to the docks, where conveyer belts carried the bags to the ship's hold.

In some recent years Brazil has experienced both heavy overproduction and toppling prices. For a while the Government fixed prices, but that practice has been abandoned. Again, in open competition, Brazil ended 1938 with a quantity export figure exceeded only once in its history.

Since 1931, when incineration of the poorer surpluses began, more than 65,190,000 bags of low-grade coffee have been burned. Though there was a somewhat unsuccessful attempt to mix oil with the berries and use them as fuel in steam engines, most of the coffee has smoldered in dumps.

Increasing interest in cotton has caused some of the coffee estates to turn to cotton (page 676).

Though planted for centuries, São Paulo cotton has attained commercial importance only three times: first, at the time of the Civil War, then during the World War, and again in the last few years.

Since 1930 its production has multiplied about twentyfold. In 1938 the State harvested the equivalent of more than a million American bales, four-fifths of which,

along with quantities of cottonseed oil, left Santos for world markets.

More than half went to Japan and Germany.

Journeying up the sharp mountain wall from Santos to São Paulo, one forgets all about shipping statistics, though timid souls might find comfortable mental occupation in a few columns of figures rather than in watching some chauffeurs take the dizzy, breath-taking twists of the Serra highway.

"THE ROAD OF THE GOLDEN SPIKES"

The railway assaults the barrier in a more forthright manner. Trains waste no time on shunting switchbacks or groaning along steep cogged rails. Special engines haul them up the incline by heavy cables, one train coming down as another ascends.

So costly was the construction of the railway that it has often been nicknamed "The Road of the Golden Spikes."

So profitable, too, has been its income from the heavy volume of freight that the recipients of its dividends may readily think of it in the same terms.

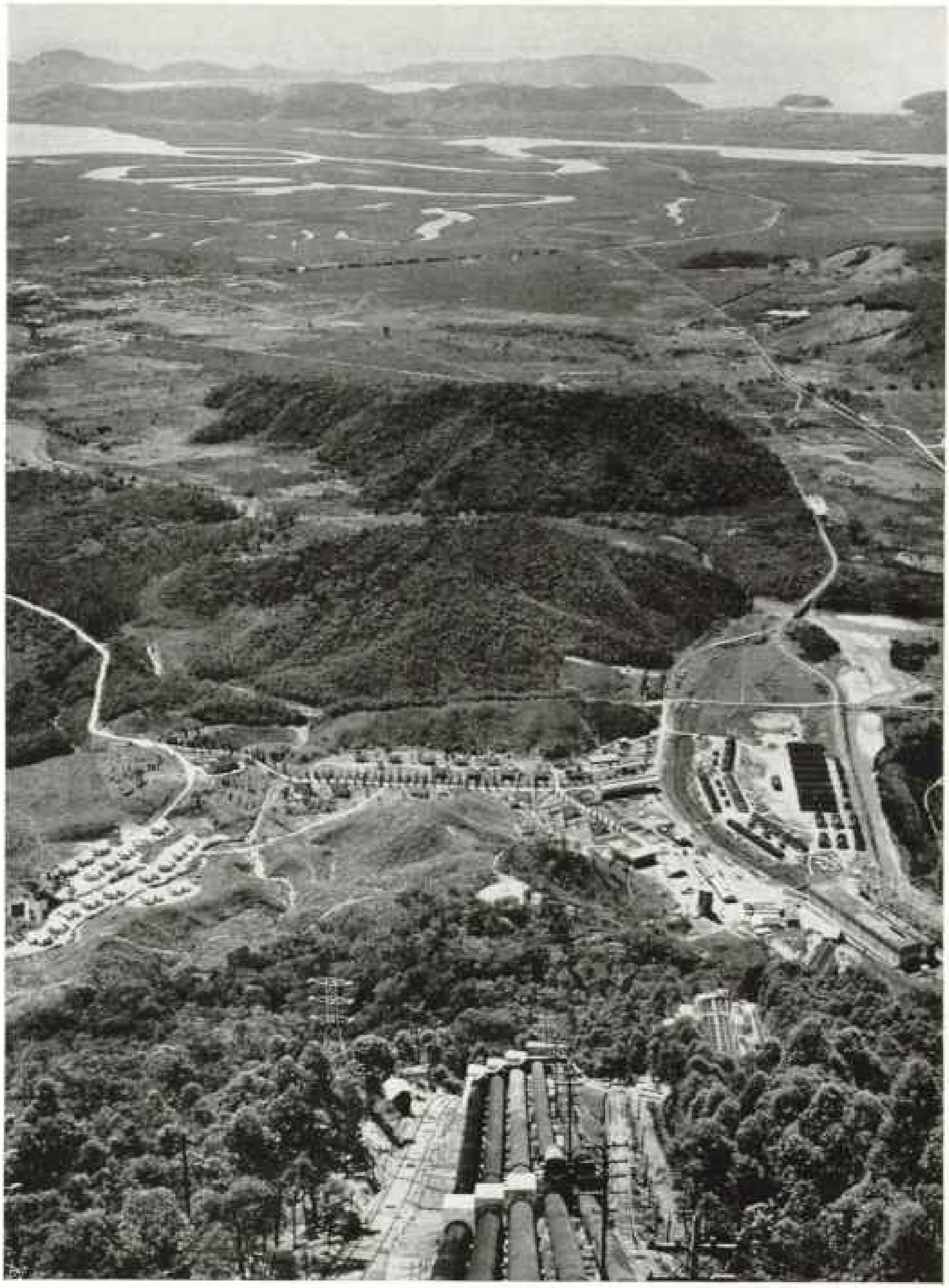
Here on the steep slopes is a paradise of tropical jungle, watered and washed by the rains that spill from clouds hanging almost perpetually over the Serra's crest. On every side orchids, strange air plants, and thick trailing vines cling to the trees. Against greens and more greens of every shade flash the vivid colors of flowers and birds.

Conspicuous against the mountainside is a narrow vertical ribbon down which extend the pipe lines to the Cubatão electric generators of the São Paulo Light and Power Company (page 664). Much twisted geography lies back of these huge pipe lines.

In a mood of fortunate fancy Nature lifted several hundred miles of the coastal region half a mile in the air, then tilted it gently inland. Consequently, streams along the coast are short. Other streams, just

POPEYE THE SAILOR INVADES SÃO PAULO

With him have come Snow White and the Seven Dwarfs. Errol Flynn peers out from the cover of a motion-picture magazine. Hollywood movies are popular. Dialogue is in English, supplemented with Portuguese subtitles. A dozen daily newspapers are published, several in foreign languages, but none in English. Newsstands are filled with weekly and monthly journals.

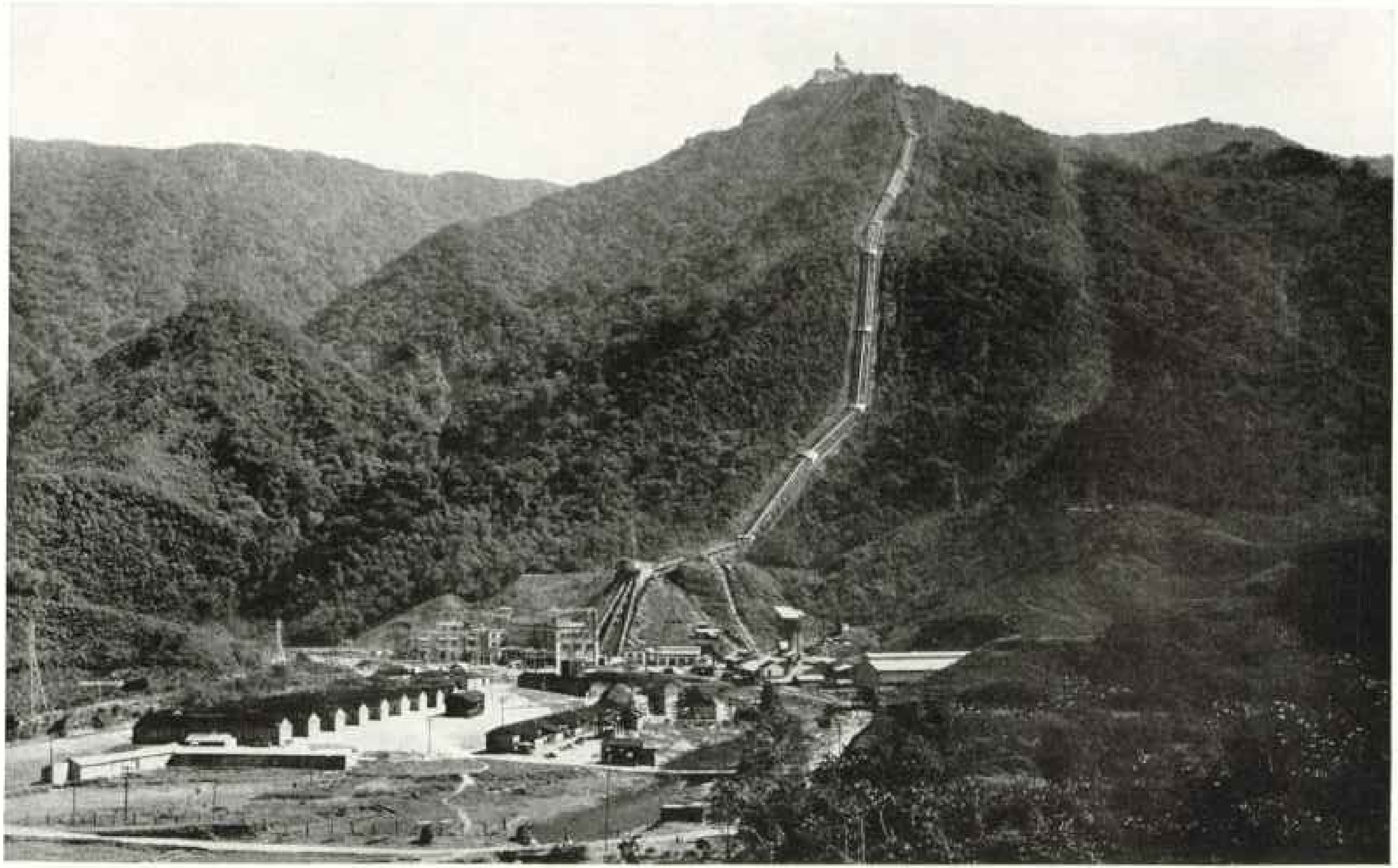


PIPE LINES POUR TORRENTS DOWN THE SLOPES TO GENERATE ELECTRICITY

A large paper mill lies to the right of the hydraulic power plant, at the foot of the precipice (page 664). Seven miles of lowland stretch from Serra do Mar to the sea. Beyond the twisting salt stream in the background lies the port of Santos, on São Vicente Island.

SANTOS EXPORTS HOME-GROWN BANANAS BY THE SHIPLOAD

Coffee and cotton on its busy docks come from the interior, but the bananas are its own. In the lowlands surrounding the port more than a million trees are cultivated, to the exclusion of nearly everything else. Other South American cities take most of the output (pages 658 and 667).



PIPE-LINE CASCADES FALL 14 TIMES FARTHER THAN NIAGARA IN ONE STEEP MILE

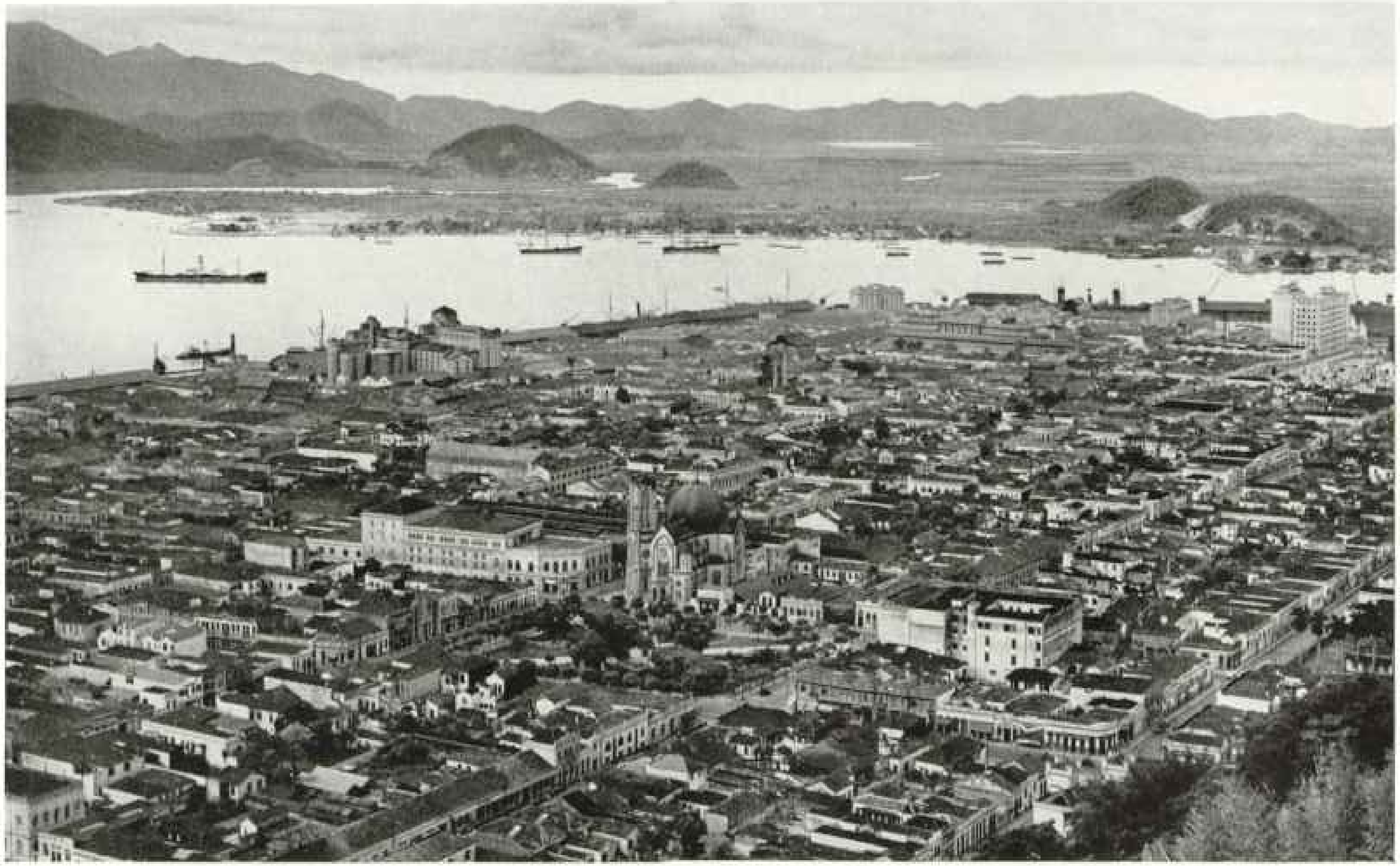
So terrific is the force of the water charging down the sheer slope of Serra do Mar that some 380,000 horsepower is available in the five pipes (pages 661-2). The torrent turns turbogenerators of the São Paulo Light and Power Company plant below. Serra do Mar rises abruptly from the lowlands seven miles from the port of Santos.

ANHANGABAHÚ PARK BRIGHTENS CONCRETE AND STEEL WITH A SPLASH OF TROPICAL FOLIAGE

Overlooking stately palms and rosewood trees stands the Municipal Theater (right). Shiny new buildings rise on all sides (page 684). The skyscraper in center, soon to be completed, will house the department store of Mappin. Like Pittsburgh, Pennsylvania, São Paulo's business district is situated in a "golden triangle."

ON THE SITE OF YPIRANGA MUSEUM, DOM PEDRO I PROCLAIMED HIS WATCHWORD, "INDEPENDENCE OR DEATH"

A large painting inside records the historic decision made in 1822 by the young prince regent. Parts of some of the aircraft built by Alberto Santos-Dumont, Brazilian aviation pioneer, are among the exhibits. One of Santos-Dumont's foremost exploits was a flight of seven miles in a motor-powered balloon around the Eiffel Tower in Paris in 1901, for which he was awarded a prize of $20,000 (page 688).



SHIPS FROM THE SEVEN SEAS TIE UP AT SANTOS, WORLD'S LARGEST COFFEE PORT

Coffee controls the destiny of this city on São Vicente Island, 35 miles from São Paulo. Odor of the fragrant bean permeates the entire area (page 658). Fifty ocean-going vessels can be loaded simultaneously at the long docks. Trains from the interior run directly to the quays. Many cargoes are automatically conveyed into the holds of craft alongside (page 663).

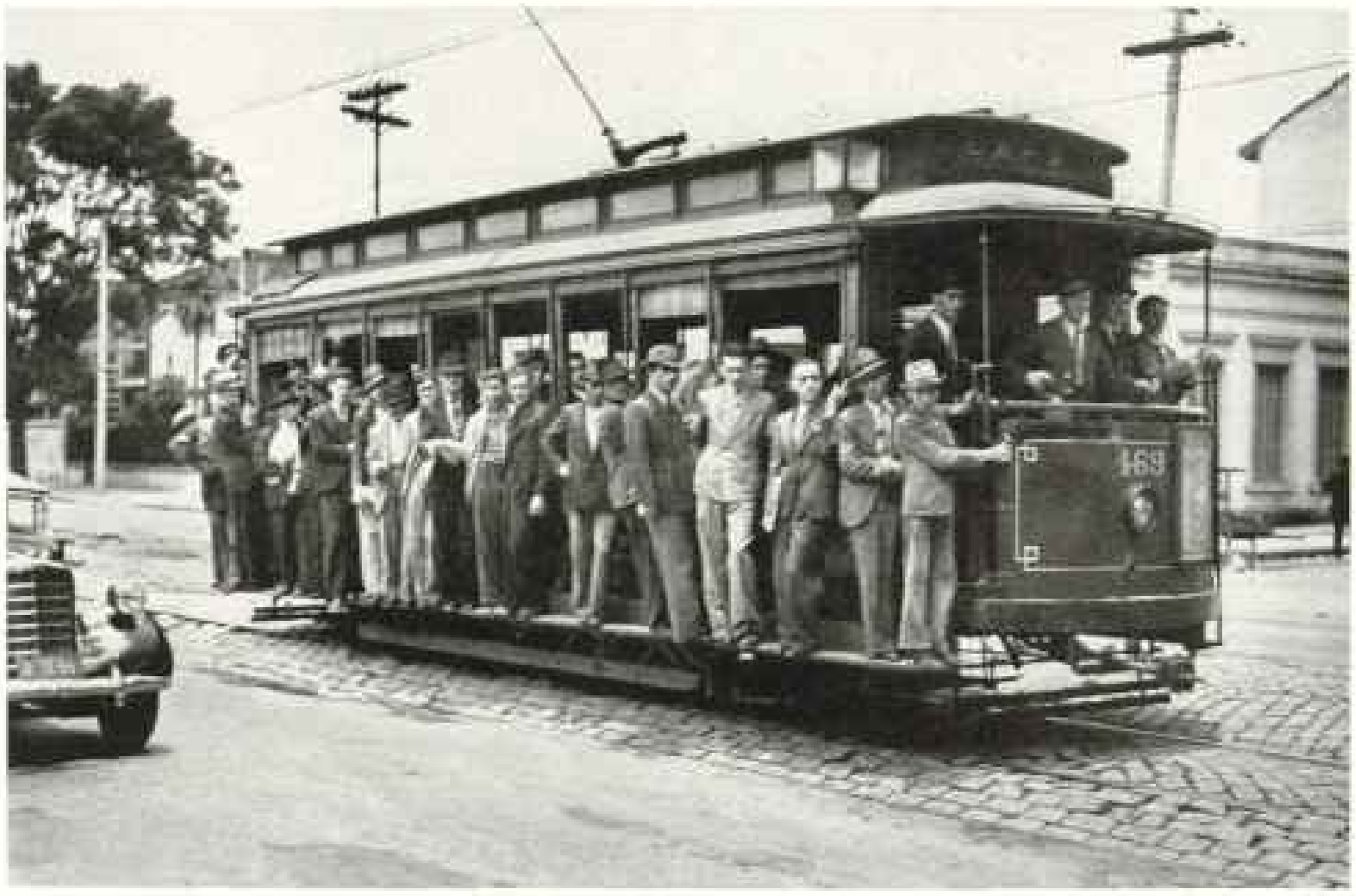
HE MAY TASTE—BUT NOT DRINK—600 CUPS OF COFFEE IN A DAY

This Santos expert takes a large spoonful from a bowl, sips the liquid, and then expels it. If he clicks the bowl with his spoon, a checker records the sample as unsatisfactory and, if other tasters agree, the lot is refused (page 659). The table rotates, so that each bowl in turn moves into place before the taster. The beans also are judged in small cans for fragrance and quality.

Photograph by Alice Schalek

ON SHOULDERS OF STURDY STEVEDORES, COFFEE GOES FROM CART TO WAREHOUSE

Santos teems with an army of brokers, laborers, wagons, and motor trucks from August to January, height of the coffee season. From 9 to 10 million bags, each weighing 132 pounds, are exported annually from Santos alone. The United States takes more than half of Brazil's export.



PAULISTAS HOMEWARD BOUND FOR LUNCH CREATE A NOON RUSH HOUR

Four times a day the streetcars are crowded. A scurry to work in the morning, a dash home for a hasty bite at midday, a quick return to the city, and a final journey home in the evening complete the cycle. Closed cars are painted red and the patrons call them "shrimps."

TO MAKE HEART OF PALM SALAD, FIRST SLICE OFF THE TOUGH OUTER CASING

When the tender heart of tightly rolled leaves is laid bare it resembles artichoke. These tubular lengths in the Santos market were cut from the tops of palm trees. Brazilians esteem the "cabbage" as a salad, but also serve it cooked.

beyond the divide, rise within a few miles of the Atlantic, yet wander more than 3,000 miles through the interior before they reach the ocean.

Waters on the crest of the Serra above Santos thus were gathered up by the Tieté in the region of São Paulo and carried on to the Paraná, eventually to mingle with the salt waters of the Rio de la Plata at Buenos Aires.

But no longer. Determined engineers have upset Nature's whimsey. They have turned the streams around, made them flow uphill, pushed them over the cliff, and created an amazing electrical project.

The gentle slope of the watershed on the plateau made it comparatively easy to construct dams across the channels and convert a large area into storage reservoirs with a level nearly the same as the top of the Serra.

Rainfall also contributes. From 180 to 240 inches fall annually on the crest of the plateau, so there is abundant water in these man-made lakes. Over most of the plateau, however, the rainfall seldom exceeds 50 or 60 inches.

Imagine more than 380,000 charging horses dashing madly down a mountainside. The thought is fantastic. Yet that much power is harnessed in the five pipe lines that carry the water down to the impulse wheels and whirring generators.

Nor can many of us fully appreciate a drop of half a mile in a single mile length of the pipes. But I heard of a man who does.

A FIREMAN'S NIGHTMARE!

A laborer, painting in the upper end of a pipe during construction, lost his grip on the rope he was holding and slid down its entire length—*inside!* Rivet heads and one or two gentle slopes in the pipe no doubt checked his descent somewhat, but in some places he must have had a swift, hot toboggan ride. Yet he emerged from the

lower end on his own feet, little the worse for his experience.

The electrical company has doubled its output of current on the average of every six years since 1902. And there is abundant reserve for more expansion. As we cruised by launch over the lake I saw new installations being put in place for pumping water up from the river below one of the dams. There, though lifted only 60 feet, the water can be made to flow across to the Serra and drop 2,400 feet, producing economical electric power.

Already thoroughly impressed by hydraulic engineering wizardry, I was informed that these same electrical motors and pumps that lift the water to the reservoir can, if desired, be reversed into turbines and generators simply by opening the valves and letting the water drop back down again.

SANTA TAKES TIME OUT FOR A LIGHT

The 9-foot papier-mâché giant carries a collection of holiday baskets of wine and fruit. He advertises wares for a São Paulo store during the Christmas shopping season. The man inside has his hands full with the bulky figure, so a friend holds a match to his cigarette.

After that, I went out to watch the sailboat races at a yacht club built on the shores of one of these artificial lakes. I know nothing about yachting, but it seemed simpler!

Sailing proved not so simple that afternoon. Seething black clouds boiled up into the blue sky and dumped torrents of rain. Four of the seven sailboats in one competition capsized on the course. Brazilians, British, Italians, and Germans, all of whom have clubs on the lake, skidded home over greasy, muddy roads.

Such tropical downpours are frequent during the summer and autumn months, from November to May.

Late Christmas shoppers found that out, as also did New Year well-wishers when they started making seasonal calls.

One day I talked with a director of a São Paulo bottling firm, which caters to the Paulistas' thirst to the extent of a hundred million bottles of beer and mineral waters annually.

ORCHIDS GO WITH PRETTY GIRLS ON EITHER SIDE OF THE EQUATOR

The author paid 50 cents for a bunch of 26 orchids and later was told he had been overcharged (page 673). In the orchidarium of the Botanical Garden in São Paulo more than 400 species are cultivated. All but a half dozen of these are native to Brazil.

Against a weekly temperature chart he had plotted the company's sales. Thirst graph and temperature graph paralleled each other with uncanny regularity. There were only two exceptions—the Christmas and New Year holidays and carnival time. Both periods showed dizzy mountain peaks in the otherwise mildly zigzagging line!

CHRISTMAS UNDER SUMMER SKIES

Arriving in São Paulo shortly before Christmas, we hurried about town trying to get photographs that might reveal the holiday spirit under summer skies.

A 9-foot bewhiskered papier-mâché Santa Claus, with Germanic cut to his tunic, stalked about town (page 671). The only Brazilian touch to his figure was the collection of holiday baskets of wine and fruits he carried as an advertisement for a local store. Santa stayed with us until after the New Year.

A few flower stalls added Christmas trees to their stock, a comparatively recent innovation.

Snow White and the Seven Dwarfs and Popeye the Sailor had invaded the bookstalls and even found place in store decorations.

But it was the street activity that we wanted most to record. Crowds of men and smartly groomed women thronged the shopping lanes of São Bento and Rua Direita, where vehicular traffic was suspended from 10 o'clock in the morning until eight o'clock in the evening; the late afternoon sea of humanity was in the Praça da Sé, and long lines of people waited at every car island and bus stop (p. 659).

"Don't worry, the crowds will still be here after Christmas," someone told us.

They were. Rush periods are the same every day in São Paulo.

A TRICK OF THE SNAPSHOT TRADE

On the streets candid-camera men click shutters at pedestrians, as do their kind in Washington, D. C., or Sydney, Australia (page 688). The only difference is that they waste less film. Trigger-pressing is largely pretense. If someone accepts the

"OPEN YOUR MOUTH AND SAY AH," WITH VENOM!

Steady hands force a rattlesnake's mouth open, thrust the edge of a glass dish below the fangs, and squeeze the glands on the side of the reptile's mouth to expel the poison (page 674). The white protuberances from the snake's mouth are the fangs; the black points are the tips of tweezers held by the keeper. Venom of the rattler is almost colorless; that of other varieties varies from bright orange to milky white. Between the Butantan Institute technician and his assistant stands Captain J. W. Rankin, commanding the U. S. S. *Phoenix*.

cards they hold out, they ask to take another snap to be sure that you really will have a good one!

Fountain-pen demonstrators, spellbinders with gewgaws, and even snake charmers station themselves on busy corners.

Clerks, stenographers, and the business man who wants to get a quick lunch can go to an Automatico, drop a few coins in slots and get sandwiches, meats, salads, or sweets, and wines, milk, or coffee (page 680).

Coffee places are legion. You can sit down, stand up, rest your elbow on a high bar, or drink coffee in any way that suits your fancy, simply by walking a few steps to your favorite coffeehouse (page 658). In many offices coffee trays appear in mid-morning and afternoon.

Countless coffee shops do their own roasting and grinding; some serve their own special blend.

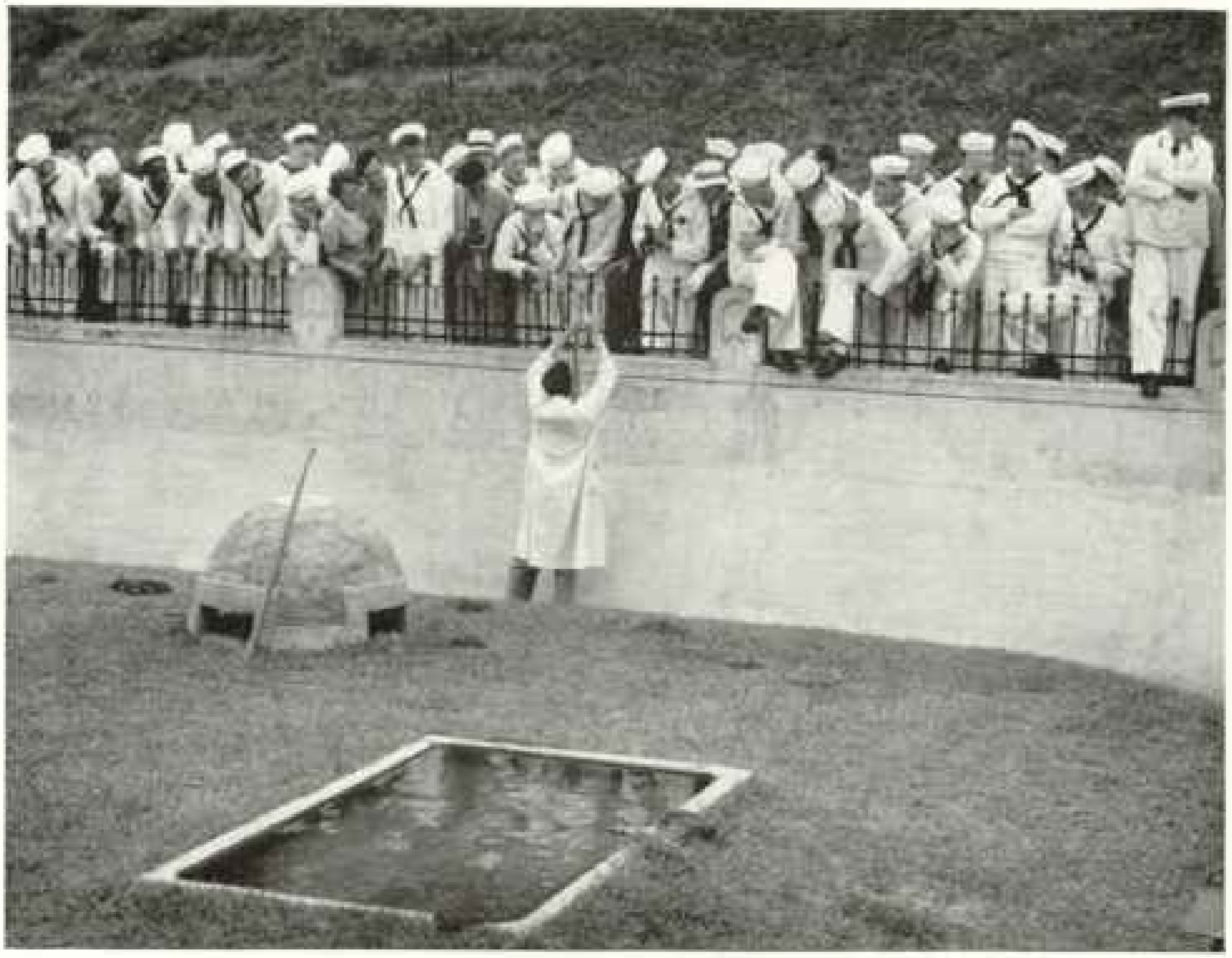
On my first day in São Paulo I saw some orchids at a flower stall in front of the Municipal Theater. An armful of 26 large blooms cost me fifty cents. Boasting about my purchase later to a Paulista, I was told that I had been overcharged! (Page 672.)

ORCHIDS FOR NEW YEAR'S EVE

As decoration for its New Year's Eve party, the hotel where I was staying used only orchids. Ballrooms and dining saloons blossomed forth with 65,000 flowers! A lady appearing there with a single orchid would have had little distinction.

Out at the orchid garden in the suburbs of São Paulo I saw many that are rare even in this orchid land. In all, the garden has some 400 species and more than a thousand varieties of plants in colorful display. Orchids are grown in numerous private gardens—2,500 plants at one home.

Many people seem to get more pleasure raising dahlias. But what dahlias!



SNAKES INTRIGUE U. S. TARS ON SHORE LEAVE AT SÃO PAULO

Sailors from the U. S. S. *Phoenix*, new light cruiser on her shakedown cruise, visited Butantan Institute in December, 1938. A skilled attendant in a pit with poisonous reptiles shows how venom is extracted (pages 676 and 679). This poison later is injected in increasing doses into horses and mules. After the animals have built up an immunity to the venom, their blood is drawn to supply the serum which cures snake bite. Most deadly to man are the coral snakes and rattlesnakes. Other dangerous types are the bushmaster and the cobra.

Magnificent blooms of blood red, gold, pink, and white grow eight to ten inches in diameter.

The managers of a large American automobile assembly plant spent much time showing me around the factory gardens and talked more about flowers than they did about putting together the parts of shiny new vehicles. They assemble 9,000 cars and trucks a year.

Miles of São Paulo's streets are lined with *jacarandá* trees, the rosewood of northern cabinetmakers, whose branches become massed floral bouquets of smoky lilac-blue in flowering season.

On other streets, *ipé* trees compete with clouds of gold. Hedges of hibiscus and gateways covered with bougainvillea add to the city's pageantry of flowers.

Out in Brisbane, Australia, I once saw many jacarandás, grown from seedlings taken there from their native Brazil. At the Horto Florestal, the gardens of the forestry department for São Paulo State, I saw bed after bed of tiny Australian eucalyptus.

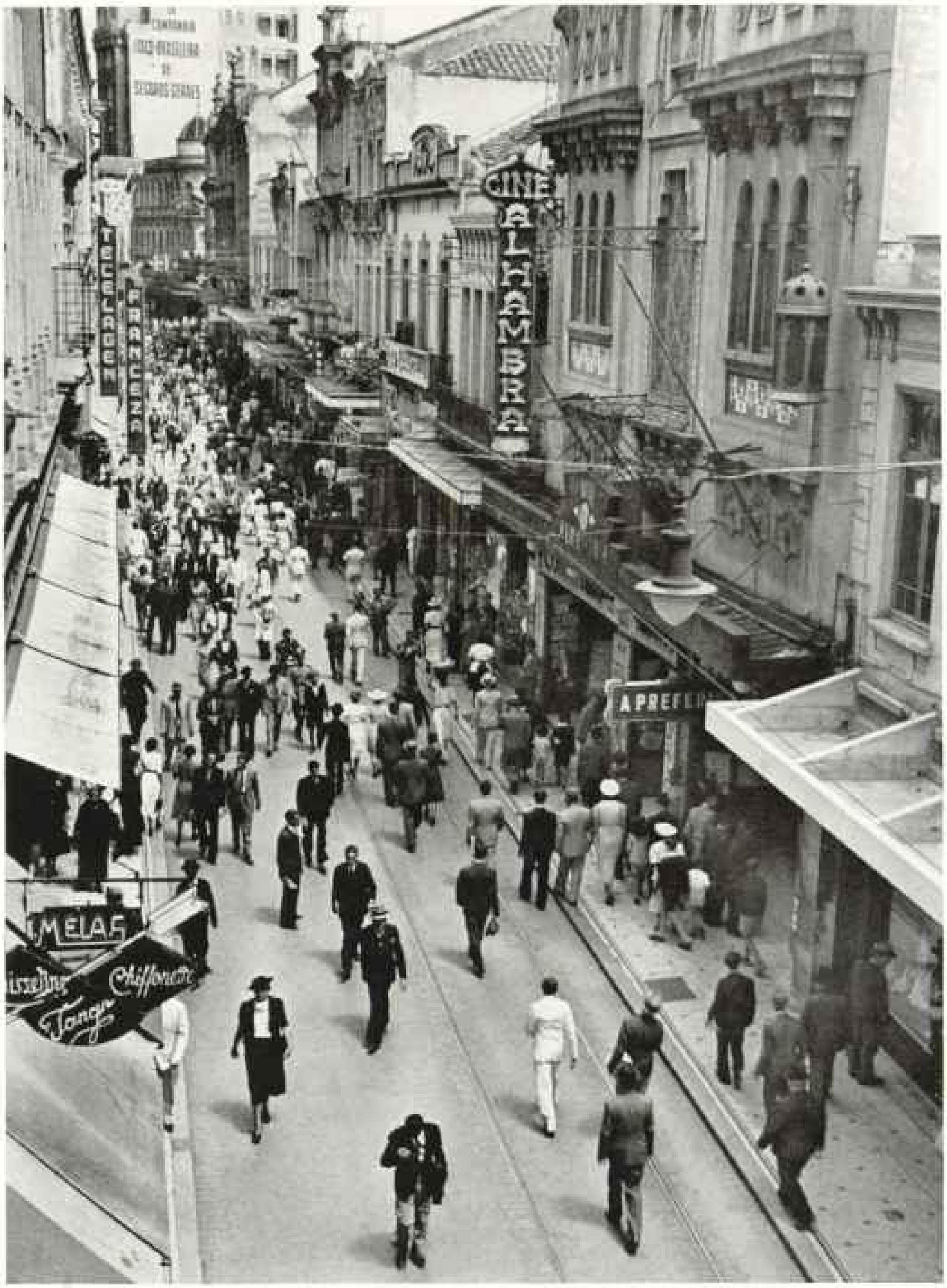
"Of four million young seedlings that we have sent out to every part of the State this year, three millions of them have been eucalyptus," said the director. "We have no tree that grows so fast, so we plant them for firewood and fence posts. But we have some fine Brazilian cabinet woods. Come and see."

A WOODWORKERS' PARADISE

We went to the new forestry museum and stepped at once into a woodworkers' paradise. Floors, ceilings, and furniture were all made from the finest Brazilian woods.

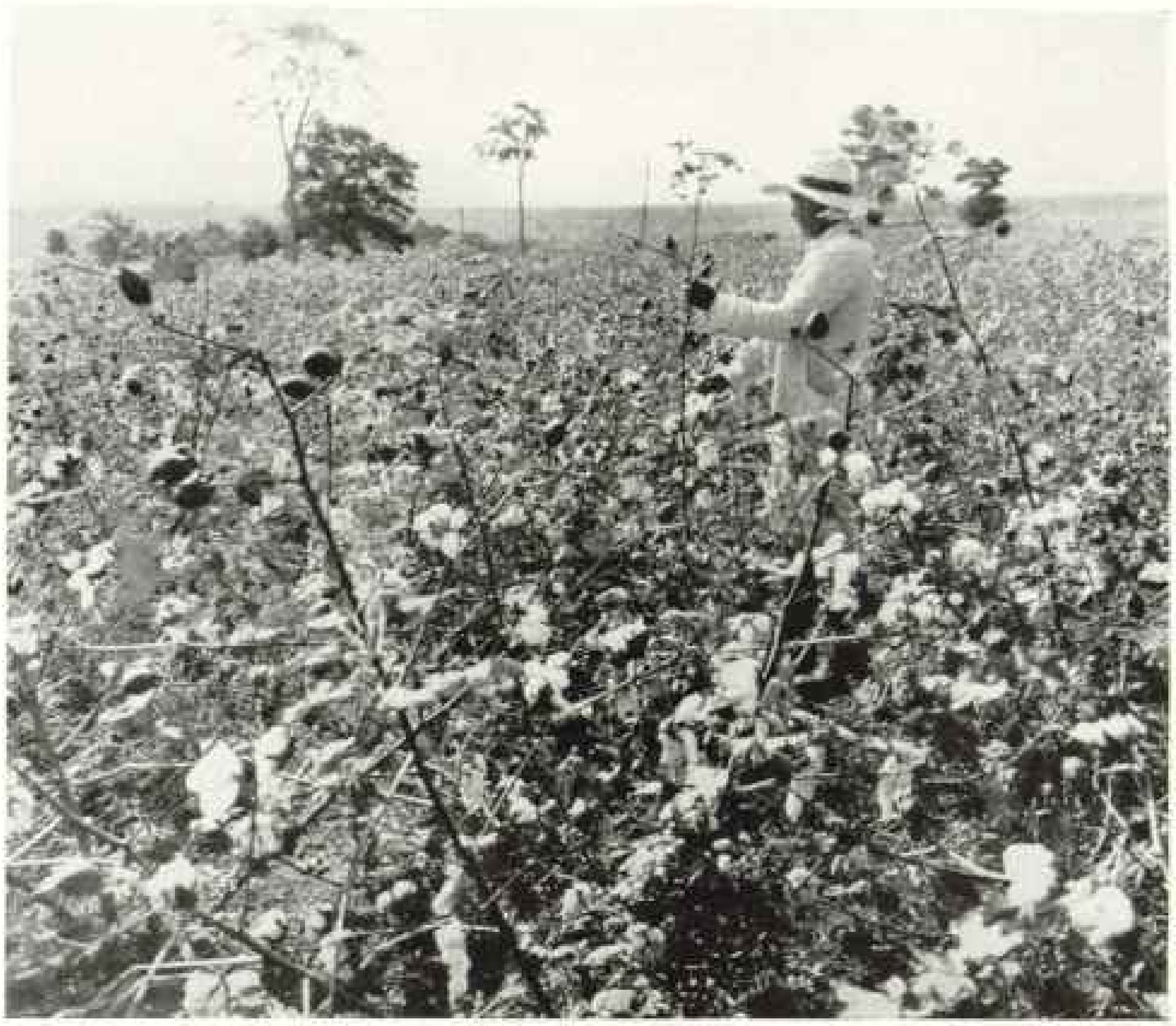
Every detail, down to the last book end and fire screen, was a tribute both to the woods and to the man who had planned the museum.

Around two rooms stood uniform rows



IN THIS PEDESTRIAN'S PARADISE, VEHICLES ARE BARRED FROM 10 A. M. TO 8 P. M.

Parisian frocks and Bond Street (London) suitings are displayed in the windows along the Rua Direita, fashionable shopping thoroughfare. Although wide avenues radiate from the business center to all parts of São Paulo, many of the old downtown streets are narrow.



Photograph by Zanella

COTTON FOUNDS A NEW KINGDOM ON THE SÃO PAULO UPLANDS

Production in Brazil has increased twentyfold in the last decade, the crop in 1938 exceeding one million bales (page 660).

of polished yard-length pieces of sample woods. One side of each was left with a natural surface, the other covered with a transparent varnish. On each sample, too, the leaf, flower, and fruit of the tree had been painstakingly carved in high relief, mounted specimens of which hung on the wall.

I picked up one of the boards to examine it more closely. It was like picking up a piece of iron—a yard-sized cube of wood weighing more than a ton.

"The greater part of our Brazilian woods will not float in water. Some kinds are so hard that the carver breaks his chisels working on them," the director continued, and then handed me a piece of wood almost as light as cork.

"Brazil has some 600 fine cabinet woods; there are more than 400 in the State of São Paulo. We have already classified nearly 160 of them, as you see here."

In São Paulo shops one sees inlay trays, lamps, table sets, and boxes made of Brazilian woods.

There, too, one finds bowls and glass trays on which butterfly wings have been placed to form pattern and luster.

Two common varieties of butterflies, one with spectacular metallic-blue upper-wing surfaces and the other with dark owl-eyed spots on the mottled brown wings, are most used for souvenir decorations.

SIGHTSEERS THRONG "SNAKE FARM"

I sat for lunch on a veranda in suburban São Paulo one day and watched the sun flash on many of these lovely iridescent creatures. Several hummingbirds also paid us a visit and flitted about or hovered over near-by bushes.

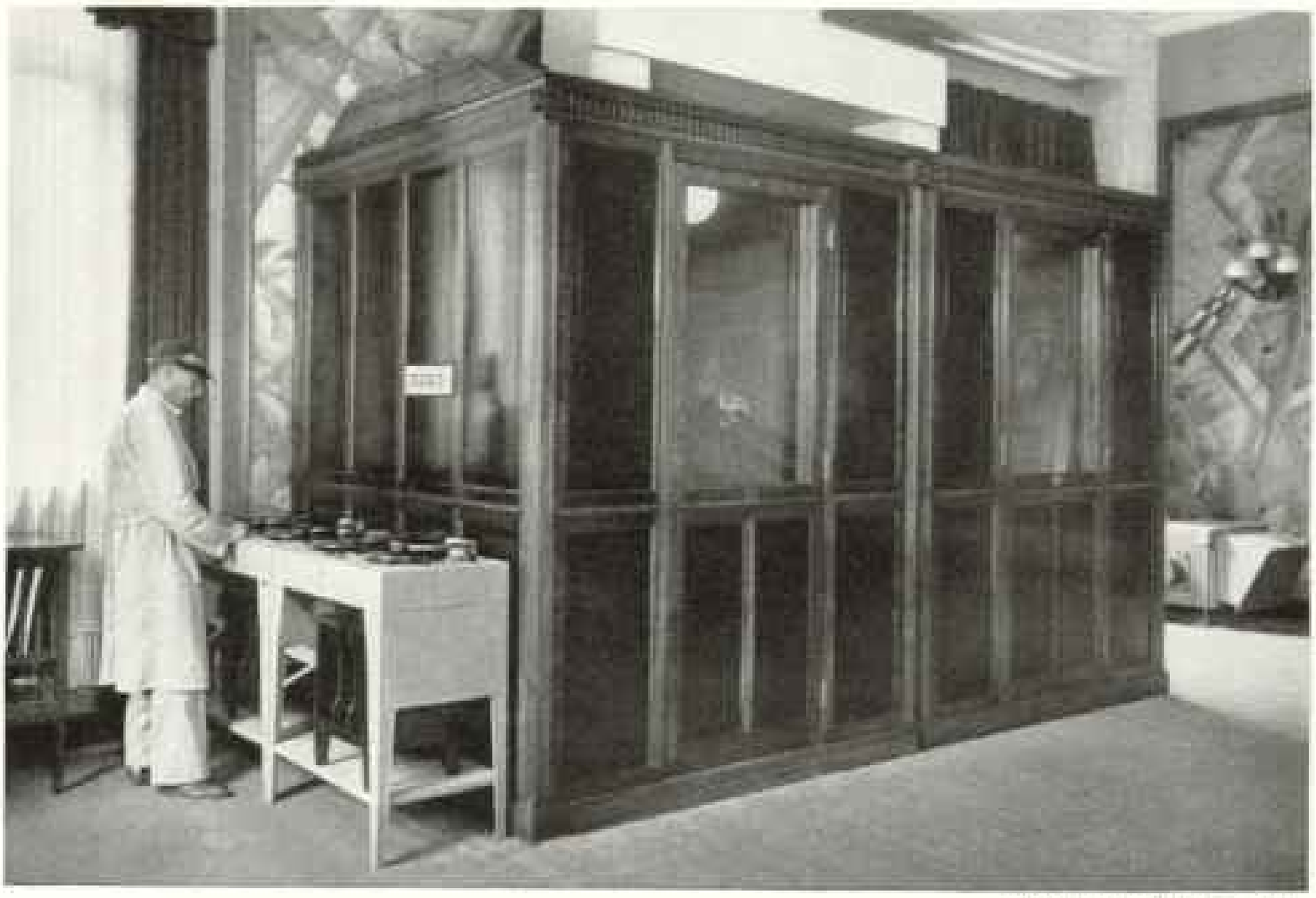
São Paulo's Instituto Serumtherapico at

SILENTLY THE TINKER MAKES HIS DAILY ROUNDS

In suburbs the 20th-century "horse and buggy" still is popular with house-to-house traders.

LOOKS TERRIFYING, BUT ITS BITE ISN'T FATAL

Like all spiders, this tarantula has in its jaw a gland which secretes poison. Most members of the tarantula family are not deadly to humans, but several tropical species are dangerous. Scorpion bites are feared even more, for their venom affects the nerve centers and causes lesions which sometimes prove fatal. Serums for treatment of tarantula and scorpion bites, as well as snake bite, are prepared here at Butantan Institute, in São Paulo (page 680).



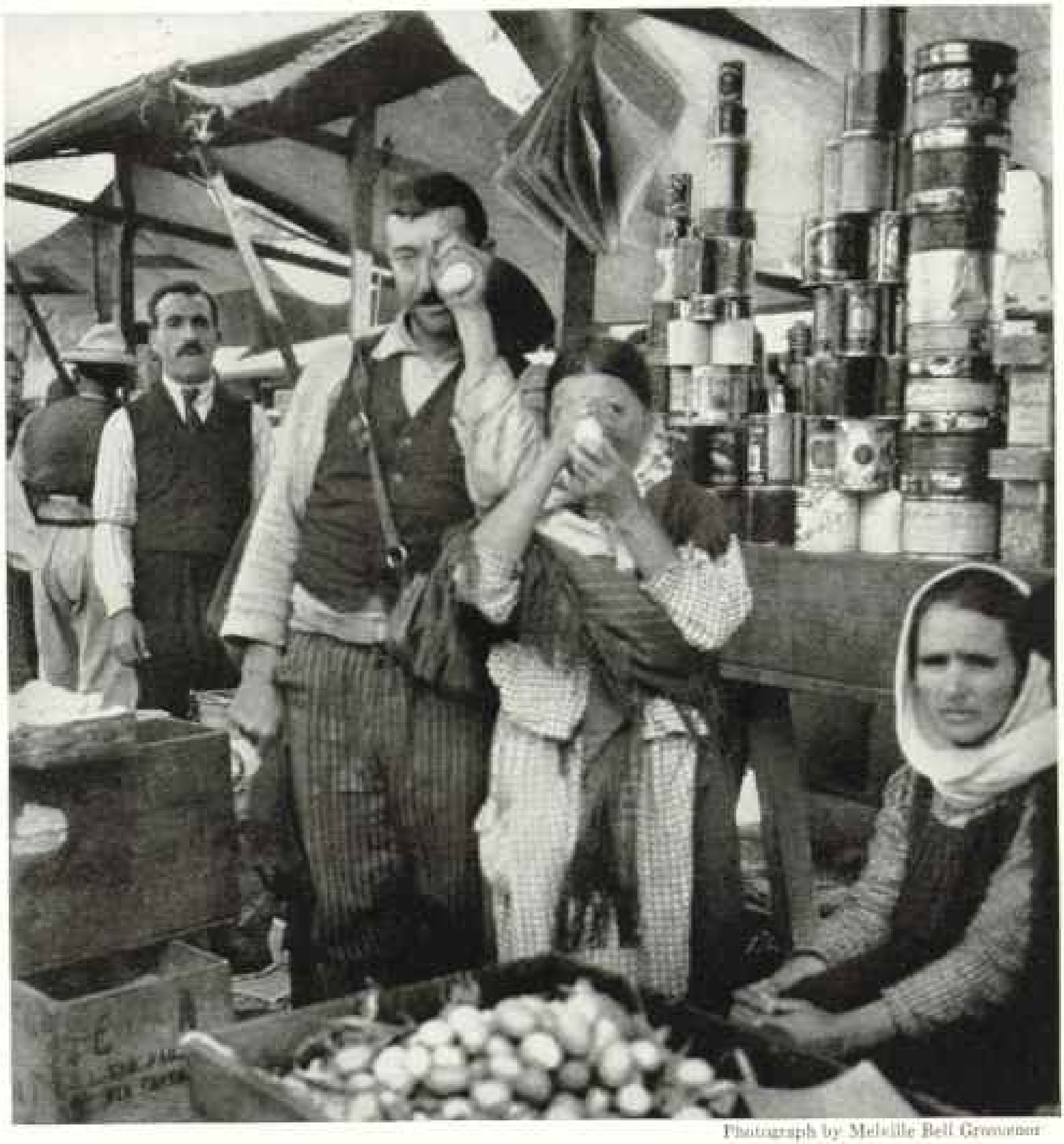
Photograph by H. Rechsteiner

SWING AND JAZZ ART BARRED AT THE PUBLIC PHONOGRAPH LIBRARY

Music lovers may hear any of 6,000 records of the Discoteca, operated by São Paulo's Department of Culture. Visitors consult an index of the classical and native folk recordings on file and an attendant brings the numbers selected. Serious students occupy the soundproof cabinets (page 682).

THE CITY EMPLOYEES' BAND HELPS SÃO PAULO CELEBRATE NEW YEAR'S

Outside the Municipal Theater, in the warm evening air of January 1, 1939, the musicians play Rossini's *William Tell Overture* before a merry throng.



Photograph by Melville Bell Grosvenor

NOT KALEIDOSCOPES—JUST EGGS, AIMED BY TESTERS TOWARD THE SUN

This method, employed in the São Paulo market, discloses bad spots, rot, or other glaring imperfections in an egg.

Butantan has world renown. It is more familiarly known as the "snake farm" by the thousands of visitors who go there.

The Institute was founded in 1899 when bubonic plague had struck Santos. Its director, Dr. Vital Brazil, has conducted extensive research on snake venoms and the preparation of antivenins.

Thousands of Brazilians owe their lives to the work that has gone on quietly in the laboratories, back of the large oblong pit dotted with snake igloos.

Every year from 5,000 to 10,000 people are treated, either directly by the Institute or through private agencies which it provides with serums.

The morning we arrived at Butantan the attendants were extracting poison from the reptiles. In one forenoon nearly 900 snakes were captured and forced to give up their deadly venoms (pages 673-4).

Rapidly the attendants would catch a snake by the neck, open its mouth, thrust the edge of a glass dish in beyond the fangs, squeeze the glands on the side of its head to expel the poison, then toss the snake over the barrier into another pen.

It seemed easy, they worked so deftly

NEW YORKERS WOULD FEEL AT HOME IN A SÃO PAULO AUTOMAT

"Hash and Rice" says the sign above the right hand of the man inserting a coin. As soon as the milreis drops, a steaming bowl will appear in the large aperture at his left hand.

and methodically. Then, suddenly, one of the men misjudged his snake and its fangs sank into his finger. He lost little time going for treatment, for it was his first experience in being bitten.

The venom extracted from some species of snakes has a bright orange juice appearance; with others it is almost colorless or milky white.

"Though there are nearly 200 different species of snakes in Brazil, only 13 are poisonous," explained a scientist of the Institute. "We have found that three different types of serum are adequate in treating all cases of snake bite."

Rattlesnakes, especially the *Crotalus terrificus*, which lives up to his name in being one of the most ferocious in appearance, are frequent offenders in biting people. Though equipped with rattles, terrificus' motto seems to be "strike first and rattle afterwards."

"Every year some 30,000 snakes are shipped to the Institute from all over the State. They come freight free, so that there is no expense to the persons who capture them. If anyone sends in four snakes, poisonous or otherwise, he is given an ampoule of serum," explained the doctor. "In that way, in addition to getting those we need, we have found more than 30 species formerly unknown."

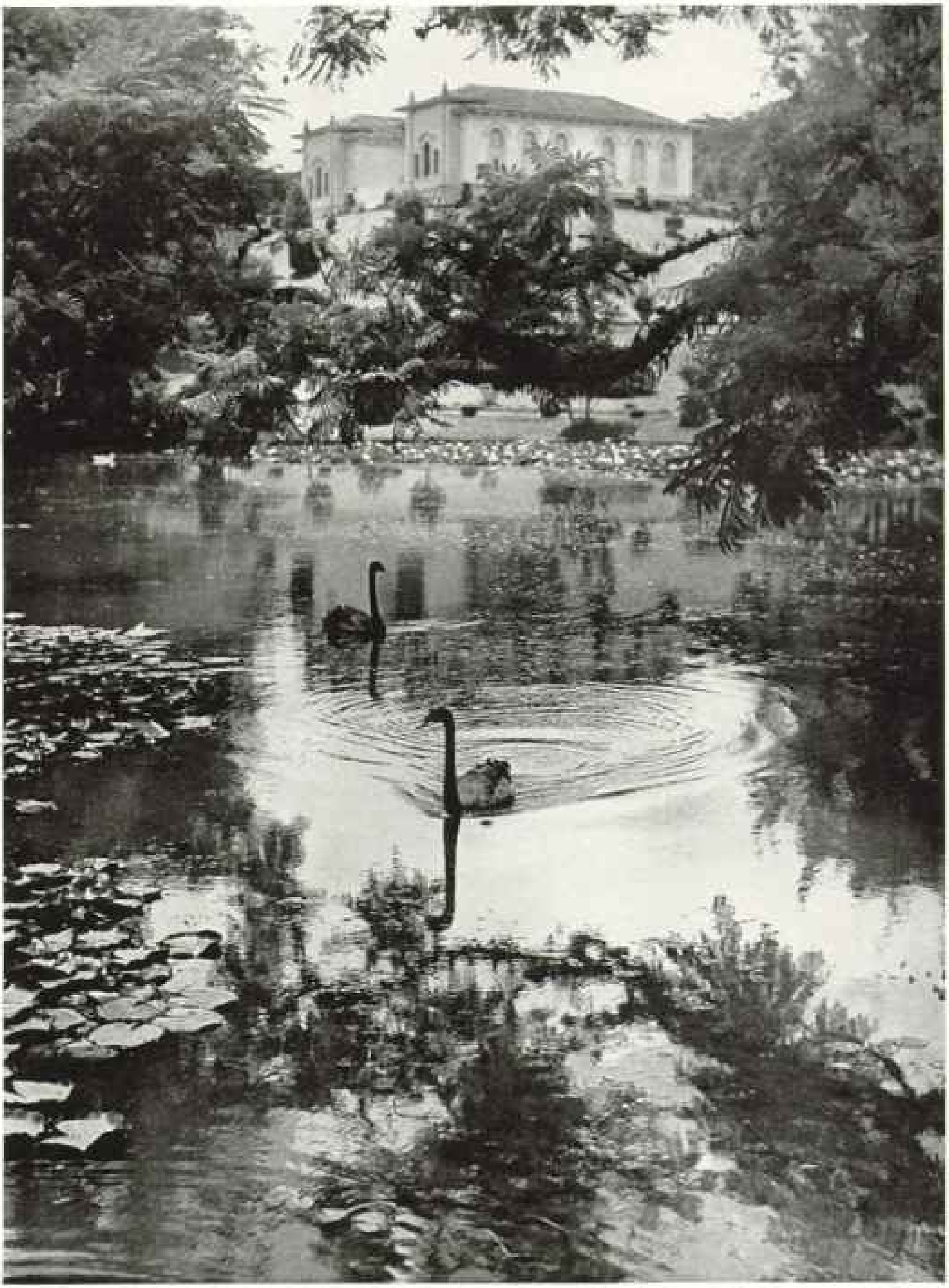
A CANNIBAL SNAKE

"What about the snake that eats others?"

"That's the mussurana; here it is." He opened the door of a small cage, pulled out a glossy black reptile, and caressed its back while we talked.

It is nonpoisonous and harmless to man, but cannibalistic toward other snakes, and is not discriminating about whether they are poisonous or not.

In the laboratories we also saw tarantulas, big, black, hairy ones, more ferocious in appearance than harmful. Several smaller, grayish-brown ones are much more poisonous. The Institute prepares an antivenin for these tarantula bites, and another for scorpions (page 677).



SUNLIGHT AND SHADOWS TURN THE WORLD UPSIDE DOWN IN A SÃO PAULO POOL

Black swans from "down under" in Australia float gracefully among the lilies before the new museum of the State Forestry Department. Their reflections point toward their native land on the other side of the globe. The Tropic of Capricorn crosses the city's suburbs beyond the museum. A golf course lies across this imaginary line and players often drive their balls across it from the Temperate into the Torrid Zone.

SUNSHADE OR UMBRELLA

The canopy serves either purpose for this traffic officer on the Avenida São João. During the summer (from December to April) the sun is hot and rains are frequent. Traffic lights are controlled by the handle in his right hand.

From Dr. Moacyr E. Alvaro, Professor of Ophthalmology in a São Paulo medical school, I learned of the successful use of the active coagulating element from the venom of the *Bothrops jararaca* in preventing hemorrhages in some eye operations. Some solutions that cause rapid coagulation at a certain dilution often have exactly the opposite effect if too concentrated.

Other venoms of the neurotoxic type, such as those from cobras and rattlesnakes, can be used as effective painkillers in certain eye diseases.

One day we saw a large brass doorplate which read: "Discoteca Publica Municipal." If a *biblioteca* is a library, then might not a *discoteca* be a place where the municipality had gramophone records for the public, we wondered. We inquired and found that the guess was correct.

In a hallway were large filing cabinets, in which are card-indexed some 6,000 records of standard classical music, national favorites, and native folk recordings.

"Anyone can come in, look at the index for the music he wishes to hear, and we will get the records and play them," an attendant explained. "We don't have new popular records, only those for persons seriously interested in music" (page 678).

We were shown three soundproof cabinets, equipped with large easy chairs. On the wall were five control buttons where the hearer can signal the operator to begin, stop, repeat, and increase or lower the volume. All the booths were occupied.

"A person is normally allowed to stay 40 minutes, unless there is no one else waiting," she explained. "We get an average of about 20 people a day."

The Discoteca also has on file original matrices of folk song music made by R. C. A. Victor, and apparatus for recording new music, especially that produced by São Paulo composers.

In one room we saw wooden drums piled high—the beginning of an ethnographic

museum started to supplement studies in native songs and dances.

The Discoteca was established in 1935 as a branch of the Department of Culture of the Prefecture of São Paulo.

CITY HAS TEN RADIO STATIONS

Popular music, of course, with Brazilian *marchas*, *maxixes*, and *sambas*, blares from countless radio sets. São Paulo has ten broadcasting stations.

Instead of the musical broadcasts, however, it was a comedy program that most interested me. São Paulo's highest-paid radio entertainer, I learned, works in a Government office during the day and in the evening gives two programs, one at 6:30 for children and another at 10 o'clock.

"WATCH YOUR CAR, MISTER?"

In São Paulo this task is performed under city regulation. Uniformed "little cops" see that parked automobiles are not disturbed. For this official service the motorist is charged a few coppers (page 686).

I went to visit him during the children's hour. He uses no script, imitates eight or ten characters, and conducts the program as the inspiration strikes him.

Friends introduced me just before he stepped into the studio.

A few moments later the children of his imagination were singing songs, telling about São Paulo, and giving the visitor from North America a lesson in geography. The agility of his mind and throat was amazing.

Before I came to São Paulo I had heard that the Paulistas were industrious, energetic, and independent. When I saw them driving cars in heavy traffic I was sure that it was true!

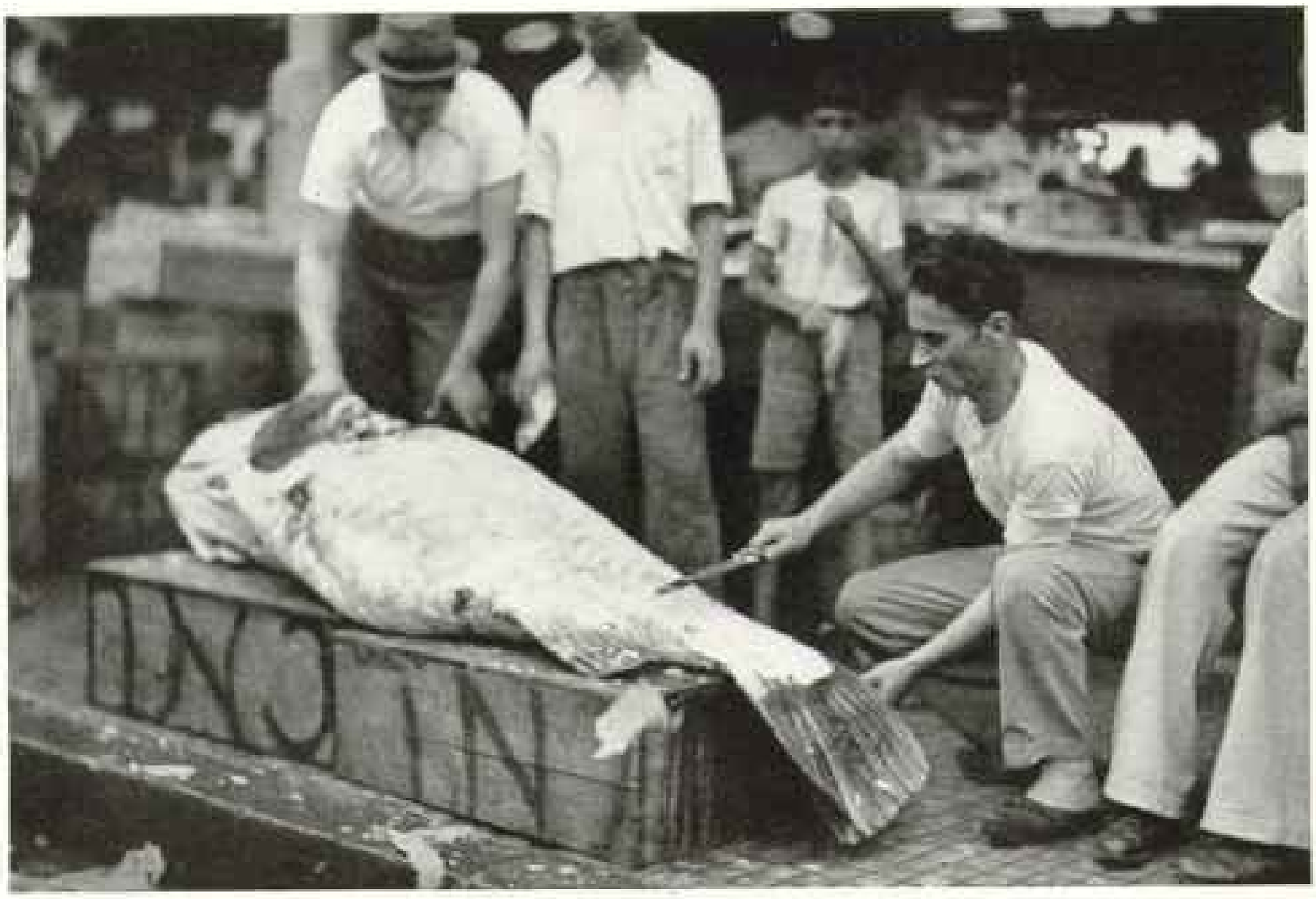
THE ETERNAL TRAFFIC PROBLEM

For days I alternately held my breath, sighed with relief after a narrow escape, shut my eyes, or leaped quickly to safety. I could discover no traffic regulations beyond the fact that cars halted at a red light or when confronted boldly with a policeman's white truncheon.

Drivers overtook and passed streetcars and other vehicles on either side and turned corners with seemingly slight regard for pedestrians.

BUILDINGS SOAR SKYWARD IN THE FAST-GROWING "LOS ANGELES OF BRAZIL"

Shops occupy the lower floor of the 26-story Martinelli Building, tallest in São Paulo, and a night club has quarters in the penthouse. Many other structures in this expanding city rise almost as high. In the plaza stands a monument to Giuseppe Verdi, Italian composer. In front of the memorial, and stretching past the skyscraper, is Avenida São João, one of the city's wide arterial highways (pages 657 and 665).



MANY A PAN IN SANTOS WILL FRY A FILLET FROM THIS BIG MERO

Common in the warm waters off Brazil is this species, a larger member of the grouper family. It is an excellent food fish.

TO LET A BRAZILIAN KNOW YOU'RE PLEASED, TWEAK YOUR EAR!

"Excellent," is the meaning this gesture conveys. To express even greater delight, the man might reach around behind his head and pull the lobe of his other ear. The enthusiastic tweaker is the proprietor of this bird stall in São Paulo's municipal market.

FISH BY THE WREATH GREET SÃO PAULO HOUSEWIVES IN A SUBURBAN MARKET

Then one morning I went for a ride with a Scottish friend. Within half an hour he was fined once and warned two other times. Apparently a more orderly day is dawning for São Paulo traffic, thanks to the active head of the traffic department who, I was told, bears a good Scottish name but does not speak English.

In a month, despite apparent chaos of traffic, I saw not a single fender crumpled.

Motorists are seldom taken to court to pay their fines, but, if they have not settled by the time they go to get their new licenses, they are reminded of the amount they owe for that traffic infraction on Friday the 13th of January, or perhaps some unfortunate day in June.

São Paulo has its *Guarda Civil*, the *grillos*, or "cops." It also has a jaunty blue-uniformed force—perfection even to bright swords and white spats—who appear on duty at public amusements. Then, too, there is the *Guarda Nocturna*, the night watchmen against whose nightlong tootling of whistles residents have often protested.

"LITTLE COPS" WATCH YOUR CAR

But the most unusual São Paulo police are the *grillinhos*, or "little cops." They are uniformed, and it is their business to guard parked automobiles (page 683).

Motor owners pay less than a dollar a year and receive a metal tag fastened to the radiator grille. The grillinhos perform efficiently. There is no pilfering, no tipping.

To find police at a night club is not unexpected, but to have them stop me at the doorway and frisk me for weapons was disconcerting. I must have looked embar-

rassed, for friends hastily assured me that this procedure was no personal reflection, just a routine measure.

Even so, my visit to the State penitentiary the next day seemed less formidable. For hours I walked through spotless corridors, visited the clothing and shoe factories, furniture workshops, the art department, kitchens, and cells.

"What are your impressions of it?" asked the director general.

I could only reply that he had carved my thoughts on the entrance of the building. Freely translated, the inscription read: "Here work, discipline, and kindness redeem transgressions and restore man to society."

Since 1920 the penitentiary has served as a model for similar institutions in other States of Brazil.

"Psychologists study all of our people and we put them into the tasks where they will be best fitted," explained the director.

"Three-fourths of the men who enter are illiterate. But all except those on short sentence are taught to read and write, and have learned a trade before they leave. Their earnings await them in the bank, and an organization helps them to find suitable employment."

MICKEY MOUSE A PENAL FAVORITE

An interesting feature is the singing on Sundays. Because few know how to read notes, the instructor has taught them by a finger code. By raising the proper finger he gets the resounding *do*, *re*, or *mi* that he desires.

Sunday also is movie day. Several American companies furnish films without charge. Mickey Mouse is one of their most popular actors.

American motion pictures, like American motorcars, predominate in São Paulo (page 661). Except that subtitles are flashed on the screen in Portuguese to supplement the English dialogue, there was little to remind me that I sat in a Brazilian rather than in an American theater.

Cosmopolitan São Paulo has many clubs; almost every foreign nationality is represented. Though much of Brazilian life centers in the home, every Paulista, from bus boy to broker, seems to belong to some social group.

"My maid is private detective in her club," said one woman.

Diverse in its industrial and business interests, São Paulo also has many foreign chambers of commerce.

"The American Chamber of Commerce is a sort of father confessor to the American colony," said its manager. "We publish a weekly circular on business statistics, and, in combination with the Rio Chamber, publish a monthly bulletin, 'Brazilian Business.' One of our most important services is the translation and interpretation of new laws.

"We also have an employment agency and a school. At present we have 173 pupils and five American teachers. Though we teach Portuguese, the school is operated on the American plan."

As I write, a full technical staff from a large rubber company in Akron, Ohio, has arrived to set up a manufacturing plant for automobile tires and other rubber products.

THE BIGGEST JIGSAW PUZZLE

A spectacular migration of industry to São Paulo, however, is an artificial silk factory. For 14 years prior to 1934 it stood in Hopewell, Virginia; then it was moved, leaving only the walls on the land where it stood.

Every pipe, boiler, and piece of equipment, even the iron stairways, were shipped down from the States; in all, there were seven shiploads of machinery. Some parts were so large that the railway company had to shift a station when transporting it up from Santos.

"Its reassembly was the biggest jigsaw puzzle I've ever tackled," remarked the manager with a dry smile. "Sixty per cent of our problem was to find that missing piece!"

I could believe him, as I watched the 400,000 artificial silkworms spinning their artificial cocoons. Fifty yards of filament issue from each tiny glass capillary every minute throughout 24 hours a day.

Yet, as recently as the turn of the century, industry in São Paulo was so unimportant that fact-finders wasted little time on its statistics!

BUTTONS, BEEF, MACHINERY

For three generations coffee had been almost the sole source of Brazilian wealth. But, in 1920, industrial production caught up with it, fell behind for a short time, then, in 1928, passed it again and remained ahead.

São Paulo's industrial energies range from buttons to beef products; textiles, metals and machinery, and clothing are the leading enterprises.

Photograph by Major Albert W. Stevens

HE FINISHES YOUR PORTRAIT WHILE YOU WAIT

There are three large meat-packing plants, two of which are American.

On a hill, well within view of one of the city's industrial communities, are a large monument and the Ypiranga Museum (page 666). The museum houses comprehensive natural history and ethnological collections, and also portrays highlights of Brazilian history.

One of the most interesting rooms was that which displayed materials used by Alberto Santos-Dumont in his pioneering air achievements. Here is the tiny 25-horsepower motor, weighing less than 80 pounds, that powered his original "Demoiselle," a 1909 forerunner of "flivver" planes.

Thanks, in part, to these pieces of iron, brass, and cloth preserved in glass cases, São Paulo now has two air services to Europe (for mail) and four to and from the United States each week, as well as air lanes to the interior.

Brazil had marked boundaries before it existed. Before its discovery, Spain and Portugal had divided, by the Treaty of Tordesillas (1494), their world interests with the meridian that cuts close to São Paulo.

Antonio Raposo Tavares, nicknamed "the achiever," Fernão Dias Paes Leme, the "searcher for precious stones," and Bartholomeu Bueno, "old devil," along with many another Paulista flag-bearer changed all that by pioneering expeditions into the interior in the 17th and 18th centuries.

As I looked at their statues and pictures, I wondered what would be their thoughts could they scan this ever-widening industrial and residential circle as São Paulo grows?

THE MYSTERY OF AURORAS

National Geographic Society and Cornell University Study Spectacular Displays in the Heavens

TO learn more about the causes and nature of one of the most spectacular and baffling phenomena of the heavens, the aurora borealis, the National Geographic Society and Cornell University are co-operating in conducting a systematic and comprehensive study, under the direction of Dr. Carl W. Gartlein of the Physics Department of Cornell. The study, made under a grant of funds by The Society, will extend over a three-year period.

The primary station for the auroral research is at Cornell University, Ithaca, New York. A secondary station has been established at Colgate University, Hamilton, New York, 55 miles to the northeast.

The two stations are connected by direct telephone wires to enable the separated observers to make simultaneous observations and photographs for use in measuring the heights of auroral displays.

A third station is being added at Hobart College, Geneva, New York, 40 miles to the northwest, to aid in making height measurements.

VOLUNTEER OBSERVERS WILL REPORT

Most of the formal observations and precise photography will be conducted from the stations. However, those in charge of the studies are relying for important supplemental information on interested, competent volunteer observers throughout the United States and Canada. It is suggested that members of The Society residing in the regions from which auroras are visible, who are interested in helping in the observations and who have a sufficient technical knowledge, write to Dr. Gilbert Grosvenor, President of the National Geographic Society, in Washington, D. C., requesting forms for reports.

An aurora may be defined simply as a luminosity of the night skies, usually seen to the northward by observers in the Northern Hemisphere and to the southward by observers in the Southern Hemisphere. It may consist of ill-defined patches of light only or may be in the form of streamers, arcs, straight or wavy bands, rays fanning out from a center, or "curtains" of light which seem to hang downward. One of the rarest forms is the corona which appears close to the zenith.

In most auroral displays the light is greenish white, but in brighter displays it may be yellowish, greenish, or red. In some cases the light forms are stationary; in others they change slowly or rapidly in position, in brightness, or in color.

In the studies of the aurora by the National Geographic Society and Cornell University, efforts are made to assemble data about each visible aurora, showing the forms, intensities, colors, and movements.

Some of these data can be recorded photographically, and numerous photographs are taken of each display. Measurements are made later from the photographs to determine the intensity and height. With a special spectrograph studies are made of the color of the aurora and of the character of the gases involved.

One project of special interest is the measurement of the heights of the various auroral displays, with particular reference to variations in height with latitude.

The physical activity that causes auroras presumably has been occurring for hundreds of millions of years—as long as there have been an earth with its atmosphere and magnetic field to serve as a target, and a sun to bombard it with countless billions of light waves and tiny electrified particles.

FORTY DAYS OF CELESTIAL HORSEMEN

The writer of a book included in some versions of the Old Testament tells of the appearance in the heavens, about 170 B.C., of strange lights, believed by commentators to have been auroral displays. The passage referred to, which is in Maccabees II, Chapter 5, of the Douay version of the Bible, says:

> Through all the city (Jerusalem), for the space of almost forty days, there were seen horsemen running in the air, in cloth of gold, armed with lances, like a band of soldiers; and troops of horsemen in array encountering and running one against another, with shaking of shields and multitude of pikes, and drawing of swords, and casting of darts, and glittering of golden ornaments and harness.

The Roman philosopher, Seneca, who lived during the time of Christ, mentioned the rare phenomena in less imaginative language. In his *Natural Questions* he writes of illuminations in the sky: "Sometimes there is a shooting star, sometimes there are glowing lights, which are occasionally stationary, sticking to one spot, and at times able to rush through the air."

Scientists have not yet formed a theory about auroras which is entirely satisfactory. But many interesting facts have been discovered which serve to narrow the problem. It has been learned, for example, that frequency of occurrence of auroral displays follows closely the frequency of sunspots. Just as there is an 11-year cycle of sunspots, so there is a corresponding 11-year cycle of auroras. One reason for conducting the auroral studies at this time is the opportunity afforded for making observations during the period of sunspot maxima in 1938-39, and during the period of waning that should follow in 1940.

Particularly vivid auroral displays occur simultaneously with marked changes in the magnetism of the earth. These large changes are called "magnetic storms."

SUNSPOTS AND AURORAS

The correlation between sunspots and auroras has led to the general agreement among scientists that auroras appear in the earth's atmosphere because of some activity that takes place on the sun. Exactly what this activity is has not been found out.

One theory supposes that tiny particles, or "corpuscles," electrically charged, are driven outward from the sun by violent explosions, and that they move in narrow bundles or beams at a high velocity through space, some of the beams being directed toward the earth.

It is assumed that the beams are deflected by the earth's magnetic field toward the north and south magnetic poles and that some of the particles follow a course sufficiently bent to conduct them into the earth's atmosphere on the night side where, at high altitudes, they produce auroral phenomena.

The second theory holds the primary cause of auroras to be the flashing forth from the sun of intense bursts of ultraviolet light. When these extremely short waves of light penetrate the earth's atmosphere, according to this theory, they ionize its gases (knock electrons from their molecules), which are driven outward to great distances.

When the intense ultraviolet light ceases, the ions (or "mutilated" gas molecules) fall back toward the earth's surface and are deflected toward the polar regions by the operation of the earth's magnetic field, and there, in some manner, produce auroras.

Because neither of these theories completely fits the observed facts of auroral displays, it seems desirable to conduct the present comprehensive researches.

CAMERA IMPROVEMENT AIDS SCIENCE

Previous studies of auroras have been made from observation stations in far-northern locations. The National Geographic-Cornell researches constitute the first systematic work of the sort as far south as 42 degrees north latitude, or even below the 50th degree of latitude.

Certain advantages result when observations are made in the temperate zones. Auroras occur throughout the year; but in far-northern latitudes, where daylight lasts in summer for practically 24 hours, no observations can be made during that season. At the latitude of Ithaca darkness persists, during the shortest summer nights, for about six hours. Observations can therefore be carried on continuously during the year.

Satisfactory work in the lower latitudes, where auroras are less brilliant, has been made feasible in recent years by the marked improvement of camera lenses and photographic emulsions.

There is the additional advantage that auroras visible in lower latitudes, although they occur less frequently than those in regions farther north, are the displays that result from unusual disturbances in the sun. They can be correlated much more easily with observed changes in the sun.

Co-operation of volunteer observers in the National Geographic-Cornell program will make it possible to assemble simultaneous reports from a larger area than has yet been covered by such studies.

Of special importance are the reports being supplied by the pilots and other flight officers of three transcontinental air transport companies—Transcontinental & Western Air, Inc., Northwest Airlines, Inc., and the Western Air Express Corporation—who can observe auroras above clouds which prevent observations from the ground.

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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was founded fifty-one years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material which The Magazine can use, generous remuneration is made. Contributions should be accompanied by addressed return envelope and postage.

Immediately after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

The Society cooperated with Dr. William Beebe in a deep-sea exploration of undersea life off Bermuda, during which a world record depth of 3,028 feet was attained August 15, 1934, enabling observations of hitherto unknown submarine creatures.

The Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and contributed $100,000 to Admiral Byrd's Antarctic Expeditions.

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.

The Society's notable expeditions to New Mexico have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches have solved secrets that have puzzled historians for three hundred years. The Society is sponsoring an ornithological survey of Venezuela.

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 an officially recognized altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

Each island is a reason for happiness

You couldn't possibly imagine all that Hawaii holds in store for you. According to the word of thousands who have visited these satisfying Islands, Hawaii is one of the most enjoyable places on earth. You never have heard a word to the contrary, have you? Mention "Hawaii" and everyone says, "Oh, I'd love to go there!"

What is Hawaii like? With continuous June weather the year around, Hawaii is a countryside overflowing with outrageously fragrant flowers—green valleys and slopes—all so out of key with reality they look almost as though painted on canvas. *They immediately suggest thoughts of Paradise.*

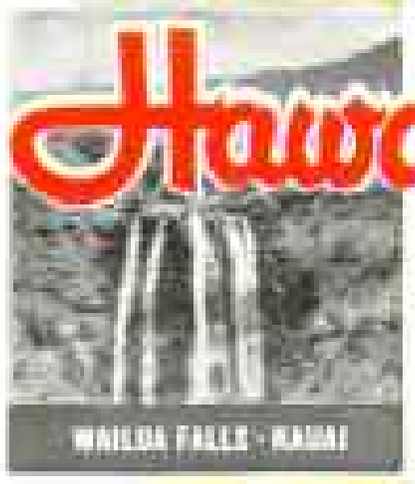
Hawaii is a story in four main parts—each "part" an Island—Hawaii, Maui, Kauai, and Oahu (on which Honolulu is located). *Each is a reason for happiness.*

Her sports are called by familiar names, such as—tennis, golf, horseback-riding and that very-much-sought-after relaxation. *But they are experienced with unfamiliar satisfaction, for playing in Hawaii has a dreamy, enigmatic quality.* While Waikiki—of which you've heard so much—is too unusual to be called just a beach.

Of course, to make up your mind about Hawaii, you should have complete information, (our pictorial booklet, "Nani O Hawaii", sailing schedule of palatial liners from Los Angeles, San Francisco and Vancouver, B. C., and costs), *and so we suggest you consult your Travel Agent who is an authority* for the facts which are essential to an essential understanding of Hawaii.

This advertisement is sponsored by the Hawaii Tourist Bureau, a non-profit community organization with headquarters in Honolulu and branches at 203 Market St., San Francisco, and 242 Pet. Sec. Bldg., Los Angeles, Calif. The Bureau represents all the islands of the Territory of Hawaii, U.S.A., *and is maintained for your service by* The People of Hawaii.

Hawaii



From World's Fair to World's Fairest: Come to Hawaii after you visit San Francisco

Down the ROMANCE ROUTE to Europe!

It's a living travelogue through picturesque French-Canada...this thousand-mile jaunt down the St. Lawrence Seaway. 39% of your trip will be over before you first glimpse the Atlantic...then the shortest of all crossings from land-to-land.

* * *

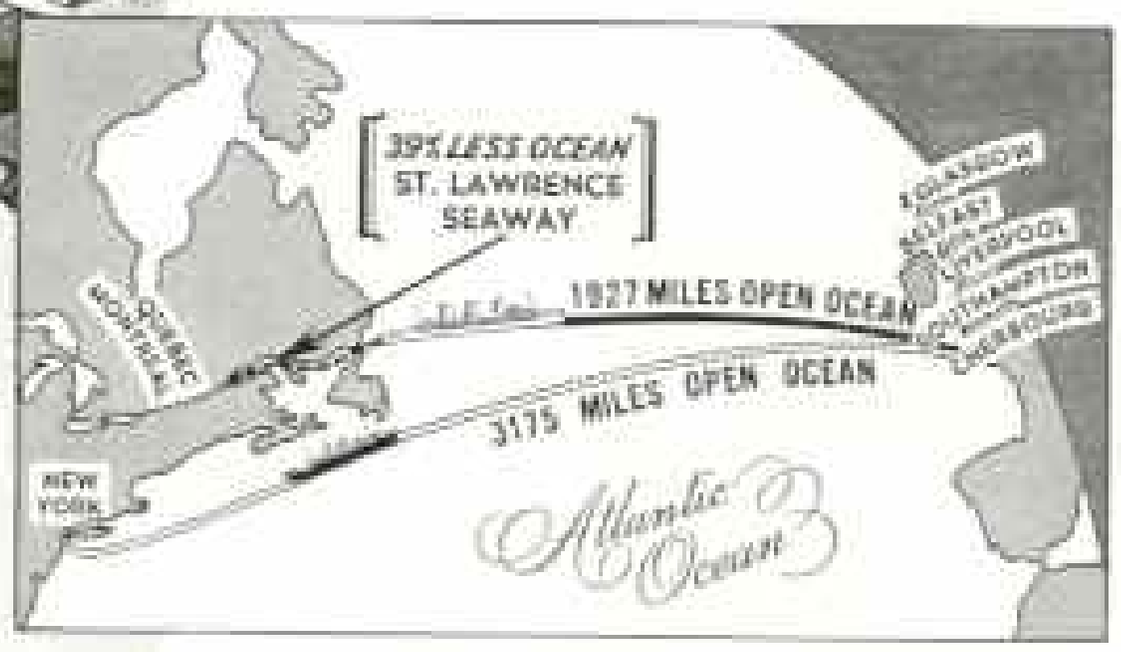
You'll see an extra foreign city, Montreal or Québec, even before you sail away! Then quaint villages, picturesque farmlands, colorful fishing hamlets...nights that will become romantic memories of an idyllic voyage. And when you reach the Atlantic, you'll have sturdy sea-legs under you, and an appetite that clamors for more and more of Canadian Pacific's famous cuisine.

* * *

Take the great *Empress of Britain* or the *Empress of Australia* from Québec. Or choose one of the four stately *Duchesses*, newly reconditioned, or the *Mont* ships from either Montreal or Québec. Modest fares from $122.50, Tourist Class.

Canadian Pacific

39% LESS OCEAN TO EUROPE



See *your own agent* or any of the 41 Canadian Pacific offices in the United States and Canada.

COMPARE THE THREE LEADERS

There's a Big Difference in Value

☛ Of leading low-priced cars, Plymouth is 5 in. longer than one; 6 in. longer than the other!

☛ All Plymouth models have the same big, 82-horsepower "L-head" engine—giving you the thrill of live, full-powered performance *with* economy!

☛ Plymouth is the only low-priced car with coil springs as standard equipment *on all models*.

☛ Plymouth is the only leading low-priced car that gives you steering-post gear shift as standard equipment on De Luxe models at *no extra cost*.

☛ The only leading low-priced car with a Safety-Steel body completely rust-proofed.

ALL PLYMOUTH MODELS have Floating Power engine mountings and the safety of time-proven Hydraulic Brakes.

WITH THE LEADING low-priced cars *priced* about the same, it stands to reason that the one with the most to offer is the best buy!

That car is the great 1939 Plymouth!

Your present car will probably represent a large proportion of Plymouth's low delivered price...with the balance in low monthly instalments.

STANDARD on "De Luxe"—Perfected Remote Control Shifting with Auto-Mesh Transmission.

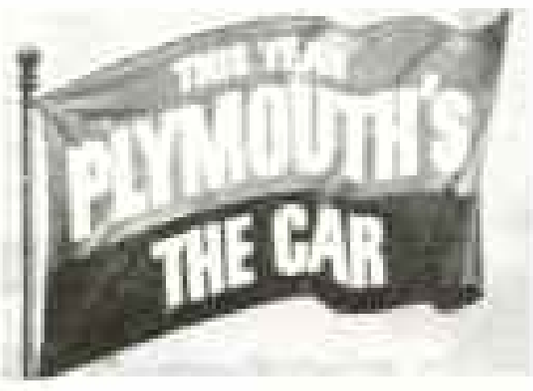
COUPES START AT $645 SEDANS START AT $685

—DELIVERED IN DETROIT, including front and rear bumpers, bumper guards, spare wheel, tire and tube, foot control for headlight beam with indicator on instrument panel, ash-tray in front and rear, sun visor, safety glass and big trunk space (19.3 cubic feet). Plymouth prices include all federal taxes. Transportation and state, local taxes, if any, not included. PLYMOUTH DIVISION OF CHRYSLER CORPORATION, Detroit, Michigan.

TUNE IN MAJOR BOWES' ORIGINAL AMATEUR HOUR, COLUMBIA NETWORK, THURSDAYS, 9 TO 10 P.M., E.D.S.T.

PLYMOUTH BUILDS GREAT CARS

THE "ROADKING"
THE "DE LUXE"



"FAIR" WARNING!

PLAN YOUR NEW YORK WORLD'S FAIR TRIP THIS WAY...WITH HOTEL ACCOMMODATIONS ASSURED!

Plan a glorious, *carefree* vacation at the New York World's Fair! Go swiftly, safely, comfortably—by *rail* . . . let American Express Travel Service help you get the most from the time and money you spend!

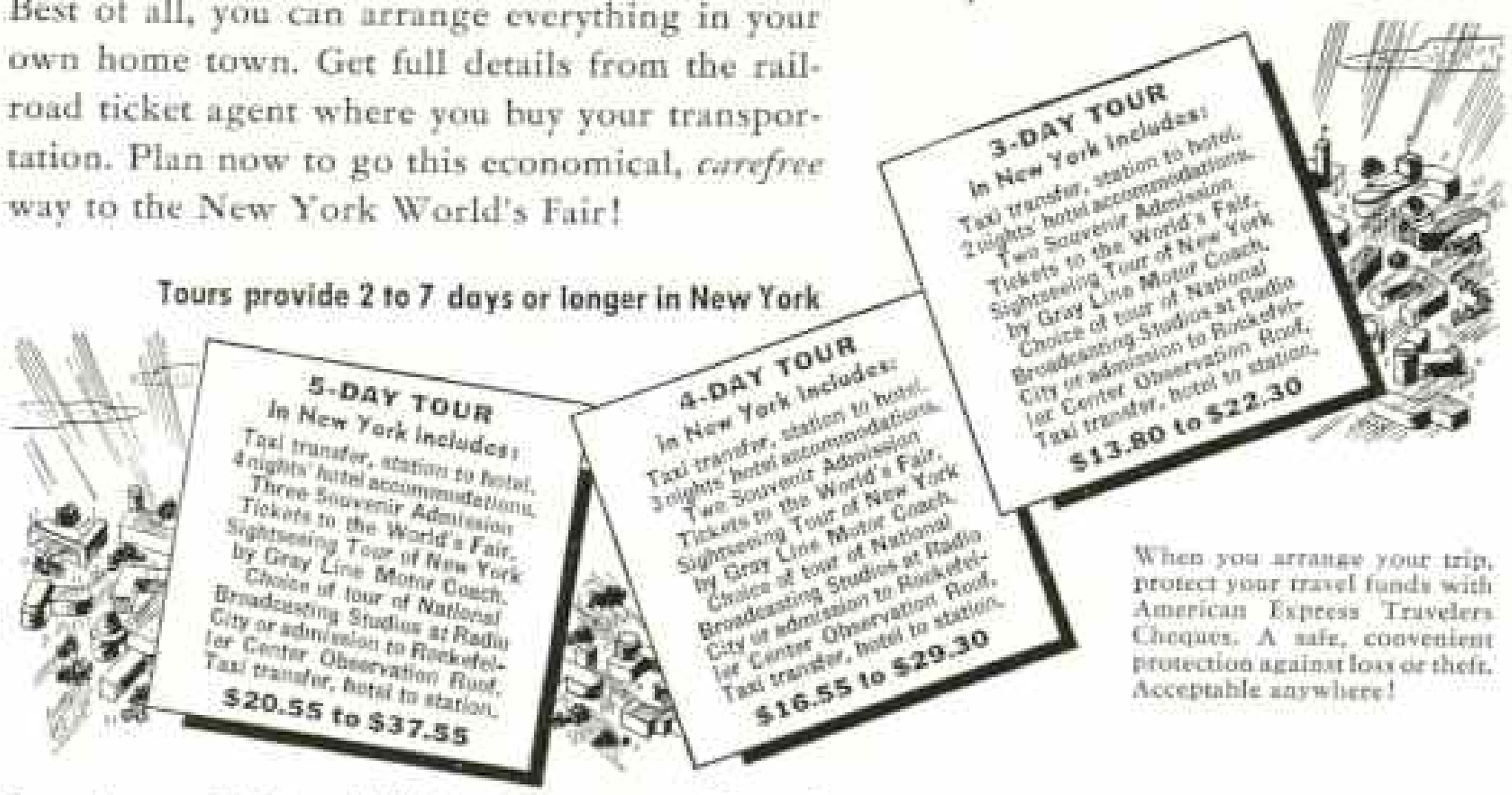
"Tailor-Made" Tours

Go by *rail* to the New York World's Fair—in modern trains, with none of the bother and strain of traffic congestion. American Express Travel Service offers you a choice of special services of from 2 to 7 days, or longer, in New York . . . "tailor-made" to fit your needs.

Arrange Everything in Your Home Town!

Best of all, you can arrange everything in your own home town. Get full details from the railroad ticket agent where you buy your transportation. Plan now to go this economical, *carefree* way to the New York World's Fair!

Tours provide 2 to 7 days or longer in New York



When you arrange your trip, protect your travel funds with American Express Travelers Cheques. A safe, convenient protection against loss or theft. Acceptable anywhere!

Consult any Railroad Ticket Office, your Travel Agent or any American Express Office

AMERICAN EXPRESS TRAVEL SERVICE AND RAILROADS OF AMERICA

"Mention the Geographic—It identifies you."

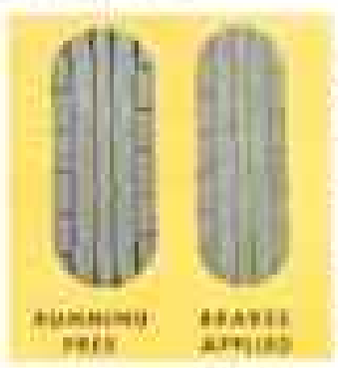
You buy the mileage . . . but
THE PEACE OF MIND IS FREE

OF COURSE you want *mileage* from your tires. Who doesn't? And make no mistake, General's famous long mileage has been the economy byword of shrewd tire buyers for many years. *But* . . . you're missing something mighty big if you haven't discovered all the *extras* you can get in a tire these days—in a *Squeegee-General.* • Enthusiastic users call it "peace of mind." To them this apt phrase sums up trouble-free driving; a confident new *feeling* of sure-footed safety, in any weather; complete unconcern about blowouts; the priceless knowledge that they are riding on America's recognized Top-Quality tire. • Let your General Tire dealer show you how easy it is to change-over your new car or to put Squeegee-Generals on your present car.

THE GENERAL TIRE & RUBBER CO., AKRON, O.
In Canada—The G. T. & R. Co., Ltd., Toronto, Ontario

PUT THEM ON YOUR NEW CAR

General Tires never come as new car equipment but your General Tire dealer or your car dealer can give you information on how easy it is to put them on your new car. Your first few miles will tell you why *"More new car buyers change-over to Generals than to any other tire."*



HERE'S WHAT HAPPENS TO ORDINARY TIRES *when you apply the brakes*

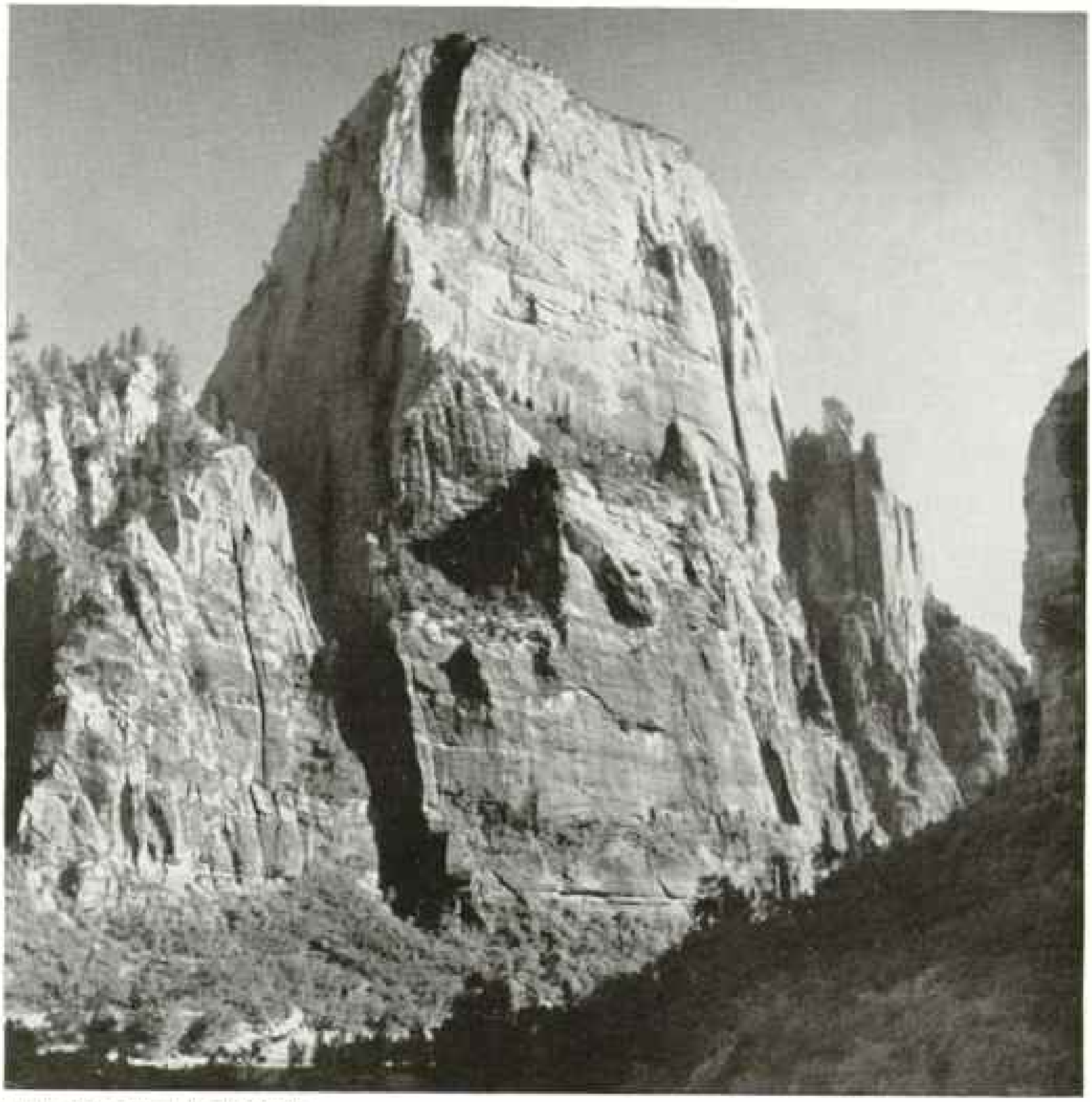
These photographs, taken through glass, show how an ordinary tire tread . . . no matter what the design *looks like* . . . squeezes together . . . becomes practically smooth when brakes are applied. Only Squeegee-Generals have the patented, sure-stopping *wrinkle-action.*

BUILT INSIDE AND OUT FOR MORE SAFETY AND COMFORT

You can twist and flex a Squeegee-General section in any direction. There is no stiffness, no sharp bending. The flexible tread works with the flexible carcass as a single unit. This exclusive design means a *stronger, softer* tire, giving maximum *blowout protection,* easier *riding,* greater *protection* to the car.

You're miles ahead with GENERAL

The only tire in the world that does THIS . . . then it STOPS. Rolling along, General's tread is straight . . . but at the first touch of the pedal the flexible ribs *wrinkle* into squeegee-action . . . grip in every direction for the quickest, safest stop you've ever known.



"THE GREAT WHITE THRONE"

A hard picture to get — but Agfa Film got it!

IT'S HARD TO GET such intricate detail in the sunlit distance and still retain the delicate tracery of shrubs in the shaded foreground. But see how Agfa Film does it!

Notice, too, the tonal gradation from sparkling highlights to deep, rich, lustrous blacks!

That's the kind of picture Agfa Plenachrome Film's "extra margin of quality" helps *you* get! It helps give you the best results under ordinary conditions, and *surprisingly good* results even under unfavorable conditions.

Plenachrome's high speed, wide latitude, fine grain, color sensitivity, and accurate response to light values make it a film *you can always* depend on.

Buy some Agfa Plenachrome Film, today . . . and start getting better pictures. Remember . . . every roll of Agfa Film is guaranteed: "Pictures that satisfy or a new roll free!" ***Made by Agfa Ansco Corporation in Binghamton, N. Y., U. S. A.***

Agfa Film

"Pictures that satisfy or a new roll free!"

YOU'RE GOING TO *Take a Journey*

IT'S WRITTEN IN THE STARS—this month you're in tune with a disturbing vibration.

Be doubly careful, if your orbit crosses a Nash showroom. For then—a dark car will come into your life—and you're going to take a journey.

You won't be happy 'til you know if any car can deliver what the bullet-like grace of this new Nash promises.

So—obey your destiny like a man. Get in and see.

There's a sweet little swish from the engine. *Click . . . click . . . click . . .* and gears are shifted from the steering post*.

Then, as you try to catch your breath, a miraculous new gear* cuts in—you shoot forward like a greyhound unleashed.

In ghost-like silence, you flick past other cars seemingly chained to the ground. Hills turn into flat country. Rutted roads become smooth as glass. The dust and the fierce wind outside never reach you.

It's uncanny . . . exhilarating . . . this feeling of floating. Only when you touch the brake and feel the tires dig in do you realize that this is what people call an "automobile"!

• • •

Don't be surprised if—a few days from now—you wake up in your Nash bed a million miles from nowhere.

For it's that way about owning a Nash. It just coaxes you to travel.

It's almost sacrilege to mention the price. But ten models are now priced *next to the lowest.*

It's a wonderful day for a ride. Let's go!

Four Series of Great Cars, 22 Models...10 Priced Next to the Lowest...Delivered at Factory, as Low as $770. Stand. Equipment and Federal Taxes Incl.

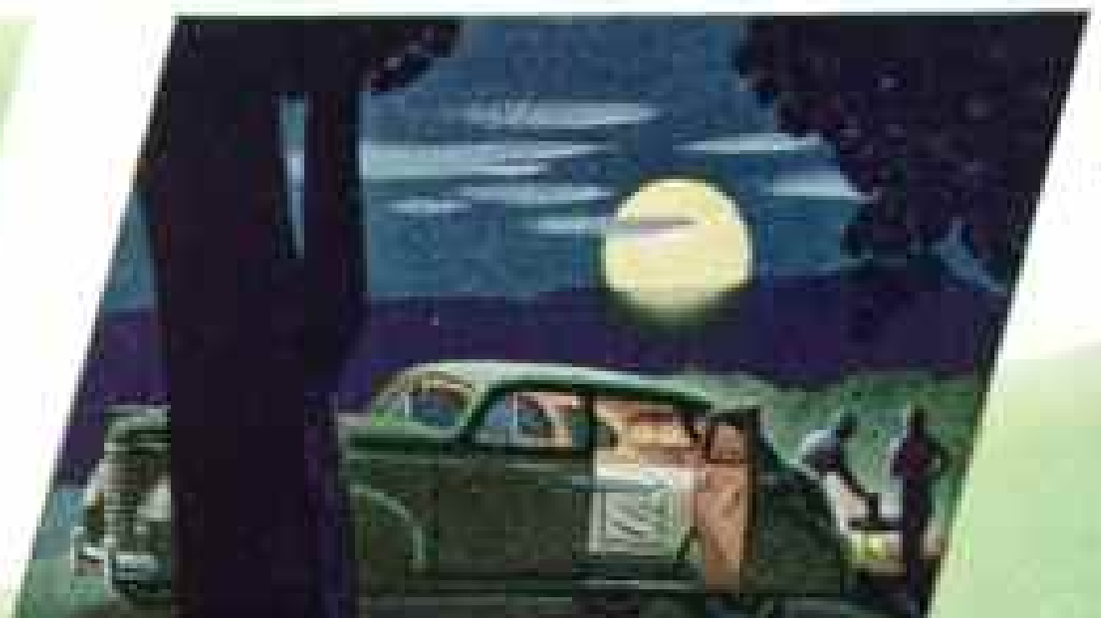
*(*Optional Equipment—Slight Extra Cost)*

$770

O CHILLY NIGHTS! Nash's automatic Weather Eye*" ends drafts and dust . . . nstantly keeps fresh "conditioned air" as warm as you dial it—inside your car.

ACK ROADS are lovelier . . . nd just as smooth as con-rete . . . thanks to Nash's ew rear-shock absorbers.

The 2-Door Sedan, 115" wheelbase, is $845 delivered at factory, with standard equipment and federal taxes included. (White sidewall tires and rear wheel-shields optional at extra cost.) 1800 dealers from Maine to California to serve you. NASH MOTORS DIVISION, Nash-Kelvinator Corporation, Detroit, Michigan.



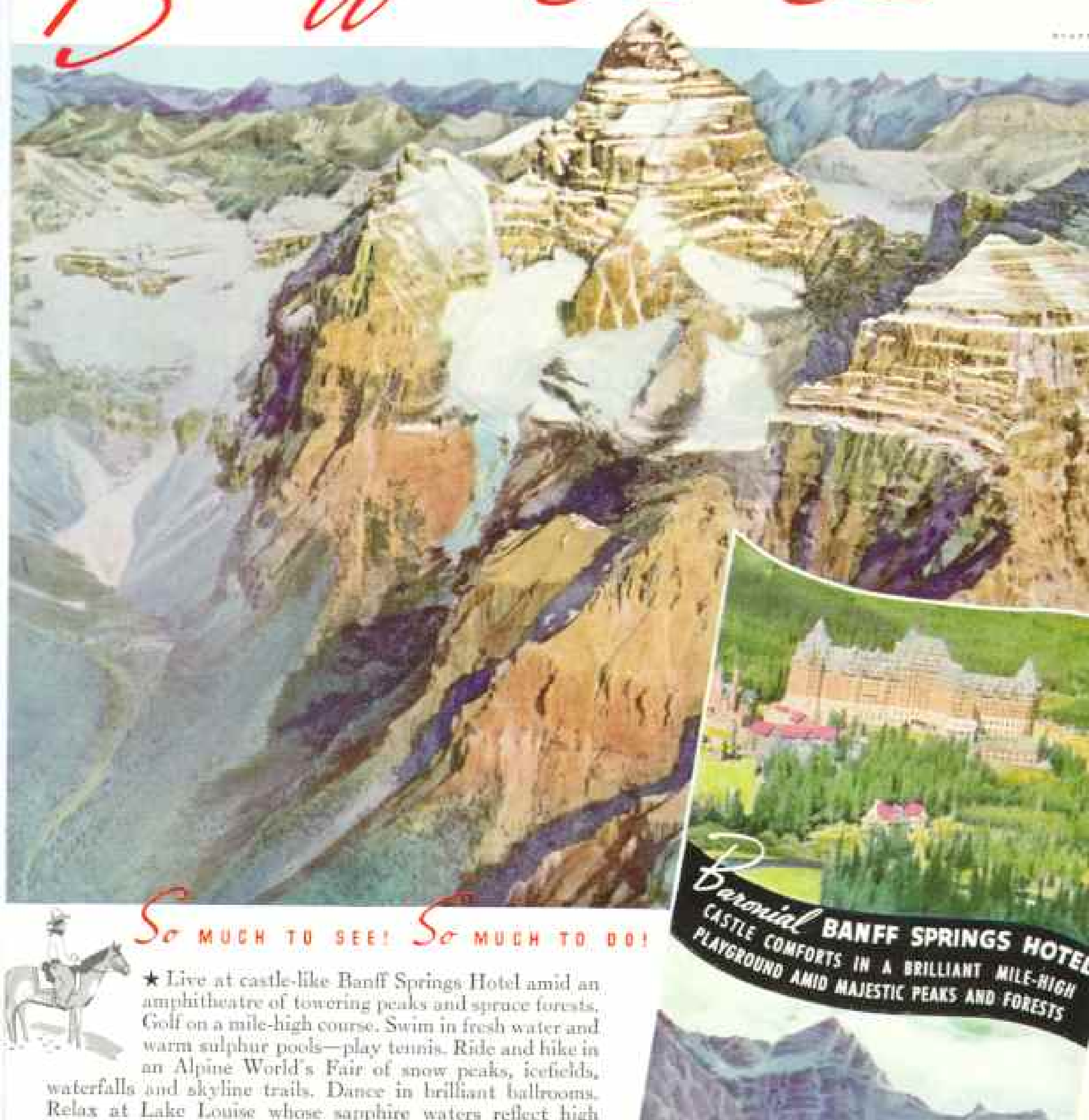
VAGABOND KING. Sleep where you like! Nash has a big, soft Convertible Bed ready for you—in five minutes' time.

It's That New NASH

THE CAR EVERYBODY LIKES

AN ALPINE WORLDS FAIR IN THE CANADIAN ROCKIE

Banff AND Lake Louise



So MUCH TO SEE! So MUCH TO DO!

★ Live at castle-like Banff Springs Hotel amid an amphitheatre of towering peaks and spruce forests. Golf on a mile-high course. Swim in fresh water and warm sulphur pools—play tennis. Ride and hike in an Alpine World's Fair of snow peaks, icefields, waterfalls and skyline trails. Dance in brilliant ballrooms. Relax at Lake Louise whose sapphire waters reflect high peaks and glaciers.

•

$1000.00 COLOR PHOTO CONTEST 47 cash prizes for Canadian Rockies color photographs—in a world of thrilling Alpine color. Ask for full details.

•

Special rates for guests staying a week or longer . . . Low round-trip fares to Banff, North Pacific Coast, California, Alaska. Travel via the Canadian Rockies on fast Canadian Pacific air-conditioned trains.

Ask Your Travel Agent or Nearest Canadian Pacific Office

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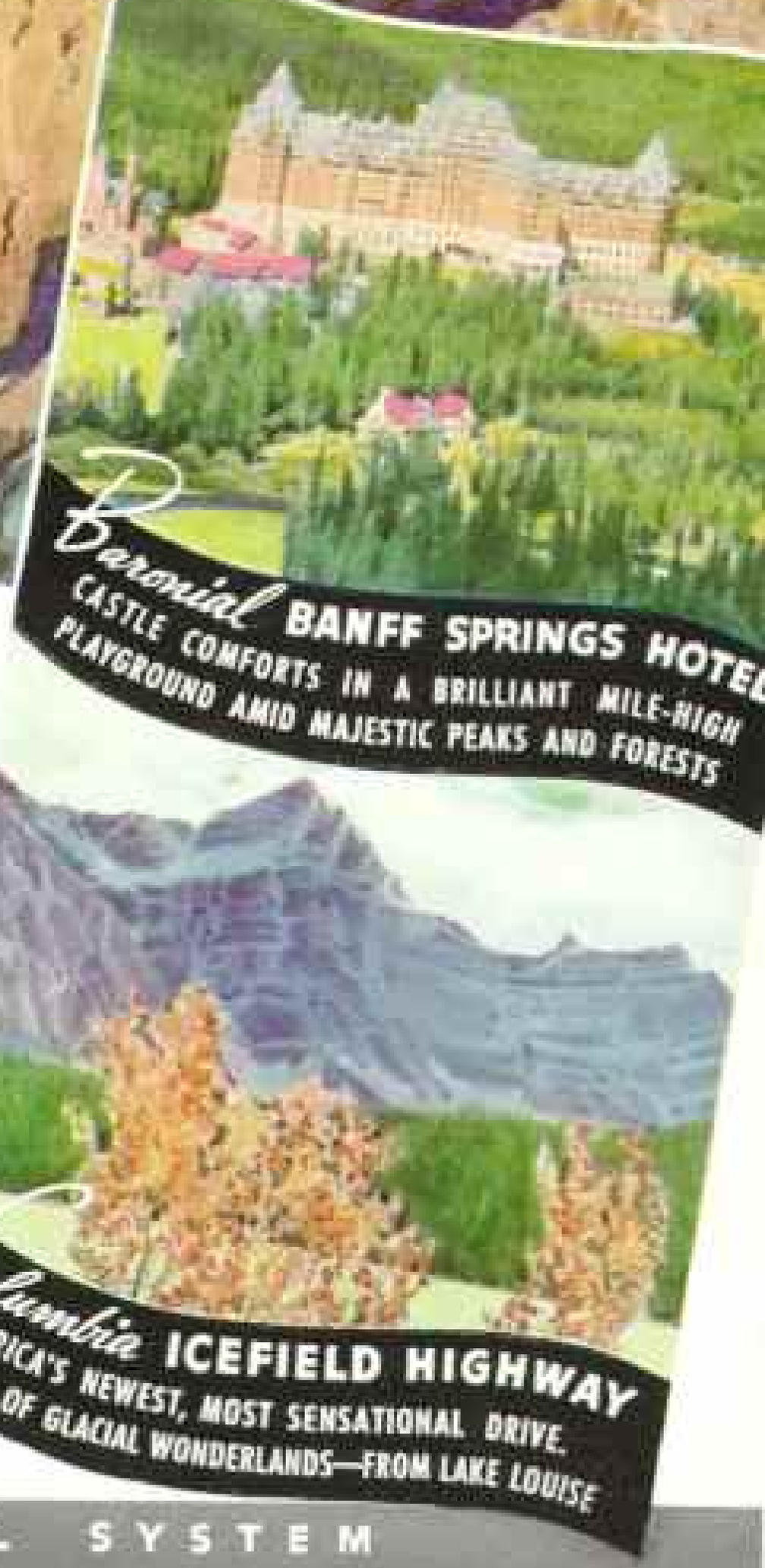
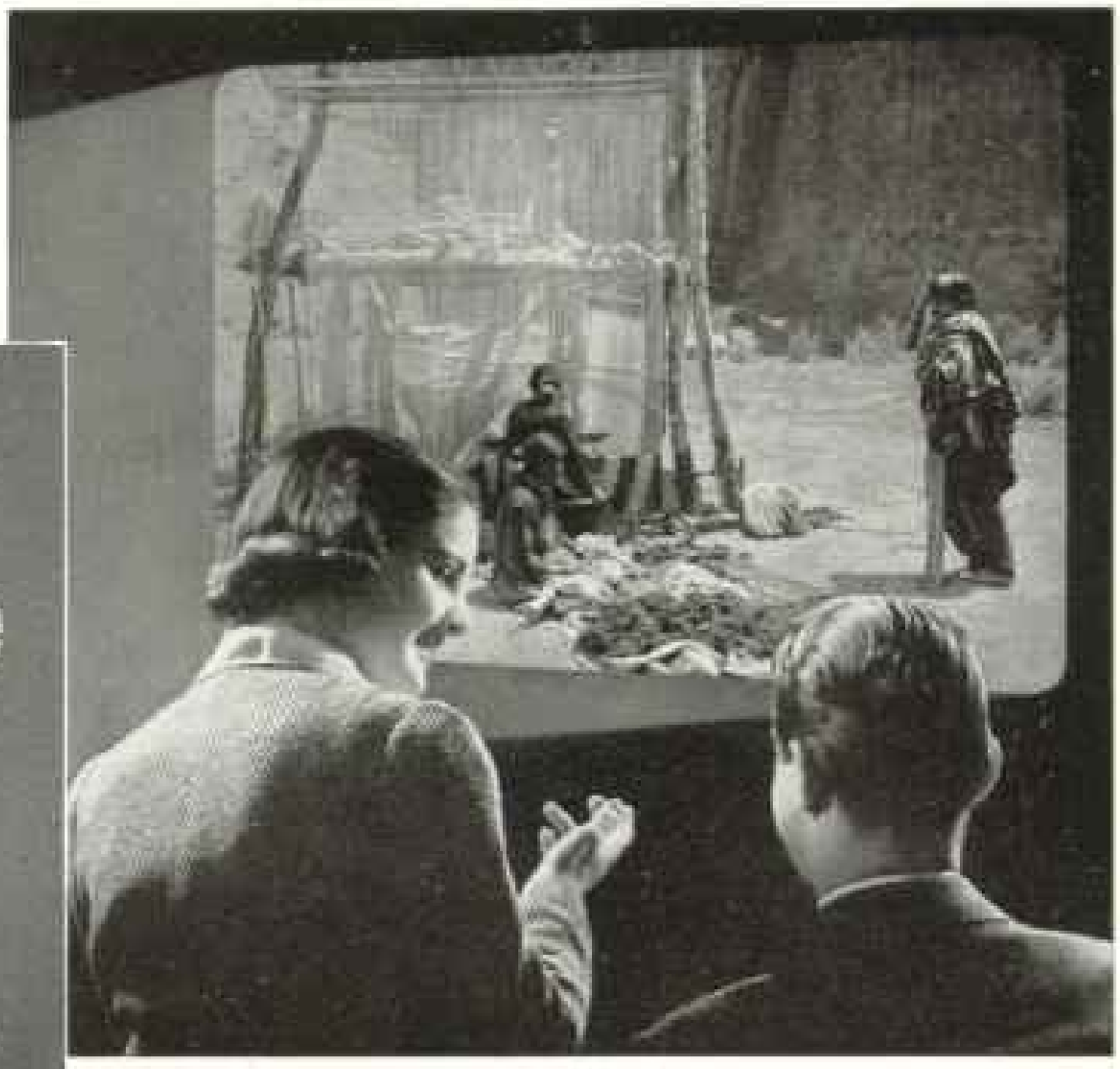
MONTREAL • and other large cities in U. S. and Canada

Canadian Pacific



WORLD'S GREATEST TRAVEL SYSTEM

Without leaving their living room, this couple relive all the thrills and pleasures of their vacation trip. They've found that Filmo movies make travel memories theirs to hold vividly forever.



"The West Came Home with Us IN GORGEOUS Filmo COLOR MOVIES"

It's Easy and Inexpensive to Make Fine Movies with a Filmo

Take a Filmo along on *your* trip. You don't need to be an expert to make fine movies. Just look through Filmo's spyglass viewfinder, press the button, and *what you see, you get* . . . in full, glorious color or in black-and-white, indoors and out. Filmos even make slow-motion movies and animated cartoons and titles, too.

The palm-size Filmo uses economical 8 millimeter film, makes movies *at snapshot cost!* Unbelievable, but a fact. Another reassuring fact: Filmos are precision-made by the makers of preferred Hollywood studio equipment . . . so you're certain of the best movies.

Don't put off owning your Filmo. See them at your dealer's or write for details. Bell & Howell Company, Chicago; New York; Hollywood; London. *Est. 1907.*

PALM-SIZE *Filmo 8*

NOW ONLY $49.50

As little as $10 down

NEW "SHELLOADING"

Filmo 141

If you want movies to show in auditoriums as well as at home, you'll want the new 16 millimeter Filmo 141. It requires no threading of film. Has features which prevent mistakes. With fine, color-corrected F 2.7 lens, only $115.

SEND FOR THIS FREE MOVIE-MAKING BOOKLET

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Tell me more about ☐ Filmo 8; ☐ New Filmo 141. Please send booklet, *How to Make Inexpensive Personal Movies.*

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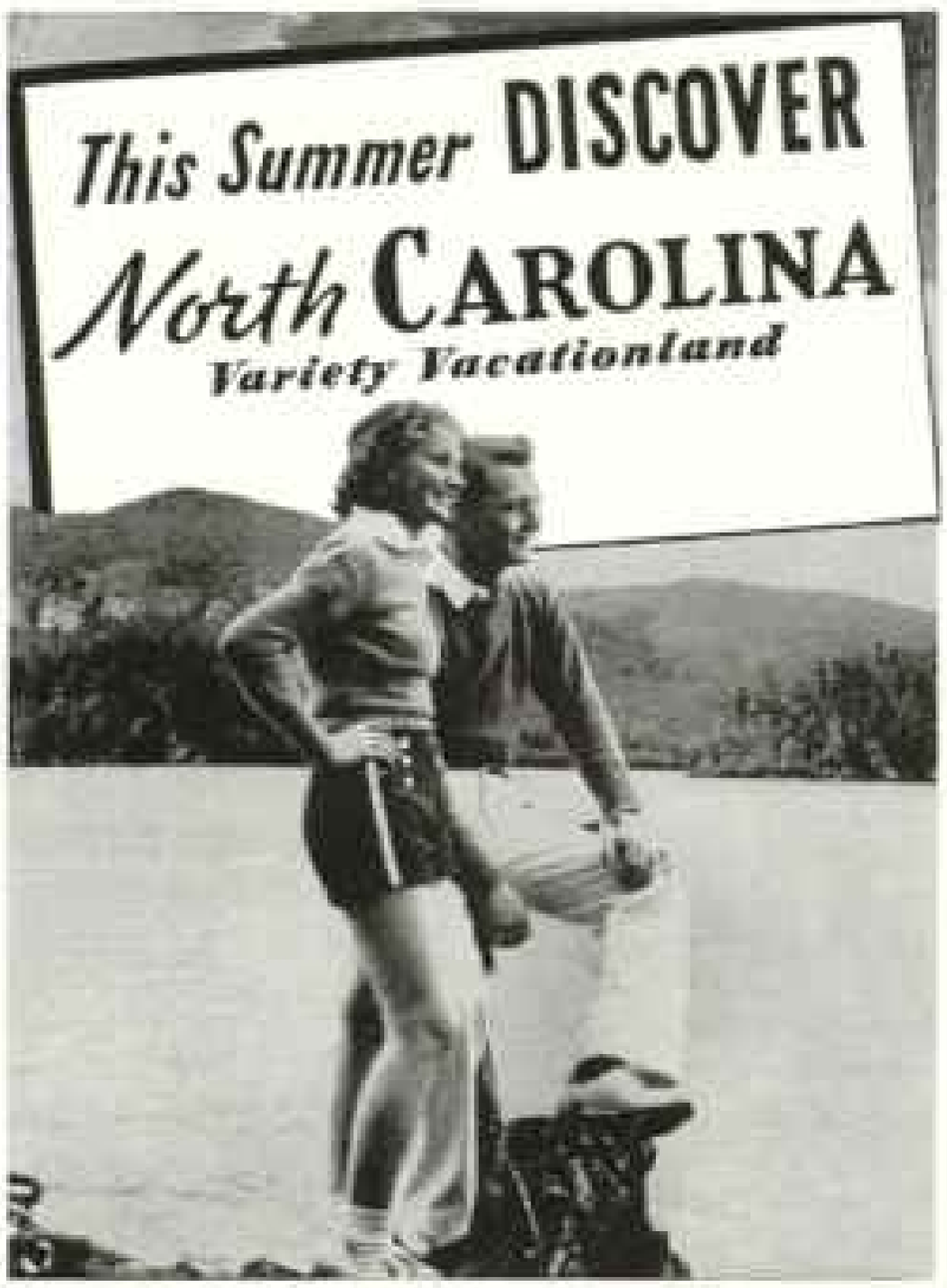
When your dealer pours *Acid-Free Quaker State* Motor Oil into the crankcase of your car, you will get perfect lubrication under all driving conditions. This result is assured by Quaker State's four great modern refineries, where the finest Pennsylvania crude oil is scientifically freed of all impurities. Each drop of *Acid-Free Quaker State* is pure, rich, full-bodied lubricant which will make your car run better, last longer. Quaker State Oil Refining Corporation, Oil City, Pennsylvania.



Where every SCENE *is a new delight*

DISCOVER the Great Smoky Mountains—the highest in Eastern America, where the pine-scented, invigorating air is like sparkling wine. Visited each year by nearly a million people. Discover sapphire lakes and rippling mountain streams which furnish some of the Country's best freshwater fishing. Discover the seashore and a picturesque coastal country steeped in earliest colonial history. Discover North Carolina's matchless system of paved highways. Discover North Carolina's famous golf courses—every variety of good golf from sea level to courses laid out mid towering mountains. Discover the vacation of your dreams in North Carolina where every scene is a new delight. Discover North Carolina's splendid accommodations at sensible rates. Mail the coupon today, or better still, make your plans to come now. *Dept. of Conservation & Development*

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Gentlemen: Please send me official booklet,
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*Name*_____
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GET MORE "GO" FROM EVERY GALLON!

LDS 60 4-DOOR SEDAN (889*)

MORE MILES AND MORE PERFORMANCE IN THIS THRIFTY, LOW-PRICED OLDS!

STEP into an Olds Sixty and step out for a wonderful drive! The way its 90 H. P. Econo-Master Engine whisks you away from stop lights, whizzes up the steepest hills and hums down the straightaway will make you mighty proud of its performance. The way it saves money on gas and oil will appeal to your pocketbook. Its big, wide-vision Bodies by Fisher are roomy and restful, as well as beautiful. Like the popular-priced Seventy and the medium-priced Eighty, the Olds Sixty offers the revolutionary Rhythmic Ride—the grandest ride on any road. It's a de luxe car in every way, yet it's priced right down in the low-price field! Come, take a drive. Just a few miles will convince you that you couldn't make a better buy!

$777 AND UP

**Delivered price at Lansing, Michigan, subject to change without notice. Price includes safety glass, bumpers, bumper guards, spare tire and tube. Transportation, state and local taxes, if any, optional equipment and accessories—extra. General Motors Instalment Plan.*

ECONO-MASTER ENGINE— A GAS SAVING SENSATION!

It's a long time between gas pumps when you drive an Olds Sixty! This grand performer is a grand economizer, too! That's because its 90-horsepower Econo-Master Engine is scientifically designed and quality-built, with all the latest fine-car engine features. It's the only engine *in any low-priced car* that gives you 100% Full-Pressure Lubrication with Rifle-Drilled Connecting Rods. In addition, Down-Draft Carburetion, Electro-Hardened Aluminum Pistons and High-Efficiency Cylinder Head contribute to economy, long life and fine performance. Come, try it yourself! A trial drive will quickly prove its performance! And the fact that Olds won first place in its class in the famous Gilmore-Yosemite Economy Run conclusively proves its economy!

"YOU OUGHT TO OWN AN OLDS"

* A GENERAL MOTORS VALUE *

Revel AND Rest THIS SUMMER in MASSACHUSETTS

Every summer recreation, every scenic delight and every variety of historic interest await you in Massachusetts. Near to the New York World's Fair and easily reached by fine highways, Massachusetts offers the perfect setting for your summer's pleasure. Make your vacation plans *now*—and be sure to include Massachusetts.

THE MASSACHUSETTS DEVELOPMENT AND INDUSTRIAL COMMISSION
State House, Boston, Mass.

Send me the free illustrated booklet "Massachusetts—The Best of the Old with the Zest of the New".

Name _____

Address _____ NG-5

"GOING TO THE FAIR!"

Going to see America en route
Going to save a lot of money
Going by GREYHOUND!

It's here! *It's now!* It's the greatest, gayest world's fair of history! Uncounted thousands of Americans from all parts of the land are going by Greyhound . . . because it costs far less—because it reveals the true beauty of America en route—because it is the smooth-riding, congenial way. Join this eager, light-hearted throng . . . go now to escape the mid-season rush. Then see the Fair itself from Greyhound's Exposition buses . . . veritable grandstands on wheels.

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DETROIT, MICHIGAN . . . Washington Boulevard at Grand River
FT. WORTH, TEX. . . 908 Commerce Street
BOSTON, MASS. . . . . 60 Park Square
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See Two Fairs For One Fare!

There has never been a travel bargain like this one! a great circle tour of all America, along your own choice of scenic routes—stopping at both NEW YORK and SAN FRANCISCO—for only

$69.95

The GREYHOUND LINES

This Brings Bright, Pictorial World's Fair Booklet. Just mail this coupon to nearest Greyhound information office, listed above, for picture booklet all about the New York World's Fair, with map of Fair grounds.

Name _____

Address _____ NG-5

The boys call our new "G-100" tire
"a BEAUTY *and a* BRUTE"!

LOOK AT THE DIFFERENCE

Dotted outline shows shape of tires before inflation; solid section after. Note how the new "G-100" actually compacts in overall diameter—firms down—compressing the tread to make it more resistant to cuts and wear.

AMONG themselves the men who build and sell a product never bother to gild the lily. So it means something when we hear our boys both in shop and field calling our Centennial tire—the new "G-100" All-Weather*—both "a beauty and a brute."

That's pretty much on the target. It *is* a beauty—smart, clean, modern in its sculptured simplicity. And it proves itself a brute under the scuff and grind and wrench of today's high-speed travel *by delivering 33% more tread mileage.*

It gets this *plus* from new engineering—new shape and new cord angles that combine to *compact* the tread as air goes in. Instead of stretching, the tread actually *firms down* under inflation. It "makes a muscle," becoming harder, tougher, more resistant to wear.

This gives us a lightfooted, cool-running, far-traveling tire—a more stable tire with 11% more rubber on the road—a sure-footed, smooth-rolling carrier that can "tough it" and call for more.

More durable cords in the sidewalls give it greater protection from bruises and blowouts—new low-stretch Supertwist* cord possessing exceptional strength and endurance.

We built this magnificent "G-100" All-Weather to star the Centennial of Rubber, and when you see it at your Goodyear dealer's—*now*—you'll agree we've succeeded in a big way.

* * *

*Trade-marks of The Goodyear Tire & Rubber Co.

A centennial product of The Greatest Name in Rubber

THE GREATEST NAME IN RUBBER

GOODYEAR

MORE PEOPLE RIDE ON GOODYEAR TIRES THAN ON ANY OTHER KIND

NEXT TO HOME JERSEY'S BEST!*

* A PERFECT VACATION *plus the World's Fair!*

It's a chance of a lifetime—to combine a vacation in "the perfect state" with a visit to the World's Fair. Wherever you're enjoying a wonderful vacation in New Jersey you can still get to the Fair and back in *one day*. Yet Jersey's BIG in the vacation fun it holds. 132 miles of delightful seashore. Scores of sparkling lakes. Deep sea, surf, stream or still-water fishin'. The country's best dance orchestras. Loads of historical lore. Golf, horseback-riding, hiking, browsing around historic spots—any kind of fun you can think of is here in greater abundance—and handier—than any place else in the world. Fact is, next to home, you'll like hospitable New Jersey best. No increase in hotel rates; sharp decrease in travel fares.

NEW JERSEY COUNCIL

Created to Tell You About one of the Great Vacation Lands

free

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Trenton, New Jersey
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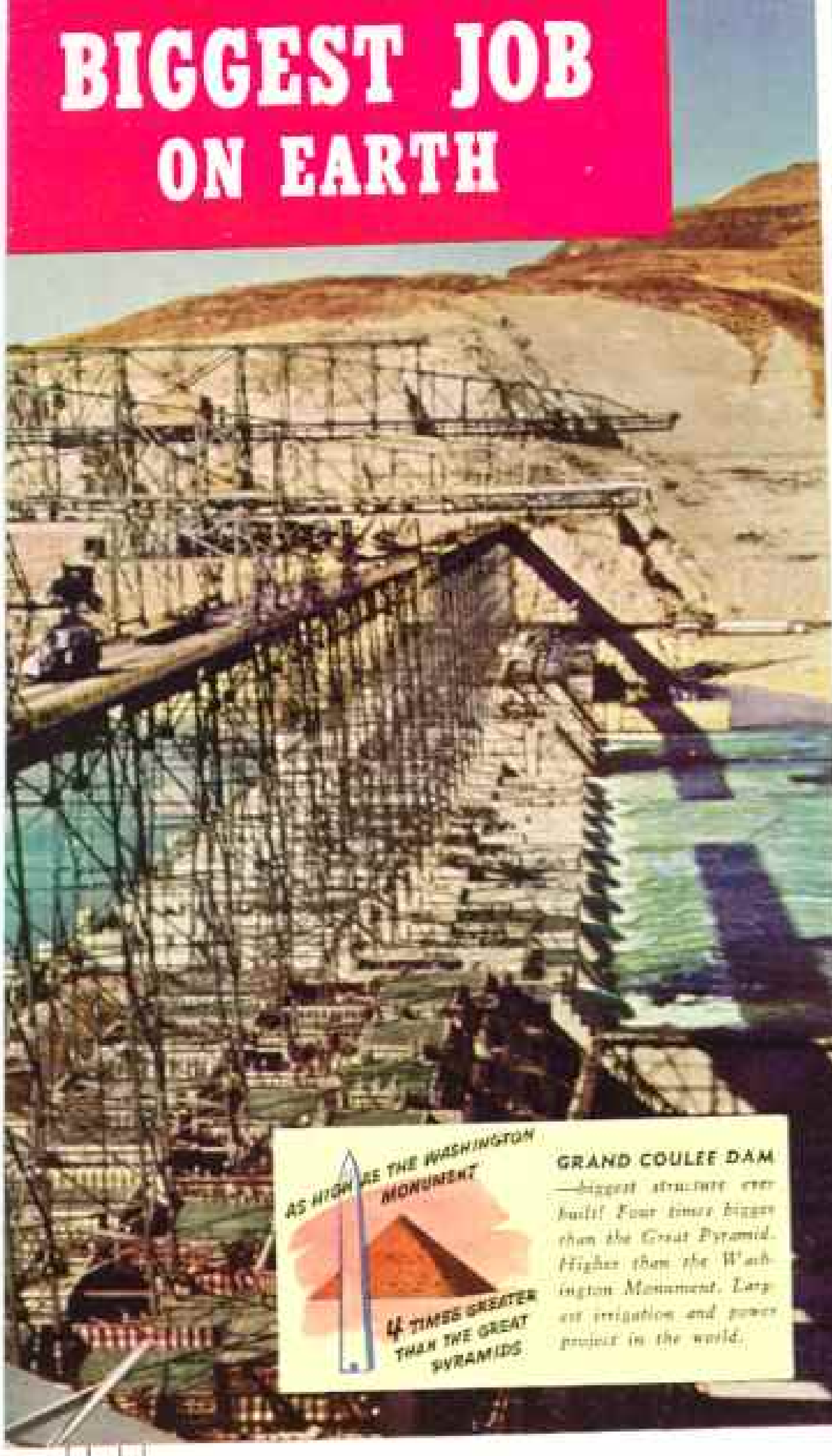

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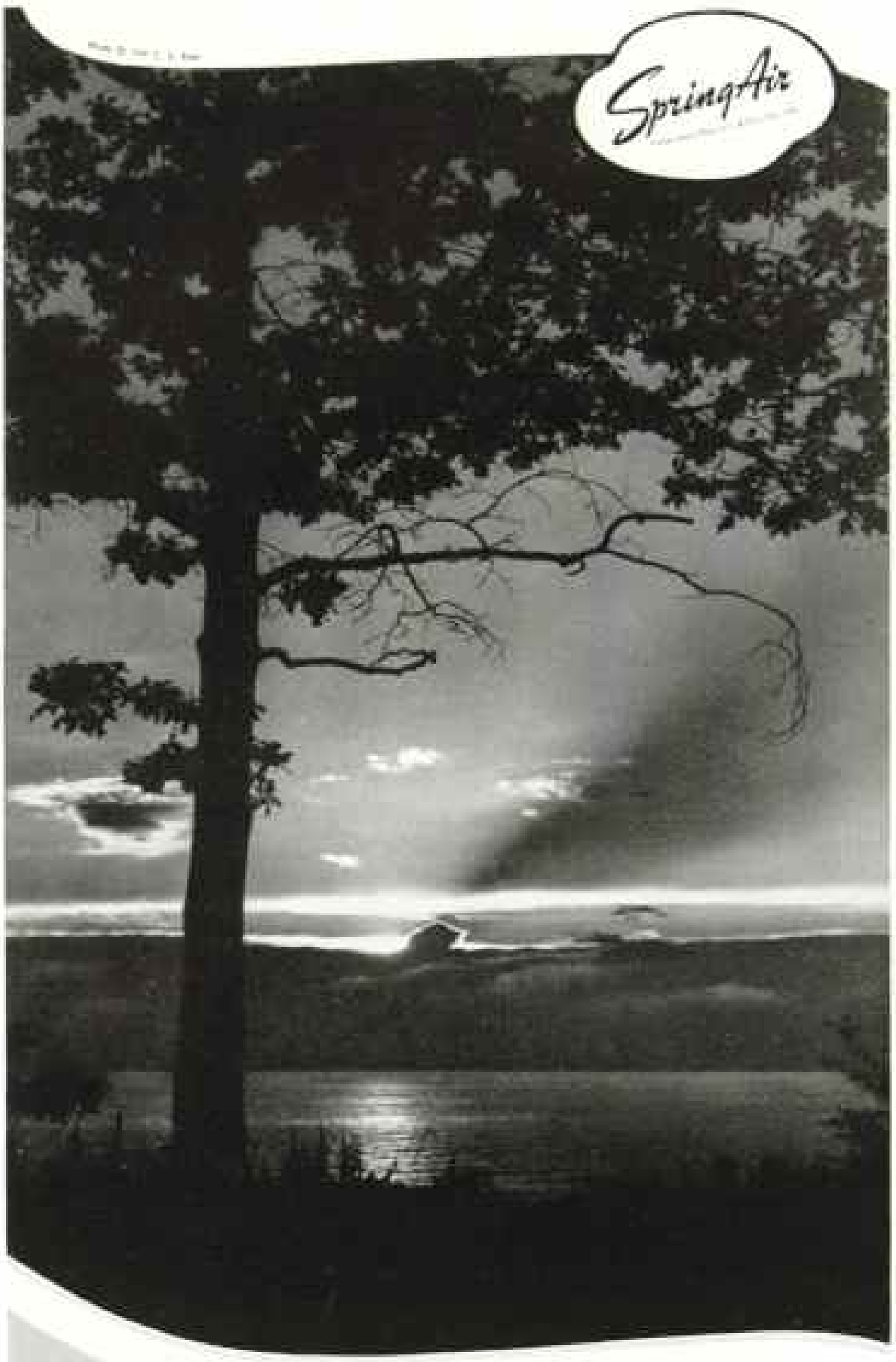

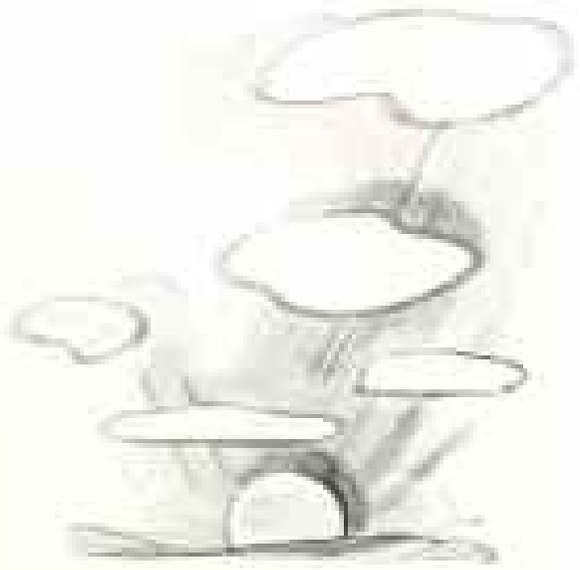

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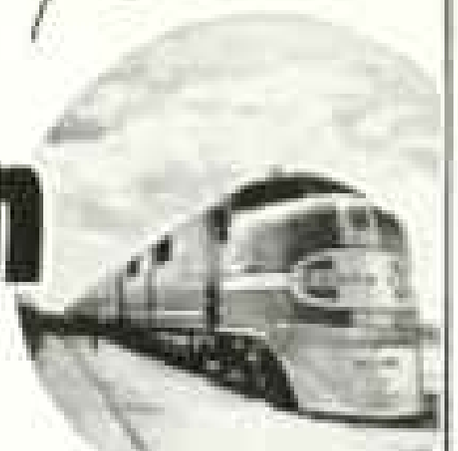

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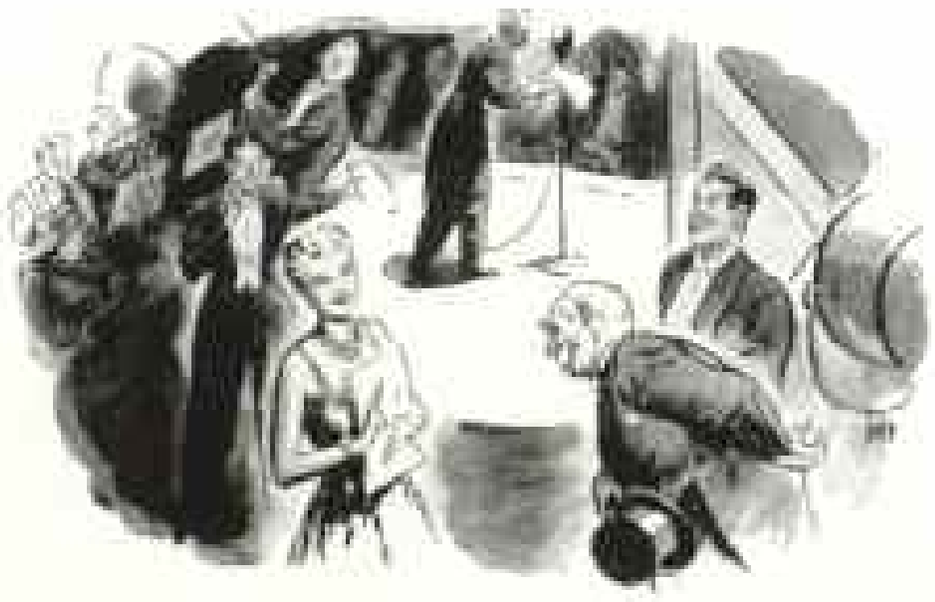
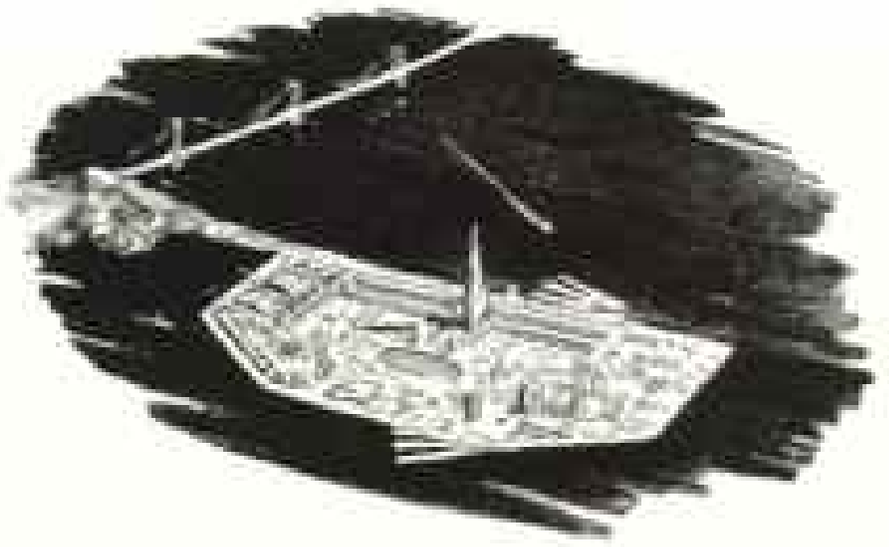


2 We even intended to tell you about the life and vigor of this place...things happening! Men creating movies, fashions (the shop windows bloom all the year 'round), new architecture, and just...news! Coast-to-coast broadcasts. Sneak previews. Hilltop supper clubs where authors, wits, stars are sitting at the next table...

There's a World's Fair right next door

1 Too bad. Here we were going to tell you all about Southern California this year...about the cool summer nights and rainless days, the white beaches, blue ocean combers, the crisp air of our high mountain country, those Symphonies Under the Stars, Old Missions, pleasure isles, Big Trees...



3 But how can we talk so much about Southern California when there's a World's Fair right next door? San Francisco's magic Treasure Island gives you a better reason than ever to come west this year. See them both—Southern California and the San Francisco World's Fair—on one cool vacation trip!

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The National Geographic Directory of Colleges, Schools and Camps

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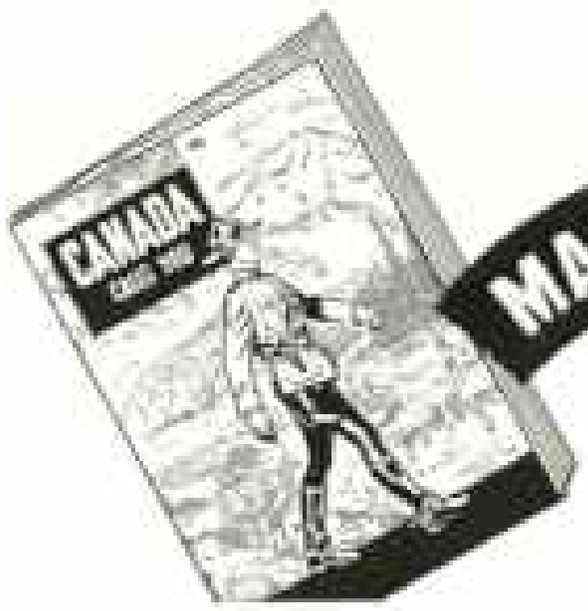

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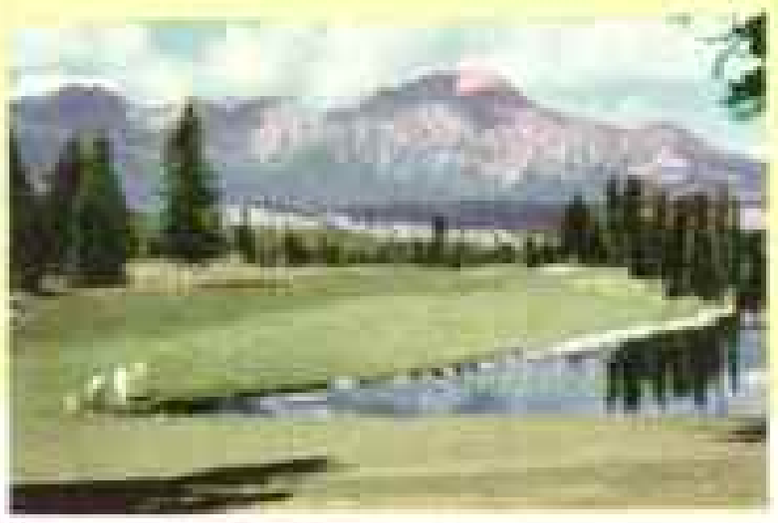

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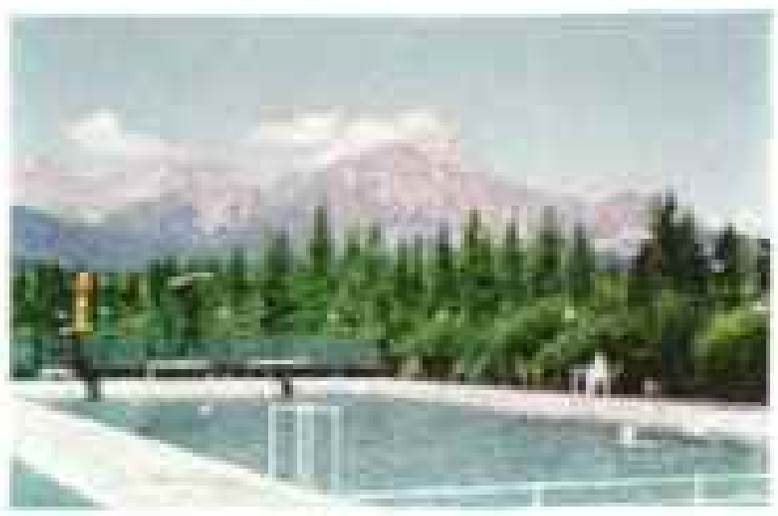

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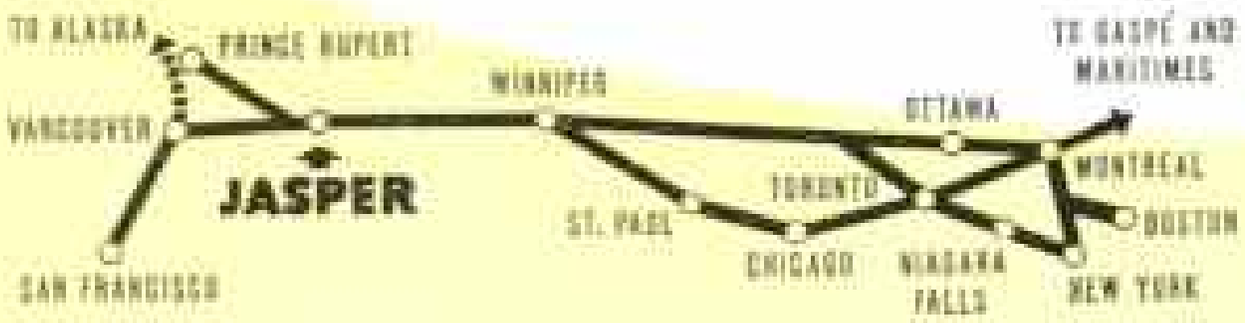

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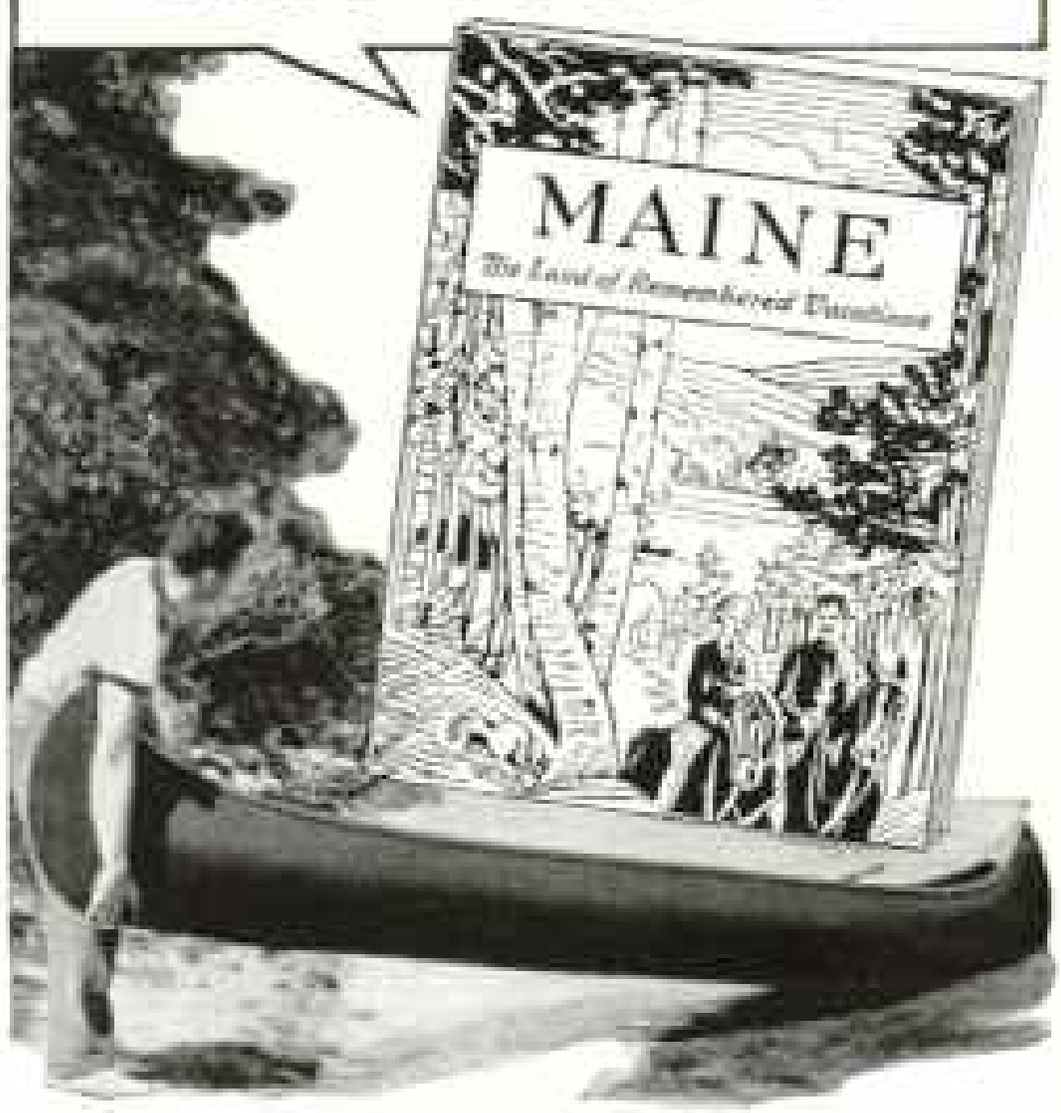

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Worry may spoil your life. It may keep your mind travelling in circles. Troubles are sometimes eased by facing them and thinking them through; at least, you have the satisfaction of having done your best. But worry has never solved a problem.

Isn't there a special interest that you have been promising yourself to take up? Perhaps it's gardening, making things for your home, going back to your music, photography, a scientific study, or building a workshop. Maybe it's "travelling" in your easy chair with books from the Public Library; it might be collecting stamps, coins, or old glassware. Whatever it is, revive your interest in it.

You may find your hobby in active participation in community work, church or other group affairs, or amateur theatricals. Mixing socially with congenial men and women is a dependable worry-chaser for many persons.

Few people realize the amount of physical harm caused by worry. Doctors know that prolonged worry sometimes is a factor in the development of such conditions as disturbances of the nervous system, stomach and intestinal tract, and even of the heart and other organs. Worry and fear are at the bottom of many breakdowns.

Today outside interests have taken on a new importance because so many people have more leisure than ever before. By developing your special interest or hobby, you may improve your health and add both zest and years to your life.

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Absorbing interests may be found in your own home—music, for instance, or photography.

Nature's a tonic for tense nerves. What fisherman has time for business or other worries?

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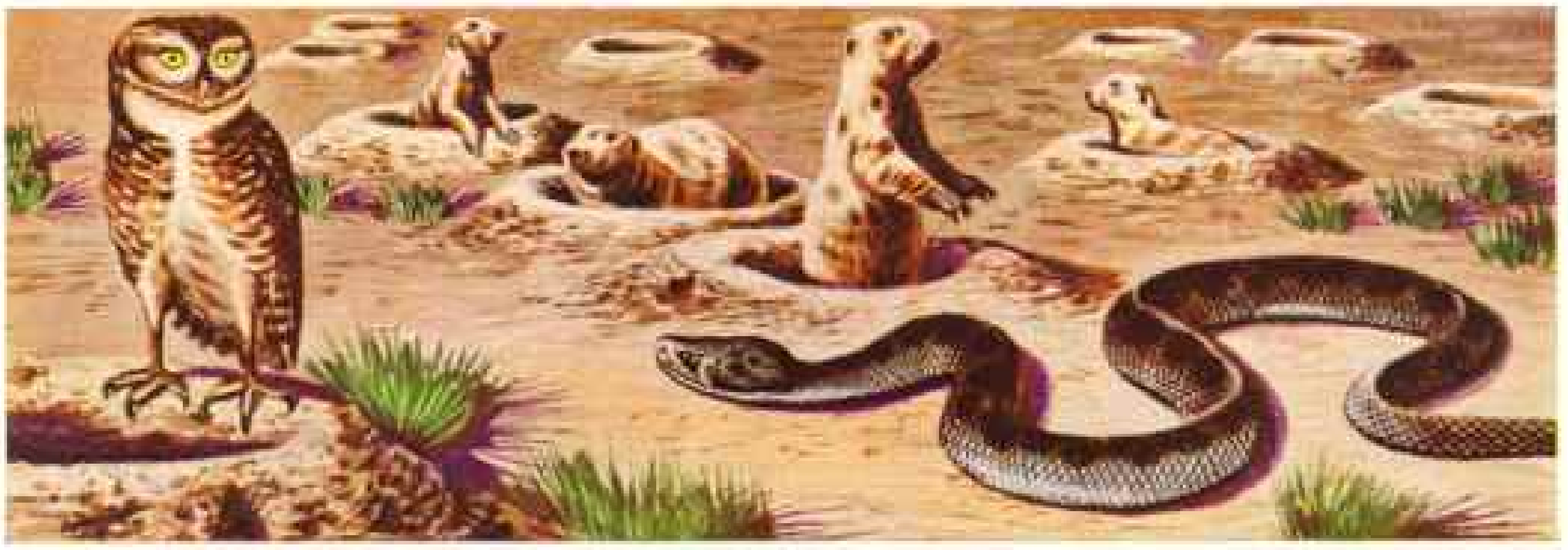
Popular Fallacies

"**Porcupines** *'shoot' their quills at enemies.*" Facts disprove this. When attacked, a porcupine shakes himself and lashes out with his tail. A few loose quills come out. This is how the fallacy probably got started.

"**A mongoose** *is immune to cobra venom.*" Not according to the scientists. The mongoose depends on his quickness and ability to dodge. If bitten by the cobra, he dies.



"**Owls, rattlesnakes and prairie dogs** *live together in the same burrows.*" Naturalists say not. It's simply that owls move into abandoned prairie dog holes to nest and snakes also come in to hibernate in winter.

"**People who haven't property or savings** *don't need to carry automobile insurance.*" Experience proves otherwise. As the result of an uninsured accident a man can lose his car, his right to drive, even his personal liberty.

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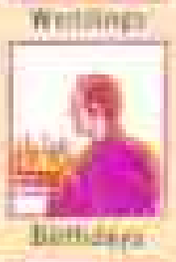
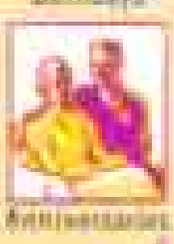

Birthdays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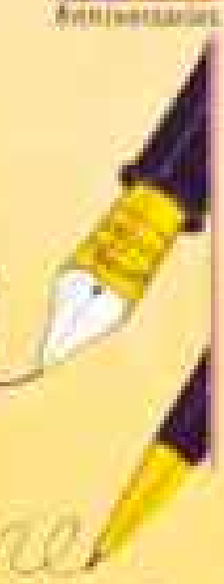

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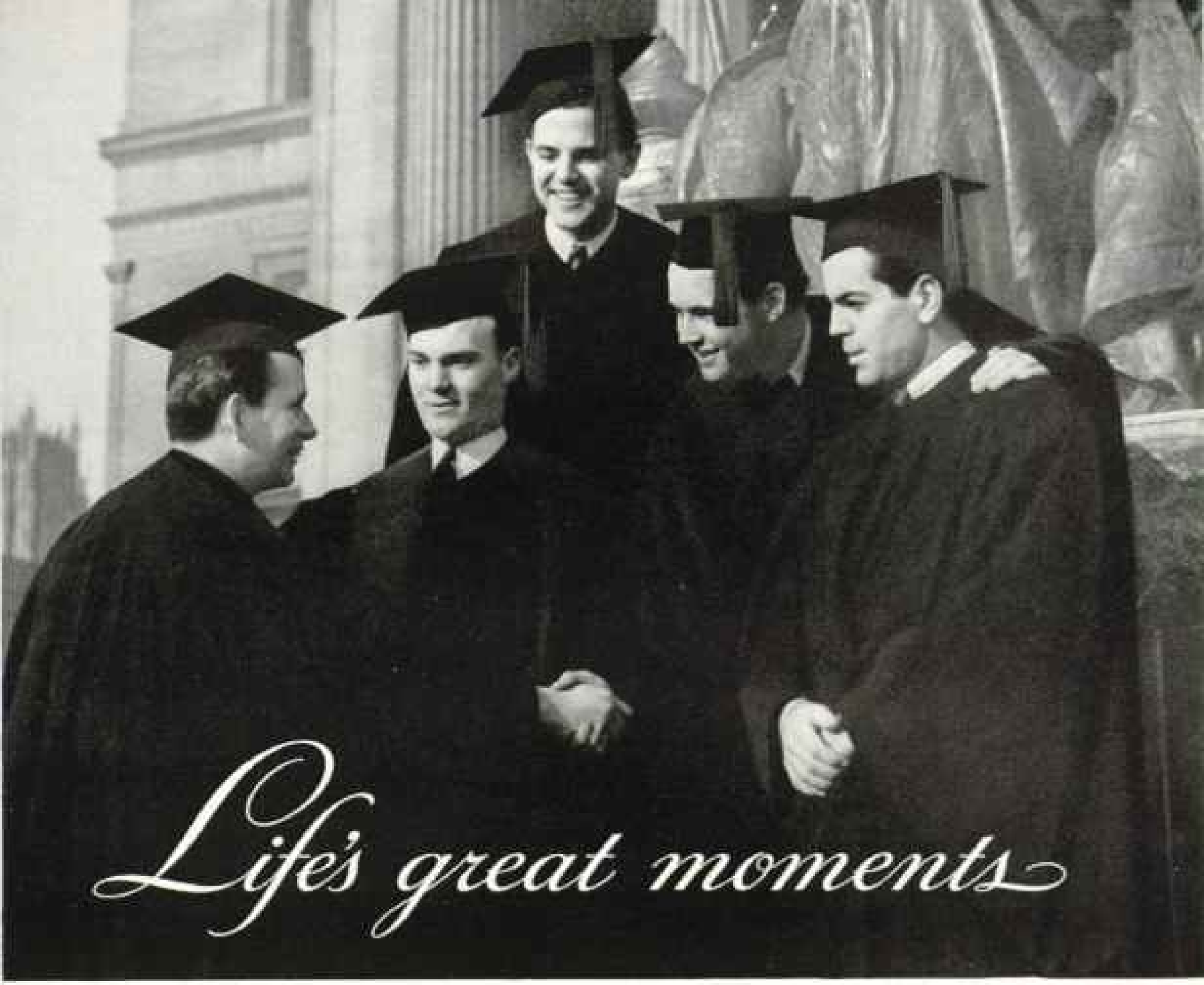

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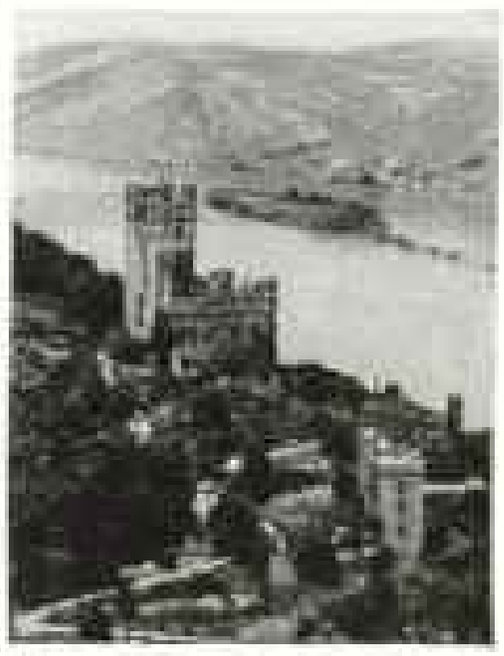

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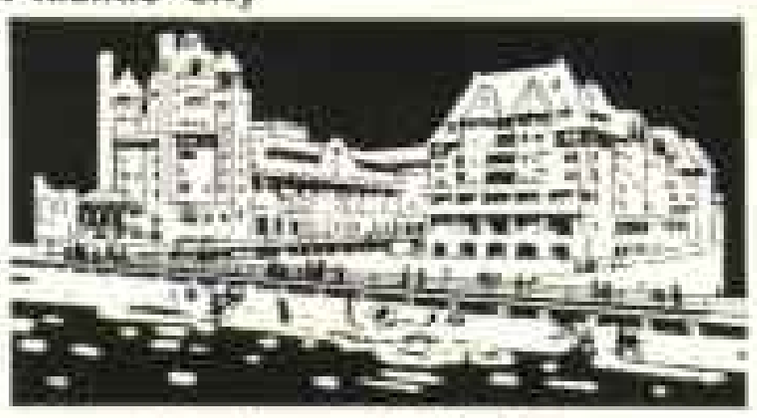

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