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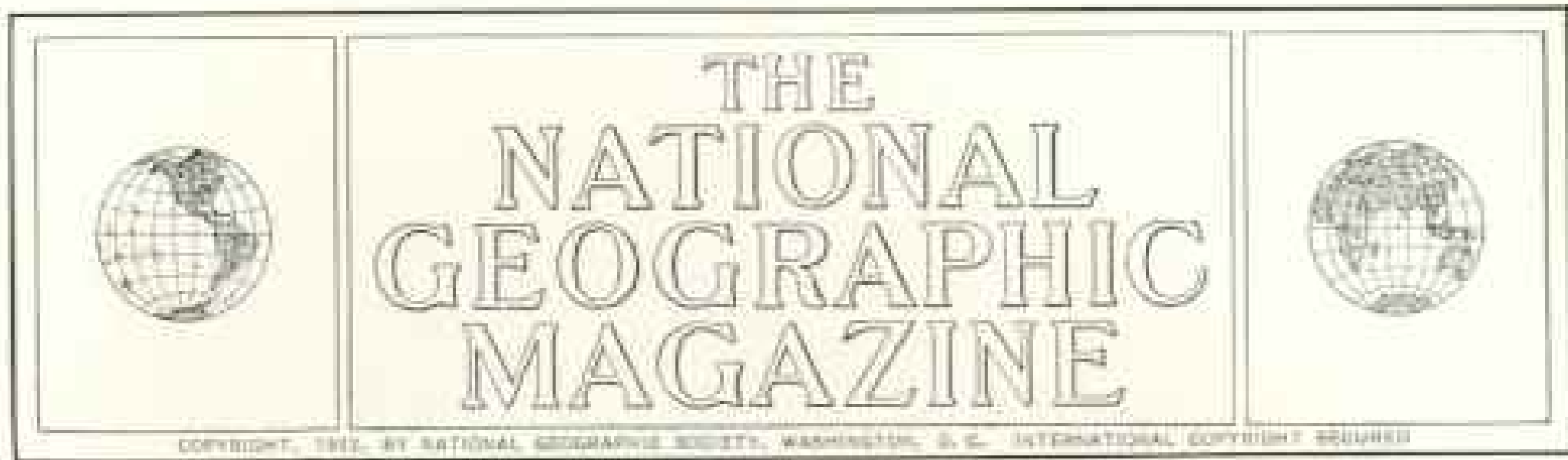
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ALICE TISDALE HOBART
and MARY A. NOURSE

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OUT IN SAN FRANCISCO

Fed on Gold Dust and Fattened by Sea Trade, a Pioneer Village Becomes a Busy World Port

BY FREDERICK SIMPICH

AUTHOR OF "THIS GIANT TRAIT IS NEW YORK," "SKYPAITH OVER LATIN AMERICA," "GIANTIC BRAZIL AND ITS GLITTERING CAPITAL," "SINGAPORE, CROSSROADS OF THE EAST," ETC., ETC.,
IN THE NATIONAL GEOGRAPHIC MAGAZINE

HERE, by the Golden Gate, San Francisco was born of salt water and reared on gold dust. That sounds fantastic; but its proof is abundant in the melodramatic annals of this bold and vital city. These annals show its close kinship with the sea; they reveal an audacious character, a fortitude in disaster, and a magic rise to wealth without parallel in the history of other great seaports.

It is not the city's size, or the manner of its structure, that sets it apart. Rather it is a quality of spirit, such as that which makes Paris or Budapest more gay than Hamburg or Liverpool.

This much you must accept on faith, till you find the evidence by years of exploring in other world cities and come, at the same time, to know San Francisco by many visits and comparisons.

Its abiding traits of pluck, its readiness to take a chance, are rooted in its adventurous origin and the reckless years of its mushroom rise: for, remember, it had no youth. It was an infant Mexican village when the gold rush of '49 peopled it pell-mell with frenzied, shouting thousands, who made it, almost overnight, a fighting, gambling, gold-mad city whose uproar echoed around the world.

Yet the sea, far more than gold mines, shapes the destiny of San Francisco. Bigger and faster ships set it closer and closer

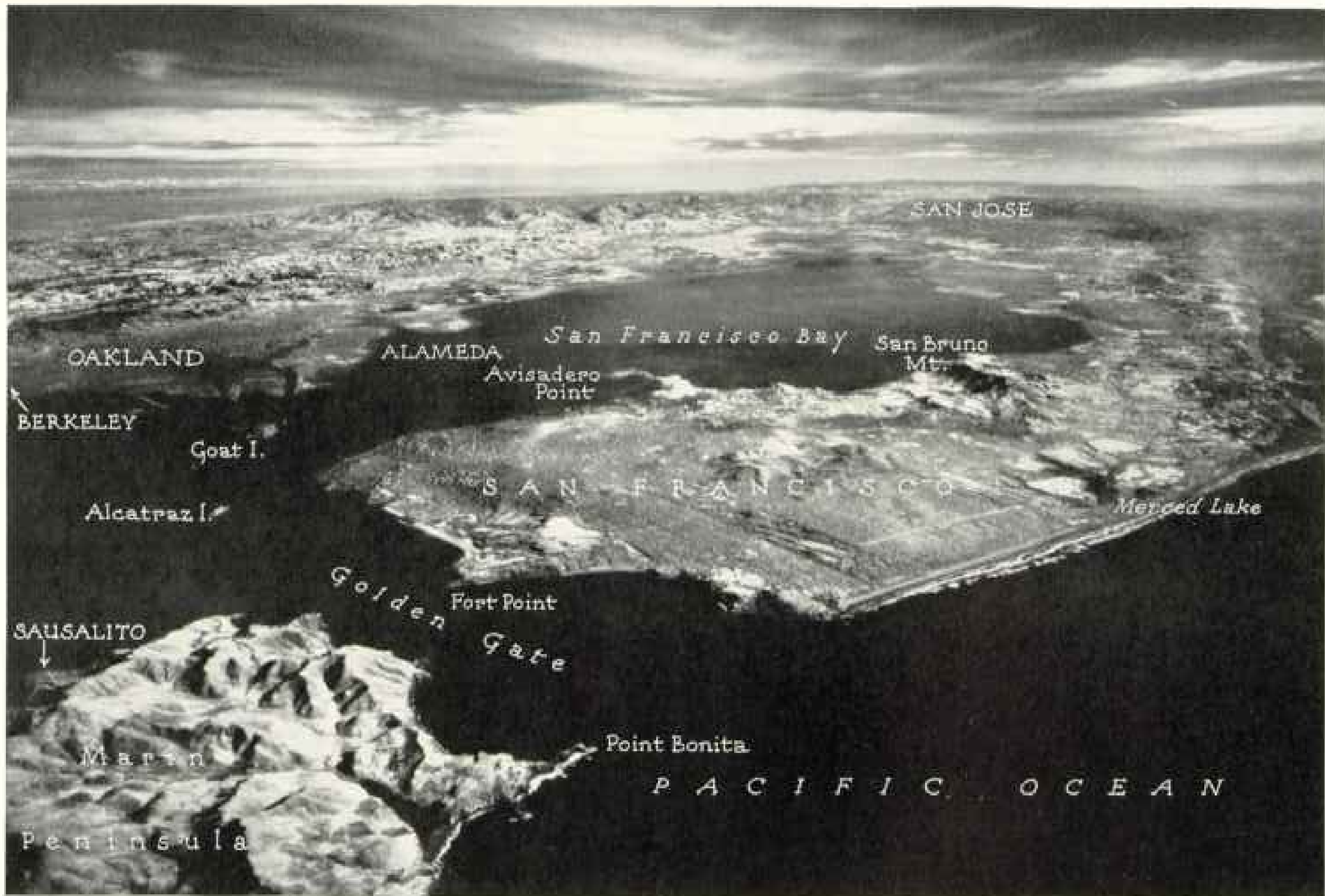
to the polyglot bazaars of the changing East. Caravels, clipper ships, whalers, and sealers give way to racing liners; now one giant freighter may carry as much as a whole fleet of early-day South Sea trading schooners.

Alaska, Japan, China, the Philippines, India, Australia—it barter with them all. Its vast panoramic Embarcadero, or water front, fairly smells of China tea, silks, straw mats, Alaska fish, Manila hemp, coconuts, pineapples, raw sugar, Singapore rubber, and coffee from Latin America. The crude adobe pueblo, where "Boston boats" first came to trade arms, tools, trinkets, and calico for the hides and tallow of Mexican ranchers, has become to-day our key port on the Pacific.

HERE IS THE CHILD OF NEPTUNE

A great city had to rise here, for the same reasons that New York grew at the Hudson's mouth, Rio de Janeiro and Sydney and Hong Kong on their great harbors, Shanghai on the Yangtze, and Istanbul by the Golden Horn. This vast haven inside the Golden Gate affords such an ideal site for a busy international city that, as one writer says, if San Francisco did not already exist men would at once start building it.

Not only in its eventful growth, but in the story of its very beginnings, you find



FLYING IN FROM THE NORTHWEST, 21,000 FEET ABOVE THE PACIFIC, SAN FRANCISCO IS GRAPHICALLY REVEALED

Hundreds of square miles of land and water, various cities, islands, mountains, and valleys unfold here before the powerful eye of the high-altitude camera. About 1,750,000 people inhabit the area shown. Far below, unseen, fleets of boats plow the bay and ocean. From here 18 coast lines operate; 20 lines run via Panama to the Atlantic seaboard; 55 lines operate to foreign ports—17 to Europe, 13 to Central and South America, 13 to trans-Pacific ports, 6 to Australasia, 1 to Africa, and 5 around the world. Yet, till that August day in 1775 when Lieutenant Ayala entered the Golden Gate with the *San Carlos*, no white man's craft had faced its tides.



THE UNITED STATES NAVY'S AIRPLANE CARRIER "SARATOGA" ENTERING SAN FRANCISCO BAY

Besides its Mare Island Navy Yard (near Vallejo), begun in 1853, and the great dry dock at Hunters Point, our Navy's Pacific history is intimately linked with the annals of this busy bay. Many famous vessels, including the *Olympia* (Dewey's flagship at Manila Bay), the *Waricanian*, *Ohio*, *Milwaukee*, *Monterey*, *Wyoming*, and *Tacoma*, were built at the old Union Iron Works, now the Bethlehem Shipbuilding Corporation. Here, too, was launched the historic *Oregon*, and from this coast she made her unparalleled 16,000-mile run around the Horn, at full speed, stopping only for coal, to reach Cuba and join in the battle of Santiago.



THE SIX-MILE WATERCOURSE SEPARATING SAN FRANCISCO AND OAKLAND

Upper left, water front and piers of San Francisco; right center, Goat Island; foreground, Oakland and its ferry slips. The cometlike specks are ferryboats crossing the Bay. They are following, in general, the line of the new highway bridge, which is to reach from Rincon Point, San Francisco, via Goat Island, to Oakland (see text, page 420).

San Francisco legitimately a child of the sea. In early days sea paths were the easiest way to this coast.

By sea Sir Francis Drake came, on that pioneer world cruise of 1579. It must have been foggy even then; for he missed the Golden Gate to land a bit north, at what is now Drakes Bay. Claiming the country for his queen, naming it New Albion, and celebrating the first Christian service in what to-day is California, Drake sailed away (see, also, page 409).

Nearly two centuries passed. Still no white man had seen the Golden Gate. Inland from it were Digger Indians, living

precariously on roots, rats, bugs, and snakes, often starving in a region now so rich in milk and honey that it exports food to much of the civilized world.

But down in Mexico things were happening—events of profound portent to future California and San Francisco. Cortez had seized the realm of Montezuma. Slowly, for generations afterwards, the gold-hungry Spaniards drifted to the northwest, some by sea, many through what is Arizona now, and thus up this coast. With them came the priests, carrying the Cross to the Indians. Often it was a contest to see whether a priest could baptize



SAN FRANCISCO AIRPORT, FORMERLY MILLS FIELD

The Century Pacific Lines, Ltd., only scheduled airlines here, operate between San Francisco and Sacramento, Los Angeles, San Diego, and El Paso. They carried 30,000 passengers during the last six months of 1931. While they run a 12-plane schedule daily, at present no air mail is handled from this field. The United Air Lines, leaving from Oakland Airport southbound, carry air mail between San Francisco and Los Angeles. Air mail and passengers from the Northwest and transcontinental lines arrive at the Oakland Airport. In the picture, to the left of the airport, is San Francisco Bay, and running diagonally across is the busy Bayshore Highway.

an Indian before the Indian could slay the priest. Haltingly they advanced, but stubbornly.

In time the missions, orchards, and irrigated farms of the padres were scattered along the meandering trail from Guadalajara up to San Diego—and finally to the Golden Gate itself. Along this same *Camino Real*, or "Royal Road," flanked to-day by golf clubs and "hot-dog" stands, came Don Gaspar de Portolá, Governor of Baja California, seeking a bay called

Monterey. "Royal Road" they called it, euphemistically; but what Don Gaspar actually followed then was a faint trail fading into hills and brush. Lost, floundering, he stumbled upon a magnificent landlocked harbor. And he named it San Francisco. That was October 31, 1769.

As if foreshadowing the liberal spirit of the city, San Francisco itself was founded in 1776—the same year that also made July Fourth the Nation's birthday. It was a Spanish captain, Juan Bautista de Anza,



THE FINANCIAL SECTION'S TOWERING GIANTS RISE OVER CHINATOWN ROOFS,
WHERE FISH ARE SPREAD TO DRY

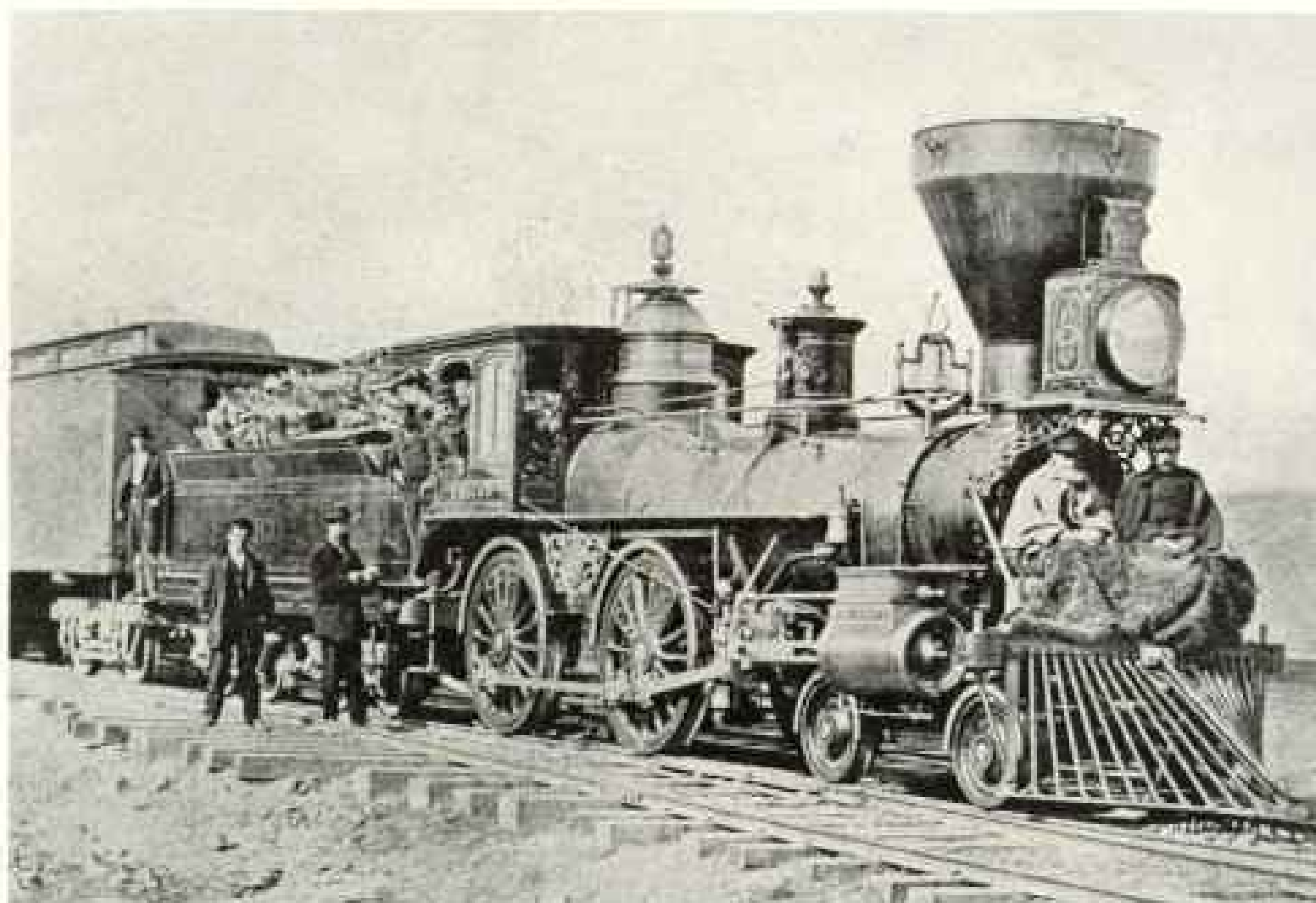
Though her growth is based on sea trade, since she was rebuilt after the fire of 1906, San Francisco's banking and industrial activity has increased enormously. Her chief trades are printing, coffee and spice roasting, canning, baking, foundries, machine shops, confectionery, and women's clothing.



Photograph by Ewing Galloway

PAGODA ROOFS AND STREET LAMPS IN CHINATOWN IMPART A SUGGESTION OF
'CITY LIFE IN ANCIENT CATHAY'

As early as 1852 several thousand Chinese had settled here. Chinatown, lying now chiefly along Grant Avenue and Stockton Street, covers part of old Yerba Buena village, where the first whites built their shacks. Though squalid, vicious, and notorious in old days, since the fire of 1906 a new life—clean, sanitary, and orderly—has developed (see text, page 431).



Photograph from Southern Pacific Ry.

A WOOD-BURNING PIONEER LOCOMOTIVE ON THE FIRST TRANSCONTINENTAL LINE

Every mile of the first transcontinental railroad was carefully inspected by commissioners appointed by the Government. Two of the commissioners are seen sitting on the pilot of the Central Pacific locomotive *Falcon*, covered over with a large buffalo robe. The picture was taken at Argenta, Nevada, in February, 1869, three months before the railroad was completed.

who laid it out and set the pattern for later "realtors." Once, when hunting quail in south Arizona, we came upon ruined old walls overgrown with mesquite. "This was the old Spanish Presidio of Tubac," said my host. "Captain Anza marched from here when he went north to found the Presidio of San Francisco."

That part of the modern city reserved for the United States Army is still called the Presidio. Its Officers' Club uses an ancient building dating from Captain Anza's time.

"The first ship to enter Golden Gate"; "the choice of the town's first *alcalde*"; and the birth of the "first white child"—all these early events are duly recorded. But of the pioneer village few signs remain, except the Presidio Club and the ancient Dolores Mission, whose thick walls, cold, rough floors, and altar carvings brought from Spain are mystic links with the past. On the crumbling, weather-beaten headstones of its crowded little cemetery you read names famous in the California of a century ago—as that of Don Luis Argü-

ello, first Mexican Governor of Alta California, whose sister became a nun when her Russian lover, Resánov, failed to return.

NEW ENGLAND SEA TRADERS PIONEERED THIS COAST

Sprawling idly by the bay, and first named Yerba Buena, Anza's town site saw things come to pass that molded, through the years, the character of the city: the growth of the vast haciendas, huge herds, bullfights, fiestas, burning Judas in effigy, church processions, rodeos and swaggering vaqueros in such feats of horsemanship as "loping" full speed with a tray of filled wineglasses, spilling none. More priests and colonists from Mexico, with new fruits, food plants, and grains, all to multiply eventually into astounding productivity.

By 1806, Russian trappers, hunting sea otters in the kelp beds, drift down from Sitka. Agents of the Tsar build a fort at Bodega, up the coast, colonizing there, with smooth intrigue, to make Alta California part of the Russian Empire.



Photograph from Southern Pacific Ry.

SQUARE-RIGGERS IN FROM A 17,000-MILE VOYAGE AROUND THE HORN

Made in 1866, when cameras were scarce and crude, this historic ship picture shows the old Vallejo Street wharf piled with cases of food, clothing, tools, medicines, and barrels of whiskey—all of which came from the Atlantic seaboard by sail in ante-railroad days.

Shrewd New England traders, on three-year cruises to Canton via California, call here to barter. Their trade goods, wrote Dana in his "Two Years Before the Mast," included spirits, teas, coffees, sugars, spices, hardware, crockery, clothing, boots and shoes from Lynn, calicoes from Lowell, cart wheels from England, capes, shawls, jewelry, and combs. With these they paid for hides, tallow, and furs. California hides early gave New England a monopoly in the boot- and shoe-making trades. And the furs taken from here to Canton, then a world market, brought prodigious profits, founding many Boston fortunes.

Bearded and buck-skinned Missouri and Kentucky men begin trickling in.

Then the Hudson's Bay Company, coming to build a fur post here; English navy and merchant ships, and more moves on the checkerboard of destiny, with a plan now to make this a British colony.

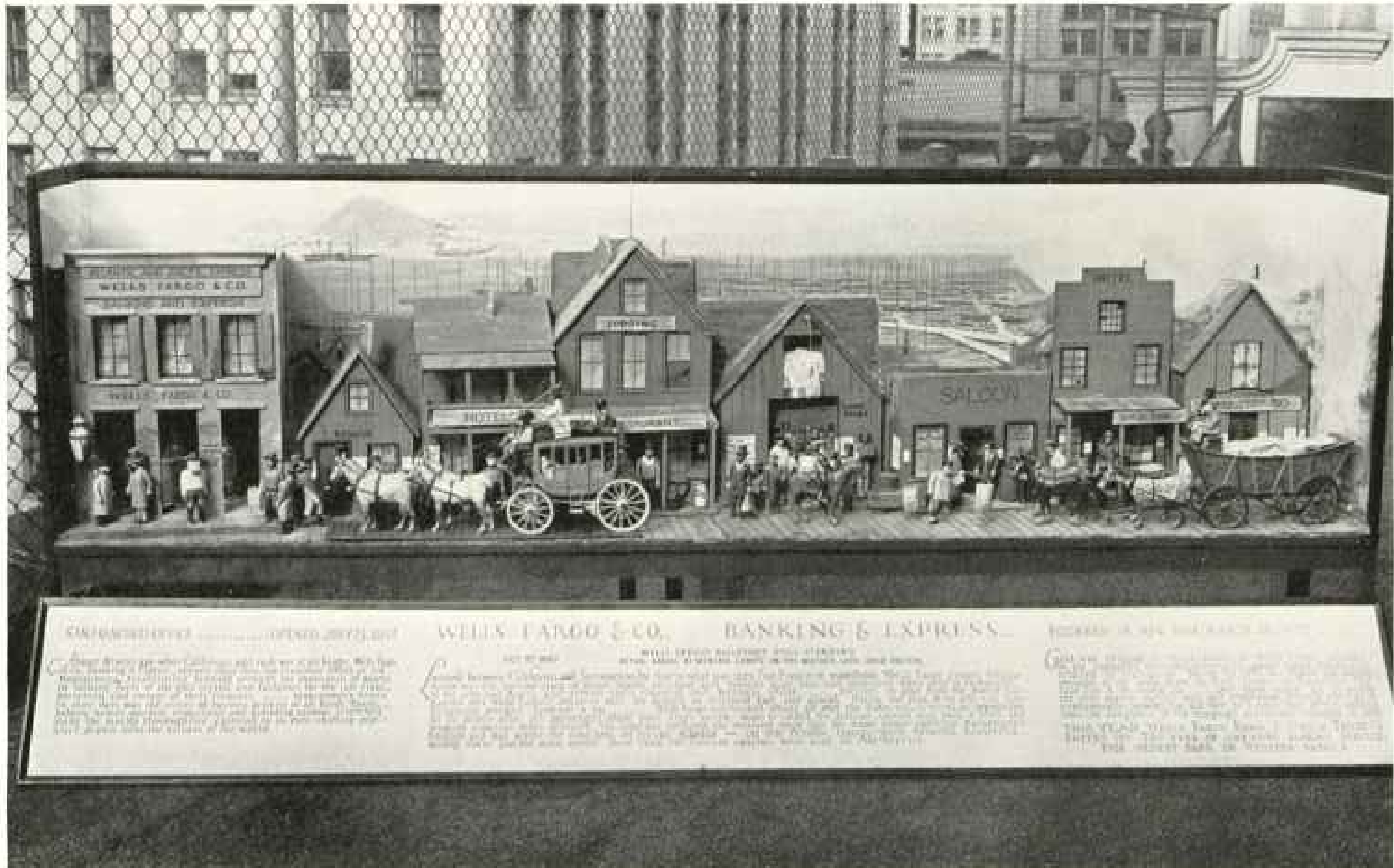
With the 1820's comes the end of Spanish rule. A new flag, the Mexican, waving now over San Francisco. Intrigues increase as years pass; disputes arise between foreigners and natives, and justice grows blinder.

But it's a long walk to Mexico, seat of power. And one-legged Santa Anna has graver problems nearer home—and in Texas.

War with Mexico. Back in Washington sits President Polk, the resolute. Scott, Doniphan, and Zachary Taylor are in Mexico; Frémont, Kearny, and Kit Carson in California. Into the little Plaza of San Francisco come the United States sailors to run up the American flag. California is annexed, 1848.

Thus California was Mexican soil within the lifetime of many Americans now living. The birth of three active members of the Board of Trustees of the National Geographic Society, Maj. Gen. A. W. Greely, Rear Admiral C. M. Chester, and Treasurer John Joy Edson, and of many other members of The Society, antedates the cession of California by Mexico.

Barely 900 people in the village then; a newspaper, a school, and two ramshackle wooden wharves. But soon Marshall found gold near Sutter's mill. It was the richest strike in history. With their jackknives men gouged chunks of pure gold from hillside seams. Seven Americans, with the



SAN FRANCISCO STREET

San Francisco, California, 1850. This miniature street scene is a reproduction of the original scene in the city of San Francisco, California, during the gold rush era. It shows a busy street with various buildings, including a bank, a saloon, and a hotel. A stagecoach is being pulled by horses, and there are many people walking on the street. The scene is set with wood carvings.

WELLS FARGO & CO. BANKING & EXPRESS

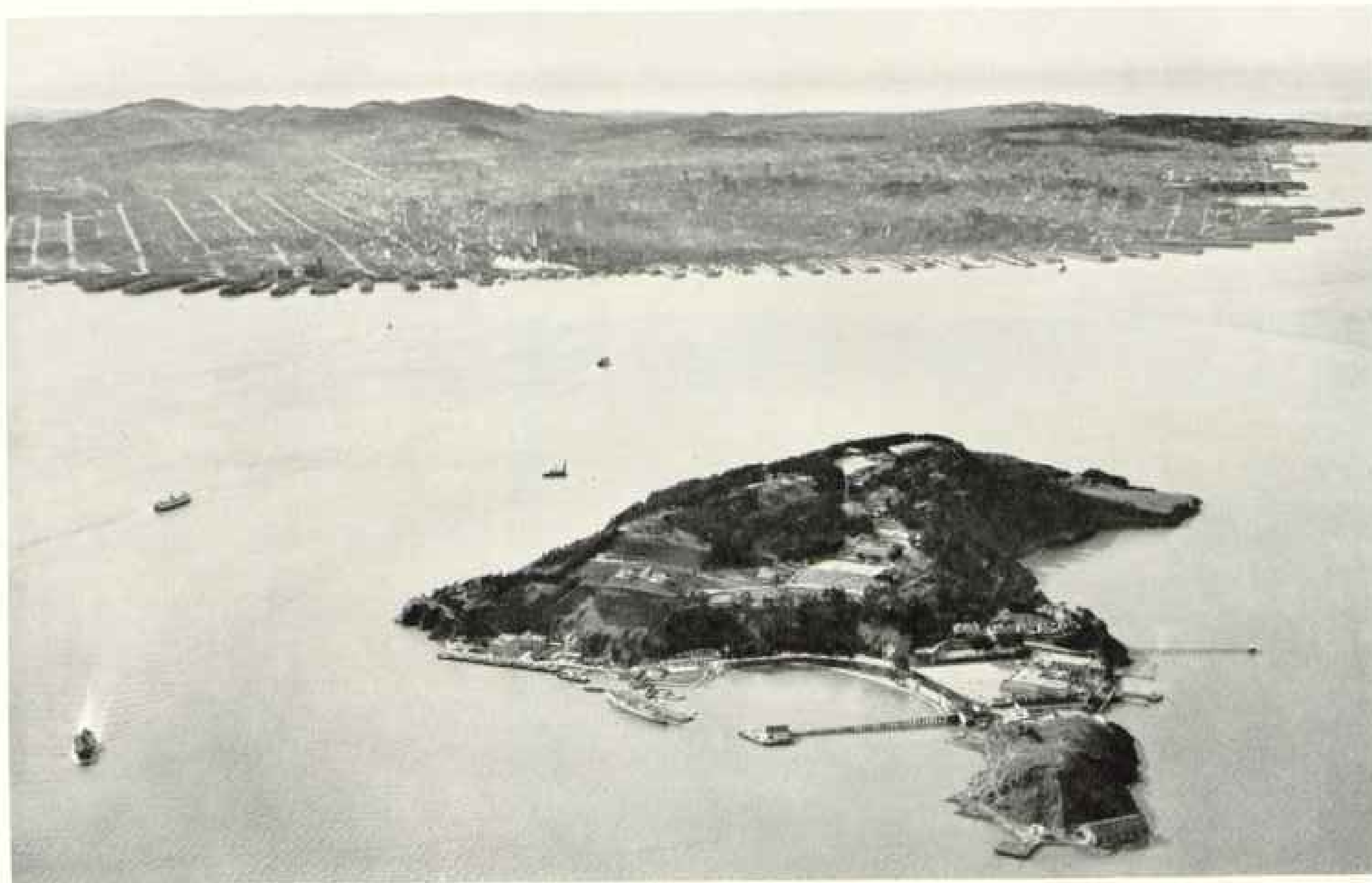
WELLS FARGO & CO. BANKING & EXPRESS. This building is the headquarters of the Wells Fargo & Co. Bank, which was founded in 1852. It was the first bank on the Pacific coast and played a major role in the gold rush. The bank handled gold dust, bullion, and mail. It also operated a stage line across the continent.

STREET SCENE IN SAN FRANCISCO DURING THE 1850'S

This miniature street scene is a reproduction of the original scene in the city of San Francisco, California, during the gold rush era. It shows a busy street with various buildings, including a bank, a saloon, and a hotel. A stagecoach is being pulled by horses, and there are many people walking on the street. The scene is set with wood carvings.

STREET SCENE IN SAN FRANCISCO DURING THE 1850'S; A MINIATURE, SET WITH WOOD CARVINGS

To the old Wild West the name "Wells Fargo" meant what "Hudson's Bay Company" means still in Canadian wilds. Pony express riders, stage drivers, armed express agents, fatal fights with Indians and highwaymen—all formed part of daily business routine for this pioneer organization. Its bank, the first on the Pacific coast, bought gold dust, paying the miners with drafts on New York. In the peak of the gold rush the bank often bought and shipped east \$1,000,000 in gold in a day. For years the company operated the overland stage line, carrying passengers, bullion, and mail across the continent on regular schedule—the only reliable transportation between scattered mining towns and the main routes. (see, also, text, page 410).



GOAT, OR YERBA BUENA, ISLAND, IN THE BAY BETWEEN SAN FRANCISCO AND OAKLAND

Yerba Buena is Spanish for "good herb," and San Francisco itself was first so named for a fragrant herb that grew hereabouts. The name Goat Island arose after 1835, when goats were turned loose here from some ships. The Navy has used the island as a training station. Lying directly in the path from San Francisco to Oakland, its great value from now on will be its use as a support for the 8-mile bridge between these two cities (see text, page 427).



Photograph by Ewing Galloway

CERVANTES AND HIS HEROES IN GOLDEN GATE PARK

Kneeling in homage before the famous novelist are his two best-known characters, Don Quixote and Sancho Panza. Here in California, with its Spanish heritage, the sculptor, J. J. Mora, finds a fitting setting for this portrait bust.

help of Indians, "took out 275 pounds of gold in a little more than six weeks. . . . Two men in seven days obtained \$17,000 from a trench a few feet wide."

IN THE GOLD-MAD DAYS OF '49

The news spread east. Polk commented on the find in a message to Congress. No such excitement had ever swept the Nation. By 1849 the whole world seemed gold mad. On every continent men talked of California, and in ever-increasing thousands they moved on San Francisco. In that year 230 American vessels reached California. During three weeks, in the

spring of '49, nearly 18,000 people crossed the Missouri River, westward bound.

"The migration was so stupendous," says Cleland, the California historian, "as to outrank anything of its kind in the Nation's history." A single issue of the *New York Herald* carried more than forty advertisements offering to the California-bound crowds every aid, from maps and pistols to "gold-finders" and "patent gold-extracting engines."

Steerage tickets via Panama sold for \$1,000. Thousands went this way; another army around the Horn; others across Nicaragua or Mexico. Death took frightful toll, especially among those crossing the western deserts. James Abbey, a Forty-niner, wrote in his diary that on one fifteen-mile stretch of desert trail he counted 750 dead horses, oxen, and mules; in the last ten miles, 362 wagons, besides leather trunks, clothing, and other

things thrown away to lighten the loads.

Imagine San Francisco then. Gold crazy. Off on the treasure hunt months ahead of eastern hordes. Its homes, cows, chickens, gardens, goods in stores—all were deserted. At excitement's height even the sailors quit arriving ships to race for the gold fields, till a vast ghost fleet of silent vessels lay idle and abandoned in the Bay.

Then, suddenly, the tide turned. Significantly, this period, and not the Spanish, marked the city's real beginning. New-comers, pouring in now by sea, made frantic demands, at any price, for food, clothes, and mining outfits. In a few weeks popu-

lation multiplied a hundred times. Thousands slept in open fields. Two streams, new arrivals on their way to the mines and men hastening back to spend their dust and nuggets, brought the young town amazing wealth. Literally, millions of dollars poured into it. Some miners brought back gold enough to toss nuggets at the feet of stage singers in the smoke-filled, boisterous music halls.

Houses couldn't be built fast enough. "Any room 20 by 60 feet," wrote Gen. W. T. Sherman in his "Memoirs," "would rent for \$1,000 a month." Two barrels of whiskey, sold by the drink, brought in \$7,000. A Kentuckian, later famous, got his start selling homemade pies at \$10 each. Tents and flimsy shacks spread for miles. After rains, mud was so deep, it is recorded, drunken men mired and suffocated. On Clay Street, in 1850, a signboard warned that the mudhole there was "Impassable, Not Even Jackassable."

Mines or camps with such names as Hell's Delight, Hangtown, Delirium Tremens, Blue Belly Ravine, Poker Flat, Shirt-tail Canyon, and Petticoat Slide hinted at the boisterous spirit of the time. Nobody shaved. Behind the full beards of the miners were the faces of young men. In top-boots, flannel shirts, and slouch hats, all miners looked alike, as they crowded the El Dorado, Bella Union, and other glittering gambling dens of the day, losing their dust as easily as they had found it.

Malays, Mexicans, Moors, Australians, Chinese, Kanakas, Chileans, Peruvians—



Photograph by Gabriel Moulin

DIEGO RIVERA'S MURALS ADORN THE STOCK EXCHANGE CLUB

Gathered about the heroic figure of the woman and held in her arms are figures which typify the growth of agriculture, mining, and industry, on whose production the activities of the Stock Exchange are based. The artist was born in 1886, in the little mining town of Guanajuato, Mexico. His first instruction was received in Mexico City when he was six; later he studied abroad.

all joined with Americans and Europeans to give the city that cosmopolitan character it still retains. From the dregs of this restless invasion came also the thieves, the crooks, and killers whose deeds for years made the name San Francisco a synonym for crime and violence.

THE YOUNG CITY FIGHTS TO CAST OUT ITS DEVILS

Life was cheap. Most men went armed, ready to die with their boots on. Bancroft, in his "History of California," says that up to 1854 there were 4,200 homicides. Yet



Photograph by Ewing Galloway

A PANORAMA OF OCEAN BEACH, WITH ITS AMUSEMENT RESORTS AND A BIT OF GOLDEN GATE PARK

Windmills in the background, patterned after those in the Netherlands, have enormous wings and in a fair breeze pump water for irrigation in the park. The boulevard is part of the scenic speedway that winds from the Presidio south, parallels the seaward side of Golden Gate Park, as shown here, and leads down toward Monterey. Sand dunes in the background.

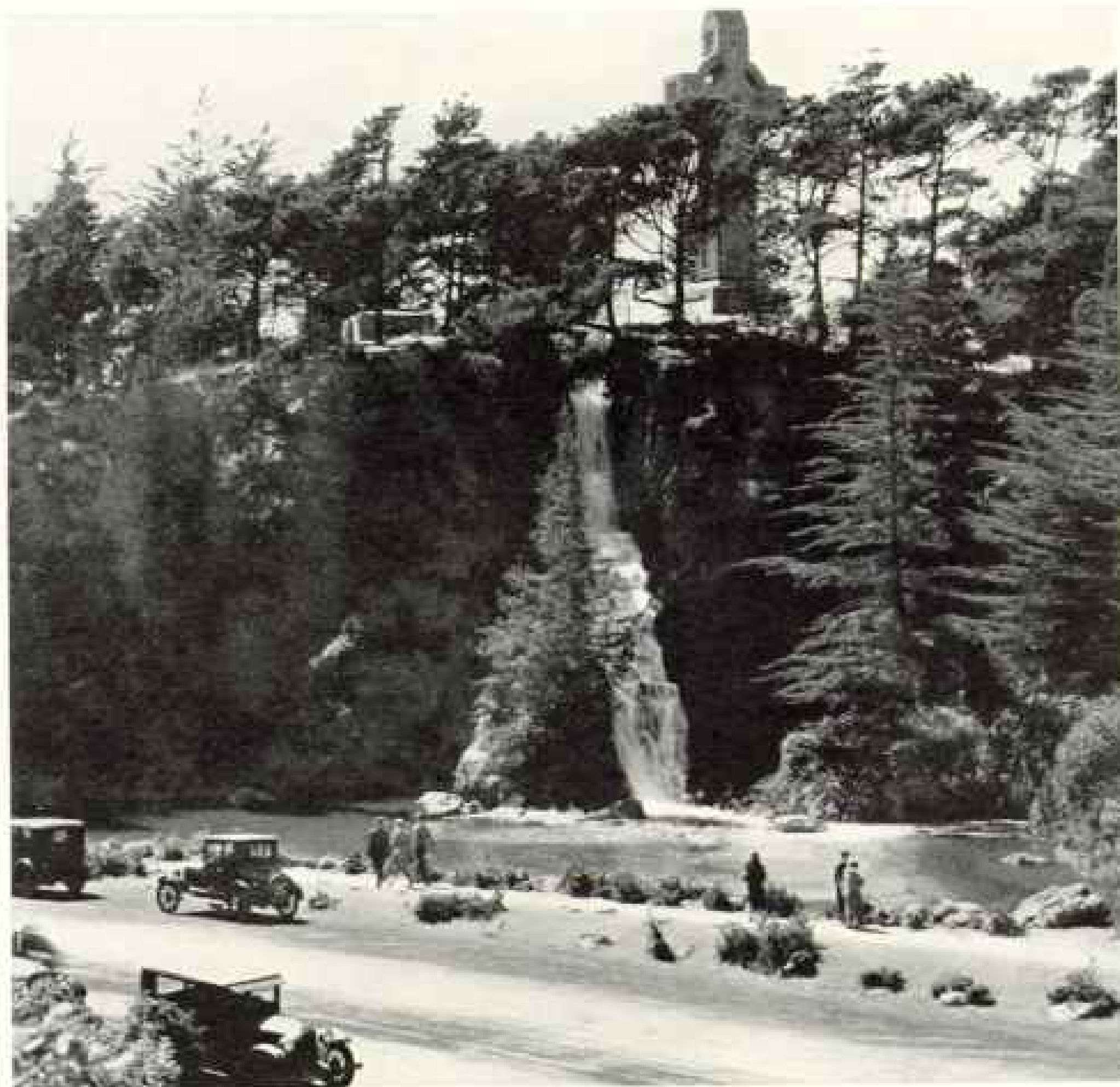
crime was seldom punished by the weak and venal courts. It was the city's darkest hour. In broad daylight men robbed and slew, defiant of society, till the Vigilantes formed.

Civilization's whole history affords few, if any, parallels for this determined group. Nine thousand strong, picked from the city's best men, organized like an army, with their own infantry and artillery units, their declaration read:

"We do bind ourselves to perform every just and lawful act for the maintenance of law and order, and to sustain the laws when faithfully and properly administered,

but we are determined that no thief, burglar, assassin, ballot-stuffer, or other disturber of the peace shall escape punishment, either by quibbles of the law, the carelessness or corruption of the police, or a laxity of those who pretend to administer justice."

Civil war loomed. But the rope's grim work went on; the Vigilantes won. "Only the utter demoralization of government and social conditions could have justified such a step," says Cleland in his "History of California." But "few to-day will deny that San Francisco profited by this over-riding of law to save law."



Photograph from Californians, Inc.

HIGH ON A HILL IN GOLDEN GATE PARK RISES THE PRAYER-BOOK CROSS IN
MEMORY OF SIR FRANCIS DRAKE

Of Celtic design and 40 feet high, this massive cross, erected by a Philadelphia publisher under the auspices of the Episcopal Diocese of Northern California, commemorates the first Christian religious service held in the English language on the Pacific coast. Drake's chaplain celebrated this service in 1579, when the famous sea rover landed at what is now called Drake's Bay, north of the Golden Gate (see text, page 358).

As a "bad boy" is often strong and acquisitive, so was young San Francisco. Money freely spent and the rise of inland towns early made it a busy market: goods came by oxcart from the East and around the Horn. It pioneered our Pacific coast commerce with the Far East; and to this day some of its leading merchants continue in the South Sea and Orient trade founded by their fathers.

A few can still remember the romantic, free-lance days when skippers sailed for Tahiti with trinkets, tobacco, and red calico to barter for pearls and coconuts.

And there was the exciting day when mad William Walker, "green-eyed man of destiny," boarded his ship with his motley crew and sailed south, seeking to carve a new Confederate State from Mexico—to die, later, before a firing squad in Honduras.

Time and again, as it grew up, fire swept the city. Then as now, lumber was a big item in trade and in its structure. Visitors marvel to-day at the mile-long stretches of wooden houses, and at their thousands of uniform, standardized "bay windows," overhanging the street to catch the sun.



TURNING A CABLE CAR AT THE FOOT OF ONE OF SAN FRANCISCO'S HILLY STREETS.

Before cable cars were invented, the aristocratic part of the city lay south of Market Street. When these hill-climbing vehicles made access to the heights easy, the well-to-do built their mansions there, and the palaces of the Flood, Crocker, Hopkins, and Stanford families became landmarks of their time. Though tiny, old-fashioned, and rough-riding, these cars are still a favorite vehicle and much used by sight-seers.

They marvel, too, at one fireproof structure of pioneer days: its stones were hewn in China, marked with Chinese characters, moved across the Pacific, and erected by Chinese masons imported for the task.

WHEN THE RAILROADS CAME

Prodigious as was the gold stream from the mines, rising to \$65,000,000 in 1853, it had dwindled by Civil War times; and, in readjustments to a new economic life, the city had suffered. In this transition the advent of railways—and colossal riches from newly opened Nevada silver mines—were to prove forces of far-reaching consequence. Railways, strange as it sounds, were not an unmixed blessing to the young city: for in time they also reached Seattle, Portland, and Los Angeles, thus opening competing Pacific ports and splitting up the vast coast territory which had long dealt only with San Francisco.

Land transport to the growing city had, of course, many dramatic phases. There were the Wells Fargo stages, road agents,

and Indians (page 404). In one year, over Johnson Pass to Washoe Valley, Wells Fargo hauled *more than 200,000 pounds of silver bullion*. There was the pony express to St. Joe, Missouri, with postage at \$5 a letter, and locomotives were shipped by sail around the Horn.

To bring rails, Huntington bought a fleet of ships. Swarms of Chinese coolies, imported like slaves, came to work on the new railway (a back-breaking job, across mountain and deserts); hunters were hired to shoot buffaloes to feed the track-layers; there was the spectacular meeting of the east and west sections of transcontinental rails at Promontory Point, Utah, and the incident of the Golden Spike—all of which is warp and wool of San Francisco—even to this curious *grand finale* typical of the times: a faded old photograph in the archives of the Southern Pacific Railway showing two officials riding a pioneer train, sitting side by side on the engine's cowcatcher, with a buffalo robe over their knees! (See page 402.)



Photograph by Gabriel Moulin

MEMBERS OF THE OLYMPIC CLUB OUT FOR THEIR NEW YEAR'S DAY RUN AND SWIM

Founded in 1860, this amateur athletic club, with several thousand members, is widely known for the number of excellent boxers, wrestlers, and track athletes it has produced. Rebuilt after the fire of 1906, the club building is equipped with a giant pool fed with salt water pumped from the Pacific (see text, page 427).

"The Comstock Lode in Nevada!" That was a phrase to conjure with. It stood for the greatest silver finds in our history. It sent literally tons of bullion to be minted at San Francisco, and started Carson City and Virginia City clamoring for more food, clothes, tools, and mining machinery to supply the swarming prospectors.

Fabulous, inexhaustible, these new silver mines seemed; and again feverish excitement swept San Francisco. "Speculation," writes Gertrude Atherton, "was soon beyond all human power to check.

Women sold their jewels. . . . The old Stock Exchange was no longer able to accommodate the increasing number of brokers. . . . Daily and hourly, until men fell in their tracks from exhaustion, it was a scene of such frenzied excitement that the old stampeding days to the diggings were relegated to the storehouse of insignificant memories. . . . Even the gambling tables languished. People invested all they had. . . . No one talked of anything else; and many women, known as Mudhens, sold stocks on the

curb." Ruin, of course, was widespread when the inevitable collapse ensued.

Yet, even in this turbulence, the city grew. It saw the rise of costly new hotels, dry docks, carriage and furniture factories, new theaters; it saw new streets climb the round-topped hills and the growth of the sugar-refining trade.

BY THE FLEET-LOAD, CRUDE SUGAR FLOWS
HERE TO BE REFINED

Fly over San Francisco Bay now and you see how colossal the sugar trade is grown. This water front has smelt of raw sugar for half a century. Cane was growing in the Sandwich Islands when Captain Cook found them, in 1778, and crude sugar was one of the first schooner cargoes for this port. Horses, hay, and fertilizer were shipped from the Golden Gate to the islands to help produce foods for export back to this city. About the time of the Nevada silver boom, Washington made a treaty with King Kalakaua by which his monarchy could send sugar here duty free in return for a United States naval coaling



SAN FRANCISCO AND POPULOUS BAY CITIES AS SEEN FROM AN AIRPLANE ARRIVING FROM THE EAST.

On the peninsula, upper left, is San Francisco. Bridges, now planned, will provide vehicular traffic with the north. The Spanish set their presidio on the peninsula for defense. Later, that location was to cramp the growing city somewhat, yet it favorably affected the rise of such transbay communities as Oakland and Berkeley, shown in the foreground (see, also, page 306).



AT THE FOOT OF MARKET STREET STANDS SAN FRANCISCO'S HISTORIC FERRY BUILDING (SEE, ALSO, PAGE 420)

A fleet of 56 ferryboats is used to move men and motor cars between San Francisco and cities across the Bay. They cover about 1,440,000 miles a year, equal to 265 trips from the Golden Gate to Yokohama. Each day 7,141 street cars, on an average of one every 20 seconds, arrive and depart from the Ferry Building, handling nearly 55,000,000 passengers a year.



Photograph by Ewing Galloway

CHURCH AND HOTEL IN ONE SKYSCRAPER

The 28-story edifice is known as the temple of the Methodist Episcopal Church. The church is on the ground floor; the upper floors are occupied as a hotel.

station at Pearl Harbor. From this incident and the introduction of sugar beets into California, a vast refinery trade grew up around San Francisco Bay. It now supplies about one-sixth of all refined sugar consumed in the United States.

One model refinery at Crockett, on the Bay, can melt 2,500 tons a day, reputed a world record. On the city's water front is another great plant, the Western Refinery, which brings raw sugar from as far away as the Philippines. From the Golden Gate, sugar is sent to markets in more than 30 States.

ALONG THE WATER FRONT

An Army transport from Manila had just docked when, as a youth, I first saw this panoramic water front. Shouting soldiers in khaki, campaign hats, and the laced leggings of Spanish-American War days crowded down the narrow gangplank, singing, to the tune of the Battle Hymn of the Republic, that Philippine war song which began:

"Underneath the nipa shack,
Where the mangy monkeys scratch,
And the bolo man is hiking all day
long;
When I lay me down to sleep,
Slimy lizards o'er me creep,
And I hear the soldiers sing their
same old song."

Sunburnt, sick with fever, or limping from wounds, they formed an unforgettable picture, yet only one in the long pageant of deep-water men whose songs in many tongues echo through the stirring annals of this crowded, foggy world port of wheeling gulls, mournful sirens, and loaded ferryboats.

Huge Clydesdales, with big feet, hairy ankles, and brass-studded harness, pulled low, rumbling, iron-tired drays, piled high with freight, over the splintered plank roads along the wooden pier sheds. To-day you see palacelike piers of steel and concrete and impudent, snorting tractors speeding along with whole trains of loaded trucks.

. . . But you miss the horses.

When the brig *Belfast*, of New York, tied up at the Broadway wharf in 1848 she was the first craft to unload at a San Francisco pier instead of into lighters—and the new board wharf was only ten feet wide! To-day's water front boasts more than 45 piers, with 17½ miles of berthing space and scores of huge warehouses.



THE CITY HALL, WITH THE LICK MEMORIAL IN THE FOREGROUND

A pioneer himself, James Lick's bequest of \$100,000 provided San Francisco with this imposing statuary. The heroic bronze figure represents California, while the subsidiary sculptures symbolize "Early Days," "Plenty," "A Group of Miners in '49," and "ComMERCE."

But you smell the same old tropic fruit, raw sugar, rotting wood, dead fish, wet rope, and oakum; and you like to remem-

ber the brig *Belfast*, or that gala day in 1854 when the whole city stopped gambling long enough to honor Skipper Josiah



Photograph from Californians, Inc.

IN PORTSMOUTH SQUARE STANDS A BRONZE CARAVEL, ERECTED
IN MEMORY OF ROBERT LOUIS STEVENSON

Known as the Plaza in pioneer days, this square was long the turbulent center of city life. Here the Stars and Stripes first flew on July 9, 1846; here Vigilantes met to deal out swift punishment, while gambling dens rubbed elbows with dry-goods and grocery stores. Stevenson's favorite loafing place was a bench in this Plaza, where he could chat with odd characters in its vivid crowds.

Creesy, who brought his clipper, the *Flying Cloud*, around the Horn from New York to Golden Gate in 89 days. Look closely at *Tony's Barge*, lying off Sausalito water front, and you may see on its stern the faded words *Wing and Wing*, all that's mortal now of Stevenson's old South Sea schooner.

BLUE-WATER MEN FROM WORLD'S ENDS
FREQUENT THIS WATER FRONT

Even when I first saw the Golden Gate a few windjammers still called here, and

a friendly water-front reporter was often asked aboard to lunch on salt horse, hear the skipper's parrot swear in "Portygee," or listen to yarns of sailor romance among the grass-garbed beauties of coral isles, to tales of adventure after seals and bowhead whales in cold northern seas, of fights on stinking coolie ships, or the sins of opium smugglers and the deeds of Bully Hayes.

Most skippers kept an album, often with daguerreotypes showing the crack ships of other days and pictures of famous masters, big, dignified men with long whiskers, "dressed up" for coming ashore, in high hats, patent-leather boots, and carrying gold-headed canes.

Sea rovers from the world's ends have haunted this historic water front; old-timers still talk of the day when boisterous boarding houses flanked such sailor streets as East and Stuart. They were noisy day and night with accordions, mouth organs, chat-

tering pet monkeys, or cockatoos perched on the steam beer kegs at Three-fingered Jack's or Mother Thompson's. From behind these swinging doors came lingual uproar in every jargon known from Liverpool and Singapore to Bremen and Yokohama.

"In those palmy days," writes Albert J. Porter, "windjammers of all nations entered Golden Gate in a steady stream. Often able seamen were as scarce as bananas in the Arctic. Skippers would pay almost any price for hands enough to

square away. Many a deep-sea sailor, just in on a long passage from the Lizard, might find himself outward-bound on another ship for Tasmania within a few hours after he had signed off and tipped his first horn of rum with the smiling, ingratiating Shanghai Harry, whose gold-knobbed cane carried the 'knockout drops!'"

MASTERPIECES OF THE TATTOOMAN'S ART

To-day, new structures rise where old ramshackle frame hotels housed the visiting sailors. The tattoo artist still survives; for this is a seaport—and seamen like it (p. 426).

Odd are the tales the needlemen can tell—of women patrons asking to be decorated with patterns of scorpions, spiders, and other creepy things; of a wealthy woman who had her will tattooed on her back, and an English sailor with a portrait of King George on his bald head; a zealous missionary with a picture of the Last Supper on his chest, and another who was tattooed with the Ten Commandments.

"Dragons, lodge emblems, anchors, cupids, fat women in tights and out—all these are favorite designs," said the tattoo man. "But the most interesting case I ever heard of was that of a sentimental sailor, whose favorite song was 'Where Is My Wandering Boy To-night?' He worried because so few people knew the words and music. Finally he had them tattooed on his chest; then, when he was lonely, in some far port like Capetown or Sydney,



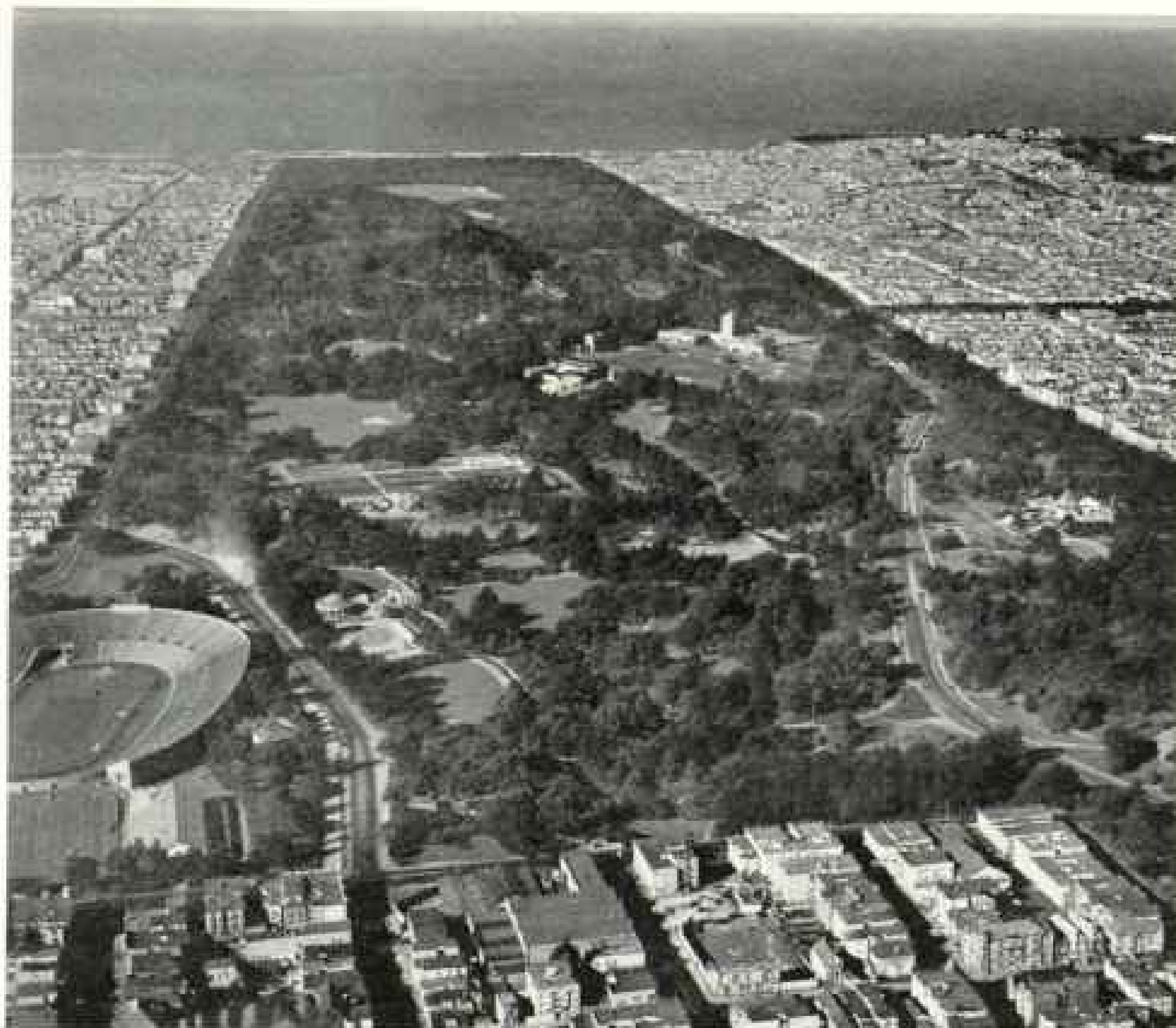
Photograph from Californians, Inc.

AN OLD GUN FROM PERU, DATED 1679, IN THE PRESIDIO OF SAN FRANCISCO

Covering 1,542 acres, this Government reservation is headquarters for the United States Army 9th Corps area. It occupies the northwest section of the city, overlooking the Golden Gate. Founded September 17, 1776, it was the official birthplace of San Francisco. With San Diego, Santa Barbara, and Monterey, it was one of the four presidios, or garrisons, set up by the Spaniards in Alta, or Upper, California. The only surviving landmark of Spanish rule is the old Comandante's headquarters, now used as an officers' club. The old gun shown here is one of four.

he could stand by a music-hall piano, take off his shirt, and have the 'Professor' play and sing to him."

To-day exotic Fishermen's Wharf is just as fascinating as when Robert Louis Stevenson combed it for atmosphere in "The Wreckers." A frame of Mediterranean life it is, lifted up and set down here by the Golden Gate. Swarthy singing men in high boots drag the brown nets out to dry (see page 425).



GOLDEN GATE PARK CUTS A WIDE GREEN SWATH STRAIGHT WEST TO THE PACIFIC

The city's ownership of this park dates from a legal fight in 1853 to hold four square leagues of land formerly given it by an old Mexican grant. As early as 1888, Frederick Law Olmsted, famous landscape architect, declared this park would "have a unique and incomparable character." Now its fame is world-wide. At the left is the Stadium, accommodating 100,000 spectators, where, October 14, 1911, President Taft broke ground for the Panama-Pacific Exposition. To right center is the De Young Memorial Museum.

People from the city drive their motor cars down to this wharf and buy their sea-foods fresh. Many come only to patronize the "curb service" of crab-meat cocktails and other marine delights. Laughing Italian boys break up old pine boxes and boil the big pots which line the curb, wherein the food is cooked. Clean little cafés, their white walls painted by amateur artists of lively fancy, are crowded at noon with up-town business men, who know where food is good.

THE GOLDEN GATE FORMS A NATURAL
PORTAL TO PACIFIC TRADE

Look well at this Bay, with its 450 square miles of roadstead and a busy shore line vibrant with complex life. It makes the

city rich. As water seeks its level, so trade flows to this geographic center of commerce. Ships of 118 lines enter the Golden Gate, and here is the home port of the first line ever to set up a round-the-world schedule.

The Panama Canal changes the map of the world for San Francisco. More and more the Pacific area becomes the stage of stubborn world-trade battles; and this port is an open gate to a trade domain wherein lies more than half the world's population.

In step with this westward trend come American industrial giants to erect their branch factories around the Bay. Familiar trade-marks wink at you by night through electric eyes. Ships, motor cars, preserved foods, linoleum, bags made of



Photograph by Gabriel Moutin

TO HONOR A LANDSCAPE ARTIST, THIS "GARDEN MURAL" WAS CREATED

Designed with flowers and leaf plants, the portrait framed by green grass is that of the Superintendent of Golden Gate Park. Members of the Board of Park Commissioners had this exhibit prepared in honor of Mr. McLaren's 85th birthday (see text, page 428).

imported Calcutta jute—everything from poultry feed to accordions. Canned goods from here cover the earth. In an ink-scented lithograph plant you meet the veteran proprietor, who landed here a poor German sailor boy. Listen to him tell about globe-trotting labels on canned fish, or the world travels of gaudy raisin or breakfast-food boxes, and you feel that commercial art is also one of California's cultural exports.

"Why, do you know," he exclaimed, "even in the shadow of the Pyramids my son found an empty salmon can. And, sure enough, on it was a label made right here in our plant! 'I knew it would have

papa's name on it!' cried my boy. Was he proud!"

Whale oil was once in common use for lights about this Bay. Even the street lamps of the city burned it. Now you smell crude oil and see it shining on the water. Long, fat tankers and greasy barges plow the Bay. About the shores stand huge refineries, and a flock of big white storage tanks, looking from the air like giant birthday cakes. From San Joaquin Valley and the amazing new field at Kettleman Hills, oil is piped here. From the hills, too, comes natural gas, a new and vast source of cheap power, a boon to factories in a region without coal.



Photograph from Californians, Inc.

THE FERRY TERMINAL BUILDING AND ITS GIANT CLOCK, AT THE FOOT OF MARKET STREET

Transbay commuters, together with armies of travelers by ocean and railway, combine to make this street one of the world's notable thoroughfares. Kings, princes, presidents, world heroes—all have passed this way, and so many parades that, at times, one marching up Market will meet another coming back. Echoing with the shrill blast of police escort whistles and the music of marching bands, it is to San Francisco what Broadway is to New York, or Unter den Linden to Berlin.

East of the Bay, by night, a Cyclops eye scours the heavens. It is the mammoth airplane beacon, placed atop Mount Diablo by the Standard Oil Company. Aviators have seen it from 150 miles away. Isolated from adjacent mountains, Diablo, with this ten-million candlepower lamp, becomes a giant lighthouse for this whole region.

Far out at sea an American Navy vessel, steering for Golden Gate the first night this powerful eye was turned on, was thrown into confusion. No such naviga-

tion light was shown on any chart. Doubtful of its position, the ship slowed down—till an alert radio man cleared up the mystery. He had heard the program on the air, broadcast when the new light was inaugurated.

Remember that San Francisco stands on a peninsula. North and east of it is the great harbor; to the west, the Pacific. So most travelers reach it by water. And its voice is the hoarse blast of ferryboats on the Bay. That sound never ceases. Counting commuters, nearly 55,000,000 people a year pass through the vast Ferry Building at the foot of Market Street, a city within itself (see, also, p. 413).

NOW A GIANT BRIDGE
WILL SPAN THIS
BUSY BAY

For years men have talked of a bridge across the Bay, tying San Francisco to Oakland. Now it is assured—a toll bridge, to be part of the State highway system.

As I write, an engineers' boat loiters near Goat, or Yerba Buena, Island. On board are world authorities on foundations and bridge-building. Deep borings are being made, to determine the structure of the earth far under the Bay; for this will be a colossal feat, "the largest bridge project in history." Nearly eight miles long and rising to a height of 680 feet, the bridge will take five years to build. At once the curious ask, "What will it cost?" The estimate is \$75,000,000.

Planned as a double-decker, it will carry nine lanes of automobiles and two tracks

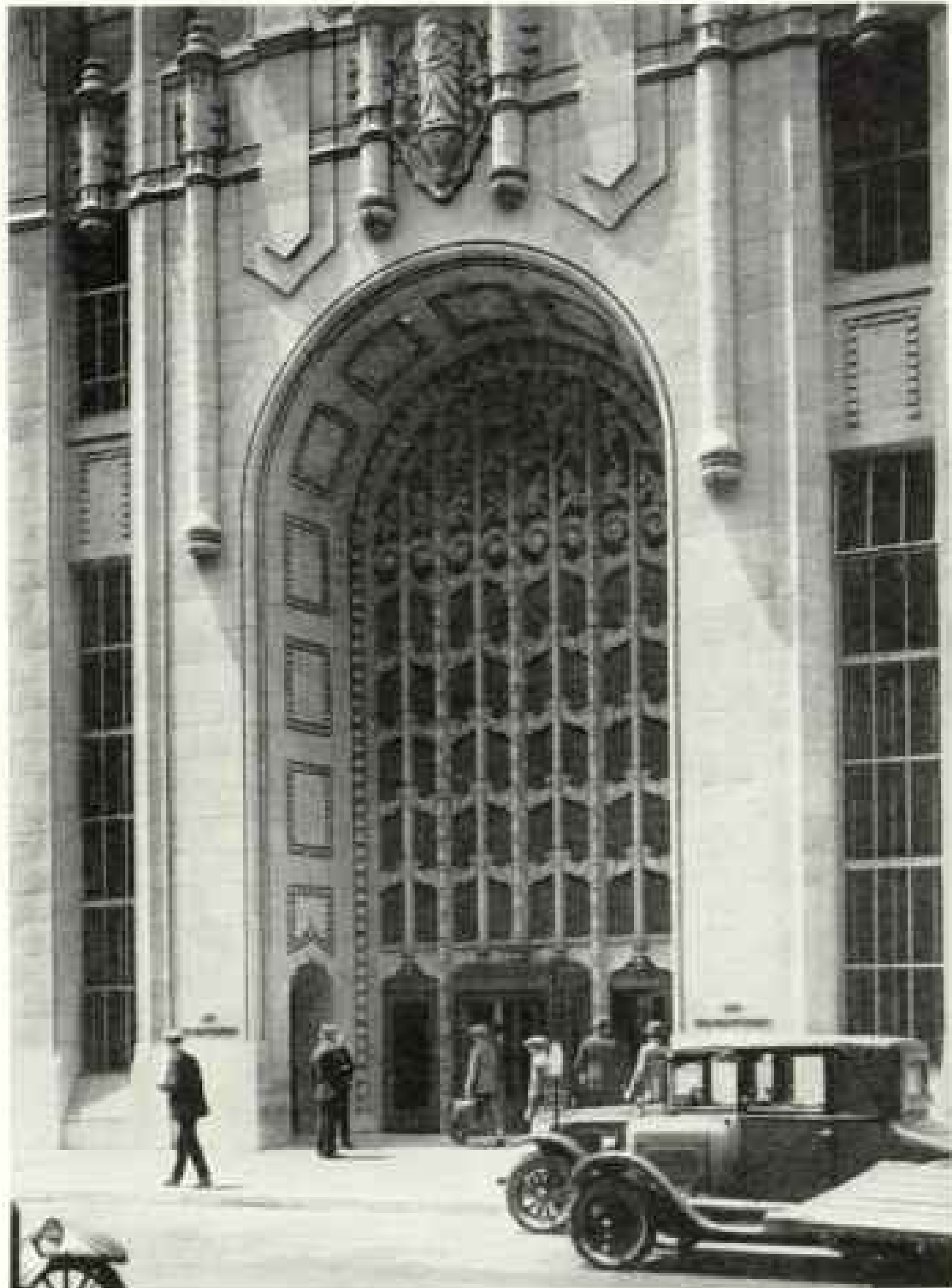
of street cars. At present, the Bay ferry-boats haul about four and a half millions of vehicles each year. The new bridge will be able to handle 15,000 vehicles an hour, at the peak of traffic, and may carry as many as 40,000,000 a year, the engineers estimate.

Still another bridge, higher but shorter, is also planned, actually to span the picturesque Golden Gate itself, that spectacular breach in the Coast Range through which, long ago, a great river flowed and which still forms the only flood-gate for draining the vast inland valley of central California.

You can think of this Bay as a great turning-around basin for ships of all nations. In a year, between 7,000 and 8,000 vessels sail in and out of the Golden Gate. Once California was the Union's greatest wheat exporter; now, on boats from this Bay you find the first ten items in point of value to be mineral oils, dried fruits, canned fruits, barley, cigarettes, automobiles, canned milk, sardines, redwood lumber, and wheat flour.

Richard Dana, writing a century ago, said: "If ever California becomes a prosperous country, this Bay will be the center of its prosperity." A bold prophecy then, for the land was empty. Now more than 1,750,000 people live about the Bay. They live in Alameda, Berkeley, Oakland, San José, San Francisco—in all the sixty-odd towns and cities shown on the map.

San Francisco is one of our richest cities, per capita, in real and personal property; yet one of the most democratic. You



Photograph by Burton Holmes from Galloway

THE CATHEDRAL-LIKE ENTRANCE TO THE NEW 26-STORY PACIFIC TELEPHONE AND TELEGRAPH BUILDING

San Francisco installed its first telephone in 1878, in the editorial offices of the *News Letter*. To-day it uses an average of nearly 50 telephone instruments to every 100 inhabitants—one of the highest averages anywhere.

may see a fastidious old gentleman buy flowers from a street vender, then climb on a tiny cable car for a five-cent ride to his mansion on Nob Hill. At sea-food lunch stands millionaires stop for a crab-meat cocktail or a hot clam broth, rubbing elbows with the newsboys. Where else could Kubelik act the wandering fiddler, or Tetrizzini play street singer on Christmas night, with a crowd of tens of thousands joining in "Auld Lang Syne"?

To boisterous San Francisco of gold-dust days, music and drama were born in those noisy nights when shouting miners



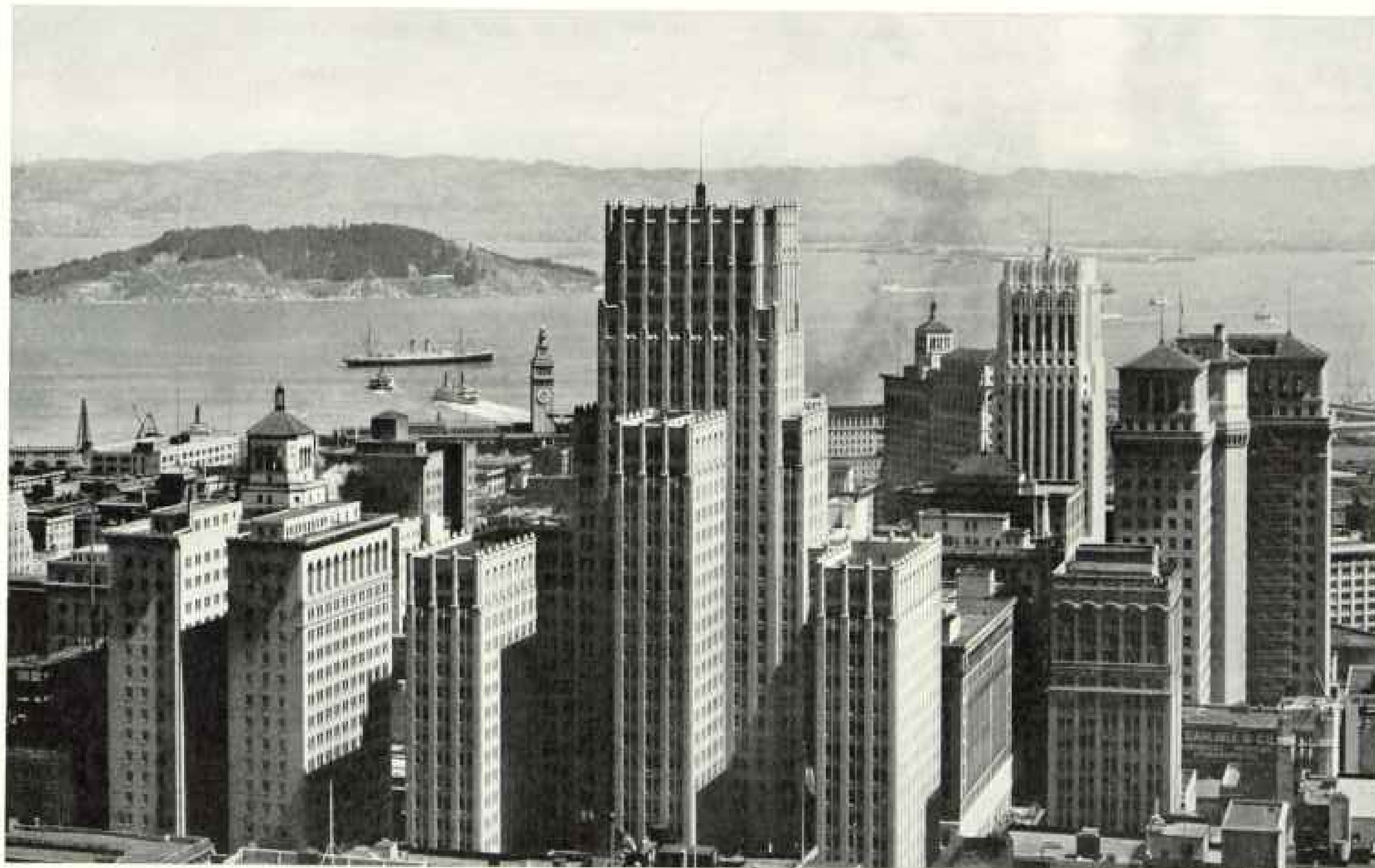
TO THE AVIATOR, EARTH'S ROUGH FACE OFTEN LOOKS ODDLY LIKE PHOTOGRAPHS OF THE MOON'S BROKEN SURFACE

Taken from an altitude of about 5 miles, this spectacular pictorial blend of land, sea, and cloud effects stretches from Mount Tamalpais, on the right, to Monterey and Monterey Bay, 98 miles south, in the far background. When this picture was taken the Bay region was wreathed in fog and smoke, hindering human vision, but not the camera's, with a heavy ray filter over its lens. At the middle right, Golden Gate.



THE PLAN OF SAN FRANCISCO, ITS BUSINESS SECTION AND WHARVES, AS SEEN FROM AN ALTITUDE OF 10,000 FEET

At the upper right is the Golden Gate. Just to the left of it is the Presidio, a United States Army reservation and post. Thrust out into the Bay, like the square ends of cogs on a great wheel, are piers which provide more than $17\frac{1}{2}$ miles of berthing space. To the right of lower center rises the clock-tower of the historic Ferry Building (see page 420). The oblong black area in the upper left is Golden Gate Park (see page 418), with the Pacific Ocean beyond.



Photograph from Californians, Inc.

NEW SKYSCRAPERS IN THE FINANCIAL DISTRICT, WITH SAN FRANCISCO BAY IN THE BACKGROUND

As the site of the Federal Reserve Bank for the 12th District and as western headquarters for more than 1,400 corporations with nation-wide activities, San Francisco is made the financial center of the West. Here is one of the major regional stock exchanges of the United States, as well as curb and mining exchanges. Many foreign banks, including famous Chinese and Japanese organizations, maintain busy branches here. In Chinese brokerage offices stock quotations are marked on the board in Chinese characters.



FLEETS OF DEEP-SEA FISHING BOATS BERTHED SIDE BY SIDE IN THE BASINS AT FISHERMEN'S WHARF

The Embarcadero, a State-owned water-front street three miles long, which begins near by, has been called "a museum of naval architecture" because of the strange assortment of sea craft, ranging from Chinese junks, yachts, sloops, scows, tugs, and barges to battleships, which call here (see, also, text, page 417).



A WATER-FRONT TATTOO ARTIST BUSY ON A CUSTOMER IN HIS STUDIO

Though the word tattoo is of Polynesian origin, the custom is, or was, world-wide. In early days such marks had various meanings among different tribes. Even now, among some Arabs and Kabyles of Algeria, babies are so marked for identification; and as late as 1879 deserters from the British Army, when caught, were tattooed with the letter D (see, also, text, page 417).

threw nuggets at the twinkling feet of Lotta Crabtree, and Lola Montez danced "The Spider" to forget her romance with Ludwig, mad King of Bavaria.

Now new stars rise on bigger and better stages to entertain the growing city. In the Civic Auditorium, where opera is sung, 11,000 people find seats; and the city's Symphony Orchestra ranks with America's best. It has an opera association which supports a permanent ballet, chorus, and its own scenery painters; its Chamber of Music Society tours the Nation.

Paid for in gold dust, New York papers brought anywhere from 50 cents to \$5 on round-the-Horn "steamer days." Now, though on the rim of the continent, the city keeps well abreast of national thinking; and, with the difference in time, its evening papers carry a full day's news from the East and Middle West.

Literature bloomed early. *The Wasp*, the *Alta Californian*, the *Overland Monthly*, and the *News Letter*, founded by the

same Marriott who started the *London Illustrated News*, helped many budding writers on the road to fame. So did the *Argonaut*, carrying such names as Mary Austin, Ambrose Bierce, Jack London, Stewart Edward White, Frank and Kathleen Norris, Gertrude Atherton, and Paul Shoup.

Here Mark Twain began his platform career, when all America was lecture-mad, and crowds flocked to hear Artemus Ward, Bob Ingersoll, Bill Nye, Walt Whitman, and Henry Ward Beecher.

Here Phineas Thayer wrote "Casey at the Bat" and De Wolf Hopper recited it at the Bohemian Club when it was young. The term "High Jinks," borrowed from Sir Walter Scott, describes the famous summer festivals staged by this club in its forest of giant trees up in the Coast Range, which it has preserved for more than thirty years.

The Family Club at its Redwood Grove, in San Mateo County, called "The Farm,"

also stages drama and music written by its members.

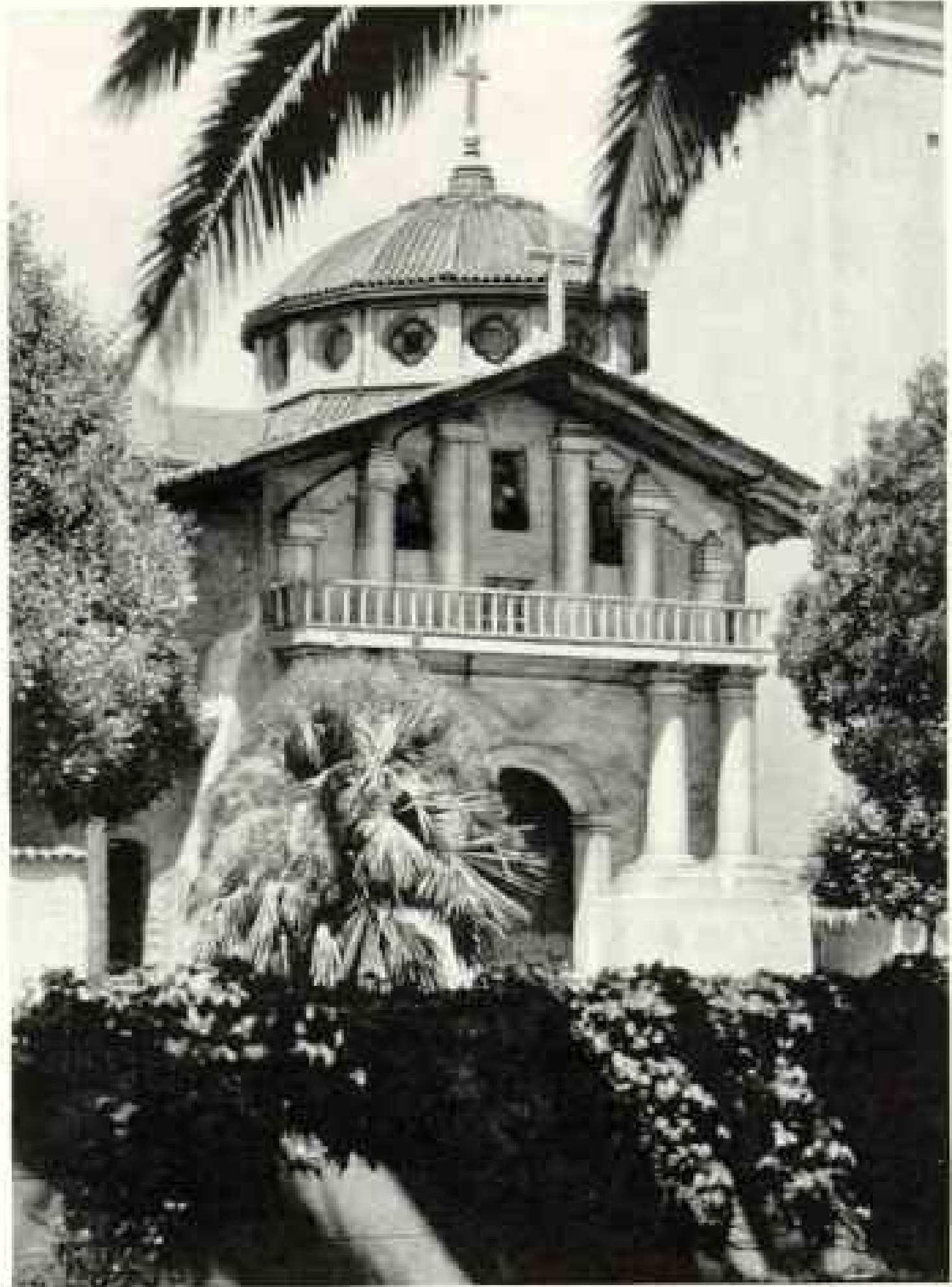
HERE EVERYBODY
PLAYS AN OUT-
DOOR GAME

Two hundred men in bathing trunks leap from the front door of the Olympic Club at noon on New Year's Day. Through the streets they go, and out to the Cliff House Beach for a dip in the surf. This is an ancient Olympic rite. And the Dolphin Club, each autumn, swims across the Golden Gate, from point to point. This is symbolic; it reflects not only the city's creed of physical culture, but is a token of faith in climate—like the legend of the ground hog and his shadow.

"I don't get tired in San Francisco." Often visitors say that. And here is a temperature range, scientists say, wherein men can work at maximum efficiency. Undeniably, one feels less fatigue of mind and body, for the fog-conditioned sea air varies only from an average of 46 degrees in winter to 65 in summer.

Faces are ruddy and men walk with light, springy steps. Any Sunday you see "hikers" and "trail-trotters" of all ages gathering at the Ferry Building, off for jaunts over Marin County hills or other favorite paths of the many walking clubs.

The total number of such devotees to outdoor sport and the variety of recreations here are astounding. You see every known sport, from a fly-casting club at practice in Golden Gate Park to an archery



Photograph from Californiana, Inc.

THE ANCIENT MISSION OF SAN FRANCISCO DE ASÍS, POPULARLY
KNOWN AS THE DOLORES MISSION

Began in 1782, this is the city's oldest church. The original building was dedicated in 1776, but later destroyed. When Vancouver visited it, in 1793, hundreds of Indians had been baptized and priests had taught the neophytes to weave, tan leather, make soap and pottery. By 1825 the prosperous mission owned more than 158,000 cattle, horses, and sheep, much merchandise and money. After it was secularized, in 1835, it declined. In 1849 Bayard Taylor found it in ruins. It is restored now, but retains its old bells, hung with rawhide straps.

meet, with a world champion present and a man who has slain African lions with bow and arrows.

Here parks are crowded the year around. And you imagine, too, that spirits are higher, that people laugh more. Beyond any doubt, energy is higher, and so is the average level of athletic skill and achievement. Proof lies in the long and growing list of Jim Corbetts and Helen Willises reared and trained in this coast climate.



TROLLEY LINES CROSS OAKLAND MUD FLATS TO REACH THIS SLIP, WHERE TRANSBAY FERRIES LOAD AND DISCHARGE

For ages the Sacramento and San Joaquin rivers, draining the great valleys of central California, have poured mud into this bay. Now, at low tide, vast mud flats appear, peopled by gulls and wading birds in quest of food. Ferryboats, unable to reach shore, use these piers set at the edge of deep water.

Among these cool, round-topped hills, drenched in turn by fog and sun, a new phase of culture may be forming; as in ancient Greece, here is pride in strong bodies that makes for clean life and freedom of thought.

A GROWING MIRACLE

Aladdin would throw away his lamp in despair, could he see the magic of Golden Gate Park. From dry sand dunes a Scots landscape artist, John McLaren, has evolved a man-made paradise. More than fifty years of his life have gone into it; but now Golden Gate Park ranks among the greatest of all gardens (pp. 406, 409, 418-19).

When you walk among its waterfalls, its jungle-choked glades, its forests and wild-animal haunts, you can hardly believe it artificial. You think, rather, that you are back in the untamed wilds of Amazonia. More than ever impossible, you say, that

such a Garden of Eden, modernized with great museums, vast bathing pools of steam-warmed sea water, and giant Dutch windmills, can all be the work of one man, even a determined Scotsman!

The park is so vast that now many small wild animals also haunt its underbrush and the thickets of rhododendron from Tibet, presented by the National Geographic Society.

"I hire a professional hunter by the year," said Superintendent McLaren. "His job is to hunt and kill the wild foxes and similar varmints that prey on my quail, pheasants, and other exhibitivie creatures."

Planned with perfect fidelity to Japanese architecture and landscape, a tea garden is here—miniature fairyland of twinkling streams, dwarfed trees, toy bridges, and scattered Buddhist lanterns.

Art students come to sketch or copy the monuments. There is a bronze of Robert



A FERRY SLIP ON SAN FRANCISCO'S BUSY WATER FRONT, THE CITY MARCHING INLAND OVER ROLLING HILLS.

Travelers from the East usually detrain at Richmond or Oakland, cross the Bay by ferry, and thus, like those arriving by sea, gain their first view of San Francisco from the water. Majestic and inspiring this vision is, especially on a fair, bright morning, when sunbeams clearly pick out the distant buildings.

Burns and one of Beethoven. The Goethe-Schiller Monument is modeled after the group at Weimar, Germany. Don Quixote and Sancho Panza kneel before the portrait bust of Cervantes, and on a bust of Verdi an inscription reads in part:

"He voiced the hopes and sorrows of all
Humanity,
He wept and loved for all!"

High in air towers the Prayer Book Cross, a stone memorial to that first Christian service on the Pacific coast held by Drake. "The Father of California Missions," Junipero Serra, too, is an arresting figure, with his uplifted cross.

Here are Rodin's "The Thinker," "The Grape Presser," blind Douglas Tilden's "Ball Player," and many others.

To the M. H. De Young Memorial Museum in Golden Gate Park more than half a million visitors come each year. Every Sunday brings its crowds, filing through

the 55 galleries of antiques, glassware, ceramics, paintings, sculptures, natural-history exhibits, arms and other things odd and beautiful. Almost every nook of the world is represented in some way, among the 55,000 exhibit groups.

Formed for original research in geology and natural history, here is the Academy of Science Museum, with startling, lifelike groups of animals shown in native habitats.

The Anthropological Museum ranks among the big four of the country and houses a costly exhibit of 80,000 specimens of Grecian, Egyptian, Peruvian, and American Indian relics.

A modern stadium, in which trotting races are also held, seats 100,000 persons. Two old-fashioned Dutch windmills wave their arms in opposite corners of the grounds and pump water for the falls. One has arms 114 feet long, the grandpa of all windmills everywhere.



GRIM ALCATRAZ, THE MILITARY PRISON ISLAND, STANDS LIKE A CITADEL INSIDE THE GOLDEN GATE

Known as "The Rock" among soldiers, this sullen islet is swept by tides so swift that escape by swimming is seldom tried. A lighthouse tops the rock, throwing its beam by night far out to seaward. Near the center of the island is a prison compound, with men visible in it. The word Alcatraz is Spanish for "pelican."

No other city knows a park just like this. It mirrors not only a vanished day, as in the Bison Paddock; not only modern life and sport in its playtime facilities; not only educational aims and achievement, and art in its purest form—in sheer drama it reveals what man's work and patience may achieve, even from a sandy waste, if he has water, plants, seeds, some marble, brick and bronze, animal traps, and the creative spirit, like John McLaren, who, at 85, still works on his masterpiece.

HERE EATING IS A FINE ART

You can hear American exiles in the Far East planning "what to eat first," when they get back to San Francisco. Often incoming passengers on Pacific steamers send

a wireless to their favorite cafés and give their dinner orders a day or two before the ship docks.

As in Paris and New Orleans, eating here is a fine art. Some of the best cooks in Europe came here about the time of the Nevada silver boom; but instead of panning gold they panned frogs' legs and rum omelets—and got rich. Many owned their own cafés. Solari's, Camille's, Tait's, The Fly Trap, The Cold Day, Coppa's, Jack's, Blanco's, The Poodle Dog, Zinkand's, Sanguinetti's, Frank's, and noisy Coffee Dan's, where guests get free hammers with which to pound the tables, have all made gastronomic history.

Most of them survive, despite the devastating quick lunch and the dry laws; for

here restaurant life is a fixed institution. Every evening you see hundreds of San Francisco families leaving home, each headed for a favorite dining place. And good food is not expensive.

Yet there is the record of one Dives banquet at dizzy figures per plate, when each lady's place card was a costly Mandarin coat, and the head waiter's tips paid for his new automobile; but such show and gastronomic excess are rare and can never rob the city of its fame for exquisite taste in the cooking art. If you're hungry, saw a fresh coconut in two, fill the halves with tender young chicken meat and green corn, and bake! This is only one of San Francisco's many recipes that makes its cooking famous. At one tiny café in the Russian Hill Art Colony you can watch the Italian cook your dinner; and then, while you eat it, he plays the accordion for an extra dollar.

SOME ODD ASPECTS OF INDUSTRY

Picks, shovels, and pans for washing gold were among the first items manufactured here, and often blacksmiths made them from old wagon tires and even by melting up trace chains of the immigrants' harness.

To-day more than 3,700 factories of many kinds dot the Bay district, and with the advent of cheap natural gas the ultimate magnitude of industry is beyond any estimate.

One of man's machines, born of the gold craze here at San Francisco, has become world famous and is exported from here now for use in Russia, Siberia, New Guinea, South America, and the Malay States. It is the gold dredge, a great dragonlike monster that crawls along river beds, plows through boulder-strewn valleys, and gorges itself with sand and gravel. It chews this fine and then disgorges any gold found in powdery flakes.

Some of these "Yuba" dredges cost from a quarter to a half million dollars; but they can pan 15,000 cubic yards of dirt a day. By this means scores of millions of dollars' worth of free gold have been recovered from rivers of northern California, and to-day, with all the world again looking so frantically for gold, there is a big movement back to the ancient fields and placer regions.

Here, too, another now famous machine was developed. This was the Pelton wheel. Lester Allen Pelton was a young mechanic of inventive mind. He made a tiny model wheel which would catch the impulse of a stream of water shot against cups set around its rim. With this first toy wheel he ran a sewing machine. Now giant Pelton wheels drive the great generators of hydroelectric plants around the world. And it was a Pelton wheel that spun the generators that sent the first surge of power over a cable 250 miles long into San Francisco.

Wild flowers grew in spring along the valley streams when the Spaniards came to this peninsula. South of the city now there flourishes a flower industry run strictly for profit, but which draws crowds of sight-seers. Here are 40 acres of violets, 300 acres of asters and chrysanthemums, besides ranunculus and anemones. Around Colma are more than 20 greenhouses filled with maidenhair and asparagus ferns. At Burlingame, one farm has 10 acres of roses under glass.

From here a steady stream of flowers goes east in winter—mostly roses, carnations, heather, and chrysanthemums. During the football season San Mateo chrysanthemums are shipped in special refrigerated cars for sale at college stadiums throughout the country.

In striking contrast to this, on a certain busy corner in the city is a shop that makes and sells excellent imitations of real flowers. Often you see it crowded with customers, paying more for artificial flowers than glowing natural blooms cost at the street vender's wagon, a few steps away.

CHINESE SONS OF THE GOLDEN WEST

One of California's most cohesive social groups is Native Sons of the Golden West.

"Who are those Chinese boys marching there?" you ask, as a snappy band of slant-eyed orientals swings past the pagodas and shark-fin shops of Grant Avenue.

"They are also Native Sons of the Golden West, a few of the 7,000 Chinese members in the State."

All these Chinese were born here, you reflect, and are American citizens.

Remember, the Chinese came here by thousands even before the Civil War. De-



Photograph by Ewing Galloway

FIVE MODELS OF "MISS CHINA," 1932, BEFORE A SCHOOL IN CHINATOWN

While pursuing their daily public-school studies in English, the San Francisco children of Cathay also take private instruction in the Chinese language and literature. They are apt, highly intelligent, and often excel in classroom recitation. Among all foreign colonies here, none more attracts the attention of visitors than does the Chinese section, with its luxurious shops, cafés, and brightly garbed children. It is "a bit of Shanghai and Canton caught in a western frame."

spite Dennis Kearney and that early sandlot battle cry, "The Chinese Must Go," here they are, one of the largest Chinese groups outside the Far East.

These American-born Chinese are more than a strong integral part of the city, important in trade and banking. They present one of the most interesting social experiments anywhere in the world. And the problem for solution is: Even when exposed to it, under ideal conditions, can a Chinese ever become really westernized?

So far, after three generations, even the young ones here still lead a double life.

They use English, but study Chinese; they go to Chinese-Christian churches (of which there are seven in the city), and no joss house is longer used for worship; yet they still read what Confucius said.

In Chinatown they have their own telephone exchange, and bilingual Chinese hello girls are running it; but calls are made by name and not by number, so these girls must memorize more than 2,000 Chinese names.

They dance to American music, but celebrate two New Years. They study medicine, but Chinatown venders of dried toads



Photograph from *Californians*, Inc.

CHINESE NEWS BULLETINS ALONG THE STREETS OF THE ORIENTAL COLONY

Practically all the San Francisco Chinese read English; but correspondence with their homeland is, of course, written in Chinese, and news of important events in China, and in the local colony itself, is usually published by means of posters pasted on walls along the shopping streets. Merchandise meant for sale to other Chinese is also marked in Chinese characters.

and powdered tiger claws still find customers. One Chinese "herbalist" fills prescriptions, identifying hundreds of different herbs not by any labels on the boxes, but only by sight and smell. The young Chinese flapper may wear the same scant clothes as her white American sister, or at least compromise by cutting her silk pajamas long or short, as goes the style in skirts; but hunt her up after she is married and she is probably living much as her grandmother did among the hills back of Amoy.

But old Chinatown, with its slums and opium dens, is no more; like the boisterous

"Barbary Coast," with its dives and dance halls, it belongs to yesterday. Most of it perished in the earthquake and fire of 1906. That holocaust, in fact, blotted out all the old business section. Modern San Francisco's great banks, office buildings, luxurious shops, sumptuous hotels and cafés, all are new—built in recent years. Only the old spirit survives, happy and indomitable.

An international city San Francisco is and must long remain, with all its diverse racial groups of French, Italians, and Chinese. When you look now at its many magnificent schools, its lakelike swimming pools, its parks, public palaces,



AMONG BERKELEY'S HILLS, ACROSS THE BAY FROM SAN FRANCISCO, STANDS THE UNIVERSITY OF CALIFORNIA

Besides its singular beauty of location, this university is widely known for its library—including the Bancroft collection—for its scientific collections, and its School of Mines. The campanile, center, with 12 bells; upper right, stadium—a combination of earth bowl and Colosseum type, possible because of the natural slope of the hills. The stadium seats 72,000 and can be emptied in 15 minutes. Among the hills stands also the famous Greek Theater. Coeducational, Berkeley draws a large share of its students from San Francisco; so, also, does Stanford University, located at Palo Alto, down the peninsula from the city.

and rich libraries; its easy transport means, its endless docks, and its \$70,000,000 water system, piping veritable rivers from O'Shaughnessy Dam, in far-away

Hetch Hetchy Valley—then you see what it owes to the pioneers, the Vigilantes, and all who fought to win a good life for its people.

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

POLAND, LAND OF THE WHITE EAGLE

BY MELVILLE BELL GROSVENOR

DURING her century and a quarter of complete eclipse, when her next-door neighbors, who had torn her to pieces, sought to smother her national character with rifles and soldiers, Kraków, ancient capital, kept alight the fierce flame of Poland's independence. But this Polish tragedy, in the chapter written since the World War, has a happy ending, for the Nation is on Europe's map once again.*

The symbol of Polish patriotism is that combination fortress, palace, and cathedral, the Wawel, which, like an immense spiked helmet, caps the crest of a hill at a wide bend in the winding river Wisla. Containing the Westminster Abbey and the former White House of Poland, this picturesque pile is the pride of every Pole (see Color Plate I).

When the Austrians descended on Kraków in 1795, one of the stewards in charge of the Wawel hurriedly ordered workmen to cover the magnificent marble staircases with wood and to plaster up many of the ornamental fireplaces and arched colonnades of the palace. During succeeding years, while Austrian soldiers were quartered in the royal apartments and cavalry horses were stabled in other parts of the building, it fell into a state of sad repair. Finally, Polish patriots in 1905 were permitted to purchase the property and present it to the Austrian Emperor as a Polish Museum!

Reconstruction, delayed by the World War, is nearly finished to-day and the camouflaged glories hidden for so long have now been disclosed to the revering eyes of Polish pilgrims as they were in the days of Kraków's splendor.

Of no less esteem to the Pole is the Cathedral of the Wawel, a rambling structure whose exterior is a strange blending of Gothic, Renaissance, and baroque art, with a tall, cross-tipped clock tower dominating the castle skyline.

High on one of the lesser stubby steeples, a huge white eagle spreads its wings. This defiant bird appears prominently as a shield on most public buildings and monuments

everywhere throughout the country and is the central motif of the national flag and crest. It is the symbol of Poland's highest order of merit, and has given its name to the Nation, Land of the White Eagle.

In the Wawel Cathedral was held in former days the splendid ceremony of the coronation of the Kings of Poland.

Poland elected her rulers and, to avoid the embarrassment of a kingdom with no crowned head, it was customary not to consider a deceased sovereign's reign at an end until after his burial. As elections sometimes were prolonged by political debate and even open conflict, this important function of burial was often delayed; but, no matter, Poland was not without a king!

KOSCIUSZKO, WHO FOUGHT FOR AMERICA,
LIES BURIED IN THE WAWEL

The Cathedral is a shrine to the Poles not only for its intimate associations with their past rulers, but because here lie Poland's national heroes. In the gloomy crypt rests John Sobieski, that gallant general who led a valiant Polish army against the Turk and gave him a terrible drubbing before the walls of hard-pressed Vienna in 1683, thus with one decisive victory stemming the invasion of Europe by a Moslem horde.

Near by lies Kosciuszko, who fought so brilliantly for the cause of American independence that Washington made him adjutant and Congress honored him with American citizenship, a pension, landed estates, and a commission as brigadier general. He is a national hero to Poland because he led his countrymen in their last desperate stand against the overwhelming armies of Prussia and Russia, who with Austria later divided her lands among themselves.

Adam Mickiewicz, Poland's poet patriot, also rests in this hallowed shrine (see Color Plate VI).

The Wawel was the nucleus of Kraków's stone wall of defense. It formed the apex of the giant cornucopia whose outline the ramparts resembled. Now, where deep moats and towering walls once stood, a park is the playground of youngsters. A commonplace trolley ambles through the narrow portal of the Florian, last of the city gates, and skirts close to the Rondel, a spade-shaped fort which bristles with pepper-box pinnacles.

* See, also, "Struggling Poland," by Maynard Owen Williams; "Devastated Poland," by Frederick Walcott, and "Partitioned Poland," by William Joseph Showalter, in the NATIONAL GEOGRAPHIC MAGAZINE for August, 1926; May, 1917, and January, 1915, respectively.

All within the *Planty*, as the green fringe of park is called, is the old city. Its central core is the *Rynek*, a large cobbled square which is the heart of Kraków. To this market place, and there is no finer in Central Europe, all good housewives come to purchase the family food from peasants.

Casimir the Great built the ornate Cloth Hall in the center of the market place when Kraków was the focal point of caravans bearing the spices of the East, the grain of Hungary, and the silks of Italy to Central Europe. But neither the women with blue, rose, and scarlet head shawls, who sit at their stalls under its colonnades, nor the Jews who loudly cry their household trinkets, ranging from frying pans to beads and ribbons, ever realize that this was a "department store" more than five hundred years ago.

A BUGLE BLOWS A TRIBUTE TO AN HEROIC TRUMPETER

As he wanders through the lanes of umbrella-covered stands, as colorful with their vegetables and peasant women vendors as an animated rainbow, the visitor's attention is attracted suddenly by a clarion call. A strange blending of taps and reveille, this bugle call rings out from the tallest of St. Mary's twin towers. But why should its sweet notes be strangled so abruptly? A student at the university explains that the *hejnal* is a memorial to a trumpeter who, seven centuries ago, while calling the people to the defense of the city walls and encouraging them in the midst of battle with his stirring blasts, was shot to death by a Tatar arrow. The choked note was the bugler's farewell.

On one of the walls of the Cloth Hall hangs a rusty knife about which a tale is told. Two brothers were commissioned to build the towers of St. Mary's Church. One completed his much sooner than the other, and in so doing incurred the latter's wrath. When the second brother discovered, in addition, that his own tower was much the shorter, he killed his rival in a jealous rage, and the knife is preserved as a memento.

When the gold ball on the summit of the taller tower, whose slender steeple is like a Pierrot's cap encircled with a golden crown, was examined recently preceding plans for its restoration, a number of fifteenth-century documents were brought to

light. Evidently it was used as a lofty "cornerstone" (see Color Plate VI).

Poland's traditions and the indomitable spirit of her people were fostered during the dark days of her history by the students of Kraków University. Founded in 1364 by Casimir the Great, this institution of learning is the second oldest in Central Europe, yielding first place only to the one at Prague. The crude astronomical instruments and celestial globes of Copernicus, whose discoveries revolutionized the best scientific thought of his day, are preserved in the library at the University. For fear of persecution, his works were kept secret and were not published until 1543, when the great man lay on his deathbed.

The roads of Poland are long and straight and are seldom congested by traffic. The principal vehicle to be seen is the long low cart which is the peasant's hay wagon, market cart, and buggy combined. Countryfolk usually live in villages of twenty or thirty whitewashed cottages, each with a thatched roof and a single whitewashed room where the family eats, sleeps, and entertains. Many humble cottages with brown thatched roofs have electric light cables and telephone wires running to their caves. On the highest pinnacle or perhaps beneath the overhanging gable a simple wooden cross is placed. Peat is stacked near the house, the winter's fuel supply. Gardens surround the houses, and in them are grown many of the common flowers of the West—lilacs, pansies, hollyhocks, and roses (see Color Plate II).

The Polish peasant is conservative and slow to change his ways. Western fashions of dress have influenced the gala-day costumes of the countryfolk less here than in most parts of Europe.

Weddings in Poland are the occasion for joyous celebrations, sometimes lasting for days before and after the important event. The bride is crowned with a tall wreath of roses and daisies tied with rainbow ribbons. The cottage floors in the winter and the turf of the lawn in summer tremble with the thump and tread of the dancers' heavy boots. Far into the night, often until 6 in the morning, the merry dancing goes on, and there is always much feasting. But the right first to cut the wedding cake is the privilege of the match-makers, in contrast to our own custom of reserving this for the happy couple.

IN THE LAND OF THE WHITE EAGLE



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Natural Color Photograph by Hans Hildebrandt

POLAND'S NATIONAL LIFE CENTERS IN KRAKÓW'S WAWEL

Castle, fort, and cathedral combined, like Moscow's Kremlin, this city within a city crowns a hill in the ancient capital. In the Castle lived Polish kings until 1610; in the Cathedral, here shown, many were crowned and buried. Here, too, rest some of the national heroes. On a lofty pedestal in the right center background is an equestrian statue of Kosciuszko,



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Natural Color Photograph by Hans Hildenbrand

LOVE OF THE LAND IS DEEPLY EMBEDDED IN EVERY POLISH HEART

"Our peasants," say the Poles, "have three loves: God, who gave the land; the land, because God gave it; and home, whose foundations are in the land that God gave." Despite some movement of population to the towns, and the growth of industry since the World War, Poland, now as always, is chiefly a country of farms. The frame, log, or brick cottage is usually thatched with straw, except in mountain regions, where the roofs are shingled. A scene near Piaski, southeast of Lublin.



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THE OLD FOLK RELISH A MOMENT OF RELAXATION: PEASANTS OF BRONOWICE, NORTHWEST OF KRAKÓW

Man's work—nor woman's—is rarely done for Poland's toilers of field and fireside. For him, among other tasks, there is grain to cut, farm animals to tend and roofs to thatch. For her, ever mindful of the proverb that "A good housewife is a full cupboard," there is wool to card and spin and dye; homespun to weave; linen shirts and blouses to embroider; and all the cooking and cleaning. The man makes his own wide leather, brass-studded belt (see also Color Plate VIII).



Natural Color Photographs by Hans Hildenbrand



COLOR AND CURLICUES BRIGHTEN GORAL COSTUMES

Mountain men of the Tatra, bedecked in richly embroidered cloaks and trousers of feltlike homespun, pipe and fiddle a merry time for neighbors in Poronin.



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Natural Color Photographs by Hans Hübenthal

A PASTORAL SCENE IN THE HIGH TATRA NEAR ZAKOPANE

Simple and primitive is the life of the Gorals in summer, when their flocks and herds are out at pasture in the Tatra dales. In winter many act as guides for visitors to this popular mountain resort, south of Kraków, near the Czechoslovak border.

IN THE LAND OF THE WHITE EAGLE



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Natural Color Photograph by Hans Hildenbrand

A NET-BROWN WATER GIRL OF BRONOWICE

Her over-skirt is adorned with poppies, not simply for their red color, but in remembrance of the fact that the Virgin's feet bled when she walked through rough grainfields. The peasant girl's youthful prettiness often disappears after marriage, when toil in house and field and child-bearing take their toll.



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GOTHIC ART TRIUMPHS IN KRAKÓW'S ST. MARY'S

For 700 years, from the higher, crowned tower of this 13th-century church, a trumpeter has sounded the *hejnal* (morning song) in memory of a bugler killed in the act by a Tatar arrow. The Mickiewicz statue in the right foreground.



Natural Color Photographs by Hans Hiljbrand

MOUNTAIN CHILDREN HONOR ADAM MICKIEWICZ

Writing of his country's customs and beliefs, her history and struggles, Poland's national poet thereby voiced her aspirations for liberty. His body rests in the Cathedral of the Wawel (see Color Plate I). St. Mary's Church in the background.



© National Geographic Society

UNITED FOR BETTER, FOR WORSE

A young married couple of the Kraków district. To signify that he had a marriageable daughter, her father chalked small, irregular bands on the lintel of the door and window. The bridegroom's hat is elaborately adorned with peacock feathers for good luck.



Natural Color Photographs by Hans Hinderbrandt

POLAND IS A LAND OF PERVERT FAITH

At home, in the fields, by the roadside, or in city streets, shrines and calvaries, chapels and churches testify to the intimate part religion plays in the daily life of the people. A wayside chapel in Poronin (see also Color Plate IV).



© National Geographic Society

Natural Color Photograph by Hans Hildbrandt

A FAMILY QUARTET OF KRAKÓW

Some of the prettiest costumes in all Poland were formerly worn in and around the ancient capital, but they are seldom seen to-day. Usually only a church festival or a national celebration brings them forth.

FLIGHTS FROM ARCTIC TO EQUATOR

Conquering the Alps, the Ice Peaks of Spitsbergen, of Persia, and Africa's Mountains of the Moon

BY WALTER MITTELHOLZER

With Illustrations from Photographs by the Author

IN THE air the aviator cannot distinguish all the depths below, but the all-embracing view gives him a new idea of the territory flown over. From his high situation he sees, so to say, the genesis of the earth; he realizes continuities unimagined by those bound to *terra firma*. It seems to him as if it were a new, unknown world, or as if he had acquired new powers of vision.

The highest degree of delight fills his soul—the joy of discovering new land. To me, flying has always been a means by which, with the assistance of photography, the mountains and the secrets of the vast world can be shown from a point of view hitherto unknown.

My ardent love of Nature and intense desire to be a pioneer into the unknown led me to become a flyer.

FLYING AMONG THE ALPS

During my 16 years of flying I have crossed the Alps a hundred times, in all varieties of weather and under all conditions. I have been privileged to show thousands of passengers the magnificence of our snow-capped mountains, each flight having an entirely different aspect. On clear, calm days one can fly quite close to the mountains, forests, and peaks without experiencing the slightest shock; but when the south wind rages over the Alps and roars through the valleys, one may be sucked down at any moment. On these occasions the flyer loses his "foothold," as it were. His blood quickens in his veins; he sits in his rocking plane, beset with a thousand risks, as he attempts to traverse the tempestuous aerial ocean above the mountains.

Up to now, "flyer's luck" has favored me.

In order to be prepared for all unexpected adventures and the tricks of the wind at high altitudes, I went in for acrobatic flying and practiced all the "stunts,"

such as looping, inverted flights, wing-overs, and tail spins.

But once I looked Death in the eyes and felt his cold hand. I was commissioned to take an Italian machine from an airdrome near Milan, over the mountains to Zürich. The sky was clear. I swung myself up to a height of 16,000 feet and hoped to land in the airdrome at Dübendorf in an hour. Then the peaks of the Swiss mountains unexpectedly disappeared in fog. It was impossible to take bearings above the deceptive fluctuations of the clouds. Turn back? No! In about half an hour I should have been above the Lake of Zürich; so I pushed on through the fog to seek my destination.

If only there had been no deceitful counter-wind. My calculations were not correct. A snowstorm set in and soon destroyed all visibility. After gliding for a minute my feeling of equilibrium left me and I felt myself being tossed about in the unknown. Then, suddenly, a dark mass rose before me and as suddenly disappeared. A black rock wall, as if charmed out of the grayness by a ghostly hand, flitted past me.

The often-proved experience that in such moments of real danger one's whole life passes through the mind in fractions of seconds was my experience then. The faces of my dearest friends and closest associates flashed before my eyes.

Suddenly a brilliant, glittering white mass shot up before me out of the gray fog. Instinctively I pulled on the rudder. Then crash! The machine had struck violently against something. Then the stillness of death.

How long I lay there unconscious I do not know. I had struck upon a steep snow slope. The machine lay 300 feet above me.

Then came a terrible evening, a ghastly night in a desolate hut. And then the painful way down into the valley. Frozen fingers, smarting wounds, hunger and exhaustion! Weeks—no, months—were



Photograph by Ad Astra-Aéro

DESPITE HER MANY MOUNTAINS, SWITZERLAND APPEALS TO THE AIRMAN

The low-lying valleys which nestle between the lofty peaks provide places aplenty for landing fields, and the Swiss Government has developed them extensively. Aerial conditions over the Alps vary greatly, and there are times when the highest degree of skill and nerve is necessary for safe flying (see text, page 445).

needed before the wounded knee-joint and the broken thigh bones were again in active service.

MOUNTAINOUS SWITZERLAND HAS MANY FINE LANDING FIELDS

Nearly two-thirds of Switzerland consists of mountains the peaks of which exceed 15,000 feet. Seen from the air, the panoramas are superb. Sufficiently extensive landing places are everywhere at hand in the low-lying valleys which nestle between the mountain ranges, and which have been constructed of late years by the military and civil air authorities.

From the three large international airdromes of Zürich, Basel, and Geneva, the high mountain region can be reached in a half-hour flight. In an hour we have already flown over the chains of the Urner and Berner Alps and are above the Matterhorn and Mont Blanc (pp. 450-60).

The Alpine chain, which, with an average of 65 miles in breadth, separates German-speaking northern Switzerland from the southern, Italian-speaking part, is at the same time the sharp, climatic boundary between the raw, foggy region of the north of Europe and the milder, more sunny zone of the Mediterranean countries.

Although Switzerland has a regular air service from her principal centers to Vienna, Berlin, and London (via Paris), it has not, so far, been possible to organize a regular flight route over the Alps to Italy.

AIR ADVENTURES IN THE ARCTIC

With improved airplanes, and especially with better instruments for blind and fog flying, the problem of a regular crossing of the Alpine chain will be solved in the course of the next few years.

I have always enjoyed letting my thoughts wander beyond the limited confines of my own country, out into the vastness of the world. It was, therefore, merely a matter of waiting for a favorable opportunity to fulfill my dreams. During a short stay in Berlin in 1923 I was asked by the Junkers Works if I would take part in the Junkers Spitsbergen Expedition, which was to be an auxiliary expedition to the first intended Polar flight of Roald Amundsen.

At the time Captain Amundsen was attempting to fly from Alaska to Spitsbergen over the North Pole, but because of the limited radius of action of his machine there were doubts as to the successful execution of this bold plan.

I accepted the proposition with enthusiasm. The next day I started in my plane from Hamburg via Denmark and Norway, and at Bergen joined the Expedition party, which had already arrived by steamer.

A Dutch coaling vessel took four days and nights to carry us, in sunshine and rain and all kinds of weather, along the magnificent fjord coast, to the north. When we had passed the Arctic Circle a radio message reached us from Alaska, stating that Amundsen had given up his projected Polar flight on account of damage to his Junkers machine.

This message put an end to our proposed plans. It was very disappointing for us to turn back after having so nearly reached our desired goal.

After a hurried conference, we decided to continue our journey to Spitsbergen in order to study there, in a few flights, Arctic conditions and to take photographs of this little-known part of the world. And so a new situation was created and new problems arose, which I liked far better than the idea of a rescue expedition.

From the beginning I had grave doubts as to the success of the proposed plan. I

could not imagine how it would be possible to find a man in an immense sea of ice. In addition, should the motor fail, there was the greatest risk of death from starvation in the midst of the pack ice.

Our new task was the detailed exploration of Spitsbergen, and we were able to return home with limited, but profitable, results.

At the time, I made the following entry in my diary: "The airplane serves as a means of exploration of unknown land difficult of access; therefore an era of profitable exploration has been opened up. The airplane will play a very important, if not a decisive, part in future Arctic and Antarctic exploration."

All my prophecies have been fulfilled. Three years later Byrd in an airplane and Amundsen, Ellsworth, and Nobile in a dirigible flew from Spitsbergen over the North Pole, and in the spring of 1928 Wilkins succeeded in traversing the Arctic regions in an uninterrupted flight from Alaska to Spitsbergen.

The palms for all Polar enterprises must be given to Admiral Byrd for his flight over the South Pole on the 29th of November, 1929. During his sojourn of nearly two years in the Antarctic, Byrd was enabled to survey a hitherto-unexplored territory of 150,000 square miles.

All these achievements are due in the first place to the great technical progress in airplane and motor construction.

SURVEYING SPITSBERGEN BY AIR

Pilot Neumann and I traversed a considerable stretch of the Arctic regions. After a few reconnoitering flights, we started with our Junkers hydroplane, Type F 13, and flew, in 6 hours 40 minutes, over the highest peaks of Spitsbergen, as far as the Hinlopen Strait and the North East Land. From there we returned along the magnificent fjords of the west coast to our starting point, the whale-fishing station of Green Harbor. This was the end of the Spitsbergen Expedition (see pp. 467-8).

I returned home with valuable experience. Often, during my flights over the mountains of the "Land of the Midnight Sun," which reminded me very much of the Alps at home, I fancied myself over the highest peaks of the Bernese Oberland.

After this first and wonderfully successful journey in the Far North, I often trav-

eled in thought into foreign countries. In the winter of 1924-25 I began a distant air excursion. I started from the Lake of Zurich and flew via Italy, Greece, Turkey, and Iraq to Tehran. The Junkers Works and the Persian Government engaged me for this flight, and especially the energetic Persian ruler, Reza Khan Pahlevi, wished me to demonstrate the great value of air traffic to his country.

Under the protection of Reza Shah, I made various flights in Persia during a two months' sojourn. My mission was to chart the most suitable air lines in that country. Once I traversed the high passes of the Elburz Mountains to the Caspian Sea; at another time I flew over the mysterious places of Isfahan and Shiraz as far as the Persian Gulf.

The culminating achievement of my Persian flights was to cross the premier mountain in Persia, the ice-crowned Demavend,* which towers to a height of 18,600 feet.

That flight is indelibly impressed on my memory, as I was the first to fly over it. I wrote in my diary at the time as follows:

"The 10th of March, 1925, the last day of my flying activity in Persia, dawned with a cloudless, deep-blue sky and brilliant sunshine. It could hardly be otherwise. During my 43 days' sojourn in Persia two days only were dull and rainy—an ideal country for air traffic."

Outside the gates of Isfahan, where we made our last preparations in the midst of a great crowd of onlookers, the sun shone with astounding power. The high chain of mountains in the north, which I had to fly over, was not discernible, however, on account of the mist; but the view from our high starting place above the town lying below us and over the surrounding mountains was enchantingly beautiful.

Under full gas pressure, our "bird" plunged down the hillside, and after a short, jumpy take-off we were in the air at exactly 8 o'clock.

Below, in the large, glittering marble courtyard of the great mosque, near the Meidan-i-Shah Square, hundreds of the Faithful to the Great Prophet knelt and prayed to Allah. Our great metal bird thundered over their terrified heads.

*See "An Ascent of Mount Demavend, the Persian Olympus," by F. L. Bird, in the NATIONAL GEOGRAPHIC MAGAZINE for April, 1921.

Above dilapidated royal palaces, above a sea of cupolas, towers, and walls, in a few minutes I was over greening cornfields and scattered villages. But then, very soon, the desert stretched out for an immeasurable distance, and beyond, in the north, the outline of a mountain range gradually rose.

At 8:40 the highest peak of this, the Kargiz, range lay under my feet. The reddish brown, horizontally stratified rock walls to the north break down in perpendicular walls to the weather-worn rock belt of the great Salt Desert.

Since my first passage there, a fortnight before, the sun had already played havoc with the snow, but no plants or vegetation of any kind sprouted in the sterile, desert land.

APPROACHING DEMAVEND'S LOFTY CREST

The atmosphere in the north was gray and gloomy. I looked in vain for the proud snow pyramids of the Demavend, which during my first flight had gleamed so supernaturally before me 155 miles away. My hopes of being the first to make a "flying visit" to the still virgin peak vanished more and more in proportion to the disappearance of the sun behind the delicate veil of mist. I glided down from my height of 15,000 feet above the town of Kashan, which then appeared before me and over which I flew, very low, at 9:05 o'clock, for the purpose of taking motion pictures. I then followed the caravan route which goes toward Qum, in order to pay a visit to the celebrated place of pilgrimage, with its golden mosque cupola, sacred to the Shia sect of Mohammedans.

Often, flying not more than 30 feet above the track, we easily overtook one caravan after another, and had a secret pleasure in the commotion which our wild, noisy machine caused below. While the camels stolidly raised their heads only, the mules and donkeys fled terrified from the track, stumbling into the hollows and holes, thus riding themselves of their heavy burdens.

The irregularities of the land which followed forced me to fly higher for caution's sake. When, after half an hour, I was again at a height of nearly 10,000 feet, I suddenly saw before me, hanging in the gray void of the sky, a bright triangle. At first I took this to be an optical illusion.



FROM GIGANTIC CASCADES OF IRIDESCENT ICE, RHÔNE GLACIER GIVES BIRTH TO A MIGHTY RIVER

The Rhône, which gathers volume as it flows across much of Switzerland and France to empty into the Mediterranean Sea, leaves its parent glacier as a narrow, milky stream. The town of Gletsch, close by the river's birthplace, is noted as a tourist center and as the starting point of two important Alpine travel routes, the Grimsel Road, toward the region about Bern, and the Furka Road, meandering away at the right toward the St. Gotthard Pass.



Photograph by Ad Astra-Acro

MATTERHORN'S PEERLESS PYRAMID DOMINATES THE VALLEY OF ZERMATT

The French call this mountain "Cervin," a name derived from the Latin word for stag and applied because from a distance, at certain angles, the peak suggests a huge rearing stag. Many attempts to conquer it ended in failure or even disaster, and stories spread about among the neighboring peasantry of supernatural monsters who held the mountain as their own and hurled rocks and avalanches down on all who tried to invade their domain. The last of the Swiss giants to be conquered by man, in 1865, it is now climbed frequently. No glacier softens Matterhorn's sharp edges, for it is too steep for any great depth of snow to cling to.



BILLOWING SEAS OF FOG FILL THE VALLEYS AROUND RIGI.

On a clear day the panorama that unfolds from the summit of this Swiss mountain in the foreground is one of the finest in all Europe. The ascent is made annually by thousands of visitors to near-by Lucerne, either afoot or on a funicular mountain railway.



Photograph by Ad Antra-Aëre

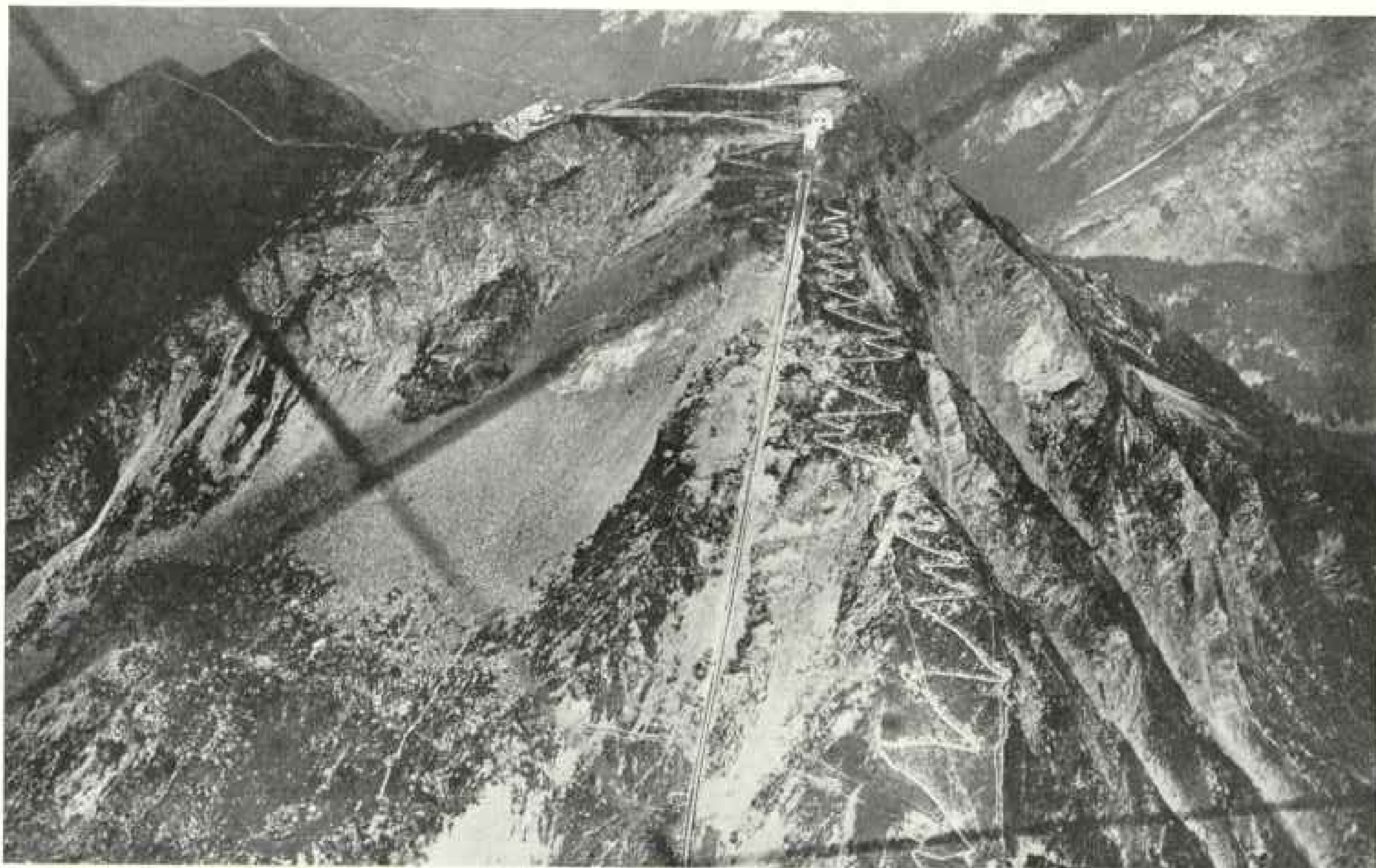
ST. MORITZ IS THE ACKNOWLEDGED WINTER SPORTS CAPITAL OF EUROPE

Four or five months of clear, cold weather each year, seldom broken by rain or thaw, make this Swiss town on the shores of Lake St. Moritz a congregating point for devotees of skate and ski. Tobogganing, bobsleighbing, curling, hockey, and horse-racing on the ice are also popular diversions for the thousands of winter visitors who come here from many lands to enjoy outdoor sports and the elixirlike air. In summer mineral springs and unusually fine scenery attract another quota of health- and pleasure-seekers.



FOR SIX CENTURIES CARTHUSIAN BROTHERS HAVE LIVED IN AUSTERITY AT VALSAINTE

The monastery is near Fribourg and came into being when, in 1294, a local baron gave the little valley in which it is located to the Carthusian Order on condition that a group of Brothers settle there. The members are pledged to absolute silence and individual poverty, as well as much hard labor, both manual and intellectual. Each monk lives and works to himself and meets his fellows only at religious services and once a week for a short period of recreation.



Photograph by Ad Astra Aera

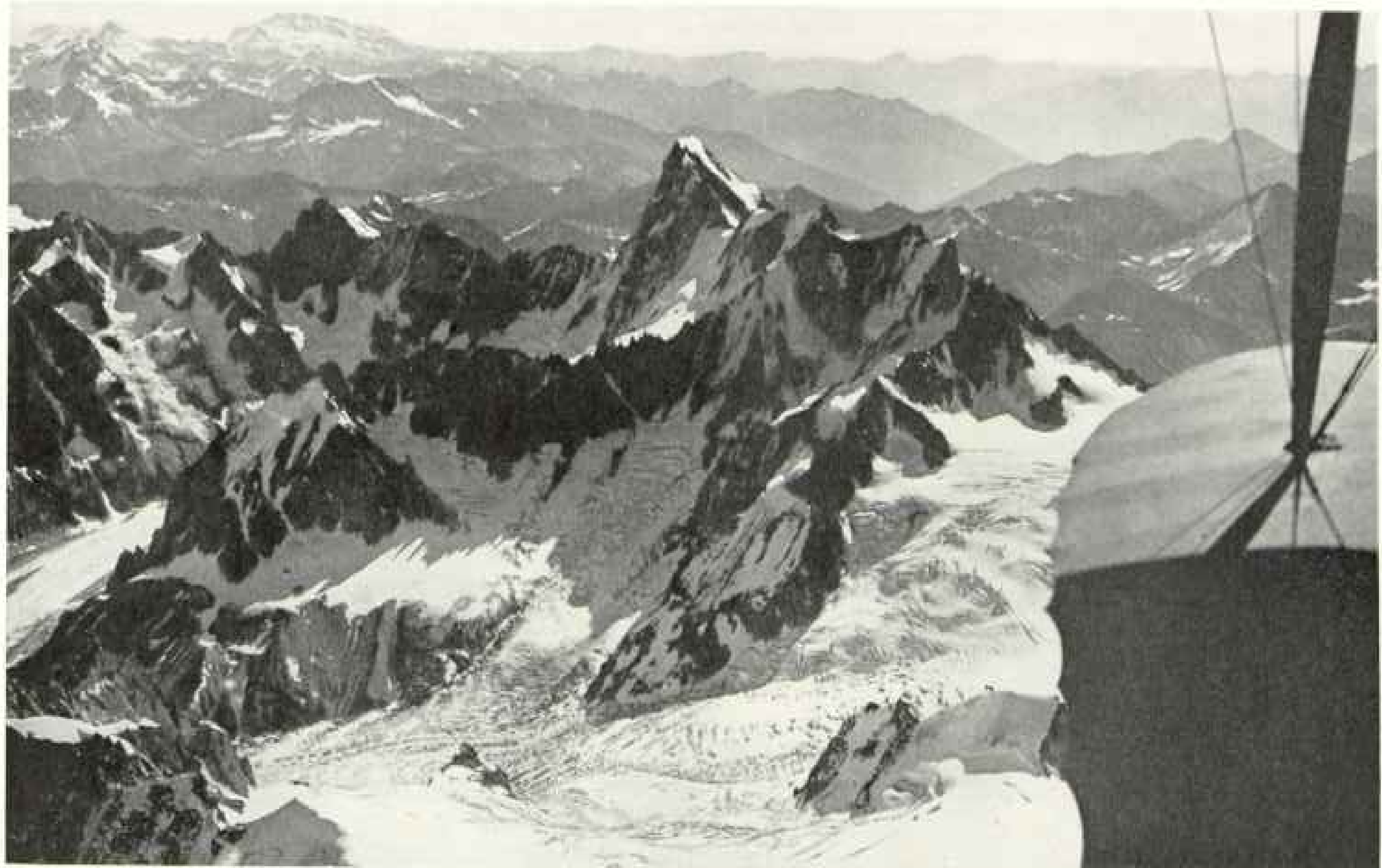
FROM THE NIESEN A GLORIOUS PANORAMA OF THE BERNESE OBERLAND UNFOLDS

The ascent may be made either by the straight cable railway or afoot by the narrow, zigzag road. Although the trip up is not very interesting, the view from the summit more than repays one for the time and trouble. Especially fine is the prospect it affords of the great snow fields of the Blümlisalp. Niesen is 7,562 feet high and not far from Spiez, on Lake Thun.



THE RHINE CIRCLES BACK ON ITSELF AT RHEINAU

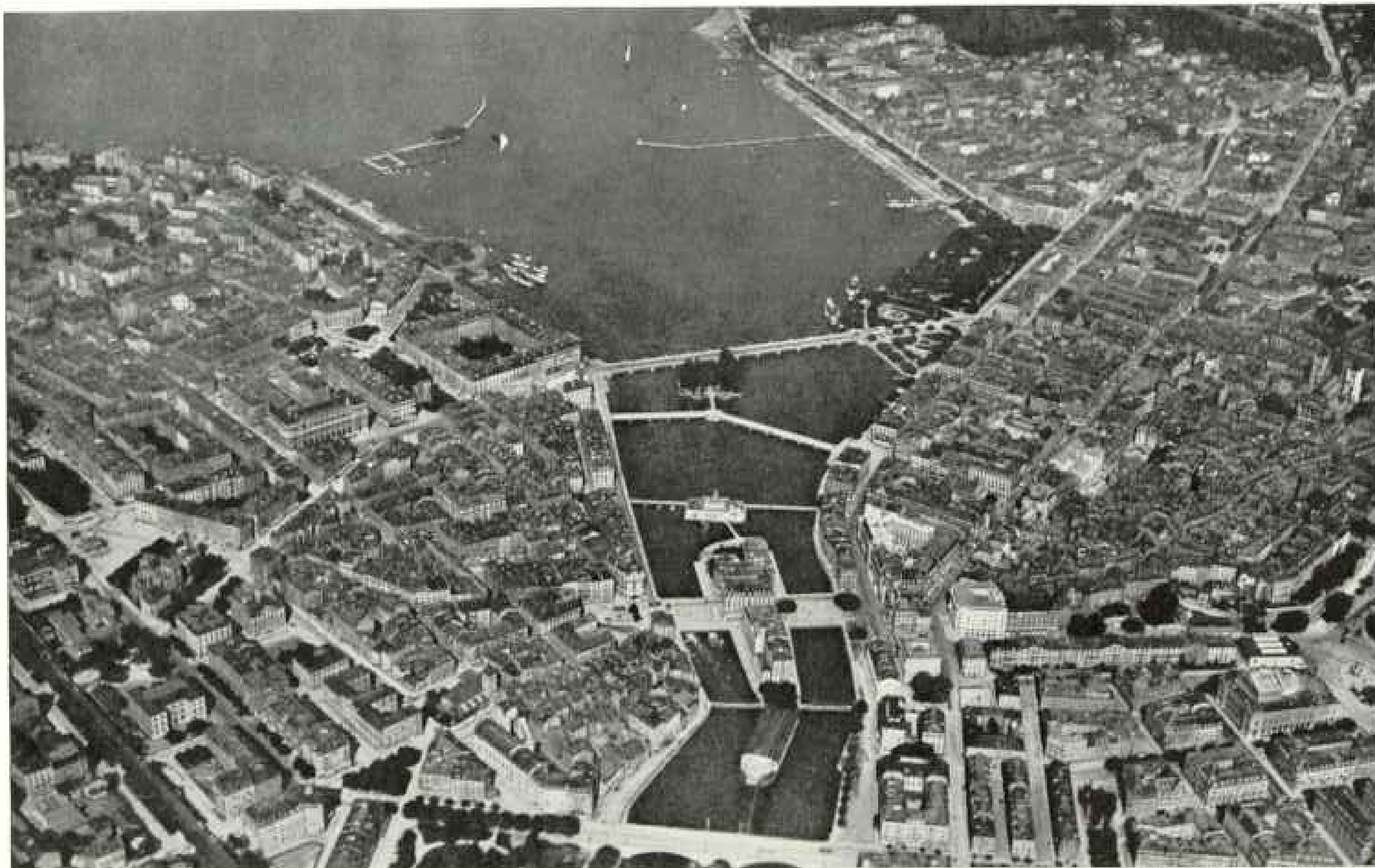
On the peninsula that results from the great river's caprice many of the inhabitants of Rheinau cultivate the vine. An island in the river (center of picture) was occupied for more than 900 years by a Benedictine abbey. After a stormy career, during which it was destroyed and rebuilt a number of times, the religious establishment was definitely abandoned in 1862 and shortly thereafter became a government hospital.



Photograph by Ad Astra-Aéro

AN AVIATOR LOOKS DOWN ON TACUL GLACIER.

The Alps center in Switzerland, but extend into France, Italy, Austria, and Germany. Captain Mittelholzer has experienced many thrilling adventures while flying over all of their ranges. Tacul Glacier is in France, very near the Swiss and Italian frontiers, and is a part of the Mont Blanc massif.



Photograph by Ad Astra-Aérs

GENEVA, GLORIOUSLY SITUATED AT THE SOUTHERN END OF LAKE LÉMAN, IS IN MANY WAYS AN INTERNATIONAL CITY

Here, in a setting of fine gardens, parks, and palatial buildings, the League of Nations has its headquarters. The city is Switzerland's third largest and an important cultural and financial center. Calvin lived and preached in Geneva in the 16th century, and it was the birthplace of Jean Jacques Rousseau. The waters of the Rhône, as they emerge from Lake Léman, divide the city into two sections.



IN THE SHADOW OF GLACIER-TOPPED GLÄRNTSCH THE MEN OF GLARUS WON THEIR FREEDOM

In 1388 Swiss peasants, fighting desperately for the independence of their country, decisively defeated a much larger force under the Dukes of Austria near Näfels, in the middle foreground. Citizens of the village celebrate the victory with religious services, choral singing, and a procession on the first Thursday of April each year. Glärnisch, in the central Alps, falls a bit short of 10,000 feet.



FRIBOURG HAS CHANGED LITTLE THROUGH THE CENTURIES

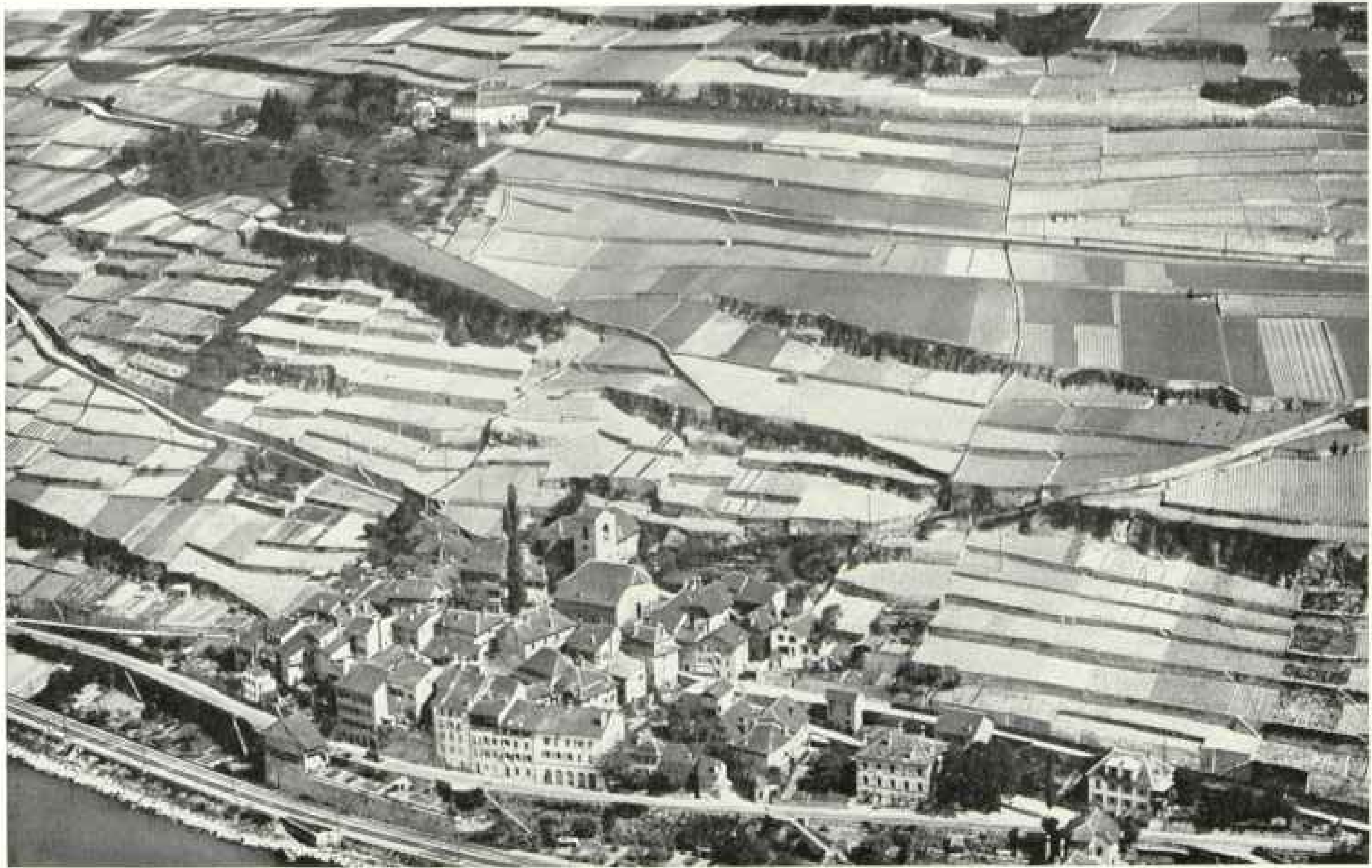
Founded in 1178, the city went through a long period of war and strife before being admitted, in 1481, to the League of the Swiss Confederates. It is situated at a bend in the Sarine River, which stream constitutes a sort of unofficial frontier between French- and German-speaking Switzerland, and the city is influenced by both cultures. Old churches, old houses, old fountains, and old bridges all add to Fribourg's air of antiquity.



Photograph by Ad Astra-Aéro

MONT BLANC ROBED IN GLITTERING SNOW AND ICE

The mountain rises to a height of 15,782 feet, the loftiest peak in the Alps. The base is partly in France, Italy, and Switzerland, but its summit is wholly French territory. Flying over mountains like this is hazardous in windy weather (see text, page 445).



VINEYARDS SURROUND THE VILLAGE OF ST. SAPHORIN

The tiny community is situated in an area on the west shore of Lake Léman, which, being protected from cold winds and storms, enjoys an unusually mild climate. The wine grapes of St. Saphorin are famed for their sweetness and delicate flavor.



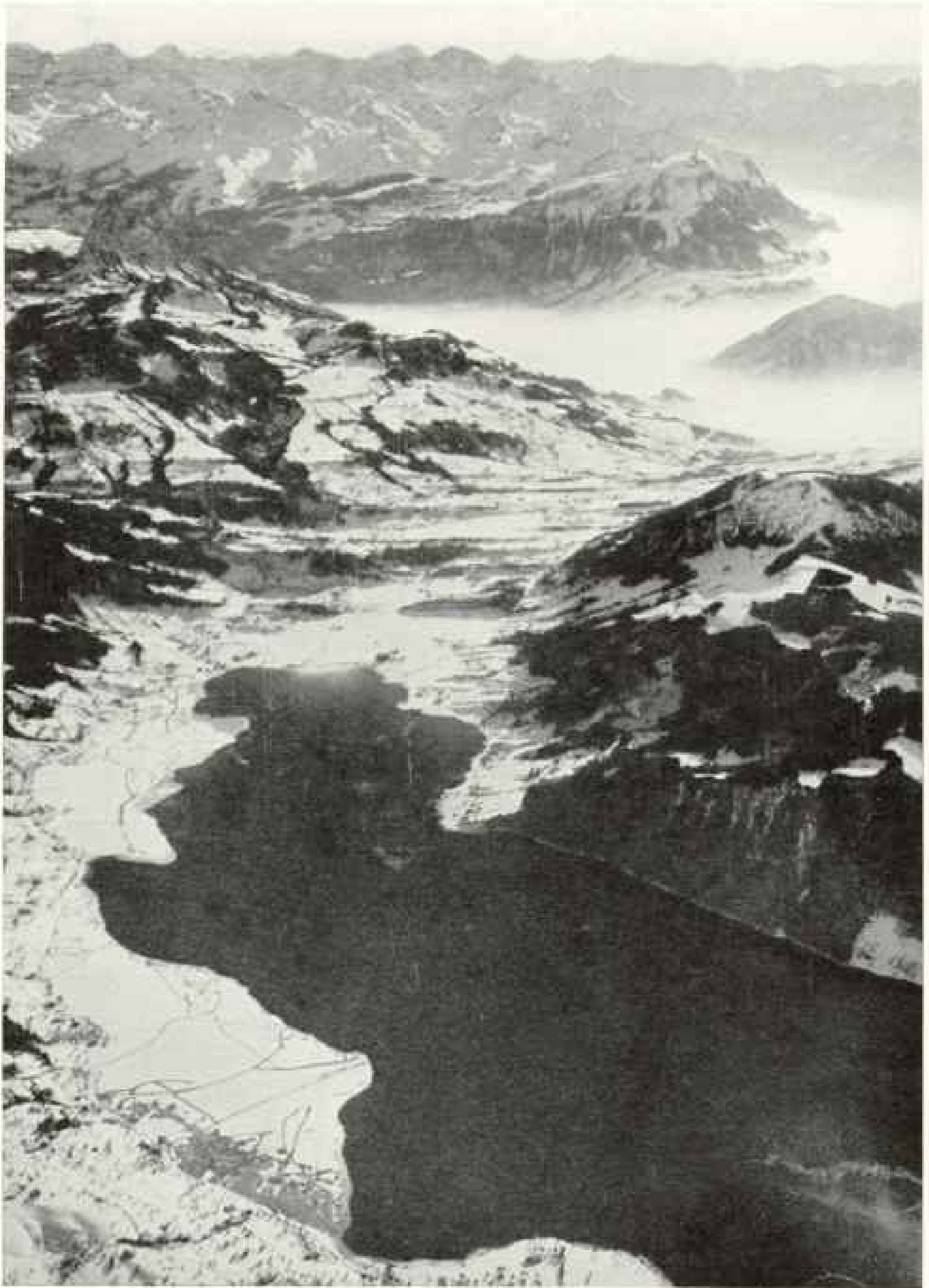
A FAMOUS TRIO OF THE BERNESE ALPS

From left to right, Eiger, Mönch, and Jungfrau pierce the clouds with their snowy summits. The last named is one of the best-known peaks in the world, rising to a height of more than 13,600 feet. It is conveniently approached from Grindelwald or Lauterbrunnen, both of which are connected with the rack railway which makes the ascent. This railway, which is electric, is the highest in Europe.



ROMONT BELONGS TO THE MIDDLE AGES

Built upon an isolated hill that it might be the more easily defended, the walled town has preserved the atmosphere of the 16th century. It was for long a fief of the Dukes of Savoy, and their castle now serves as a town hall. The well-preserved round tower in the foreground, just outside the walls, was built for an unknown purpose. Its openings face the cardinal points and the entrance is high above the ground.



Photograph by Ad Astra Afro

THE RUGGED MASS OF THE URNER ALPS RISES BEYOND LAKE ÄGERI

At Morgarten, on the shore of this lake, two battles important in Swiss history were fought. In 1315 the straight-shooting, lightly-armed Confederates routed Duke Leopold's mail-clad Austrian knights with a hail of stones and arrows. Nearly 500 years later a French Republican army met defeat at the same place. During the latter battle the Swiss ran low on ammunition, and one soldier is reputed to have extracted a French bullet from his own wound and, loading it into his gun, to have fired it back at the enemy. Ägerisee and Morgarten are in the tiny Canton of Zug.

However, after a while, no more doubt was possible; it was Demavend, the highest peak of which towered through the veil of mist.

According to my calculation, I might still be about 60 miles south of the Demavend, and I gave my motor full pressure and high gas and gradually rose through the misty veil from the gloomy, gray depths of the deadly Salt Desert up into the dazzling sunlight.

At 10:30 I had reached a height of 16,000 feet. Below me was a waving sea of fog, above me the deep-blue sky, and before me a conglomeration of hundreds of unimportant snow peaks, above which the once-active volcano of the Demavend towered majestically, like a strange apparition.

Now and again, through gaps in the clouds, I could see, far down in the narrow ravines, mountain villages hanging like birds' nests to the green slopes traversed by foaming watercourses. My ship's chronometer registered exactly 10:46 as I shot by, at a height of 18,700 feet above sea level, hardly more than 100 feet higher than Demavend's rounded, conical peak.

Just as I wished to take my hands from the controls for a moment to take the motion-picture apparatus from my mechanic, who had reloaded it, we were suddenly flung high from our seats; then thrust head down.

Only after some seconds could I get the plane under complete control again. Behind me the Demavend had risen. The height aneroid showed me that we had been driven down more than 600 feet by the "fall wind."

During this rapid descent the motor sputtered, owing to the lack of flow of fuel into the carburetor, so that the machine jumped and trembled—a really uncomfortable situation!

To the north the mountain falls steeply, in richly wooded ravines, to the rice fields of the Caspian Sea, the shore line of which was faintly recognizable. I flew in a wide curve to the left, again heading toward the north, at a respectful distance past the Demavend, and then turned toward Tehran, above several long chains to the southwest.

Far away in the west three snow-capped chains, more than 14,000 feet high, rose above the sea of peaks and clouds. Over

these I had flown four weeks previously to the Caspian Sea. Once more I drew round in a curve, let my eyes satisfy themselves for the last time with the beauties of the Persian highland. Then the separation had to come.

At a height of 11,000 feet I passed the cloud covering through a gap and was again thrown violently backward and forward like a football, and finally came into the lower air strata not far from Tehran. Below there was the smell of spring in the air, and in the gardens of the capital there were many green spots where all had been bare a few days previously. After a four hours' flight I landed safe and sound, at 11:50, in the airdrome before the Kazvin Gate.

THE FIRST HYDROPLANE FLIGHT OVER THE LENGTH OF AFRICA

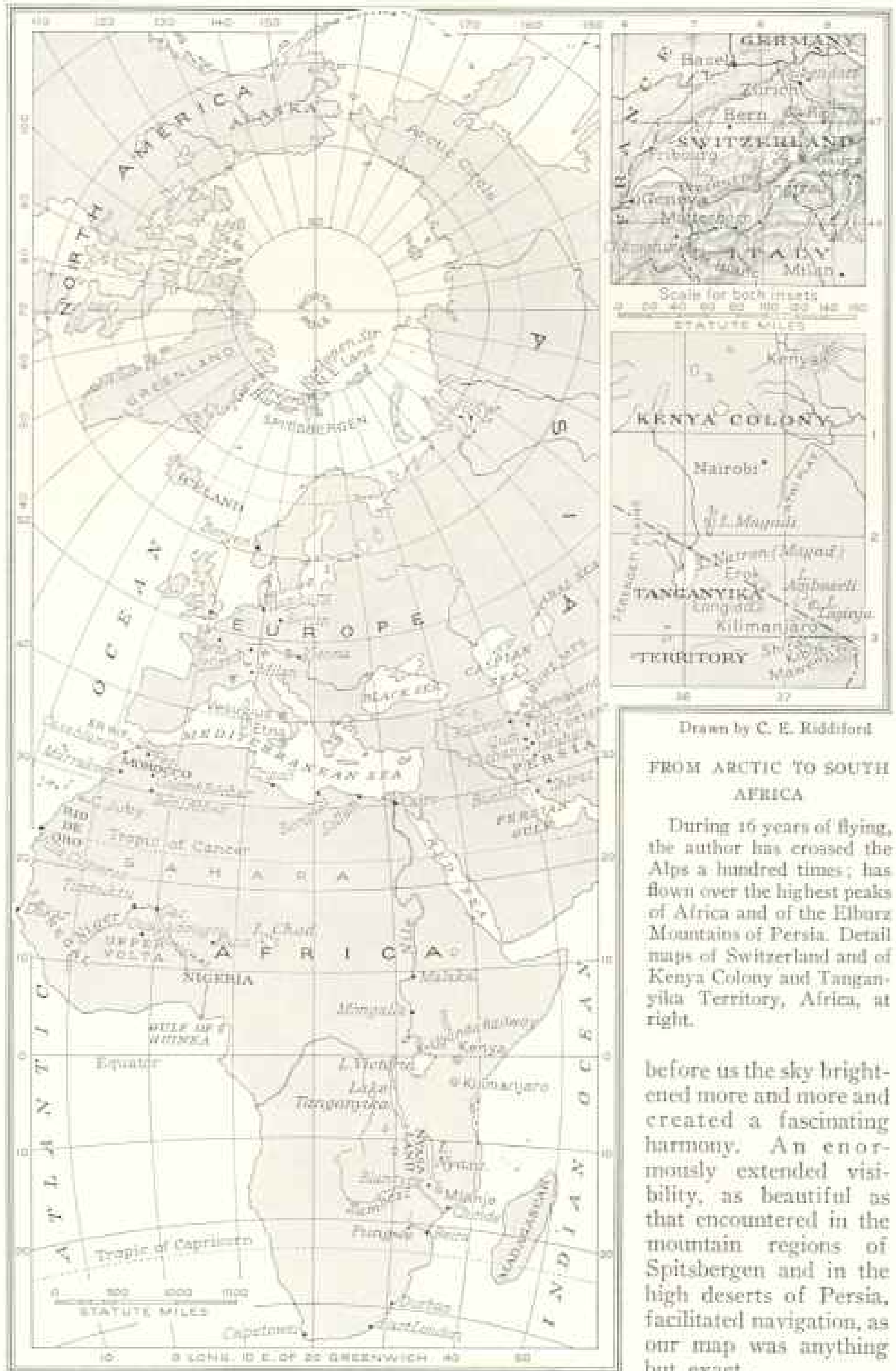
Two years later, in the winter of 1926-27, I flew over Africa from north to south with three companions. We were the first to fly over this part of the world in a hydroplane. No engine trouble occurred during the flight.

Eight months were spent in preparation for the trip. The distribution of about 4,200 gallons of gasoline among four European and 20 African stations alone required four months. My German Dornier hydroplane, with a 12-cylinder BMW motor, with which I won twelve world records on the 24th and 29th of July, in Zürich, worked excellently during the African trip.

From Switzerland, via Italy, Greece, and the Mediterranean, I reached Cairo in 21 flying hours. From there I followed the long course of the Nile to Lake Victoria in order to arrive on the east coast of Africa near Beira, by way of Lake Tanganyika and Lake Nyasa. From there, in four stages, I reached Capetown via Durban and East London.

Between the Zambezi and Beira I experienced one of my most difficult situations.

We flew 6,500 feet above Nyasaland, one of the well populated districts of Africa. In the meanwhile the land rose below us, always covered with brushwood and leaf forests, to the Blantyre Highland. Far in the distance lay the 10,000-foot-high Mlanje Mountains, partially shrouded in black rain, whereas, fortunately, directly



Drawn by C. E. Riddiford
FROM ARCTIC TO SOUTH AFRICA

During 16 years of flying, the author has crossed the Alps a hundred times; has flown over the highest peaks of Africa and of the Elburz Mountains of Persia. Detail maps of Switzerland and of Kenya Colony and Tanganyika Territory, Africa, at right.

before us the sky brightened more and more and created a fascinating harmony. An enormously extended visibility, as beautiful as that encountered in the mountain regions of Spitsbergen and in the high deserts of Persia, facilitated navigation, as our map was anything but exact.



KONOW GLACIER AND THE LOWENSKJOLD PLATEAU, SPITSBERGEN

Over these wastes of snow and ice and barren rock the author and a companion pilot flew to make aerial photographs of the archipelago which has served as a base for the arctic flights of Andrée, Zeppelin, Byrd, Amundsen, Ellsworth, and Nobile (see text, page 447, and "The First Flight to the North Pole," by Comdr. Richard Evelyn Byrd, in the NATIONAL GEOGRAPHIC MAGAZINE for September, 1926).

Chain upon chain of mountains rose in violet hues on the east and west horizons. At 4:30 p. m., from an elevation of 7,200 feet, I recognized distinctly the broad silver ribbon of the mighty Zambezi, flowing deep before us through the extending green Zambezi Valley. Everywhere a fairylike reddish lilac hue was reflected and we soon realized that we had reached the many red sand banks which give the slowly flowing water of the Zambezi (which measures here more than two-thirds of a mile in width) its beautiful color scheme.

FLYING OVER JUNGLES AT TWILIGHT

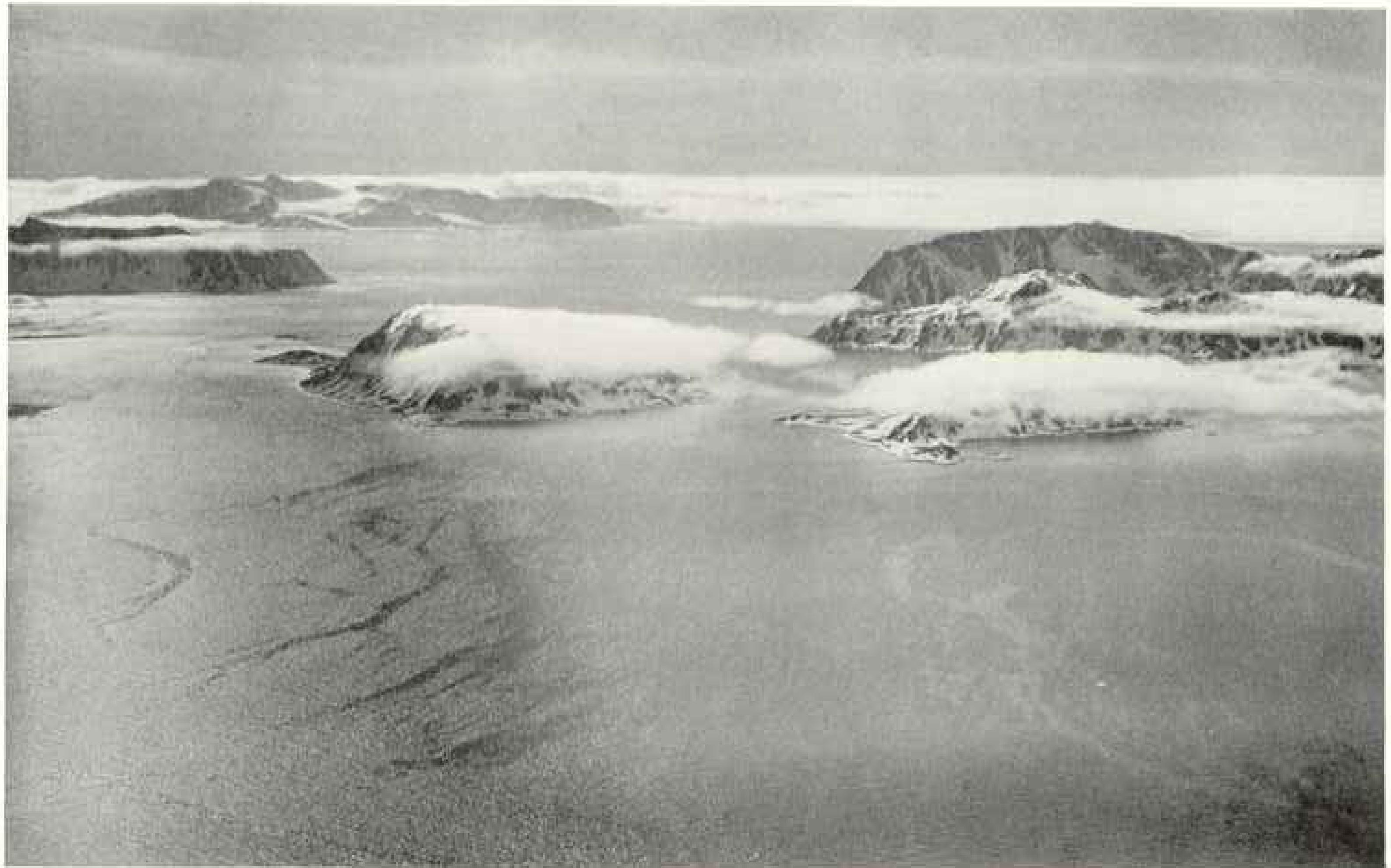
It was 5:02 p. m. We had covered the distance of 250 miles from Lake Nyasa to the Zambezi in the incredibly short time of two hours seven minutes.

What should we do now? Carry out our program and follow the course of the Zambezi and descend at Chinde or make a jump and try to reach Beira? Our gasoline was still good for another three hours. From the Zambezi to Beira it is about 165

miles, as the crow flies. We should, therefore, with the aid of the powerful north wind, probably be in Beira in one and a half to two hours. So I signaled to Hartmann, who was steering while I was occupied in the cabin with photography, to steer south and fixed the *Switzerland* on a calculated course.

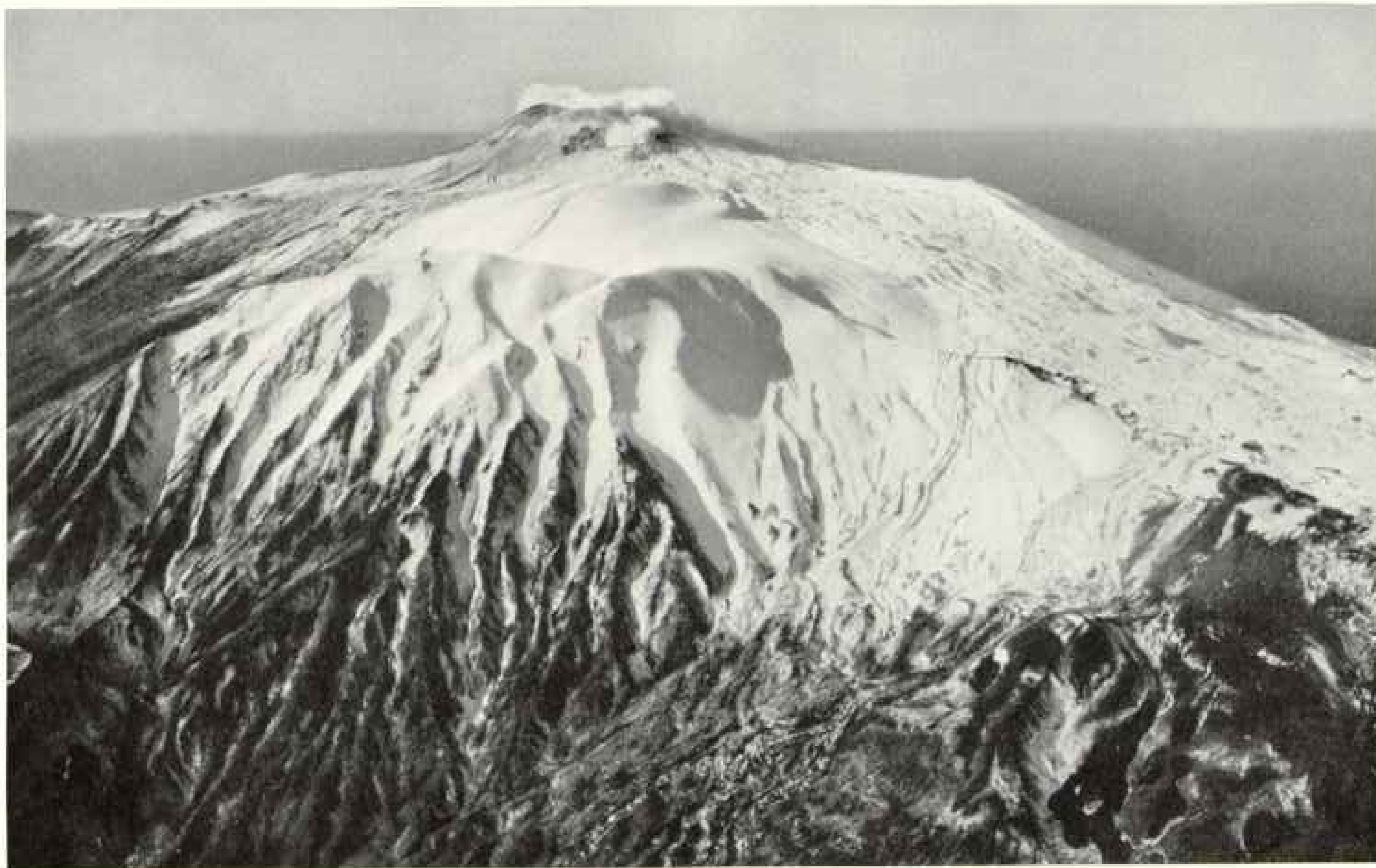
A vast plateau, covered for the most part with virgin forest and illuminated by the yellow light of the evening sun, which intensified the greenness still more, stretched below us. On the starboard I could follow the course of the Zambezi, glittering 60 miles away to the northwest and growing continually narrower, while to the southeast the blue of the sky mingled with the blue of the Indian Ocean.

We rose to a height of 5,000 feet. The air was agreeably warm and quiet, our unthrottled motor sang its usual song, and we were in the best of spirits. That evening the *Switzerland* would rock on the indigo-blue waves of the Indian Ocean and our task would be, so to say, completed.



PLEECY CLOUDS SHROUD SPITSBERGEN'S FRIGID COAST

Whaling, sealing, scientific investigation, and more lately coal mining, have attracted men to this northern archipelago. The islands were discovered by a Norse sea captain in the 12th century and named Svalbard, which signifies "cool coast." In 1920 Norway assumed control over them, under an international agreement, and reestablished the ancient name (see, also, "A Woman's Winter on Spitsbergen," by Martha Phillips Gilson, in the NATIONAL GEOGRAPHIC MAGAZINE for August, 1928).



SNOW AND CINDERS CROWN ETNA'S MASSIVE HULK

The 10,758-foot volcano dominates the Sicilian landscape and is visible far at sea. One must travel 90 miles to encircle its base, which covers an area about five times that of the District of Columbia. Among the ancients it was thought to be the prison of a chained giant, the flames that issued from its crater being his breath and its rumblings his groans. Earthquakes were attributed to his turning over. Captain Mittelholzer flew above Etna *en route* to Persia and to Africa.



AT INTERVALS SINCE THE DAWN OF HISTORY, VESUVIUS HAS POURED DEATH AND DESTRUCTION ON THE COUNTRY ROUND ABOUT

After a long period of quiescence, the most famous of volcanoes burst forth A. D. 79 with a fury that destroyed the cities of Pompeii, Herculaneum, and Stabia. There followed more than 1,500 years of comparative inactivity until, in 1631, another eruption resulted in the loss of 18,000 lives. The last three centuries have seen a continuous state of subdued activity, with occasional serious flare-ups, the most recent of which was in 1929. The volcano rises to a height of about 4,000 feet above the eastern shore of the Bay of Naples.

As, after an hour's flight, I could see no river before me and the sun was already throwing long shadows over crater mountains rising fantastically from the plateau, I realized that Beira could not be reached before dark. I therefore gave Hartmann a more southwesterly course, so that we might at least reach the upper arm of the Pungwe River, which flows into the Indian Ocean and which would provide a favorable landing place.

OVER DENSE FOREST AS THE SUN SETS

The sun set at 6:35, while we still flew onward to the southwest, above dense virgin forest without a river valley. Anyone who knows how quickly darkness in the Tropics sets in after sunset will understand my serious thoughts.

I now took the controls, after having stowed all the photographic apparatus in the tail end of the machine.

At last we were over the Pungwe, which, however, at this point did not look at all

tempting for a landing. In a deep ravine, with steep sides and fringed with steeple-high virgin forest, it flowed toward the south in great bends. So, farther on we must fly, in spite of the rapidly enveloping darkness! Little by little long river stretches came into sight, but here the water seemed to give out and flowed foaming wildly through ravines. It was a desperate situation!

For a moment, I confess, I almost abandoned hope. I did not fear for my life, which was not in danger as long as our motor had enough fuel; but one single thought circulated continually in my brain: How will you fly up again in the morning? Will it be possible, on such a narrow stream, without a take-off, to get into the air? A depressing uncertainty! And if really the heavy machine did not rise from the water, how was I to accomplish its transport through this impenetrable virgin forest land? This would be an impossible business, and I convinced myself of this fact as I dropped to an altitude of 1,000 feet.



THE MOSQUE OF SHAH ABBAS AT ISFAHAN

The soaring blue-tiled dome shimmers, opalescent, in the sunlight, while delicate minarets flank a magnificent vaulted doorway which screens the inner courtyards of the holy structure from the gaze of Unbelievers.



THE DELTA OF A SALT RIVER BETWEEN SHIRAZ AND BUSHIRE

The photograph, taken from an altitude of 7,000 feet, shows a remarkable fanlike sand formation.



ACROSS A GLOOMY, DESERT WASTE WINDS THE CARAVAN ROAD FROM TEHRAN TO KAZVIN

It is the only line of communication between the two cities, and over it passes what traffic there is in silver goods, carpets, tea, and sugar. Karvin is associated with the activities, in the 11th and 12th centuries, of Shaykh-al-Jabal, the "Old Man of the Mountains," whose notorious band of murderous hashish eaters maintained their "earthly paradise" in a mountain stronghold only 30 miles distant. From their activities has come the English word assassin.



TEHRAN'S EXTENSIVE DRILL FIELD AND BARRACKS FROM ALOFT.

On this ground the Shah organized a military display to celebrate the author's arrival. In the foreground stands an immense gateway remarkable for its size and blue faience decorations. The snow-clad Elburz Mountains are visible in the distance.



SOME OF PERSIA'S FINEST CARPETS COME FROM THE LOOMS OF KASHAN.

The city, administrative center of a province of the same name, is about 150 miles from Tehran. It was once the center of an important velvet and brocade industry, but competition of European machinemade products made this an unprofitable business. The craftsmen turned their attention to carpet-making with remarkable success.

Painful minutes, which seemed like hours, passed. We were now flying in complete darkness. Sinister violet gas flames shot out from both the red-glowing exhaust pipes. Inside, in the pilot's seat, I could no longer read any instrument. Long ago I had been obliged to lay the map aside. I must land, go down, cost what it would.

A MIRACULOUS LANDING IN THE DARK

At last—oh, what luck!—a somewhat more open place, where the forest had been held back a little by a wide sand bank, appeared before me; then quickly a curve

to reconnoiter as far as was possible; then a glide, and the *Switzerland* settled gently on the stream where it was hardly more than 60 feet wide. Almost immediately we grounded firmly on a sand bank.

So, luckily landed after all! Safe and sound our great bird rested. The water lapped lightly against the floats. The moon, which now rose, threw its mild, silver light and illuminated our bivouac in the midst of the virgin landscape. Thousandfold hummings and chirpings of millions of awakened insects surrounded us. Everywhere the sparkling lights of the fire-flies twinkled through the warm tropical night.



BUSHIRE, NEAR THE HEAD OF THE PERSIAN GULF, IS IRAN'S CHIEF PORT

Carpets, opium, wool, cotton, and dates are exported from here. The population is mainly occupied with seafaring and trading pursuits and contains a large Arab element. Modern Bushire was founded by Nadir Shah about two centuries ago as a base for his projected Persian navy. Compare the flat roofs of these buildings with the numerous domed dwellings of Kashan shown on opposite page.

A refreshing bath and a short, light meal made us forget all our hardships. We drew our mosquito nets before the cabin window—it was very necessary—and lay down, tired, on our blankets. Hartmann was already sleeping soundly when, after about half an hour, out of the forest, five natives, carrying a lantern, cautiously approached the machine.

Curious to know exactly where we were, I got out. "Does one of these gentlemen speak English?" was my first question. To my great joy, one of the natives came forward and answered in the affirmative. As I had rightly judged, we were on the upper arm of the Pungwe, which flows into the

Indian Ocean near Beira. The nearest native village, Nyarupari, which is not noted on any map, I was told, was six days' march—about 75 miles from Beira. The natives then retired and I again lay down on the floor of the cabin.

Hardly was I half asleep when I was aroused by another lantern light on a native canoe. I saw a mulatto take out a notebook and shine his light on the letters of the name *Switzerland*. Then he shook his head several times, as if not believing what he saw.

Once more, in my night shirt, I came out of our "house" and spoke to the people. A native explained to me in English



THE "SWITZERLAND" MADE A BRIEF STOP AT MONGALLA, ON THE UPPER NILE

This Government station in southern Sudan consists of a cluster of native huts and a few scattered bungalows, but it is the administrative center of a large district. The negro standing at the left, wearing a hat, is a native soldier of the British Colonial forces.

that the mulatto was the postmaster, who very much wished to know whence the curious bird, which had literally fallen from the skies, had come. To my answer, "Switzerland, Suisse, Svizzera," they all believed it to be a town in England, until I explained that our homeland lay between France, Germany, and . . . England.

Evidently a light dawned on the postmaster, as a beaming smile exposed his glittering white teeth. With the greatest obligingness he then asked me if I needed anything at all, which I, fortunately, was able to answer in the negative.

Needing sleep as I did, I bid him good-bye with my best thanks for his friendliness.

But the Fates had written that I should get little rest. Toward 11 o'clock a knock came from without. There were the natives who had been there before, bringing me two large boiled fish and half a dozen eggs on a dish!

I was deeply touched by this hospitality in the midst of the apparently uncivilized virgin forest. So these were the terrible savages described by writers with fantastic

imaginations! How rightly had I acted when I left at home the machine gun kindly put at my disposal by the Swiss military authorities. At Lake Victoria I had even sent back my officer's pistols in favor of an equal weight of photographic films.

Thus, I have crossed the whole of central Africa without any weapons whatever and never have I found myself in the least danger. It was otherwise in the time of Stanley and the pioneers in the Dark Continent, but anyone knowing the Africa of to-day realizes that one can travel through a large part of it with as much, if not more, security than in civilized Europe.

If I must thus rob the romantic adventures of certain authors of their "hero" halos, I am sorry, but I consider it my duty to paint things as I found them.

That which is said of human beings applies also to animals. A lion, a leopard, an elephant, or a snake will not usually attack a person unless the animal finds itself on the defensive.

But now back to the *Switzerland*, in the cabin of which it was terribly warm! I envied Hartmann, who slept like a bear,



NATIVE DANCERS OF THE UPPER SUDAN

The men of this region are remarkable for their great height (six to seven feet) and lean muscularity. They commonly go about stark naked, but streak their bodies with red, yellow, and gray clays. When the author's plane landed on the narrow Sobat River, a tributary of the Nile, the men were extremely shy at first, approaching the huge, strange bird with the greatest caution.

whereas twice I vainly sought coolness in the warm river water.

Sunday dawned with a beautiful red glow. At the first sign of light we cooked a delicious breakfast, which we supplemented with the cold fish and eggs brought by the natives the night before.

A THRILLING TAKE-OFF

In the meanwhile the whole population of the neighborhood had assembled round the plane. It was just as well, for it needed more than 20 stalwart men, spurred on by continuous shouting and encouragement on my part, to get the *Switzerland* free of the sand bank. After an hour of effort the plane was again afloat on the river, which had dropped more than a foot during the night.

A take-off of two-thirds of a mile in a narrow valley that then narrowed to a ravine, the walls of which, with the high trees thereon, towered up to well over 300 feet, was at my disposal. Could we get away from there, especially with the pres-

ent shallow water? That was the troubling question which I asked myself.

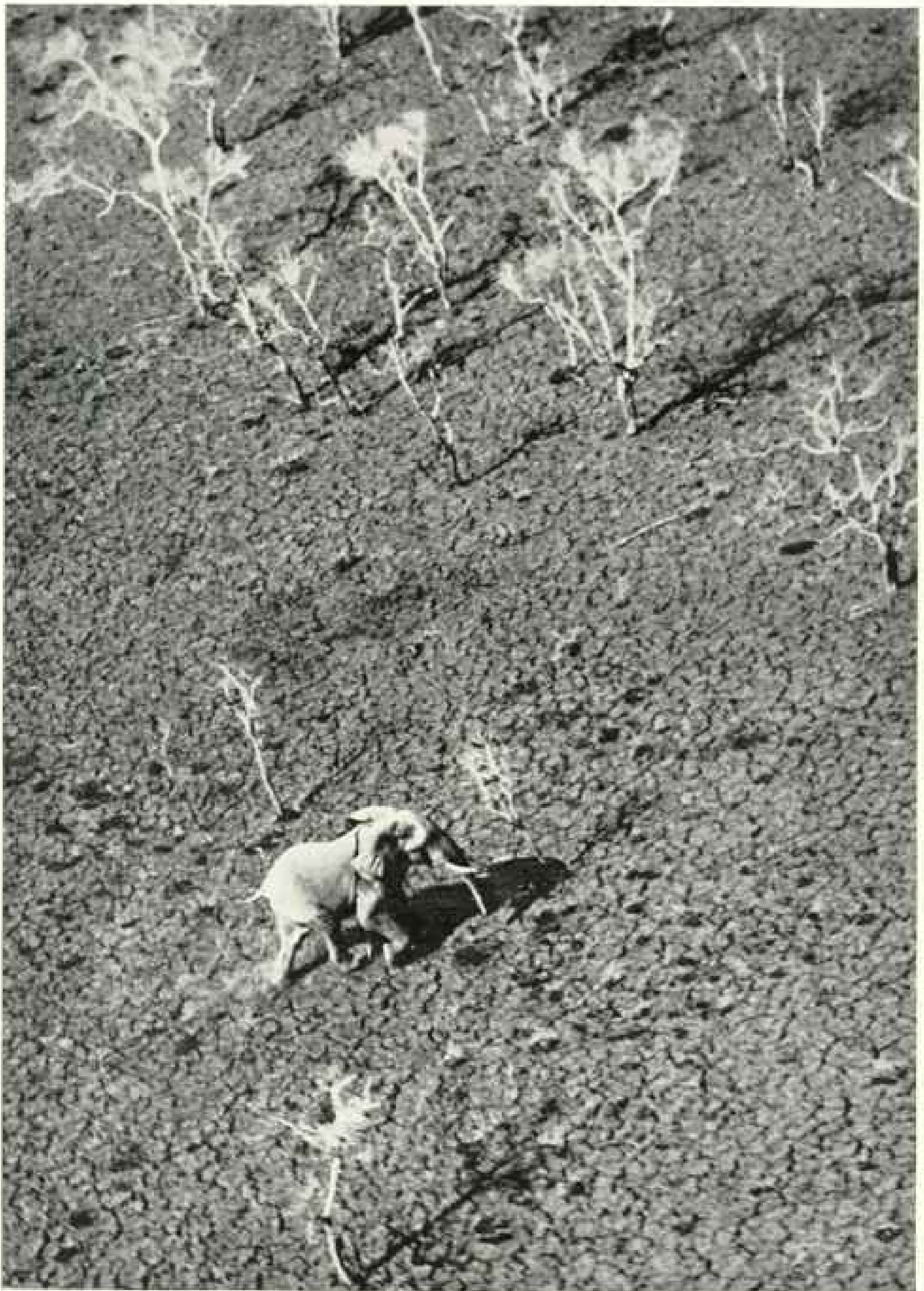
As I skimmed along with running propeller at the end of the starting stretch, we suddenly stuck fast on a hidden sand bank. In spite of full gas and pushing, we could do nothing. Half an hour passed before ten natives, in answer to my calls, came swimming out to us.

Another half hour of hard work and we were again afloat. Now full gas!

Suddenly Hartmann, who had taken his place in the cabin, struck on the controls. "Stop the motor!"

Three natives were sitting on the floats and hanging on for dear life! Then they let go, plumped head over heels into the water, and swam to the bank in a couple of seconds. What a pity that this scene could not be retained on the film!

Lightened of the weight of the unwilling passengers, I again gave full gas. To my joy, the machine leaped forward and in a few seconds was off the water. Then I turned into a narrow ravine and was



Royal Air Force official photograph (Crown copyright reserved)

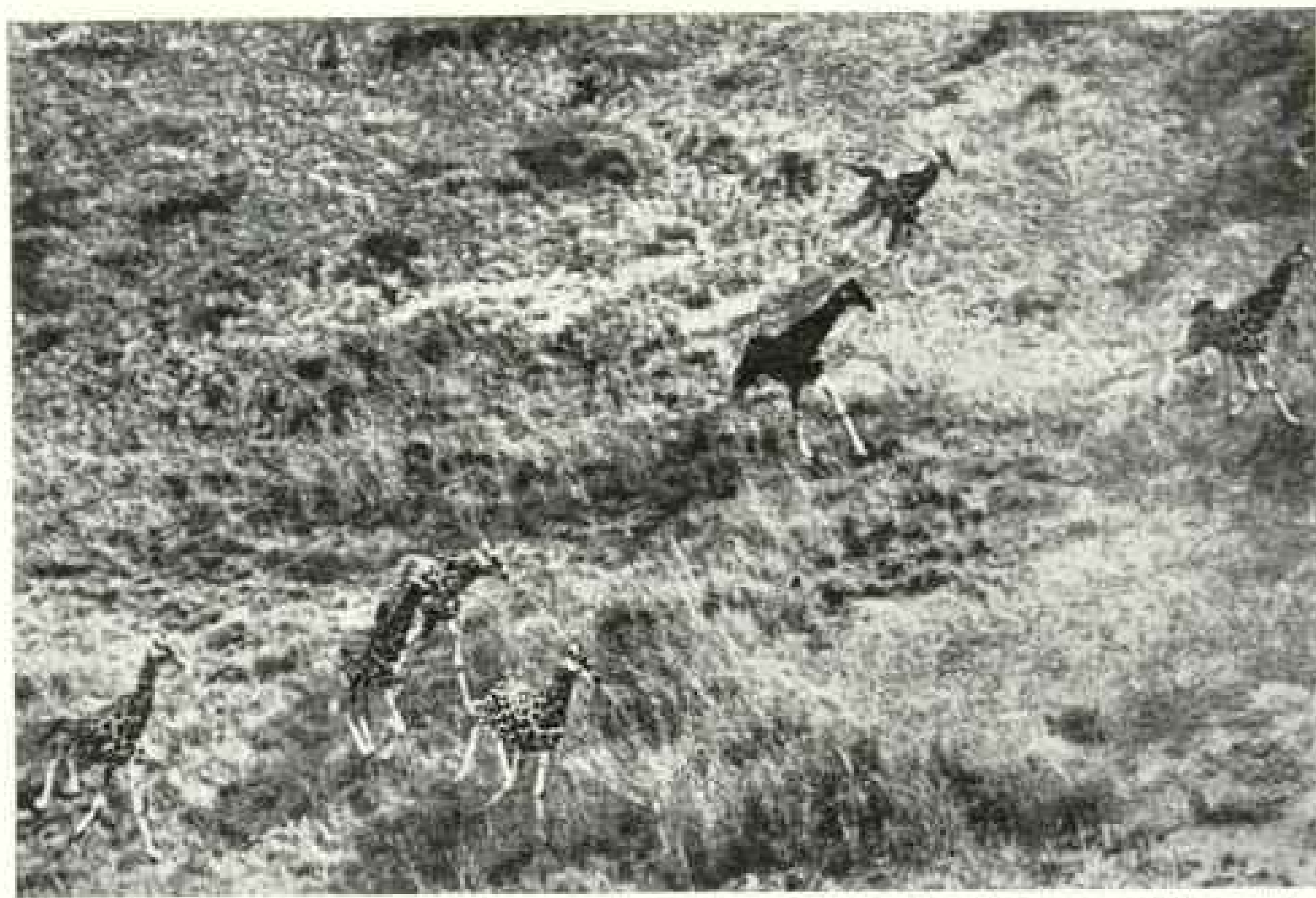
HIS DIGNITY RUFFLED, A LONE BULL ELEPHANT MAKES FOR THE FOREST

An airplane interrupted the big fellow's early morning drink at his water hole. In thus disturbing his elephantine lordship, the man-made bird accomplished what none of the jungle folk would dare attempt.



HIGHEST POINT ON THE CONTINENT, SNOW-CLAD KIBO RISES IN LOFTY MAJESTY

Together with its companion peaks, Mawenzi (left) and Shira, it forms the Kilimanjaro Mountain group in Tanganyika. The author made the first flight over these mountains (see pages 480 and 492).



Royal Air Force official photograph (Crown copyright reserved)

DESPITE HIS LUMBERING GAIT, THE GIRAFFE COVERS GREAT DISTANCES SWIFTLY
The tall beasts are inoffensive and can offer little resistance to their enemies. This herd was checked in mid-gallop by an airplane diving in front of them.



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LOOKING DOWN INTO THE CRATER OF KIBO FROM AN ALTITUDE OF MORE THAN 20,000 FEET

Fearless determination and superb flying skill were essential to attain the great height necessary to fly over Kibo, loftiest of the Kilimanjaro group of peaks in Tanganyika. The orifice at the center of the arenalike extinct crater is a mile and a half wide (see text, page 495).



A SMILE CONSTITUTES FULL DRESS IN PARTS OF TANGANYIKA

Although clothes are not much worn, physical mutilation is practiced as an aid to beauty. Besides scarification, lips and ears are distended. Great rivalry exists as to who shall have the longest ear lobes, and there is a record of one individual who succeeded in getting his ear loops, unbroken, under his armpits.



A NATIVE OF SPANISH WEST AFRICA

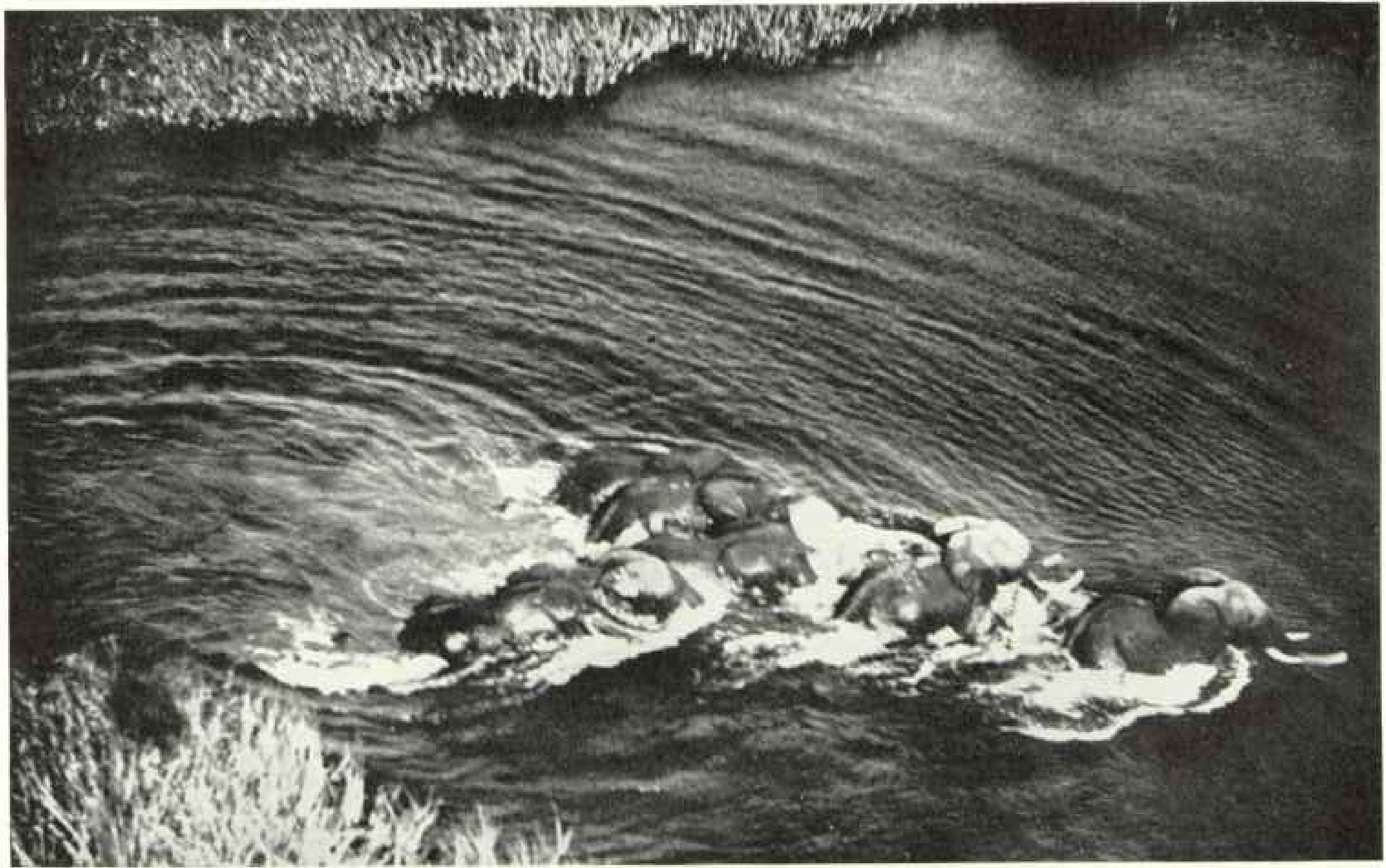
Of mixed Arab and Negro blood, he is employed by the Spaniards to fly with the air mail and serve as interpreter in case of a forced landing. While dwellers in the immediate neighborhood of Cape Juby (see illustration, page 488) are friendly toward the stranger, formidable bands from the distant interior sometimes visit the coast on marauding expeditions.



Royal Air Force official photograph (Crown copyright reserved)

AN AFRICAN BUFFALO HERD ADVANCES IN "ARROWHEAD FORMATION"

The animals are making their way toward a river bed, with bulls in front and cows guarding calves in the rear. No beast met with in the Sudan or, indeed, anywhere in Africa is a more formidable opponent than this species of buffalo.



ELEPHANTS SWIMMING ACROSS THE NILE IN THE ANGLO-EGYPTIAN SUDAN

The shores which flank the upper reaches of the great river are among remaining strongholds of the African elephant. Unlike his Indian relative, this giant beast is not easily tamed and seldom accords to man a complete surrender (see, also, text, page 492).



Royal Air Force official photograph (Crown copyright reserved)

PART OF A HERD OF FIVE HUNDRED ARIEL GAZELLES BOLTING ACROSS THE DRY BED OF A RIVER IN THE ANGLO-EGYPTIAN SUDAN. These members of the gazelle family (*Gazella arabica*) inhabit the arid desert regions of northeast Africa and Arabia. They are sometimes tamed by the natives.



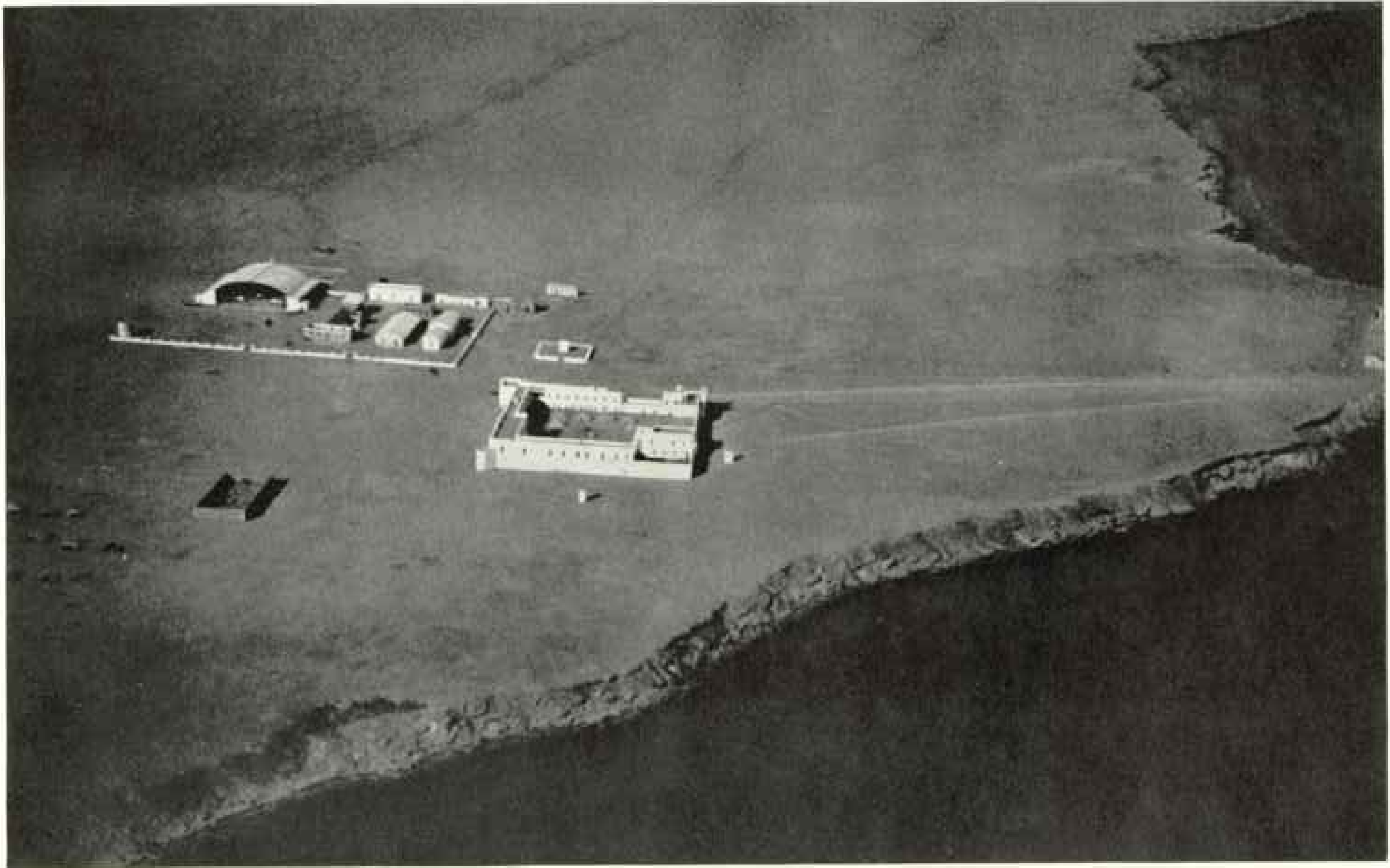
VAST HERDS OF GAME RANGE THE SERENGETI PLAIN: ZEBRAS IN FLIGHT

This area, along the Kenya border of Tanganyika, is an undulating country, set aside as a game reserve, where hartebeest, wildebeest, gazelle, zebra, ostrich, giraffe, eland, and impala thrive. As might be expected in such good feeding grounds, lions, too, are numerous.



WAVING PALMS AND FLOWING WATERS OF BENI ABBES OASIS, IN THE ALGERIAN LAND OF DROUGHT

Despite the fact that the River Saoura rises in the High Atlas Mountains and is fed by their snows, its flow is not constant and the fertility of the oasis is dependent more upon a large spring. Palm, apricot, and fig trees are cultivated. The white structure (right foreground) is a marabout, or religious shrine.



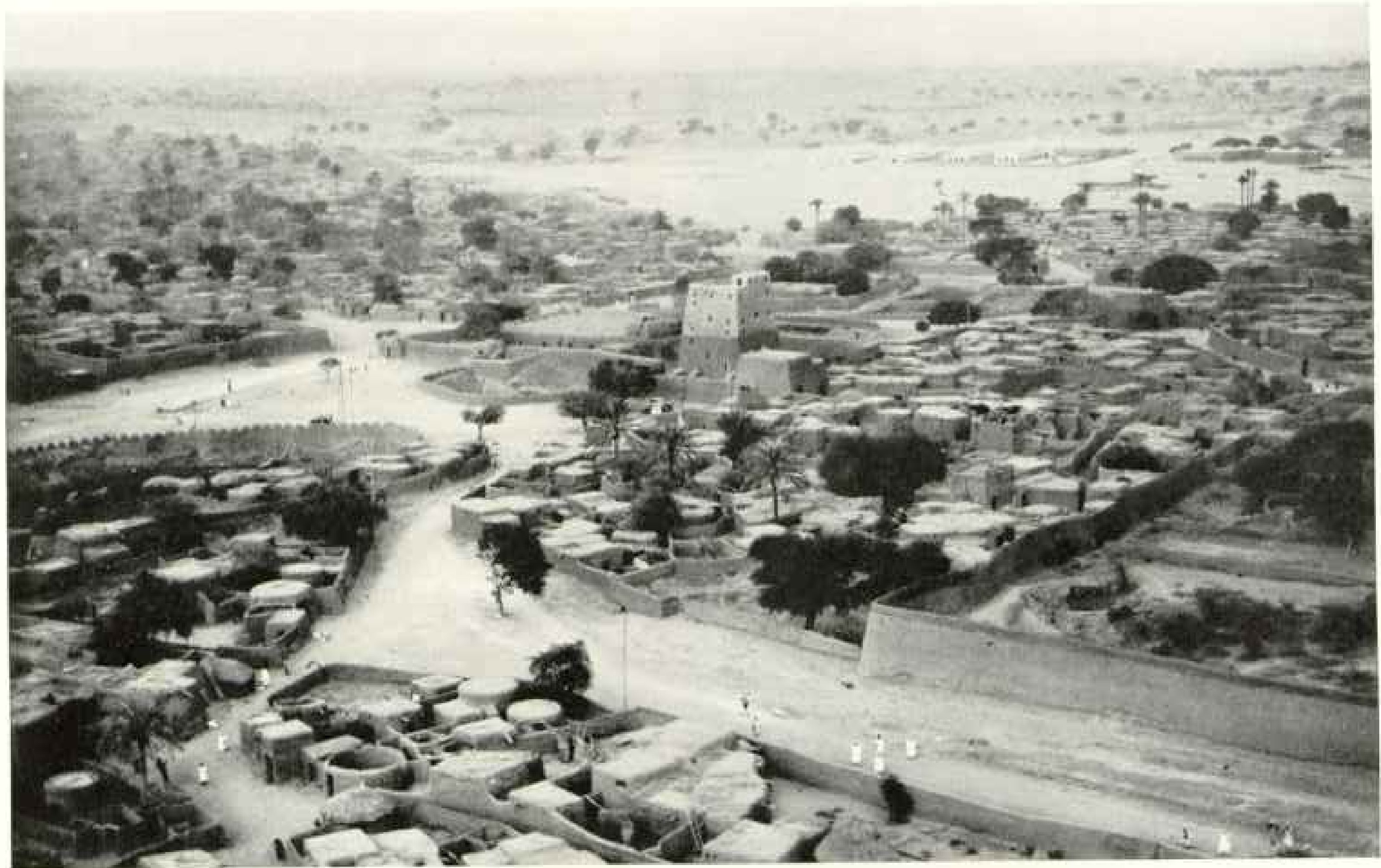
THE SPANISH FORT AND AIRPORT AT VILLA CISNEROS

This seacoast station in Rio de Oro, Spanish West Africa, is headquarters of a fishing industry of some magnitude and serves as a mainland contact with the Canary Islands fishing fleet. In recent years it has become an important aviation field.



SPANISH SOLDIERS LEND A WILLING HAND IN DRAGGING THE AUTHOR'S MACHINE OUT OF DESERT SANDS

From this perilous landing the plane was hauled to the protection and security of a hangar at Cape Juby, on the coast of Río de Oro, Spain's African desert colony of 109,000 square miles with less than 500 inhabitants.



ONCE A STORM CENTER OF WARRING TRIBES, KANO IS NOW THE METROPOLIS OF BRITISH WEST AFRICA

The beginnings of Kano are shrouded in obscurity, but it can claim at least a thousand years of history. Chief city of the largest and most important Nigerian Emirate, it has been termed the Manchester of Africa, for cotton cloth from its looms is to be found all over the central and northern parts of the continent. Nearly all of its buildings are of mud, baked hard as stone in the blazing African sun.



THE FAME OF KANO'S MARKET ATTRACTS MERCHANTS AND GOODS FROM A LARGE PART OF WEST CENTRAL AFRICA

From 4,000 to 7,000 people gather here each day to buy and sell a vast variety of merchandise. The crowd is businesslike, good-humored, and composed of an extraordinary multiplicity of types. Each trade has its own quarter, but food and clothing constitute the most important articles of sale.

immediately high above the waving tree tops of the illimitable forest.

With lightened hearts we raced toward the Indian Ocean. After about 10 minutes we came out of the forest. A plain stretched before us. New tributaries fed the Pungwe from both sides until it poured into the Bay of Beira as a broad river.

Fifty-five minutes later, shortly before 10 o'clock, I circled above the clean Portuguese seaport, the streets and open places of which were suddenly packed with people. Two "rounds of honor," and the floats of the *Switzerland* touched, close to the quay, the salt waves of the ocean which washes the shores of India and Australia!

A BIG-GAME HUNTING TRIP BY AIR

Two years later I received a request from Baron Louis Rothschild, of Vienna, to take his hunting party as quickly as possible, by air, to what is, without doubt, still the richest district in the world for

big-game hunting, the Serengeti Plain, in Tanganyika Territory, a seemingly inexhaustible game reservation, where the expert photographer, Martin Johnson, has "shot" hundreds of lions and tens of thousands of gazelles and zebras with his camera.

Based on the experience I had gained and the technical progress made in air traffic, for this trip I used, for the first time, a three-motored Fokker plane of the same type as that with which Admiral Byrd carried out his Atlantic flight from New York to France.*

According to program, our December flight carried us over the Alps, over Vesuvius, and the highest crater in Europe, Mount Etna (see pages 469 and 470). Along the barren coasts of Tripoli, Bengasi, and Sollum, I reached Cairo in three

* See "Our Transatlantic Flight," by Comdr. Richard Evelyn Byrd, in the NATIONAL GEOGRAPHIC MAGAZINE for September, 1927.



A MOUND OF STICKS AND MUD MEMORIALIZES THE FOUNDER OF A DYNASTY

The Askia line of kings, which began with Mohammed Abubakar in 1494, ruled over the Songhai Empire, in the French Sudan, for nearly a hundred years. The first Askia was a wise and able monarch, who made his country both feared and famous. This, his tomb, is near Gao.



KADORS FOR SALE ON THE STREETS OF KANO

He offers skewers of mutton, goat, or beef, but certainly not pork, for this is a Mohammedan land. These bits of meat, spitted and roasted over a fire of coals, appeal to the Hausa appetite as do "hot dogs" to the hungry American.



SUNLIGHT DRENCHES THE MUD-WALLED SQUARES OF OUAGADOUGOU

The French administration has decreed that this nearly shadeless town shall be the center of government for Upper Volta and has laid it out on a grand scale. Each walled-in block provides living quarters for one family in all its ramifications. Upper Volta has an area two-thirds as large as continental France, with a population of three and a quarter million natives and less than 400 French residents.

days. From there the city of Nairobi, in the Kenya Colony, was reached in a four-day flight. In the Upper Sudan, between Malakal and Mongalla, we saw hundreds of elephants, which I photographed from the plane at a height of a few yards (483).

From Nairobi, where there are several thousand white residents, attracted by its elevated and healthful situation, we carried on to the great grass steppes of the Serengeti Plain, where I found ideal landing grounds at all points (see page 485).

While my friends hunted lions, rhinos, leopards, and gazelles there, I undertook several reconnoitering flights over the in-

teresting high craterland, where I flew over and photographed dozens of extinct giant craters.

On January 5, 1930, we flew over the 17,040-foot Mount Kenya almost without difficulty, whereas the crossing of the 19,450-foot Kilimanjaro made great demands on both machine and pilot.

On the 8th of January I started with my assistant pilot, Künzle, with much photographic material on board, from the airdrome in Nairobi. We flew past hundreds of zebras and antelopes, and stampeding Grant's gazelles almost came under our wheels as we flashed by.



CLOTH DYERS OF QUAGADOUGOU EMPLOY CRUDE BUT EFFECTIVE METHODS

Into pits which are sometimes as much as 30 feet deep, indigo leaves and charcoal are placed and water poured on. Pieces of cotton cloth are then placed in the solution and left for from one to ten days. From this immersion they acquire varying shades of blue much in demand by the natives. The process is an old one among the Mossi.

We took to the south, and after a few minutes could see the characteristic outline of the two independent peaks of the Kilimanjaro—on the left the pointed cone of the Mawenzi, 17,286 feet, and to its right the brilliantly lighted lines of the Kibo, 19,450 feet high, rounded off regularly on nearly all sides (see page 479).

The missionaries, Rebmann and Krapf, were the first white men to see these mountains. That was in 1848. As recently as 1889 the German, Hans Meyer, was the first to make a successful ascent of the Kibo and to bring back information as to its ice-bound crater plateau. Three strati-

fied volcanoes, through succeeding eruptions, have molded themselves together into the gigantic mountain mass which now forms the Kilimanjaro.

Shira, west of Kibo, is the smallest and oldest of the volcanoes. Its crater, which from our flight height appeared as an unimportant ridge of the Kibo, has a circumference of about three miles.

After the formation of the Shira the Mawenzi arose, the eastern crater edge of which was destroyed by eruptions and in the course of centuries was changed by weathering into a steep rock tower. Later the Kibo towered between the Mawenzi and Shira.



THE AUTHOR EXPLAINS SOME OF THE MYSTERIES OF HIS PLANE
TO LADIES OF OUAGADOUGOU.

The high plateau of the Athi sank rapidly below us. At 7 o'clock, at a height of 13,000 feet, we crossed the railway line which connects the large soda works on the Magadi Salt Lake with the Uganda Railway. A monotonous, brown-red desert landscape, void of all trees and bushes, extended before us for at least 60 miles.

I arranged my five aerial and motion-picture cameras in the cabin in order to have them immediately to hand if anything of great interest occurred. On starting, the outer temperature was 72 degrees Fahrenheit, at 10,000 feet it was 55 degrees, at 13,000 feet 44 degrees, and then, as we reached the respectable height of 16,000 feet at 7:25 o'clock, it was still 5 degrees above freezing.

We passed the great blue, shimmering salt lakes of Amboseli and Loginja. We now came into the rainy zone of the Kilimanjaro, which appeared distinctly below us in the beginning of the brush and forest zone. On the starboard, the crater mountains of the Erok (8,375 feet) and the Longido (8,574 feet) sank into small, unimposing hills, whereas the Kibo, with its unblemished white, glittering ice screen, still towered above us in the dark-blue, cloudless sky. At 7:45 the altimeter indicated 18,500 feet; the outer temperature had meanwhile sunk below freezing. However, we were comfortable in our machine, thanks to our heated cabin.

CREEPING ABOVE THE
CRATERS WITH THE
AID OF THE WIND

I was fully conscious that thanks only to the lifting wind on the broad north front

of the mountain was it possible to reach such an abnormal height as 20,000 feet with our heavy transport machine. I therefore held on from the beginning in the region of the upward-flowing air currents as they became known to flyers, a few years ago, through the art of air sailing.*

As the air currents are more or less favorable according to the distance from the mountain, the problem is to find the best mounting position and to profit by it.

Very carefully my companion, Künzle, manipulated the plane, as we had still to ascend a good 2,000 feet if we wished to

*See "On the Wings of the Wind," by Howard Siepen, in the NATIONAL GEOGRAPHIC MAGAZINE for June, 1929.



WHEN MOSSI FRIENDS MEET IN UPPER VOLTA AN ELABORATE GREETING ENSUES

The younger man throws himself on the ground. The other may follow his example or, if he be a chief, may merely sit down. Various antics follow, depending on the respective ranks of the individuals, but nearly always there is a handclasp, and the younger or inferior person bows his forehead to the dust, and then, with elbows wide apart and thumbs upright, strikes the ground sharply with his forearms three or more times. The two decorated round objects are cushions used for ceremonial purposes (see, also, illustration, page 496).

discover the secrets of the crater floor. If he pulled the elevators too forcibly, the bow of our plane certainly rose; but, on the other hand, we sank again to the former height because of the loss of speed. At last we found out, by means of a comparison of the speed indicator and the aneroid, the most favorable rising speed, and, to our great joy, we perceived that we were gaining height slowly.

But, disregarding the height indicator, I was conscious of the high altitude in my own person, as, with confidence in my robust health, I had taken no oxygen apparatus with me. Whereas Künzle, who up to now had sat at the controls almost immobile, without the least physical exertion, still felt no unpleasantness, I began to experience pains in my head and an increased pulse.

After each photograph, after each turn of the motion-picture handle, I was obliged to take deep breaths. The lack of oxygen, which decreased even the capacity of our motor by more than half, rendered every

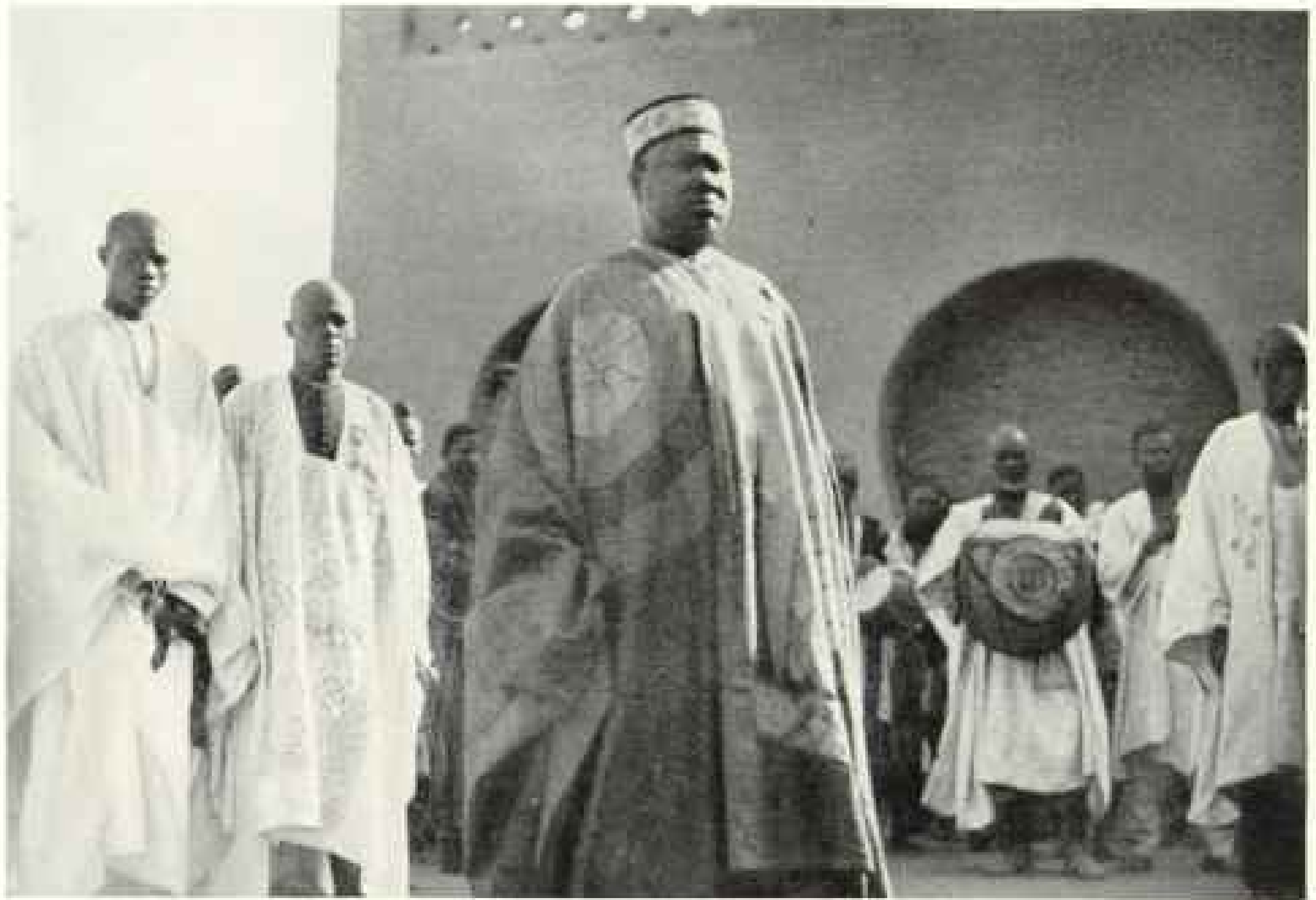
human exertion much more exhausting. However, the pleasurable excitement, the strained will power, caused all bodily exertions to be forgotten.

Visibly the ice roof of Africa sank, apparently only inch by inch, into the depths. We flew in large curves on the north and east sides, always remaining at a respectable distance.

At about 8:30 I spied, above the concave glacier cap of the eastern flank of the Kibo, the sharp southwest ridge, falling in steep rock walls to the crater, and of which the highest point has a height of 19,450 feet. This "piling" resulted in our having reached a 19,500-foot level. For the 600 to 1,000 feet still lacking, which were necessary for a safe flight over, we needed another 10 minutes' ascent.

Meanwhile a most remarkable, unexpected picture spread out below us.

The outer ring of the old extinct crater is marked by sharp rock and ice ridges. Gradually the ring deepens to a gigantic arena, at the bottom of which the one-and-



NO VOICE MAY BE RAISED IN HIS ROYAL PRESENCE

Morho Naba, King of the Mossi, was one of the last of the black potentates to accept French rule in Upper Volta (see page 492). He lives in a vast mud palace at Ouagadougou, surrounded by a numerous court and supplied with an extensive harem. Each morning at 7 a gun is fired. This is the signal for His Majesty to rise, don a red robe, and rush out of the palace. Mounting a horse ready saddled in the courtyard, he shouts lustily, "I want to go to La," which signifies that he is consumed with a desire to make war on the traditional enemies of his State. At this point an official of the court approaches and suggests, in a small, meek voice, "Sire, order them to unsaddle your horse; you will go there to-morrow." Then all the bystanders prostrate themselves as the monarch dismounts and curses the cowards who keep him from his duty.

a-half-mile-wide orifice of the former fiery abyss yawns, reminding one of the Cyclops eye in a mythological picture (see page 480).

How often, without having felt any special thrill, have I seen things from the air which no human eye had seen before. To us flyers the new experience is such a matter of course. To-day, however, as I looked down onto this enormous, fantastically formed peak, the joy of success tingled in my veins, the pride of the discoverer.

The *Switzerland* thundered, 21,000 feet high, over the Kibo. When exactly over the ghastly crater the plane was shaken by wind gusts, so that I had to hold fast to avoid being thrown over.

During half an hour, in which I turned hundreds of feet of films, we flew in wide curves round and above the Kibo, whose three greatest ice streams—the Credner, Drygalski, and Penck glaciers—flow down

on the west side more than 4,000 feet into the lava slopes.

To the east of the Kibo the 17,286-foot Mawenzi, with curious rock towers, seemed to beckon to us above an undulating sea of clouds, but I reserved a visit to this high rock stronghold for a later flight and gave Künzle the signal to throttle the motor and fly back to Nairobi.

Suddenly I noticed that my companion's face had become white and drawn, with dark rings round the eyes. He complained of terrible pains in his head. I took over the steering, so that he could recover in the cabin. In the warm air his condition did not improve immediately; he was very sick. Eventually, however, he came forward again to the controls, looking decidedly fresher.

Although our motors were almost shut off, we sank but slowly. Our lightly charged machine sailed in the air, which



CEREMONIAL DANCERS OF THE UPPER VOLTA REGION

At funerals men perform a regular burial dance, while the women stand about and chant to the accompaniment of weird drumbeats. When a body is put in the grave, coins are thrown in to pay its way on the journey to eternity. Before filling in the earth, a gravedigger exhorts the departed to be economical of his money and not let his ghost return to haunt the relatives.

was becoming more and more unquiet, like some well-fed, gigantic bird. During a spiral at about 13,000 feet above Lake Amboseli, I saw how the peak of the Kibo sank, little by little, into the clouds. Soon in the cold snow and ice clouds, which render the ascent of the mountain so difficult, it had withdrawn from our view altogether.

Somewhat tired from all the brilliance of the ice region and the perpetual exertion, I landed at 10:40 in the airdrome at Nairobi after a good four-hour trip.

After this flight, which was the most interesting of all my experiences and of which the photographs can give but a feeble idea of the reality, we flew home. Our return from this two-month African sojourn was made in seven one-day stages of about 600 miles each, again according to program, via the Sudan, Egypt, the Mediterranean, and Greece.

Africa, the continent of so many charms and secrets, had now fascinated me. With joy I accepted a mandate from the American financier and sportsman, Kingsley Macomber, to carry him by air, in the winter

of 1930-31, to Lake Chad,* that enormous inland sea spun round with unending enchantment, from the vicinity of which, a few decades ago only, gruesome reports of slavery and superstitious massacres trickled through to Europe.

THE SAHARA AS A THOROUGHFARE FOR AIR TRAFFIC

On this third African flight I had an opportunity to make thorough acquaintance with the Sahara, for thousands of years, the dividing barrier between the white and black races. Thanks to its natural landing places, often of enormous dimensions, it is the thoroughfare par excellence for future air traffic to the fertile regions of Central Africa, and to the gold and copper mines of the Belgian Congo, which are of such economic importance.

On December 8, 1930, I reached the ancient sultans' town of Fès, in Morocco, via

*See "Through the Deserts and Jungles of Africa by Motor," by Georges-Marie Haardt, in the NATIONAL GEOGRAPHIC MAGAZINE for June, 1926.



FROM THE AIR, SAHARA'S GREAT DUNES APPEAR MERELY AS CRESCENT RIPPLES ON THE BOUNDLESS SEA OF SAND

The photograph was made from an altitude of 3,000 feet, near Beni Abbes (see illustration, page 486). The dunes are actually 30 to 50 feet high.

Spain, the Mediterranean, and the rugged Rif Mountains. From Marrakech,* the largest town in Morocco, the highest chain of the High Atlas was flown over toward the Sahara to the oasis of Colomb Béchar, which was to be the point of departure for the actual desert crossing of 1,200 miles.

Thanks to the excellent civilizing work of the French, who have established a network of airdromes in their widely extended colonial territory, from the Mediterranean to the Gulf of Guinea, we were able to carry out our program without a hitch.

*See "Across French and Spanish Morocco," by Harriet Chalmers Adams, and "Morocco Beyond the Grand Atlas," by V. C. Scott O'Connor, in the NATIONAL GEOGRAPHIC MAGAZINE for March, 1925, and March, 1932, respectively.

On Christmas Day, 1930, with our congenial client, we reached Lake Chad from Kano, in British Nigeria. The extent of the lake varies according to the height of the water, the greatest depth of which is now not more than $7\frac{1}{2}$ feet.

Via the Niger and Senegal country, we came to Dakar, on the west coast, and then flew over the dreary coast of Rio de Oro, partially populated by nomad robbers, toward Casablanca.

It was an exceedingly interesting journey, free of all difficulties. We were therefore afforded ample opportunities to make the acquaintance of the native peoples, whose customs and traditions gave us highly interesting glimpses into their culture, which is more fully developed than that of the black folk of the east side of the continent.



LOOKING IN ON NEW TURKEY

THE former sick man of Europe has taken a new lease on life—in Asia. There, on the bleak, wind-swept Anatolian plateau, Turkey has set about the task of building up a new State and a new social order, looking to the West for a pattern.

Progress is slow in some phases of its development, for the Anatolian peasant is fundamentally a conservative of conservatives and has proved acquiescent rather than enthusiastic in accepting reforms. However, more change probably has come into his life during the last decade than in any century that has gone before.

He no longer owes allegiance to a Sultan of the House of Osman, but serves the Turkish Republic.

By Government order he doesn't wear a fez any more. Not that there was anything economically unsound about a fez, but because the leaders who ordained its departure were keen psychologists, and realized that their countrymen could not compete as well with representatives of the Western World while they wore a head-gear that set them off as distinctly different.

In accord with another official promulgation, a Latin alphabet has replaced the beautiful but cumbersome Arabic script. Everyone set about learning this new method of written expression.* Only a very small percentage of the population could read or write the difficult Arabic characters, and even these found the alphabet a handicap in commercial dealings with foreigners.

NATURAL RESOURCES ARE PLENTIFUL— MONEY IS SCARCE

When the Republic came into being, in 1923, it took over an empty exchequer. Turkey is not lacking in natural resources, however. Copper, silver, zinc, chrome ore, manganese, meerschauum, borax, emery, some coal, and a little iron make up the mineral treasure chest. There are also approximately 21,000,000 acres of timberland and a considerable amount of unharnessed water power.

Only about 2 per cent of the population is engaged in manufacturing. Perhaps the most important articles produced are car-

pets, the weaving and coloring of which require some degree of skill. Fig-packing plants, ginneries, textile and sugar mills also assume prominent places in the nation's rather meager industrial life.

A vast majority of the people of Anatolia have always derived a living from the soil or from their flocks, but the methods used are only just beginning to develop past the primitive.

Many peasants still break the ground for planting with flint-tipped wooden plows drawn by oxen or buffalo or, perhaps, if there are no animals available, by daughter or wife. However, steel plows are beginning to make their appearance here and there, and near the coast cities tractors are coming into use.

A RACE NOT EASILY DISCOURAGED

Eleven years of almost constant warfare immediately preceded the establishment of the Republic and culminated in a decisive victory over the Greeks at the Sakarya River, in August, 1921, and a heroic defense of the medieval citadel of Gazi antep, near the Syrian frontier (see Color Plate I). This period of conflict left Turkey sadly depleted of farm animals, seeds, and agricultural implements, as well as able-bodied man-power.

But these Anatolian peasants are a tenacious race and, at the disbanding of the armies, back to their despoiled farms they went—those who were physically able—and, with such equipment as could be scraped together, began again to cultivate the soil.

There was no money for farm machinery. Grain was threshed by the primitive method of rolling it out under a heavy log set with sharp stones, and was converted into flour between two heavy stones manipulated by the women of the farm household. Now the new Government is operating agricultural schools which teach the advantages that accrue from the use of modern farm machinery.

TURKEY IS FAMED FOR FIGS AND TOBACCO

Among the more important crops raised are cereals, figs, olives, fruits for drying, tobacco, and cotton. Smyrna figs and Samsun tobacco have long been famous in the markets of the world, and of recent years cotton from the region about

* See "Turkey Goes to School," by Maynard Owen Williams, in the NATIONAL GEOGRAPHIC MAGAZINE for January, 1929.

Adana has begun to attract international attention.

There are about 12,000,000 sheep in Turkey and nearly as many goats. The former yield a rather coarse wool which is admirably suited to carpet manufacture. The hair of the goats, many of which are of the Angora variety, supplies the material for the manufacture of mohair.

Savage dogs, their throats protected from wolves by heavy spiked collars, guard the flocks, and some shepherds would almost rather lose a child than one of these watchdogs.

Although official freedom has come to the Anatolian peasant women, they have not experienced practical emancipation to the same degree as their city sisters. They cling to their veils, resent the Government liquor stores, are shocked by the semi-nudities of the new periodicals, see in the motor car a terror to their beasts, and dread the railways, for whose coming the men are eager. They do much of the hard work about the farms, and in addition spin out the wool which their sheep give, and weave it to make clothes for all the family (see Color Plates II, V, and VII).

The Ottoman Turks first appeared in their present homeland early in the 13th century, when a few thousand of them, driven from Central Asia by Mongol invasion, settled near the present Ankara. Sixty-eight years later the Osman dynasty established itself and eventually conquered a large territory extending into Europe and Africa, as well as Asia.

Through the succeeding centuries unsuccessful wars followed the earlier victorious campaigns, with the result that the far-flung Empire was reduced to the limits of the present Republic. But in some respects the shrinking process was a disguised blessing, for it eliminated many of Turkey's polyglot racial problems.

There are still within the country minority groups of Circassians, Armenians, Arabs, Kurds, and Turkomans; but, with the possible exception of the Kurds, who are fairly numerous and intensely nationalistic, these people do not present grave difficulties. The Turkomans, who live near the western borders, are a nomadic people and subsist almost entirely on their flocks (see Color Plates VI and VIII).

Ten years ago there were approximately 3,000,000 Greeks living in Anatolia and eastern Thrace, but those who survived the war of 1919-22 were removed to Greece in exchange for about 500,000 Turks living there.*

LARGE CITIES ARE FEW IN THIS NEW REPUBLIC

Turkey's only large city is Istanbul (Constantinople), and since it has been shorn of its importance as the seat of government, many of its palaces are empty and in disrepair, and the bazaars, while still wonderful, have not the variety of attractions for which they were once noted. The only feature which has not changed is the matchless beauty of the Golden Horn and the Bosphorus, as their blue waters reflect mosque and minaret and crumbling fortress tower.

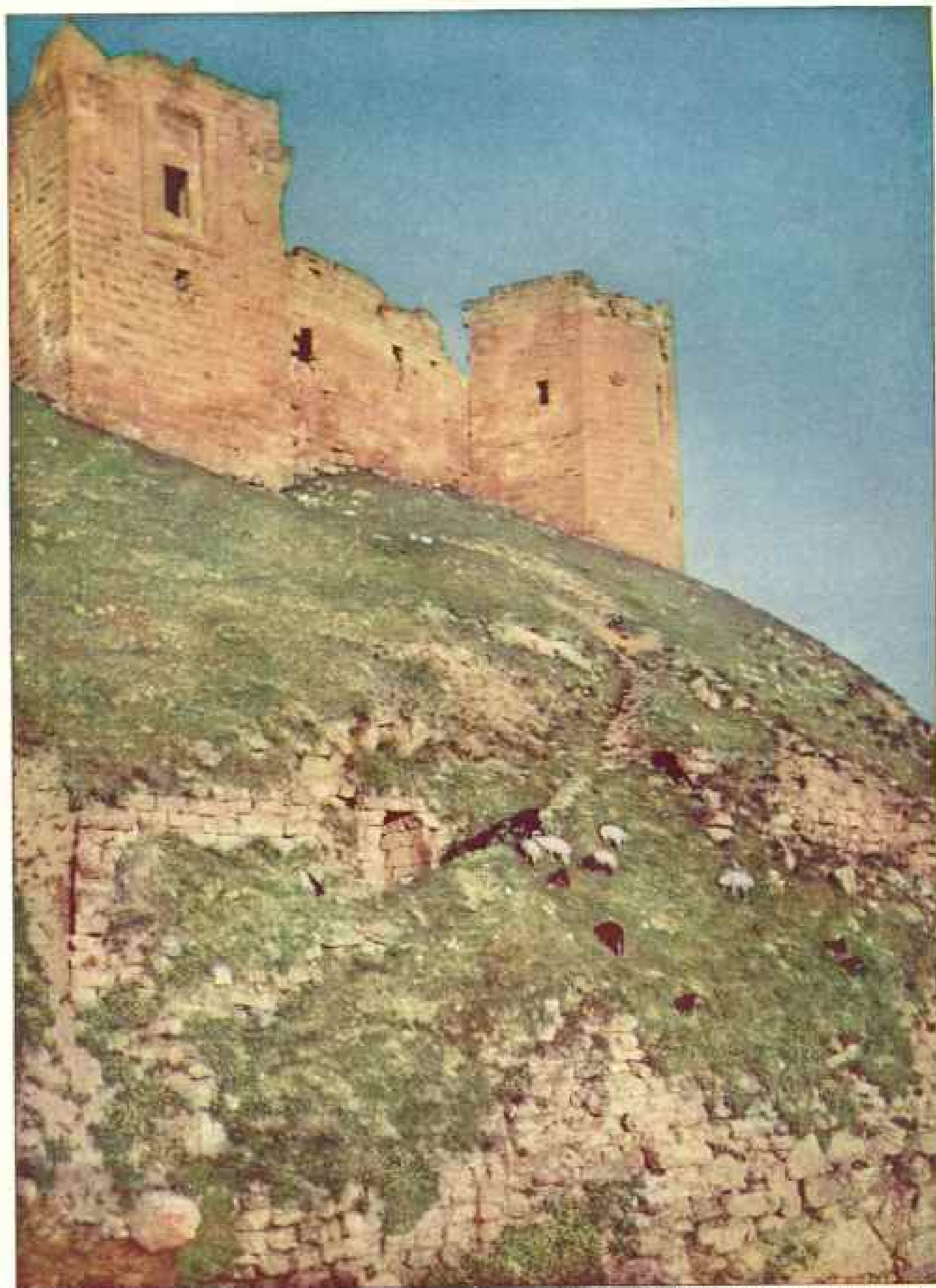
Ankara, awkward adolescent, throbs with energy. Call the new Turkish capital An-go-ra and you relate it to Angora cats and Angora goats. Call it Ankara, as the Turks do, and its name suggests the anchor, paradoxical emblem of an inland city, which marked its ancient coins.

Between the railway and the city, what was a malarial swamp has become a sports field, resort of fashion. On the main street, up which big buses climb to a shoulder of Citadel Hill, are crowded schools. Near the Museum, happily conceived and magnificently placed, is an equestrian statue of the first and present President of the Republic, Mustafa Kemal Pasha, confidently scanning the West.

Anatolia still colors the life of its capital. Bright-shirted peasants throng the market place. Flocks of turkeys wander about, fattening themselves for sale. Carts with solid wooden wheels and drawn by sluggish water buffaloes poke solemn fun at the speed-suggestive red helmet and arm band of an ultra-modern traffic policeman.

Izmir (Smyrna), Adana, Konya, and Bursa are other important cities. The last named (see Color Plate III) is a veritable dream city, charmingly located on the gorge-gashed lap of the Mysian Olympus, not far inland from the Sea of Marmara.

* See "History's Greatest Trek," by Melville Chater, in the NATIONAL GEOGRAPHIC MAGAZINE for November, 1925.



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Natural Color Photograph by Hernan H. Kryzler

SHEPHERDS PASTURE THEIR FLOCKS ON THE CRUMBLING CITADEL OF GAZI ANTEP

Sheep and goats graze contentedly now where in other days Crusaders and Saracens did battle. The castle was an important strategic point when in 1183 it was captured by the famous Saladin, and so prominent was its rôle in the Franco-Turkish warfare of 1919-21 that it earned the name of "Verdun of Anatolia." During the last decade Gazi antep has lost much of its military significance.



Natural Color Photograph by Maynard Owen Williams

ENTRANCE TO THE TURKISH NATIONAL ASSEMBLY BUILDING IN ANKARA

The legislative arm of the Government, in which the constitution of the Republic vests all the attributes of national sovereignty, meets here. The single-chamber legislature is composed of 283 deputies in whose election every male Turk over 18 years of age is potentially eligible to participate.



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Natural Color Photograph by Herman H. Kreidler

ALL OF THEIR CLOTHES WERE MADE AT HOME

Many young Anatolian villagers wear garments which have been woven, fashioned and embroidered by the women of their own families. The youth on the right has a characteristically Turkish countenance, while his companion's features betray a Kurdish ancestry.



Natural Color Photograph by Gervais Courtellmont

BURSA SPREADS ALONG THE LOWER SLOPES OF MYSIAN OLYMPUS

The ancient and beautiful city has been besieged, destroyed and restored a number of times. It was here that the Ottoman Turks established their first capital. Silk spinning and the manufacture of carpets and prayer rugs are important industries.



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Natural Color Photograph by Herman H. Kreider

A WOMAN OF NEW TURKEY CONTEMPLATES THE BEAUTY OF THE BOSPHORUS

Her vantage point is one of the princely establishments which border the famous waterway. Dozens of such estates, the property of former office-holders, may be bought for a song since the seat of government has been transferred to Ankara.



© National Geographic Society

Natural Color Photograph by Maynard Owen Williams

FOR COUNTLESS CENTURIES MEN HAVE MADE THEIR HOMES IN THE STRANGE ROCK CONES OF CAPPADOCIA

The ancient eruptions of a now extinct volcano laid the foundations for these remarkable habitations, and in succeeding centuries erosion became their tireless architect. The material ejected by the volcano during its ages of activity covers a wide area and consists of a vast bed of pumice-stone of unknown depth, beneath a comparatively thin layer of lava. The pumice is soft and the cones have been excavated into giant apartment houses by the troglodytes who live there (see also "The Cone Dwellers of Asia Minor" in the National Geographic Magazine for April, 1919).



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HENNAED FINGERS PLY THE DISTAFF

A familiar scene on the Anatolian plateau where sheep and goat raising is extensively carried on by the peasants. Anatolian wool, except that of the Angora goat, is generally of a coarse quality and is used chiefly for homespun clothing and in the manufacture of carpets.



Natural Color Photographs by Herman H. Kreider

MAKING BUTTER IN SOUTHERN ANATOLIA

The housewife of Gazi antep Province churns her week's supply of butter from whole goat's milk. The practice of skimming the cream has not been adopted and no attempt is made to lessen the labor involved or to produce more palatable results.



© National Geographic Society

Natural Color Photograph by Maynard Owen Williams

A TENACIOUS PRIDE HAS PRESERVED RACIAL INTEGRITY FOR THE TURKOMANS

These unveiled women of the table-lands of western Turkey retain a remarkable purity of blood and maintain their ancient type almost unchanged despite long association with other tribes and races of Asia Minor (see also Color Plate VIII).

LOOKING IN ON THE EVERYDAY LIFE OF NEW TURKEY



HOME INDUSTRY IN AN ANATOLIAN VILLAGE

Here the whole process of producing, cleaning, spinning, weaving and dyeing the wool is carried on in the home with every member of the family taking a part.



© National Geographic Society

Natural Color Photographs by Herman H. Kreider

TURKISH PEASANTS MAKING FLOUR

They are slow to believe that the methods used by their forbears have been improved upon by machines which can do work quicker and better than human hands. Flour is still ground between two stones.



© National Geographic Society

Natural Color Photograph by Maynard Owen Williams

SHE IS AS FREE AS THE MEN OF HER TRIBE

The Turkomans live under tribal laws of their own which subject women to few of the hampering restrictions that fettered their Ottoman sisters and were traceable largely to Persian and Byzantine influences. They are essentially a pastoral people and their religion is closely akin to the orthodox Mohammedan (see also Color Plate VI).

HOW HALF THE WORLD WORKS

BY ALICE TISDALE HOBART AND MARY A. NOURSE

WITHOUT machinery, how could we exist! Thus one imagines the efficiency-managed American would exclaim. And yet there is at least half the world that does live without it, carrying on its toil with primitive handmade tools—tools forgotten and despised by our industrial age. But what we have pushed lightly aside as outgrown efficiency holds its own unique value—simplicity and individuality. There is an intimate human feeling about these tools, a charm illusive yet real.

How far away and unimportant to one is the modern hurrying, machine-driven world when some day, walking along a winding footpath in China, you are forced to turn from your way because some withered old peasant woman has placed her crude little spinning machine right in the middle of the path and sits beside it smiling at you.

She has never heard, much less conceived, of the up-to-date thoroughfare of the West, which both law and safety bid you beware of monopolizing. You are altogether willing to turn from the path in payment to her for the vivid glimpse she has given you into that simple world in which she has her being.

Often when in some ancient spot in China we come upon these simple toilers we are tempted to tell no one, for we know well that every bit of disclosure brings a little nearer the inevitable invasion of machinery, devourer of that quiet and no-haste spirit. However contradictory it may seem, we are writing now not to destroy, but to preserve.

A SPRING INDUSTRY—RAISING SILKWORMS

The modern world is marching so fast into the Orient that at best the old order of things will very soon disappear and be forgotten. In Japan it is rapidly going, and to a large extent it has disappeared from the port cities of China. We would hasten to catch the humble atmosphere of the old order and preserve a little of it between the leaves of a magazine, in order that it may not be forgotten.

There is that wonderful springtime in central China! As you pass out of the city gates for a walk along the stone-flagged country paths, you will see the

mulberry trees stretching out their distorted branches like clenched fists to the passer-by. Farmers in blue coats are out in these groves cutting off the new sprouts and leaves and carrying them in large baskets behind the high white walls that hide the farmhouses. You may not follow. The silkworms are being reared there, and the superstition runs among the countryfolk that the worms will die if a stranger looks upon them.

If an ordinary stranger could work such havoc, what dire calamity might not a foreigner bring to the precious silkworms? Indeed, they are precious, so precious that if the weather is cool or rainy the women carry the tiny eggs in their bosoms until they are hatched. Then the young worms are laid in large flat trays in some dark corner of the house, where they are fed with mulberry leaves and tended carefully, lest cold or draft destroy them.

Just once our opportunity to see the rearing of the silkworms came through the advanced ideas of some young Chinese women, teachers in one of the new industrial schools. They set aside the old superstitions and even went so far as to invite us to visit the school to see their silkworms.

We passed through a big central court to a room where a class of young girls sat cutting up mulberry leaves for the smallest silkworms to eat, and then into another room, dark and quiet, where were racks with great flat wicker trays piled high.

They led us there on tiptoe, cautioning us to make no noise; for, after all, evidently they thought it wise not to disregard entirely the time-honored superstition. There was no use letting the silkworms know that foreigners were looking at them.

THE SILKWORMS "GO UP THE HILL"

In the darkness there was no sound but the munch, munch of the worms, as they devoured, with surprising rapidity, bits of mulberry leaves. There were trays of little worms, trays of middle-sized worms, and trays of big, fat worms, all munching, munching.

The next week we were again sent for, as the worms were "going up the hill."



CHIEFS FOR A COLONY OF SILKWORMS

The girls are cutting mulberry leaves, which must be delivered fresh, as soon as gathered, and fed to the worms the same day.



Photographs from Alice Tisdale Hobart

REELING SILK THREAD FROM THE COCOONS IN A TIME-HONORED WAY
(SEE TEXT, PAGE 511)

China's silk industry had its origin in legendary times. Later a brisk trade in the precious commodity developed with Europe and the Levant, the caravans traveling over Central Asian routes. As early as A. D. 551 Nestorian missionaries brought Chinese silkworm eggs as a gift of great value to the Emperor Justinian at Constantinople.

Whatever that might mean we hastened to discover.

Now there was no noise in the room, but when our eyes became accustomed to the dim light we saw quantities of tiny wigwams made of sticks of straw, and climbing over them were the silkworms.

Again we were cautioned to be quiet, as a noise might frighten the worms, making them turn their heads suddenly, thus knotting the slender thread that they were spinning.

Their heads moved back and forth, back and forth, rhythmically, until they had enfolded themselves in filmy masses of white silk threads, which grew thicker until the first comers were entirely hidden in their silky cocoons.

A HARVEST OF SILK

There is a crucial moment in the silk industry when he who tarries may lose his all. If the chrysalis rolled up in the cocoon should be allowed to stay too long, he might forestall his owners, make his own use of his cocoon, eat his way through, and cut the delicately wrought thread. To avoid such a catastrophe all members of the patriarchal family are assembled and big and little put to work.

In a quiet corner sit the aged, sorting the cocoons and piling them on huge wicker trays; the men and women work at steaming caldrons; the children hurry back and forth, bringing the trays piled high with cocoons.

Into the large caldrons of boiling water, with charcoal fires beneath, the cocoons are dropped. The silk thus loosened is carried over octagonal reels turned by the feet. Slowly creak the reels, slowly grow the broad, glistening loops of taffy-colored silk (see opposite page).

We linger, looking upon the busy scene. As the taffy bands grow thick and heavy, they are taken from the crude reels and carried to the main room, where skein is piled upon skein in high pyramids.

The day lengthens, the piles grow higher and higher, the cocoons upon the big trays grow fewer and fewer until



Photograph from Alice Tisdale Hobart

TRAYS OF SILKWORMS AT A CHINESE INDUSTRIAL SCHOOL

Here, in semidarkness, the worms consume great quantities of mulberry leaves while attaining their full growth and before spinning cocoons. So small are they at hatching that 700,000 weigh only a pound. However, within 42 days they have shed their skin four times, and the same 700,000 worms weigh 9,500 pounds.

they dwindle to nothing, and the empty trays are stacked against the wall, the fires die low, the steam ceases to rise from the caldrons, the busy scene is closed. The members of the patriarchal farmer family have harvested their crop of silk.

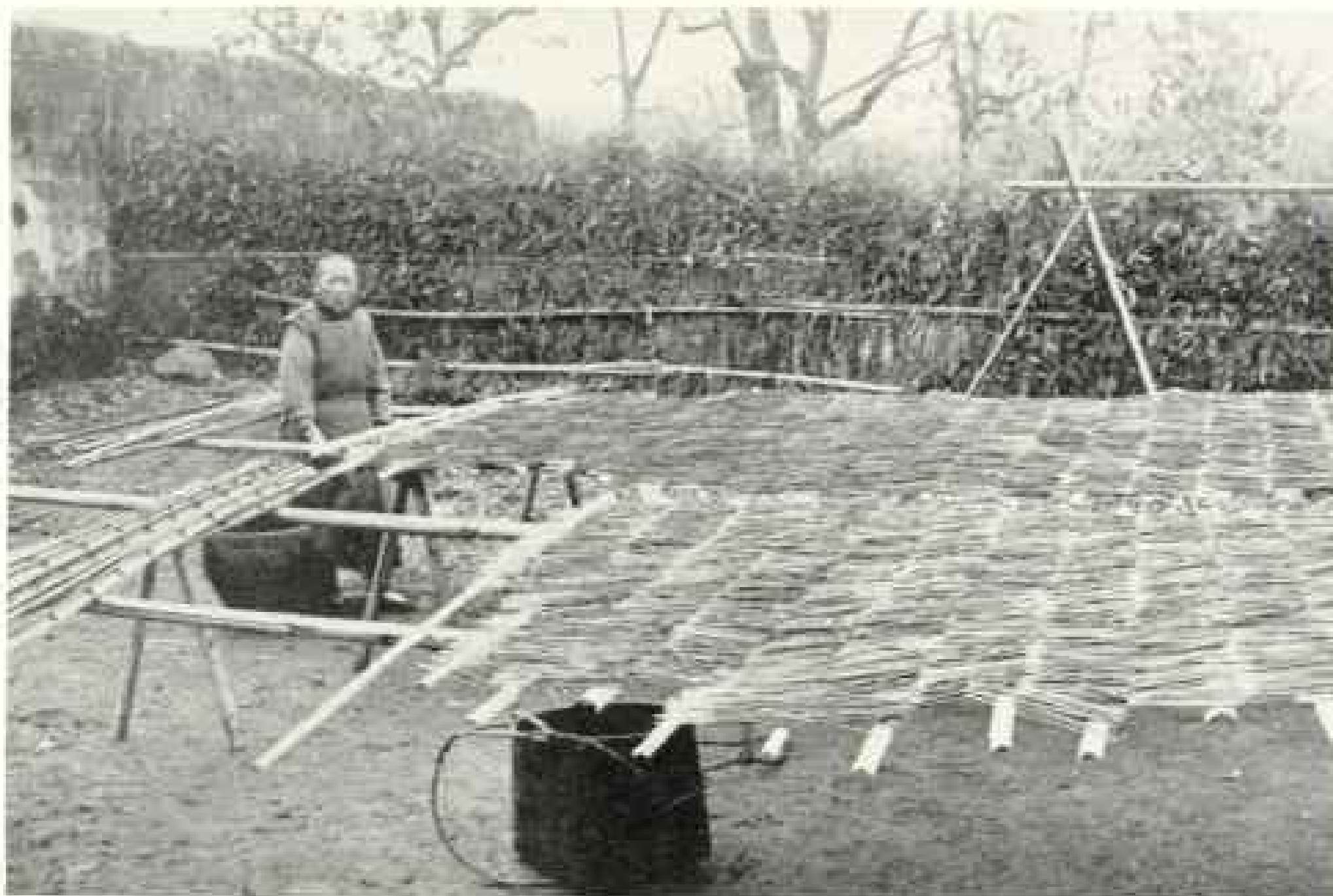
Tired but content, they eat their evening rice. Perhaps not all the advantages are to the factory country. What is lost in speed in these out-of-the-way places of the earth is possibly more than made up for in the companionship of labor as



Photograph from Alice Tisdale Hobart

FOR A COPPER THESE WOMEN WILL PATCH OR DARN YOUR OLD CLOTHES
(SEE TEXT, PAGE 518)

The "While-you-wait" shop was known in China long before it was in America. The customer may stand beside these needlewomen while his garment is being repaired.



Photograph by J. C. Carter

PREPARING OFFERINGS FOR GODS AND ANCESTORS ON A WHOLESALE SCALE

Some varieties of incense are made by powdering aromatic leaves and then wetting the powder until it becomes an adhesive mass. Small sticks are rolled in this and put on frames to dry in the sun. They are then sold to be burned in temples and ancestral shrines.

it is found in these old-fashioned patriarchal families.

THE SPINNERS AND WEAVERS

But it is in the cities that these taffy skeins are painstakingly turned into beautiful silks and satins. Here the spinners and weavers ply their crafts.

For some reason, these workers and their ways have always been entrancing mysteries to the rest of mankind. Did not Silas Marner's neighbors look upon him with a mixture of superstitious fear and unbounded curiosity? Only when the industry is moved to the great factory does the mystery cease.

Loitering along the stone-flagged streets of China you may chance to hear above the street noises a rapid, jerky click-clack, and following the sound you are drawn to a dark doorway. Shadows within beckon to be explored.

Girls and women in dull-blue trousers and coats sit in the half shadows spinning. They sit before crude contrivances of four bamboo poles on which bright bands of silk are placed much as we hold a skein of yarn for some one to wind into a ball.

Each holds in her hand a square distaff. Up across the dim rafters over her head goes the silk thread from the brilliant band, then down to the lips of the spinner, where it passes lightly through to her finger and thumb; after that, transformed into a fine, even thread, it winds itself around the square distaff that she twirls round and round with her other hand. With her feet she works a wooden treadle that moves the band of unspun silk on the bamboo poles.

Tirelessly, on and on move these twirling distaffs.



Photograph from Alice Tisdale Hosiart

WATCHING SILKWORMS "GO UP THE HILL"

The expression is used to describe their actions as they mount tiny "hills" of straw or twigs to spin their cocoons. The worms indicate that this stage of their development is at hand by elevating the fore parts of the body and slowly swaying from side to side. After eight days their spinning is completed and the cocoons are picked off (see text, page 511).

The men of the family are the weavers. At the sides of the room stand the cumbersome looms, with the dirt floor dug into a pit for the feet of these primitive machines.

On a wooden bench, with his feet in the pit, working the treadles of his loom, sits the weaver, throwing his shuttle across a warp of beautiful colors. Behind him glow fantastic paper windows, and high above him, very near the dim rafters over which pass the silk threads of the spinners, sits his more clever brother or more experienced father, pulling mysterious



IT'S NOT WASH DAY; THEY'RE SHRINKING SILK AND COTTON IN A CANAL
(SEE TEXT, PAGE 518)



Photographs from Alice Tivdale Hubbard

LONG STRIPS OF BLEACHING COTTON CLOTH SUGGEST A FIELD OF SNOW

China ranks high as a cotton-producing country. The plant is grown as far north as northern Ho-pei (Chihli), but its chief production area is in the Yangtze Valley.



Photograph by Charles H. Krugh

THESE SHOEMAKERS, BEING WITHOUT CHILDREN TO CARE FOR THEM IN OLD AGE, MUST TOIL AS LONG AS LIFE LASTS.



Photograph from Joseph Beeth

WICKER NETS HOLD BOWLDERS IN PLACE TO GUARD THE DIKES

Flood control is one of China's most pressing problems. Her great rivers frequently go on rampages that devastate large areas, ruining crops and resulting ultimately in famine.



Photograph by Charles H. Krugh

MOVABLE CAFÉS FIND MANY HUNGRY PATRONS IN THE CITIES

The food is cooked over a small charcoal fire and eaten in the street. Prices are astonishingly low at these well-patronized "cook-it-while-you-wait" counters (see text, page 518).



Photograph from Alice Tisdale Hobart

HE MAKES BROKEN DISHES WHOLE AGAIN

Where the Western World would throw away a broken dish as so much rubbish, the Chinese take it to one who cleverly rivets it together again. Beginners learn their trades by first riveting broken eggshells.



Photograph by Maynard Owen Williams.

THE ORIENTAL "STAFF OF LIFE" REQUIRES LONG AND CAREFUL CULTIVATION

Rice is not an easy crop to grow, but the Chinese farmer is not deterred by the labor and trouble involved, so long as he gets maximum production from his land. Despite her enormous acreage of rice and the large yield, China has to import billions of pounds of her favorite cereal annually. The field which this man is cultivating will produce one, and perhaps two, crops of vegetables after the rice is harvested.



Photograph by Robert F. Fitch.

MAN MUSCLE MAKES THE WHEEL GO ROUND

Both men and water buffaloes are used in Szechwan to operate the wheels which raise buckets of brine from the salt wells. There are more than a thousand of these wells within a 60-mile-square area about Tzeiutsing. Some of them are more than half a mile deep and have been operated since before the Christian Era.

cords and threads which set the pattern for him.

That maker of the pattern, sitting up there near the rafters, as if in the rigging of a ship, seems to be playing some strange musical instrument built of numerous pipes infinitely thinner than the pipes of any organ. The strange keyboard below—the warp of the weaver—responds not with music, but with color. As he pulls his cord pipes, up and down go the numerous silk threads of the weaver's warp.

Thus, at this strange musician's bidding, do satins and silks of many colors,

with quaint and occult symbols, grow under the hand of the weaver.

THE WONDERS OF THESE CITIES

How those historic children who stopped under the chestnut tree to watch the village smithy would stand entranced if they could have seen this weaver, with his huge horn-rimmed spectacles and the wonderful pattern growing under his hand.

In fact, the whole city would hold that child spellbound.

Down at the edge of the canals men stand knee-deep in the water swishing around the large, heavy pieces of white cloth or rinsing the indigo-blue ones that have just come from the dyeing vats on the banks.

On a grass patch near the city wall they lay these long strips of white cloth (a veritable field of snow) to bleach in the sun; and, floating overhead, waying in the wind, over the canals and over the streets, hang yards upon yards of pale lavender, delicate blue,

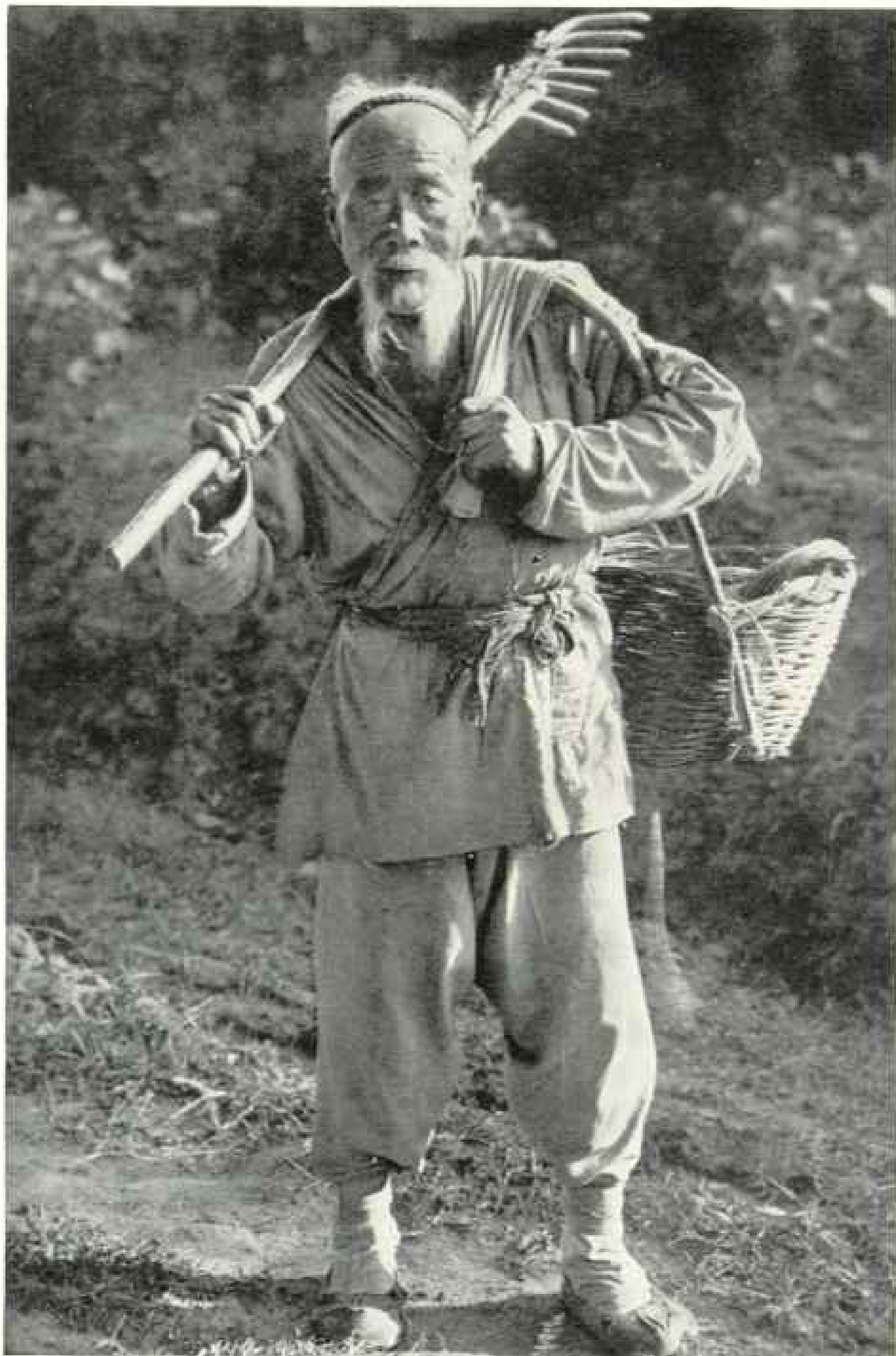
or green silk and dark-blue cotton.

Along the street the candy-kitchen comes, traveling on a bamboo pole over the shoulder of a vender who calls, "Your food cooked while you wait."

And the old woman sitting on the bridge with her mending basket begs to mend your coat for a copper.

In a doorway sits the dish-mender, putting together the shattered bits of a rice bowl. Cleverly he bores the tiny holes and fits in the brass rivets.

Then there are courts full of yellow mushrooms (oil-paper umbrellas drying in the sun), other courts where the



Photograph © Herbert G. Ponting

TILLERS OF THE SOIL HAVE EVER BEEN CHINA'S STRONGEST BULWARK

Since earliest historic days the bulk of the Chinese people have been farmers—frugal, hard-working, conservative. Governments and dynasties have come and gone, but the methods of these people and their devotion to the land remain steadfast (see "Farmers Since the Days of Noah," by Adam Warwick, in the NATIONAL GEOGRAPHIC MAGAZINE for April, 1927).



Photograph by Annie M. Wells

HARVEST HANDS ARE NEVER LACKING IN CHINA

It takes two men to operate this old-fashioned fanning mill (see text, page 522), but labor is so plentiful that the farmers can afford to use it prodigally.



Photograph by Charles H. Krugh

MILLSTONES WORKED BY HAND HUSK MUCH OF CHINA'S GRAIN

In the north wheat is a commonplace, rice a luxury, while exactly the reverse holds true of the south. China's production of rice in a normal year exceeds 700,000,000 bushels.



Photograph by Charles H. Kragh

WOMEN PULL THE RICE PLANTS FROM NURSERY BEDS AND TIE THEM INTO
CONVENIENT BUNDLES FOR TRANSPLANTING

About 20 bushels of rice seed are planted to the acre in carefully prepared and highly fertilized soil. After a month or six weeks, when the shoots have reached a height of eight or ten inches, they are transplanted. The men who place them in the fields can cover about one-third of an acre a day and receive less than 10 cents for their labor.

basket-weavers work, and open shops where brass and copper kettles are being hammered into shape.

Everywhere in the cities of the old order are the fascinating primitive tools, each with its own peculiar voice.

AUTUMN HARVESTS

The autumn brings the rice harvesting, than which there is no more engrossing scene in all the world. Some fine day the wind blowing through the rice fields makes great yellow waves—a prophecy that the harvest is at hand.

On a lovely morning soon afterward that prophecy is fulfilled. There is a soft metallic murmur—the sound of full grains grating against one another in the breeze. And as we wander along, it is to view a busy scene; but there is no haste or hurry.

Men and boys with very short sickles are cutting the rice and threshing it without a scrap of machinery—just whipping it against an iron grating in a huge fan-shaped box.

Such a scene—day after day, sun and haze, and the blue-clad men in the rice



Photograph by Maynard Owen Williams

WHERE IT IS CHEAPER TO HIRE MEN TO BAIL WATER THAN TO INSTALL,
AND OPERATE A MECHANICAL PUMP

A large part of China's agricultural land is irrigated and numerous methods of getting water to the soil are practiced. When the fields lie below the level of a near-by stream or canal they may be flooded by merely making a small opening in the dikes. On sloping ground terracing systems are used, while a number of ingenious devices serve where neither flooding nor terracing is possible. One of these is a shallow container with ropes attached to each side. It is swung out into the water, scooped full, and then swung back and emptied on the field with a jerk of the ropes. Some men become very adept at this operation and perform it with remarkable rapidity.

paddies, a perfect symbol of drowsy Indian summer!

THE WHOLE FAMILY HELPS PREPARE THE
RICE FOR MARKET

Some evening you come back along the same path to find the harvest finished. In the water standing between the stubble of the newly shorn rice paddies, the harvest moon is gleaming in a glistening streak. Stacks of the short rice straw against the darkening horizon stand like dwarf sentinels.

To the thatch-roofed farmhouses the rice is now carried for winnowing and husking, and the whole patriarchal family is at work. Again, no machinery, only the simple tools that have been passed

down, like a legacy, through the generations, from father to son and father to son.

In one corner of the open court a child of the family tends the millstones. He pours the yellow kernels into a cuplike hole in the upper stone, at the same time turning a wooden crank, thus loosening the husks of the rice between the stones.

Women gather it up and pour it into a weather-beaten box which stands near. The box has four legs, a chute at the top and another at the bottom, and a wooden crank at the side which turns two fans within. Into the top goes the rice with husks cracked by the millstones; some one turns the crank, the chaff flies out of a little opening in the front, and the grains flow down in a golden stream



Photograph by Robert Fitch

RICE STRAW SERVES MANY USEFUL PURPOSES

After the grain has been threshed, the straw is shocked and left in the fields to dry. It is burned for fuel, is used in the manufacture of paper and matting, and as thatch.



Photograph from Alice Tibbels Hobart

CHINESE THRESHING MACHINES ARE SIMPLE CONTRIVANCES

Grain is whipped against an iron grating in a large fan-shaped box, and the kernels fall into the box. The farmer and his two children are threshing wheat, staple crop of North China.



Photograph by Charles H. Krugh

A PLEASING PROSPECT ON THE ROAD BETWEEN SHANGHAI AND NANKING

China has nearly as many miles of transportation canals as the United States has of railways. Wusih, near which the picture was taken, is a walled city of about 200,000 people. A large trade in silk and rice makes it one of the wealthiest interior cities of Kiangsu Province.

through the chute at the bottom into a basket.

The whirl of the fans and the patter of falling grains seem as much sounds of nature as rain on a roof. Day in and day out they labor, until with the first bleak November days the long, slow task is finished; the winter stores of rice are completed.

So, century after century, generation after generation, life in China has flowed in the old accustomed paths, unbroken, unjarred by the other half of the world that lives by the creed of efficiency and speed.

Each year the invasion of machinery is

greater. Factories have come to the big cities, automobiles are now seen far in the interior, airplanes carry mail hundreds of miles from the coast. Yet the old order gives way reluctantly. Close to Shanghai, the most modern city of China, the rice fields are still cultivated by means of the old and simple tools.

Even war cannot entirely devour the simple, quiet life of the peasant. In the last few weeks, between the lines of the Chinese and Japanese soldiers raining down upon each other the high explosives of modern warfare, Chinese peasants were seen quietly tilling their fields.



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TO carry out the purposes for which it was founded forty-four years ago the National Geographic Society publishes this Magazine monthly. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over \$50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

The Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and contributed \$55,000 to Admiral Byrd's Antarctic Expedition.

NOT long ago The Society granted \$25,000, and in addition \$75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

The Society's notable expeditions to New Mexico have pushed back the historic horizons of the Southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region The Society's researches have solved secrets that have puzzled historians for three hundred years. The Society is sponsoring an ornithological survey of Venezuela.

TO further the study of solar radiation in relation to long range weather forecastings, The Society has appropriated \$65,000 to enable the Smithsonian Institution to establish a station for six years on Mt. Brukkaros, in South West Africa.



On Vacation

*this Filmo tumbled down a mountainside
...but it came up  unharmed*

Up the mountains to Sequoia National Park and the source of the Kern River went Henry F. Swift, San Francisco broker, and Mrs. Swift on vacation. With them they took a cook, a packer, pack horses . . . and a Filmo Personal Movie Camera. On a narrow trail, Mr. Swift's horse slipped and fell, and he and the Filmo went flying off, the Filmo rolling down the mountainside. "Except for a few scratches," writes Mr. Swift, "the camera was none the worse for the fun. I might add that I have taken many thousand feet of movies with my Filmo and never once has it caused me any trouble."



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The Filmo 70-D, here pictured, is the master of all personal movie cameras. Three lens turret head. Seven speeds. Variable viewfinder. In beautiful Strano-locked Mayfair case, priced at \$245 and up. Other Filmos as low as \$95. Filmo Projectors, \$190 and up.





PUT YOURSELF IN
this VACATION SCENE!

*Never before could
you visit the*

San Francisco Vacationland

at such little cost!

SURELY you've wanted to visit San Francisco, the colorful, cosmopolitan city beside the Golden Gate . . . *fascinating San Francisco*. And the famous outdoorland it centers.

New low railroad fares and new special round-trip privileges make this the year of all years to come! From most Eastern and Mid-western points your San Francisco roundtrip ticket can include Los Angeles and Portland, Seattle and Vancouver—the whole Pacific Coast . . . without paying one cent more for railroad fare than you would have paid last year to visit only one of these cities.

See the whole Pacific Coast at last. And rest and play in San Francisco's varied vacationland.

Nowhere we think, will you find a city you'll enjoy more than this . . . this many-hilled city that the Forty-Niners built. You'll thrill to great hotels and restaurants and famous streets of shops; to downtown sidewalk flower-stands and 1000-acre Golden Gate Park. To

gay, mysterious Chinatown, picturesque Fisherman's Wharf, and the long Embarcadero. To the sunny Bay . . . and to the incredible Golden Gate.

You'll play in the Park and at the Beach, and you'll thrill to the chill of summer nights.

Beyond the city, but near at hand you'll find the Sierra's Yosemite Valley and mile-high Lake Tahoe. You'll find the gorgeous Bay of Monterey, with debonair Del Monte, Santa Cruz and Carmel-by-the-Sea; Feather River and Russian River; deep forests of giant Redwoods; Mt. Lassen, the real volcano. Nearby too, are Spanish-relic villages and lovely Missions, Gold Rush towns and dozens of other picturesque places that you've always heard about . . .

Send the coupon below for the illustrated vacation book and schedule of costs while here, *proving how your days in California need cost no more than they would at home.*

FRANCISCO OF THE CALIFORNIA VACATIONLAND



Tell anyone to come to California for a glorious vacation, but advise persons seeking employment not to come here at this time, lest they be disappointed.



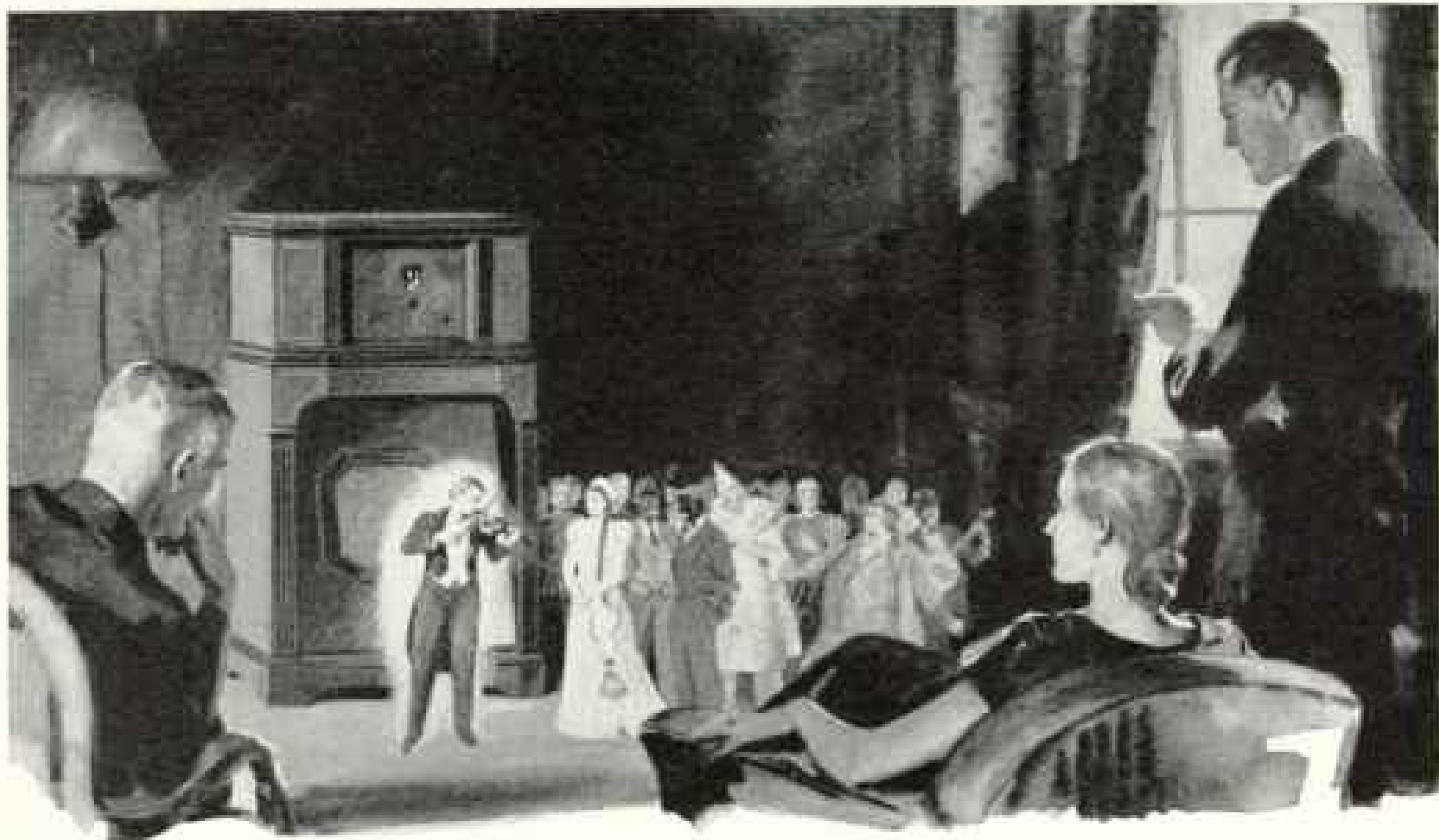
CALIFORNIANS INC., Room 504, 703 Market St., San Francisco.
Please send me the free Illustrated Book, with schedule of costs;
also road Maps (or) rail and steamship Rates to San Francisco

Name _____

Address _____

PHILCO

A Musical Instrument of Quality



ABOVE IS MODEL 112K Balanced Superheterodyne, eleven tube, Automatic Volume Control, \$150. Other Philcos from \$36.50 to \$295, complete with Philco Balanced Tubes, including new Pentode Power Tube, illuminated station recording dial, hand rubbed cabinets, and many other exclusive Philco features . . . Also Philco Battery Operated Radio for unwired homes, Philco Balanced Tubes for replacement, Philco Short Wave Converter, Philco Transitions for motor cars and boats, Philco Electric Clock and Radio Regulator. Prices slightly higher in Canada, Denver and West.

WHEN you hear your favorite radio programs on your PHILCO, you enjoy an intimate recital as vivid as if the artists and instruments were present, in person, in your home, just for you . . . Such vital realism, such fidelity of tone is almost unbelievable. It is not found in any radio except PHILCO. Close your eyes, turn your back and listen. Your ear cannot distinguish between the voice of PHILCO and the original . . . Give yourself, your family, the pleasure and benefit of the vast wealth of music, education and entertainment that literally crowds the air. It is yours, at its best on PHILCO—the first radio ever scientifically designed as a musical instrument. Leading dealers everywhere are PHILCO dealers. See it. Hear it. Buy it. Enjoy it.





"ALASKANS, OFF TO THE POTLATCH"

Alaska

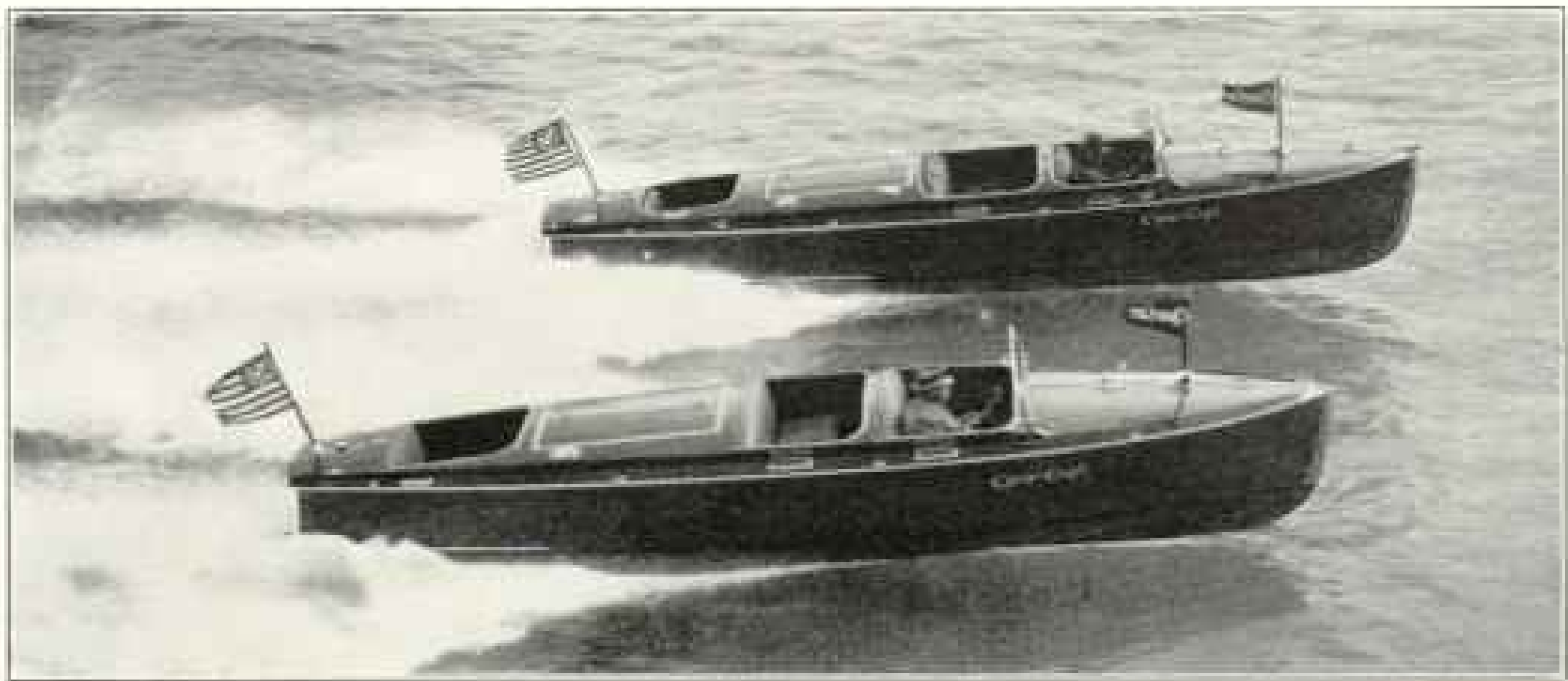
A summer cruise to Alaska is a most restful and inspiring experience. Imagine yourself at ease in a deck chair aboard a modern ocean liner, just floating day after day on the calm waters of the Inside Passage, between those incomparable mountains, where native Alaskans sail their graceful canoes! And, after your voyage—venture into the great Interior, to Mt. McKinley National Park.

Cruises to Alaska are very inexpensive.
May we tell you about them?

*For
booklets
address* → **Alaska Steamship
Company**
Room 5-D, Pier 2, Seattle

**Alaska
Railroad**
333 N. Michigan, Chicago

**Northern Pacific
Railway**
527 N. P. Bldg., Saint Paul



Plain Investment Sense Says **A LEVEL RIDING Chris-Craft**

OF COURSE, you buy a runabout for the uses it will serve . . . the places it will take you . . . the pleasures it will bring.

But there's another angle. People ordinarily don't invest in a new motor boat every year or two. How long will it last? Will it be economical to operate? Will it command a good resale value? Consider your boat as an investment, and it will be a LEVEL RIDING Chris-Craft . . . on all three counts.

Nowhere in the industry is Chris-Craft's experience duplicated . . . 45 years of fine boat building, and three generations of the Smith family personally engaged in the business. These years have been devoted to the development of design that is smart and distinctive; of motors that are quiet, powerful and dependable; of hulls that are seaworthy, safe and dry.

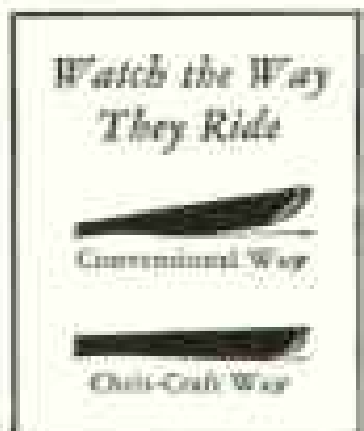
Hence the use of the finest graded Philippine mahogany . . . heavy, sawed frames of hardwood, closely spaced for strength . . . double-planked bottom and batten seam construction

that eliminates caulking and insures a dry boat always. No Chris-Craft hull has ever worn out.

These are some of the things that explain the long life of Chris-Craft runabouts, and the relatively high resale value they have always enjoyed. These are also factors in economy of operation and low upkeep cost.

Now, Chris-Craft adds LEVEL RIDING, the exclusive principle that has revolutionized motor boat performance. It is a feature of all models in the finest, most beautiful fleet in Chris-Craft history — ranging from a 15½-foot, 32-mile runabout at \$795 to the 25 and 27-foot models pictured above, at \$4175 and \$4975 (F. O. B.), with speeds of 42 and 45 m. p. h.

This year, the boating world is talking of performance in terms of LEVEL RIDING. Enjoy this new experience for yourself; your nearest dealer will give you a demonstration, and explain how you can buy any Chris-Craft out of income.



Some desirable Chris-Craft sales territories are available

Chris-Craft

RUNABOUTS · SEDANS · COMMUTERS · CRUISERS · YACHTS · TENDERS
PRICED FROM \$795 TO \$13,950

C O U P O N

© C-C Corp., 1952 (143)

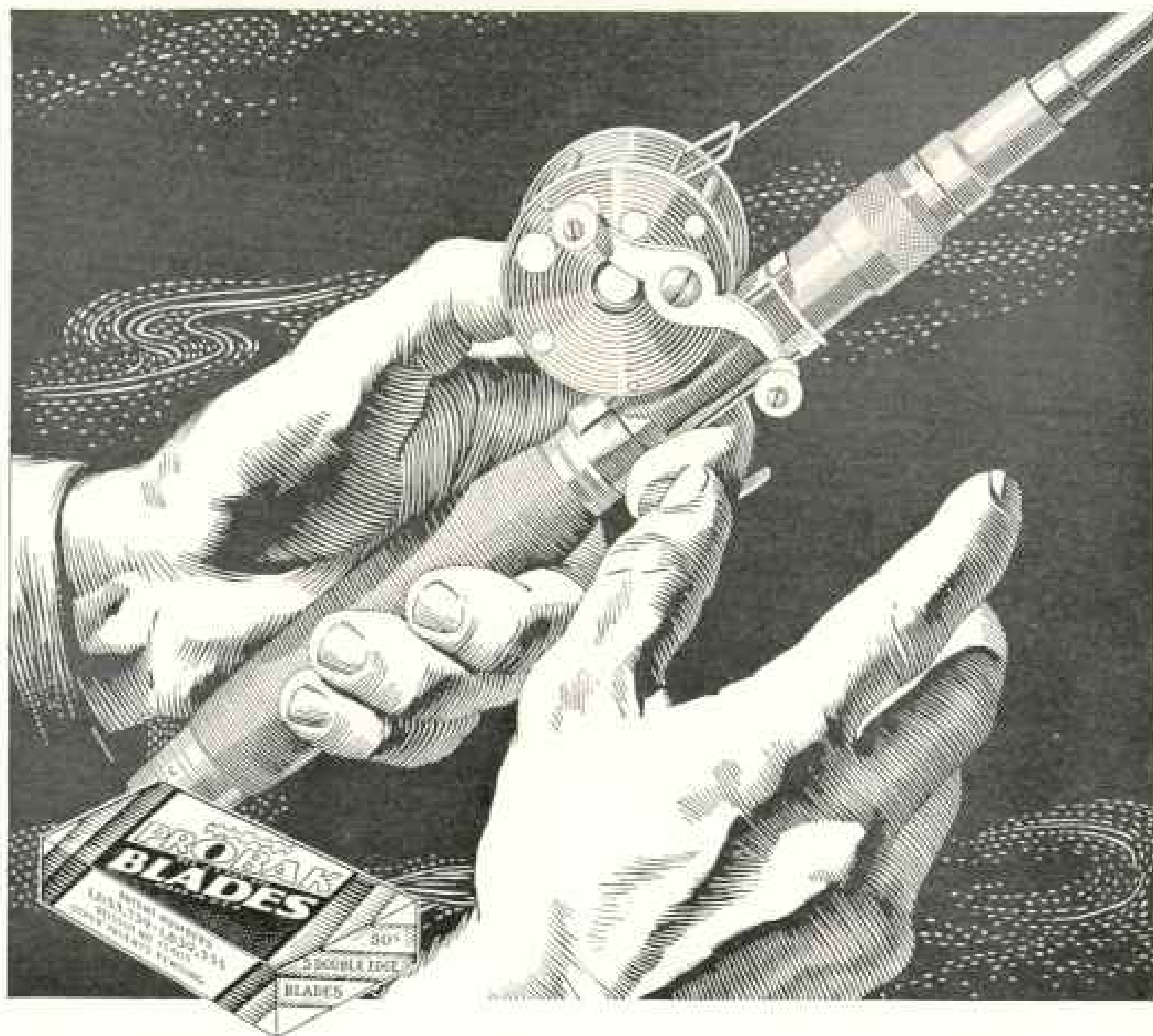
CHRIS-CRAFT CORPORATION, 704 DETROIT ROAD, ALGONAC, MICHIGAN

Please send me information about the new LEVEL RIDING Chris-Craft.
I am interested in a ____-ft. Runabout.



Name _____ Street _____ City _____ State _____

ARE YOU THIS KIND OF A MAN ?



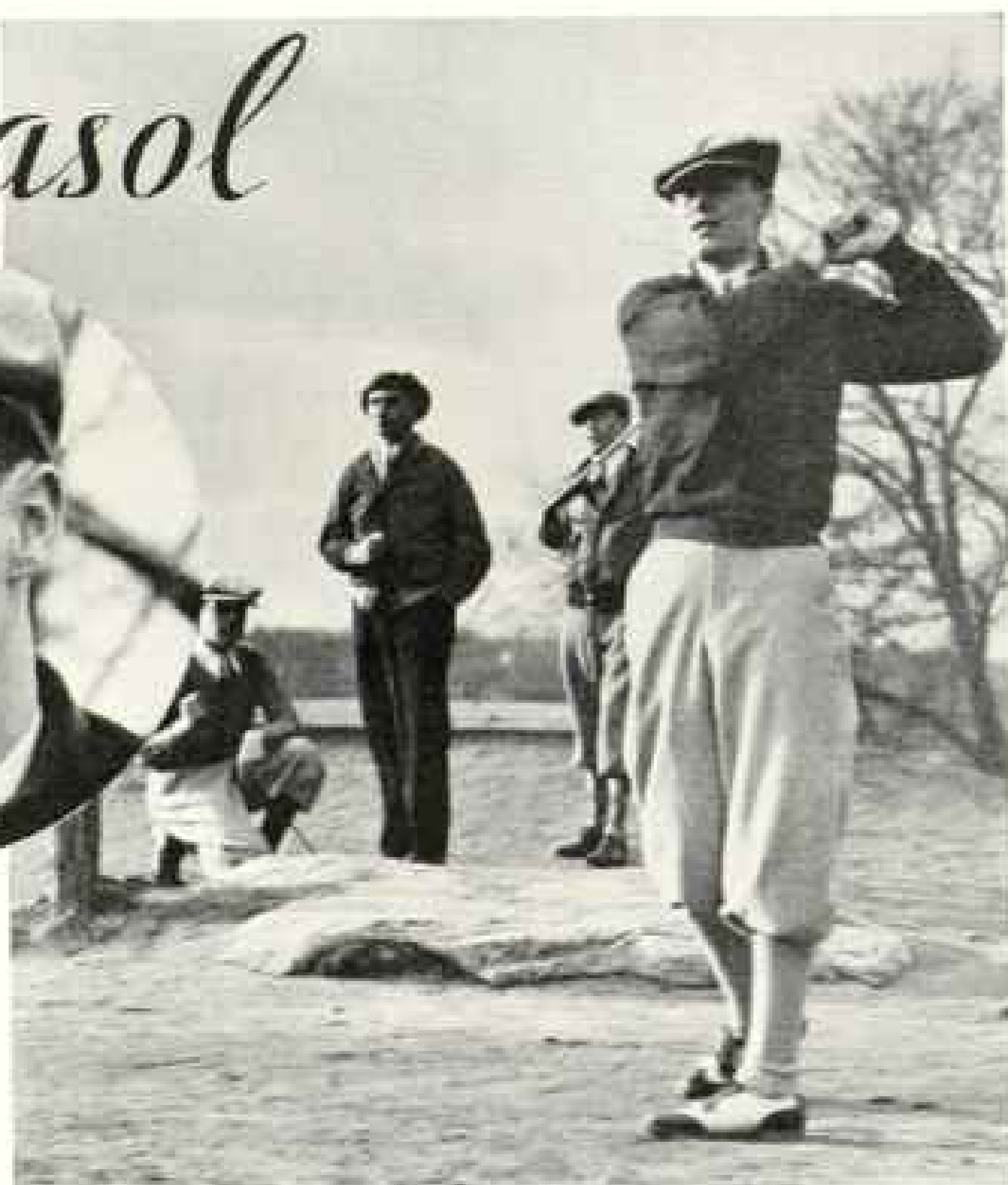
● We're talking to you regular men, whether you're chained to a desk or work outdoors. You'd rather hear the splash of a bass than listen to the Moonlight Sonata. Your beard is tough and you find it hard to shave. The double-edge Probak blade is designed for bristles like yours. You can feel it on your face. This is why hundreds of thousands of he-men say "Probak is a far better blade." Join the army of "regular guys" who get real shaving comfort with Probak. Buy a

package on our guarantee and match a blade or two against your beard. See how it mows down the stubble, cutting every hair cleanly at the base. Make the test tomorrow morning. If Probak doesn't measure up to your expectations—return the package with the unused blades to your dealer and he'll refund the full price.

PROBAK BLADES
THE BLADE FOR MEN THAT ARE MEN

Faces that laugh at weather are shaved

with *Barbasol*



So this spring—
SHAVE WITHOUT LATHER!
Barbasol—a cream—keeps the face soft, smooth, pliable. Prevents dry, harsh, weather-roughened skin, chapping and windburn.

BRED to the open and the sky, this keen modern world of out-of-doors, men have learned a trick worth knowing in all-weather facial protection.

THEY SHAVE WITHOUT LATHER—that's the secret! They use BARBASOL. Increasing millions of users have made it the fastest-selling shaving cream in the world.

Because it is a cream, and free from harsh, biting alkalis, it leaves the skin soft, smooth and pliable. The natural oils are kept in. Skin-drying air is kept out. And the wonderful unguent properties of Barbasol supply added protection and balm-like healing power.

This smooth, cool cream softens the whiskers instantly. It holds them erect. And your razor, gliding on a thin film of cream, zips them off like magic.

Now use Barbasol right. Follow these directions and you'll follow the crowd:

1. Wet your face and leave it wet. **2.** Spread on Barbasol. (No need for vigorous rub-in.) **3.** Wet a good blade—and SHAVE.

That's all there is to the finest shave in the world. It's simple, easy, quick. Try it today. Generous tubes at all druggists', 55¢ and 65¢, or large jar 75¢, will quickly make you a Barbasol Believer, too.

Barbasol recommends TEFRA TOOTHPASTE

In every 50¢ tube there is a free Tefra toothbrush refill, to fit a lifetime Tefra refillable toothbrush handle. For full information tune in Barbasol radio programs listed below.

BARBASOL RADIO BROADCASTS

Singin' Sam, the Barbasol Man, in songs you can't forget. Every Monday, Wednesday and Friday evening, at 8:15, Eastern Standard Time, over an extensive Columbia (WABC) Broadcasting hook-up.

The Old Singin' Master and his singers—mellow old hymns and ballads the way you like them. Tune in every Sunday night at 10:15, Eastern Standard Time, on the N.B.C. (WJZ) Blue network, coast to coast.

Consult radio page of your local newspaper for stations.





and avoid costly engine repairs

You put good, clean motor oil in your car. You change it at regular intervals. *But to keep oil effective after it's in your engine, there is one more thing you must remember.*

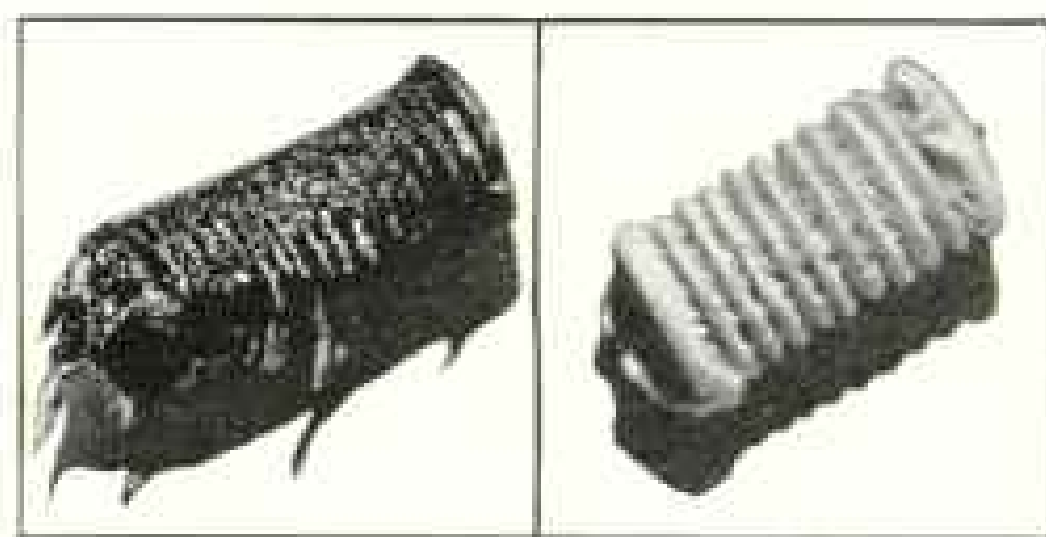


Dust, grit, hard carbon and metal chips are constantly lodging in the crankcase. It's impossible to keep them out. These deadly substances mix with the oil. They turn it into a destructive sludge—a grinding compound—that cuts and wears the moving parts of your engine.

Your Purolator Oil Filter intercepts these injurious particles. It stores them safely away from your engine.

So well does the Purolator do this job that, by the time you have driven 8,000 miles, the old Purolator cartridge is full of dirt and grit. Unless you have a *new* cartridge installed at that distance, the Purolator cannot continue to protect your motor. Costly engine repairs and replacements may result.

Re-cartridging the Purolator is quick and inexpensive. Your garage or service station will do it for you in a few minutes. Then you can drive off knowing that your engine is assured of clean, filtered oil for another 8,000 miles. Motor Improvements, Inc., 352 Frelinghuysen Avenue, Newark, New Jersey.



Here is what is found in the old Purolator cartridge the garage man takes off your car at 8,000 miles. It shows the deadly mass of dirt and grit the Purolator filter removes from the oil.

Here is the inner structure of the new cartridge he puts on—a clean, effective filter element developing a large area through ingenious principles found only in a genuine Purolator.

PUROLATOR

THE OIL FILTER ON YOUR MOTOR CAR
LICENSED UNDER SWEETLAND PATENTS

See **GLACIER PARK**



YELLOWSTONE

VIA THE CODY ROAD



and **COLORADO**

**FOR ONLY
\$475 MORE**

**than a vacation ticket
to Glacier Park alone!**



THIS SUMMER'S vacation fares via the Burlington will be astonishingly low. Lower than ever before from many points.

The Burlington will take you on fast trains to Glacier Park—America's wildest mountain grandeur—at fares almost half!

And, for only \$4.75 more, take you to the Magic Yellowstone . . . and the famous Cody Road, America's most thrilling mountain highway! Then to the glorious Colorado Rockies! And get you back in two weeks, if you wish. The vacation of a lifetime—at surprisingly low cost!

Enjoy the fun of real freedom in these wonderlands you've

always wanted to see! Do it this year when bargain fares are attracting the smartest people.

On this same trip, the Burlington can take you through the Big-horn Mountain country of Wyoming. For a slight additional cost, you can tour the interesting Black Hills of South Dakota.

Only the Burlington's complete service to all the Rockies makes this unusual vacation bargain possible. Truly—the fast, pleasant, low-cost way to all the West!

Ask about Escorted Tours

Carefree vacations, everything planned in advance, one definite cost covering all necessary expenses.

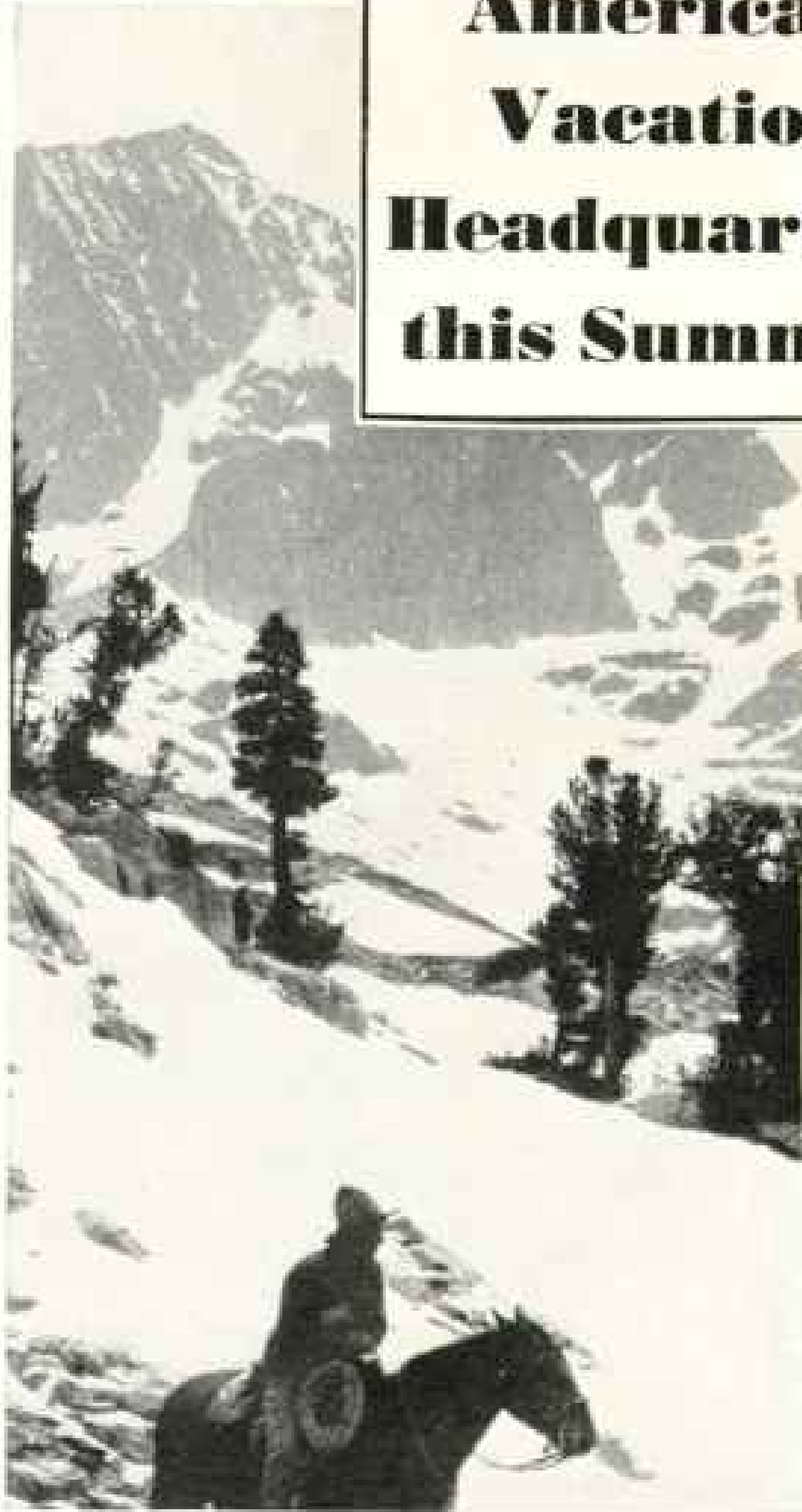
**Burlington
Route**

SEND THIS—NOW

BURLINGTON TRAVEL BUREAU, 547 W. Jackson Blvd., Dept. NG-9, Chicago, Ill. Send me (my name and address is written on margin below) your booklets on trips to the Rockies. I am most interested in places checked: Colorado , Yellowstone , Glacier . Check here if interested in a carefree Escorted Tour.



Gay beaches



Glaciers and summer snow not far away

America's Vacation Headquarters this Summer

AVACATION opportunity that *can't* be repeated during your lifetime: everything that Southern California normally offers in thrilling summer play . . . and the Olympic Games!

The world will be watching. Athletes and notables from everywhere are coming. And Southern California, after ten years of preparation, is ready with the vacation of your life!

Finals in all events . . . 135 separate contests . . .

will be held in Los Angeles July 30 to August 14. Be here then if you can, but come some time this summer, for festival will reign all season, and this is the year you need a *real* vacation most.

Every vacation joy . . . low costs

Here are clear, rainless days . . . nights under blankets . . . and *every* essential for perfect play: The blue Pacific for swimming, sailing, fishing or basking on the sand . . . gay resort islands near the shore. Crystal lakes in mighty, forested mountains. Golf and every sport in exciting settings. Palms, orange groves, ancient Spanish Missions and

nearby Old Mexico. Hollywood's scintillating night life.

Pasadena, Long Beach, Glendale, Beverly Hills, Pomona, Santa Monica and other celebrated resort cities are short, scenic drives from big, hospitable Los Angeles, center of this whole world playground.

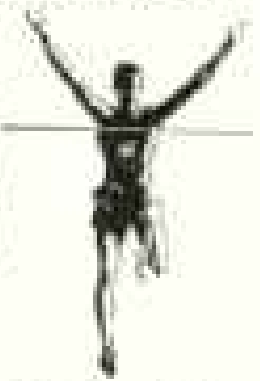
Come for a vacation you'll never forget. Advise anyone not to come to Southern California seeking employment lest he be disappointed, but for the tourist the attractions are unlimited.

By rail (new low summer fares) from most points in the country, even a two-weeks vacation gives you at least eleven days actually here. And costs while here need be no more than those of an ordinary vacation. For in this year 'round vacationland you escape the "peak prices" necessary in short-season resorts. We prove these statements in a remarkable new book which the coupon below brings you free.

FREE NEW 64-PAGE VACATION BOOK OLYMPIC GAMES INFORMATION

The book outlines, day by day, a summer (also a winter) visit to Southern California, including over 100 interesting gravure photographs, map, information about routes, *itemized daily cost figures*, etc. . . perhaps the most complete vacation book ever published. With it, if you wish, we will send, also free, another book giving Olympic Games details and schedules, with ticket application blanks. Send the coupon today. Start planning now!

(If you wish *another* beautiful book, "Southern California through the Camera," include 10c in stamps.)



the Olympic Games in **SOUTHERN CALIFORNIA**

All-Year Club of Southern California, Ltd., Div. Bldg.
2157 So. Broadway, Los Angeles, Calif.

Send me booklets I have checked below:

Free new 64-page illustrated book with details (including costs) of a Southern California vacation.

Free Olympic Games schedules and ticket application blanks.

"Southern California through the Camera" (10 cents enclosed).

Also send free booklets about counties checked below:

Los Angeles Orange Santa Barbara San Diego
 Los Angeles-Spurs Riverside San Bernardino Ventura

Name _____

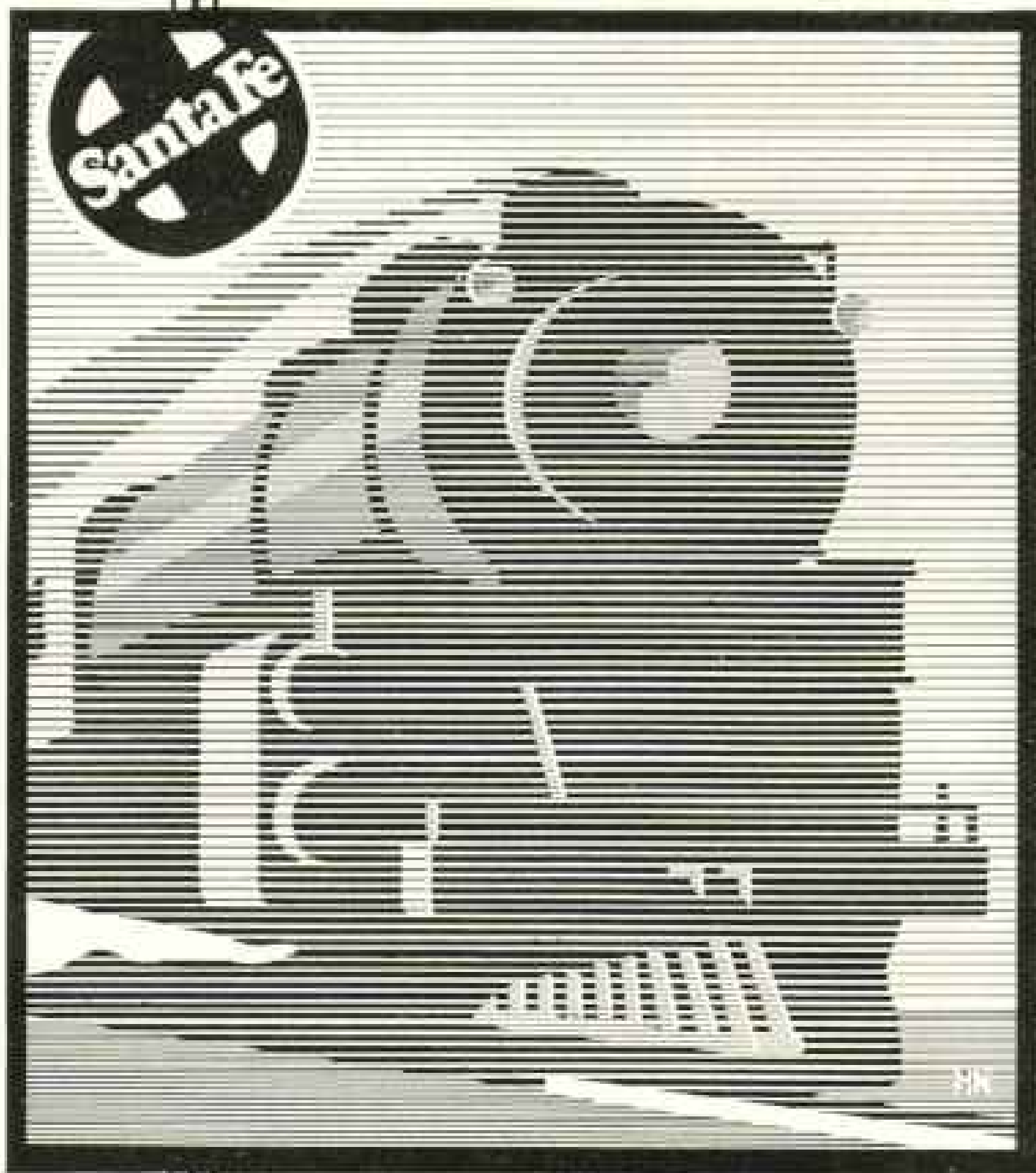
Street _____

City _____

State _____

(Please Print Your Name and Address)

this summer



**Santa Fe
Summer
Xcursions**

***Santa Fe Travel Experts Have Worked
on This Problem—***

How can people go farthest and see the most on the least money, during their vacation.

They have the answer. They know.

You will be amazed at how much you can see—even in two weeks.

The free booklets listed below will help you.

Just clip and mail the coupon.

Santa Fe Summer Xcursions "cut the cost!"

All expense Escorted Tours on
certain dates this summer.

*If you live on the Pacific Coast Santa
Fe "Back East" Xcursions solve the
vacation problem.*

MAIL THIS COUPON

W. J. BLACK, Passenger Traffic Manager, Santa Fe System Lines
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Please mail folders checked below:

- California The Indian-detours Colorado Grand Canyon
 Dude Ranches All-expense Tours

Name _____

Address _____





"Hill-climbing always wears me out. I'm not used to such strenuous exercise."

"Sore muscles, eh? Never mind—we have something in camp for that—Sloan's Liniment."

lame muscles

Relieve the Soreness!

Tired, aching muscles find quick relief in the comforting warmth of Sloan's. It rushes fresh blood to the sore spot the minute you pat it on, restoring circulation to muscles and joints without the necessity of rubbing or massaging. The pain quickly disappears and you feel soothed and relaxed, even after the most strenuous exercise. . . . Get a fresh bottle of Sloan's today at your druggist's. Only 35¢.

SLOAN'S LINIMENT

*Go abroad
en route to*



CALIFORNIA or NEW YORK

\$200 FIRST CLASS

Colombia *visit* Nicaragua
Panama El Salvador
Costa Rica Guatemala
Mexico

Grace Line is the lowest cost per day of any water route to or from California. It is the only line that offers 10 fascinating visits in 7 foreign countries en route, plus a visit in Havana on the Eastbound trip. Delightful inland excursions are available at slight additional expense. 24 joy-packed days afloat and ashore.

You can buy a complete rail water circle cruise for \$300: by rail from your home city to either Atlantic or Pacific ports, Grace Line through the Panama Canal to the opposite coast, and back home again by rail. Comfortable, spacious "Santa" liners sail from New York, San Francisco and Los Angeles every other week. No passports required. Ask your local travel agent or



New York: 10 Hanover Square; Boston: Little Building; Chicago: 230 N. Michigan Avenue; New Orleans: Queen and Crescent Building; San Francisco: 2 Pine Street; Los Angeles: 348 So. Spring Street; Seattle: Hoge Building

WHERE TO GO? what will it cost?



NO SINGLE ADVERTISEMENT could even list all the things *Geographic* readers want to know about vacations in New England. *What brought three million people here last year?*

YOU ARE INVITED to write for a new and profusely illustrated book that reveals all. It's authentic. It's dependable. It's a fascinating book filled with the lure and lore of New England. Covers every type of vacation and recreation region in 6 famous states. *Send for it.* It's the answer to questions of where, why and how much—for all sorts of interesting people.

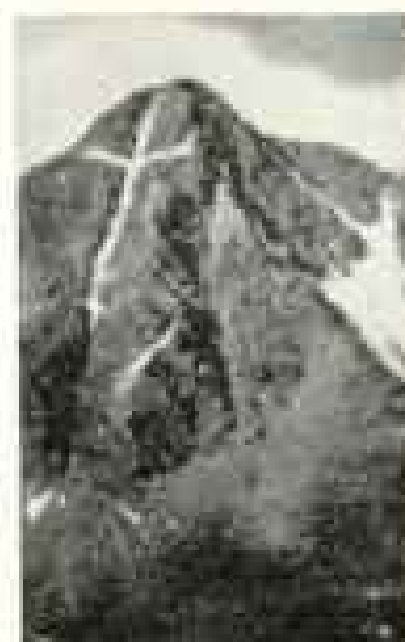
THREE MILLION VACATIONS IN NEW ENGLAND

NEW ENGLAND COUNCIL, Statler Bldg., Boston, Mass.
Send me FREE official 1932 VACATIONS book, G-1.

Name _____
Address _____



SEE UNCLE SAM'S 7 Wonders of Colorado



The Mount of the Holy Cross Commands a Rugged, Rock-bound Region of Thrilling Beauty.

At Top: Spruce Tree House, in the Mesa Verde National Park.

THE
KEY STATE
OF THE
NEW WEST



C
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D
O

Search the world over, and you would fail to find as many varied mountain marvels all in one place as can be seen on a Colorado vacation. For example, the Government administers Seven Wonders of Colorado: two great national parks, showing (1) the best preserved cliff dwellings (Mesa Verde) and (2) the most accessible and gorgeous high vacationland (Rocky Mountain); national monuments preserving (3) Yucca House and (4) Hovenweep cliff ruins; (5) vast rock pinnacles in Colorado Monument; (6) the weird "melted" Wheeler rocks; (7) inspiring Mount of the Holy Cross. At almost less expense than staying home, have your next, best vacation in Colorado. Railroad rates to Colorado this summer from the Atlantic seaboard will be the lowest in history! While you are here, see at first hand the remarkable opportunities and advantages of permanent living in "the land of Sunshine and Vitamins."

*Taste Colorado at home
by asking your grocer
for Colorado fruits
and vegetables.*

COLORADO



Living Glaciers in Rocky Proposed Nat'l Monuments-Sand Dunes Mountain National Park. Between Snowy Peaks and Fertile Land.

THE COLORADO ASSOCIATION

837 Kit Carson Building, Denver, Colo.

Send me FREE book, "Colorful Colorado: Opportunity's Playground," illustrated in natural colors.



Name _____
Address _____

Add the whole Pacific Coast to your California Roundtrip at no extra fare!



FROM most Eastern and Mid-western points, on May 15, the extra charge for including the Pacific Northwest in a regular California roundtrip will be removed. Then you can go West on one route, and return on another Southern Pacific route and add a thousand thrilling miles to your vacation trip for not 1 cent extra fare.

Only Southern Pacific offers the choice of Four Great Routes. Only Southern Pacific's rails will carry you to many of the West's outstanding attractions.

Low summer roundtrips to California (thru Pacific Northwest if you wish)

Season roundtrip examples (good leaving from May 15 to October 15, return limit October 31): From New York City \$135.12 to \$138.32, Chicago \$90.30, etc.

30-day limit examples: From New York City \$119 to \$122, Philadelphia \$118.50, etc.

On sale May 15 to September 30.

*From most Eastern or Mid-western points.

Southern Pacific

4 GREAT ROUTES FOR TRANSCONTINENTAL TRAVEL

Write for detailed itinerary

to O. P. Bartlett, Dept. C, 310 South Michigan Boulevard, Chicago, or H. H. GRAY, Dept. C, 531 Fifth Avenue, New York City. Name your Pacific Coast destination and the places you want to include in your roundtrip. Here are a few to choose from:

Los Angeles	San Antonio	Crater Lake
San Diego	Great Salt Lake	Big Trees
San Francisco	Phoenix, Tucson	Lake Tahoe
Portland	Santa Barbara	Apache Trail
Tucson	New Orleans	Del Monte
Seattle	El Paso	Salt Lake City
Vancouver, B. C.	Yosemite	Cathedral Caverns

Ask for details on West Coast of Mexico trip



LOW FARES TO THE ORIENT! SPECIAL SUMMER RATES

NEVER BEFORE have rates to the Orient been so attractive to American travelers. Round trip summer rates to Yokohama are now equivalent to approximately one-and-one-half minimum rates in first, cabin, second and tourist classes. To Japan, China and the Philippines. De luxe first, second and cabin classes from San Francisco and Los Angeles via Honolulu. Cabin and tourist cabin from Seattle and Vancouver.

• Every comfort of the twentieth century... magnificent dancing salons, tiled swimming pools, gymnasiums, public rooms—the pride of European designers—and menus that reflect the culinary skill of masters. Splendid new motor ships in all classes.

JAPAN, CHINA and the PHILIPPINES

From Pacific Coast to Japan and Return

FIRST CLASS	CABIN CLASS	TOURIST CABIN
\$465	• \$375	• \$195 up

For rates and information apply Dept. 9 or call at

N•Y•K•LINE (Japan Mail)

New York, 25 Broadway, 545 Fifth Avenue • San Francisco, 551 Market Street • Seattle, 1404 Fourth Avenue • Chicago, 48 North Dearborn Street • Los Angeles, 605 South Grand Ave. • or any Cunard Line office. Consult your local tourist agent. He knows.



THIS IS
**OPPORTUNITY
 YEAR**
 for **VACATIONISTS**

... with rail fares lowest in years and all-expense tours at remarkable reductions. Vacations to suit all tastes and pocketbooks are offered by Union Pacific which serves 15 National Parks and more of the West than any other line, including:

- Zion-Bryce-Grand Canyon
- Yellowstone-Grand Teton
- Rocky Mountain National Parks
- Colorado
- California and Hawaii
- Pacific Northwest and Alaska
- Western Dude Ranches
- Hoover (Boulder) Dam

Start planning your vacation now. Write today for facts about possibilities and prices of Union Pacific vacations.

UNION PACIFIC

J. P. Cummins, General Pass'r Agent
 Room 250, Union Pacific System
 Omaha, Nebr.

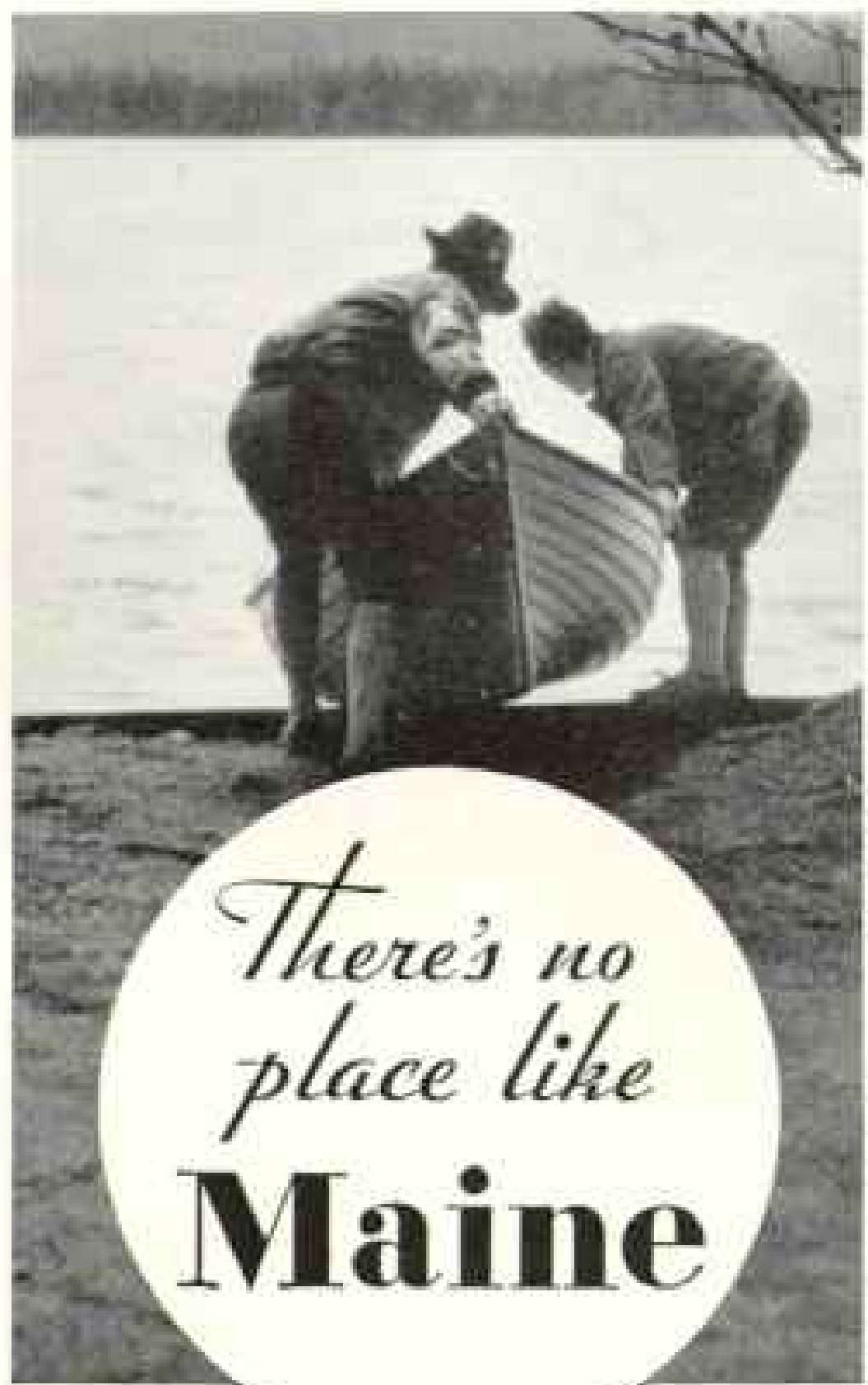
Please send me information and booklets about

Name

Address

Grade in School (if student)

THE OVERLAND ROUTE



*There's no
 place like*
Maine

It's time to make your summer plans. Decide on Maine where you'll find health and sheer happiness under smiling summer skies. There's every outdoor sport—fishing, canoeing, swimming, motor-ing on fine roads, golf. . . Your appetite will sharpen, your nerves relax. A Maine vacation costs less than you think. Plan now—mail the coupon today.



MAINE DEVELOPMENT
 COMMISSION

MAINE PUBLICITY BUREAU,
 20 Longfellow Square, Portland, Maine.

Please send free copy of Official State Pamphlet giving all information on Maine vacations.

Name

Address

City State



Miss America IX
at 100 Miles an Hour!

For Fast Shots

Nothing Can Compare with

Leica

THE UNIVERSAL CAMERA

fits the pocket—yet does the work of a dozen other cameras; the most unusual pictures are easy to take with the LEICA. It is small in size and instantaneous in operation—the ideal camera to catch the unexpected photos when speed is essential! With its 8 interchangeable lenses it is instantly convertible into a speed camera, a telephoto camera, an aerial or panoramic camera, a portrait camera, a stereo camera and many more. Economical—takes up to 20 pictures on a single roll of 35mm film. Enlargements up to 10x18 inches are meticulously sharp and clear and of the highest commercial value.

Write for FREE Descriptive Booklet

K. LEITZ, INC.
Dept. 73, 60 E. 10th St., New York

The NEW PLAUBEL MAKINETTE

VEST POCKET CAMERA

with fast F 2.7 Antico-mar Lens, using any standard make Vest Pocket FILM,



WILL TAKE PERFECT PICTURES UNDER THE MOST ADVERSE LIGHT CONDITIONS

The perfect camera for those who demand extreme accuracy, clarity and convenience. Produces pictures that stand exceptional ENLARGEMENT.

- Takes 16 pictures on standard 8-exposure film.
- Has the THREE important adjustment scales (Focus, Diaphragm and Depth of Focus) on ONE side, that can be seen at a glance.
- Compur shutter with speed up to 1/300 of a second.
- Self-erecting direct view finder.
- Metal throughout, covered with leather.
- Special "ever-ready" case permits loading without removal.
- Complete with case and two color filters.

\$70

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NEW YORK CITY
CAMERA HEADQUARTERS



ON TO GERMANY FOR Sparkling Cities

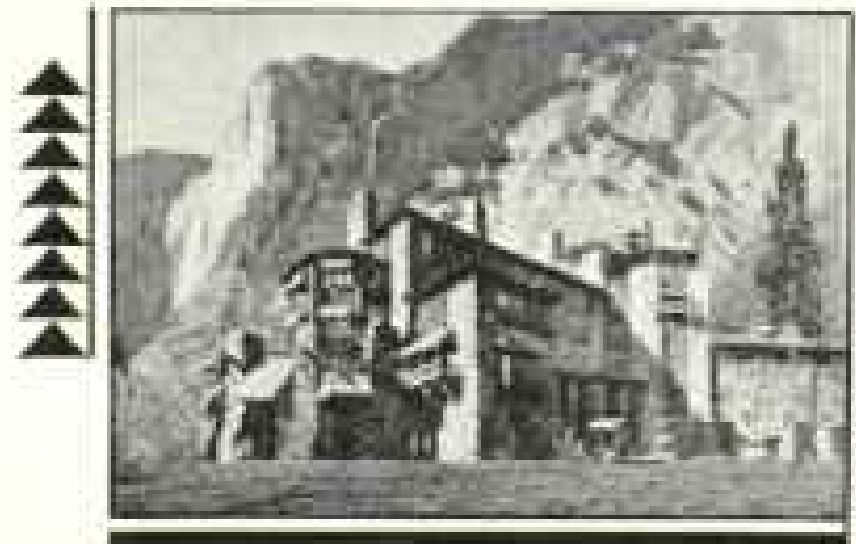
Distinctly different and unique are the life and art of each great city in this rich wonder land. Each one has its own history, customs, color, and gaiety. Travel is inexpensive; prices have been greatly reduced. Write for Booklet No. 19. GERMAN TOURIST INFORMATION OFFICE, 665 Fifth Avenue, New York, N. Y.

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Cologne
on the Rhine

"Going to Europe" means going to

GERMANY

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OPEN ALL YEAR



Fight— to a Finish!

PHYSICIANS, nurses and public health workers are fighting brilliantly, doggedly and untiringly to conquer tuberculosis. They have cut the deathrate two-thirds in the past thirty years. But because the deathrate has steadily declined, many people are being lulled into a false sense of security, making the fight more difficult.

Tuberculosis is still the chief cause of death of persons between the ages of fifteen and forty-five in this country. Last year, in the United States, the disease cost about 86,000 lives.

Not merely the underfed and undernourished are stricken. Many who have every advantage that money and care can provide, unexpectedly develop tuberculosis.

There is a modern defense against mankind's old enemy, once the most destructive of all diseases. By means of annual physical examinations which include X-ray and other tests for children, and fluoroscopic or X-ray examinations for older persons, the presence of tuberculosis can be detected before serious damage has been done to lungs, bones or other tissues.



Failing such regular health examinations—for old and young—tuberculosis will continue to attack unwary and unsuspecting victims.

Tuberculosis doesn't "just happen." Those in close contact with tuberculosis may contract the disease if not guarded against infection. Children are especially susceptible.

Early recognition is the all-important element in preventing the spread of tuberculosis in a family. Immediately after a person is discovered to have the disease, every member of his household should have a complete examination. Clinics are usually available if a private physician cannot be afforded. By prompt measures, it is often possible to find other cases of the disease in such early stages that a rapid and complete cure may be effected.

When each family gives this most valuable cooperation and when each doctor promptly searches for and reports all active cases, tuberculosis will be well on the way to extinction.

Victory can be won in this splendid war—but not until *all* take part in this fight to a finish.

METROPOLITAN LIFE INSURANCE COMPANY
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For in it are only tiny pieces—one-half the size of ordinary candy. Each piece is a real creation—unusual—custom made at the hands of master candy makers. Only the most costly, luscious combinations are used—the rare fruits and nuts combined with the most delicious coatings of vanilla, milk or bitter sweet chocolate.

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Soup-making is an art. There is no higher expression of the skill and training of the great chef. In fact, the epicure regards the ability to blend a soup of exquisite flavor as one of the crucial tests of an acceptable cook. Campbell's famous

French chefs have devoted a lifetime to soup. And the soup upon which the enviable Campbell's reputation is chiefly built—the soup that everybody knows and likes—is Campbell's Tomato Soup. Enjoy it—often!

21 kinds to choose from...

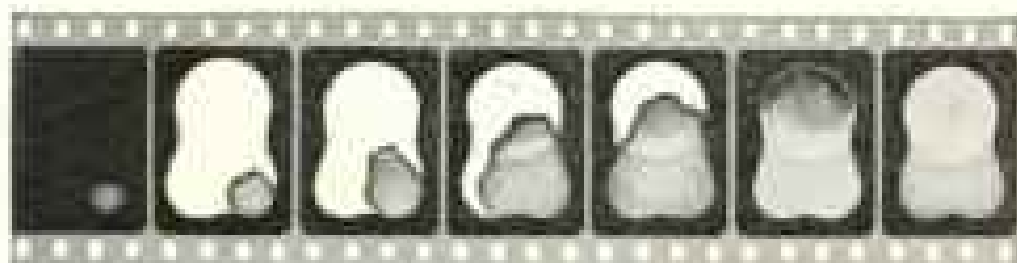
Asparagus
Bean
Beef
Bouillabaisse
Celery
Chicken
Chicken-Gumbo
Clam Chowder
Consommé
Julienne
Meat-Torte
Mulligatawny
Mutton
Ox Tail
Poa
Pepper Pot
Pintadine
Tomato
Tomato-Ox
Vegetable
Vegetable-Beef
Vermicelli-Tomato

11 cents a can

LOOK FOR THE
RED-AND-WHITE LABEL



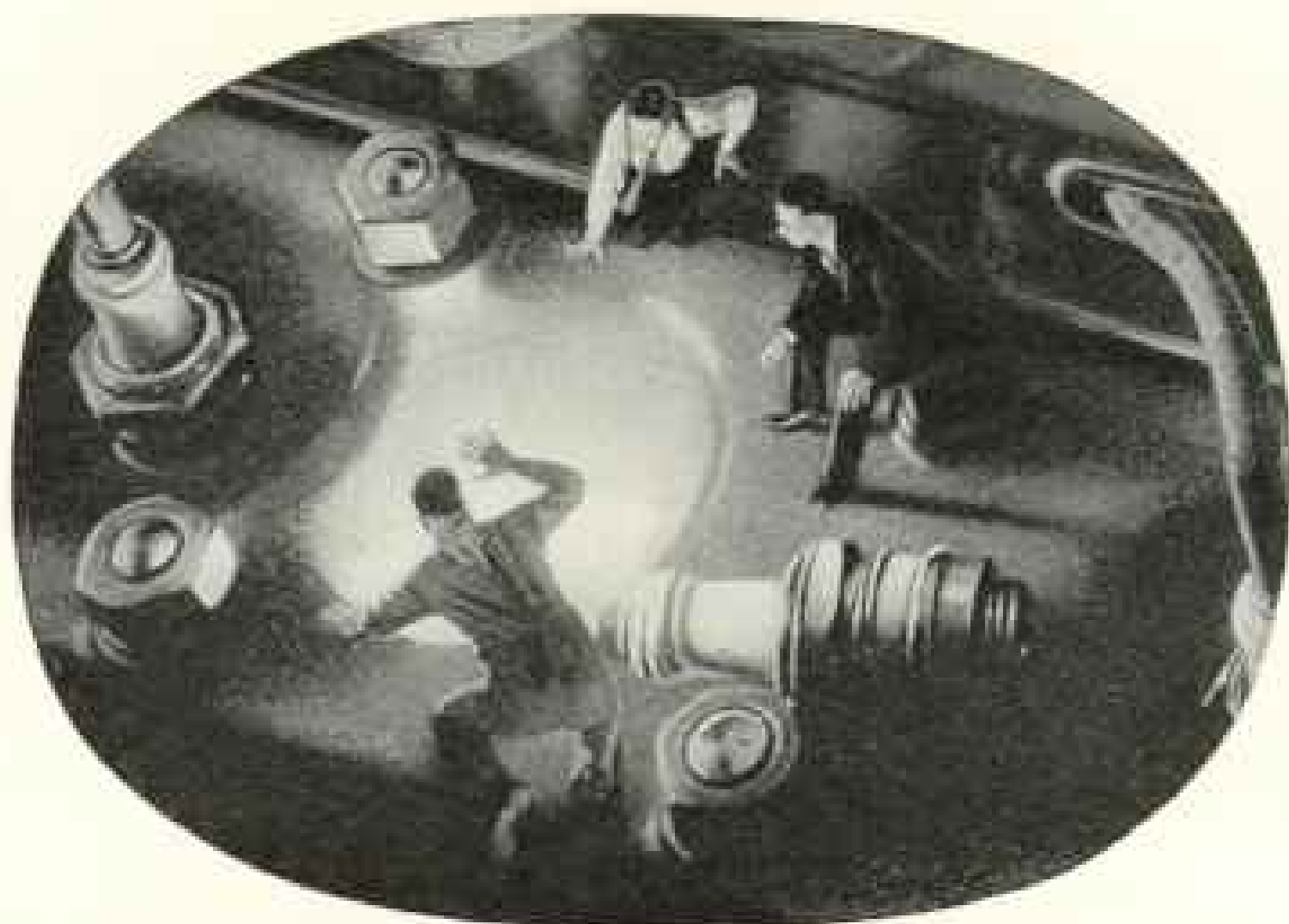
MEAL-PLANNING IS EASIER WITH DAILY CHOICES FROM CAMPBELL'S 21 SOUPS



ORDINARY GASOLINE is in the cylinder. You see the spark in the picture at the left. In the next the gasoline vapor starts to burn. More—more—more burns. Then suddenly, in the sixth picture—BANG! The remaining gasoline explodes. That is KNOCK. The last picture shows nothing but after-glow. Knock wastes the gasoline that should be working now.



ETHYL GASOLINE starts from the spark in the same way—as shown in the first three pictures. But Ethyl can burn at only one speed: the right speed. See how its flame spreads evenly from start to finish. It is not all burned until the last picture—delivering its greatest power when the piston is going down—when power counts most in the performance of your car.



Look *INSIDE* the engine There's where Ethyl proves its value

SEEING is believing. You can now see the difference Ethyl makes in gasoline. By the use of special instruments and high-speed photography, engineers have made pictures of the actual combustion of motor fuels.

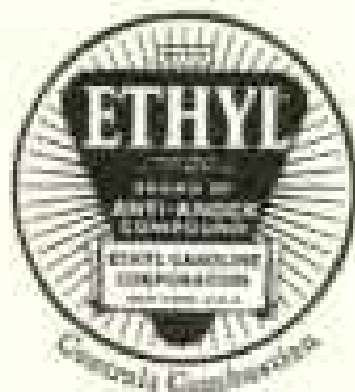
Look at the two strips above. They show what happens in that important 1/100th of a second after the spark plug fires.

At the left, you see ordinary gasoline failing under the strain of a modern high compression engine. You see the uneven explosion that causes harmful knock, overheating and loss of power when you use ordinary

gasoline in your car. At the right you see how Ethyl Gasoline burns smoothly, evenly, powerfully—in the test engine or in any engine—at any load.

That is why car manufacturers now offer high compression engines as either standard or optional equipment. These engines are *designed* to take greater advantage of the quality of Ethyl. Car manufacturers know it makes *any* car run at its best.

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The quality of Ethyl Gasoline is maintained by laboratory inspection of samples collected daily in all parts of the country. Ethyl fuel contains lead.

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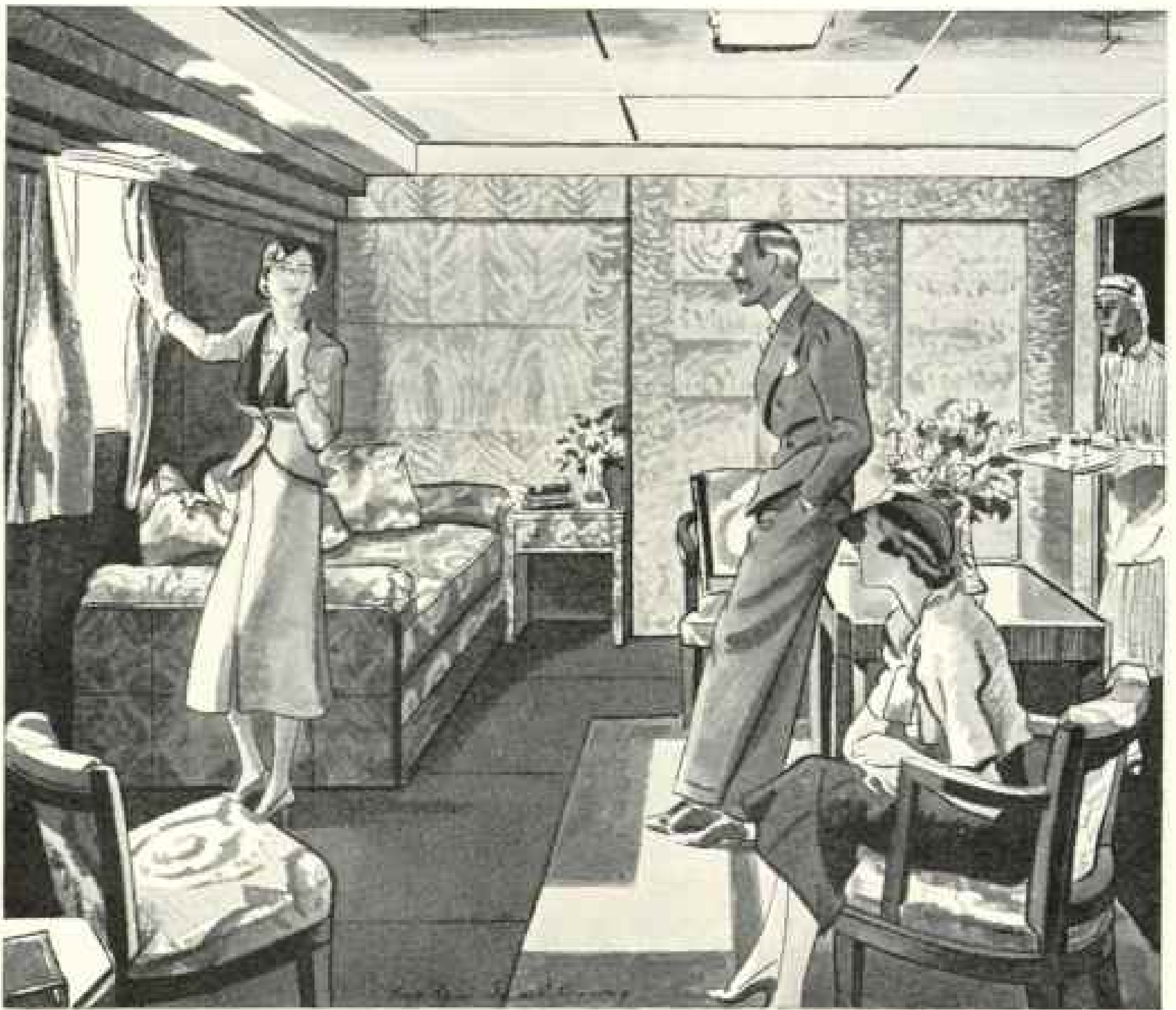


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torch to that phrase of Mark Twain... 'no other land could so beseechingly haunt me... its balmy airs are always blowing, its summer seas flashing in the sun; the pulsing of its surf beat is in my ears. I see its garlanded crags, its plummy palms drowsing by the shore; in my nostrils still lives the breath of flowers that perished twenty years ago.'"

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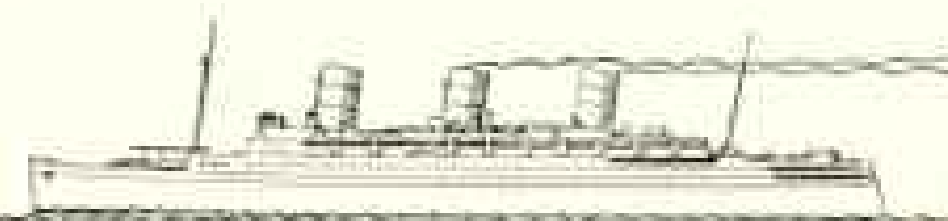
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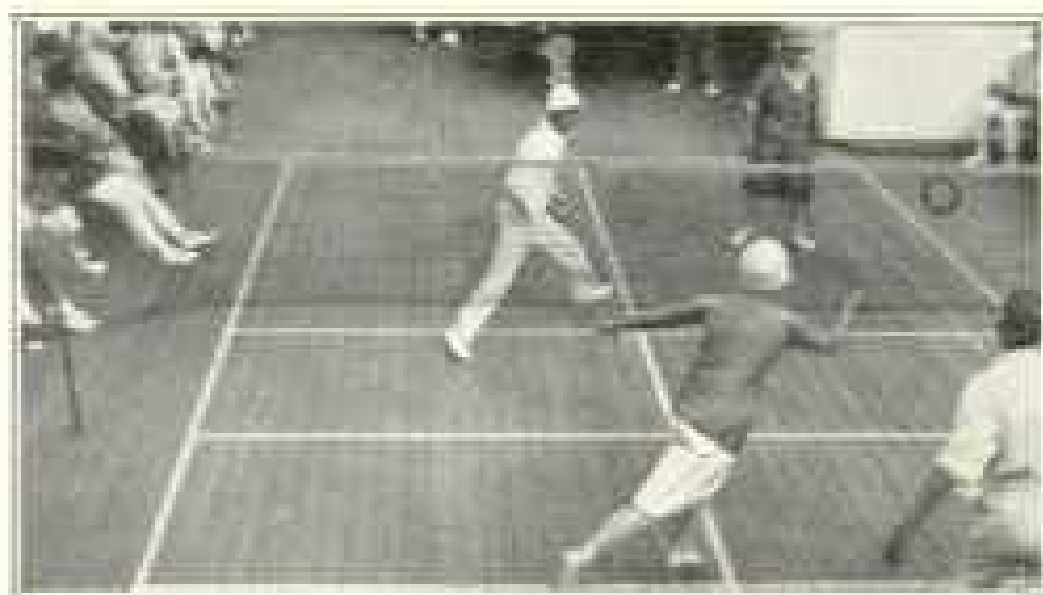
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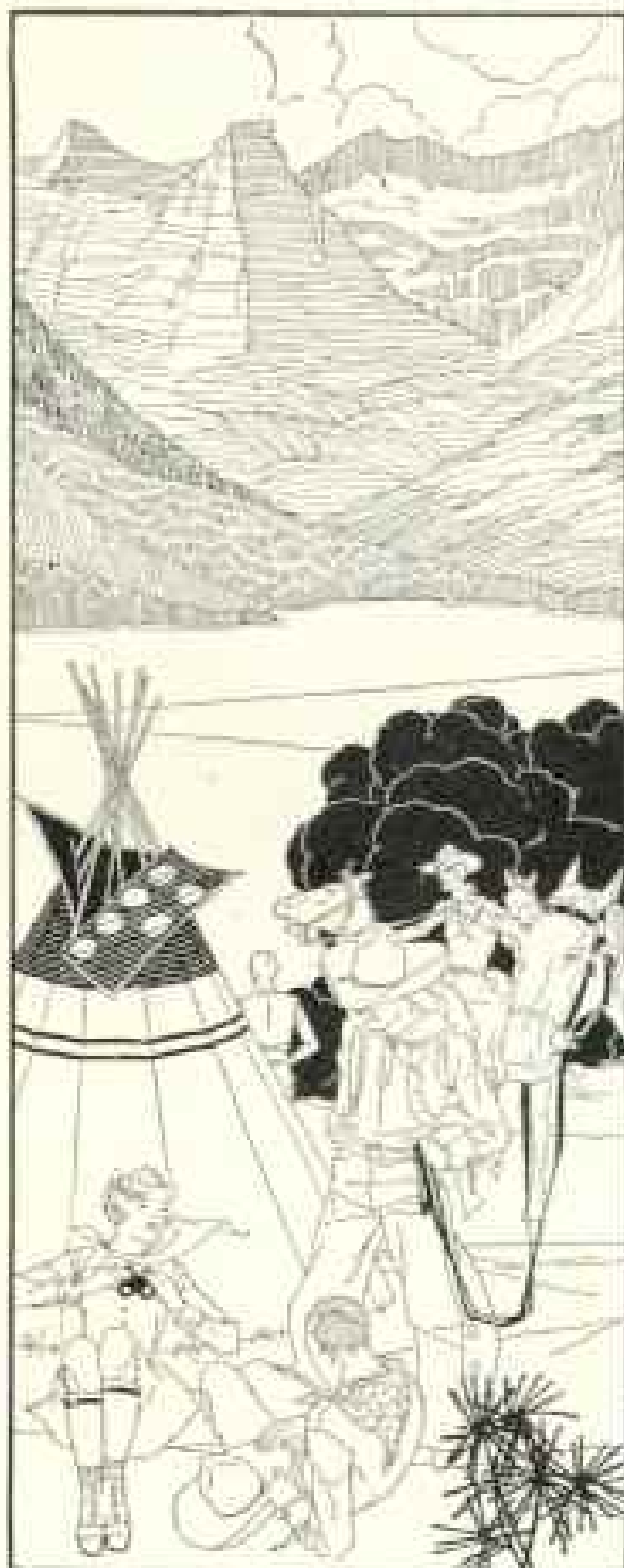
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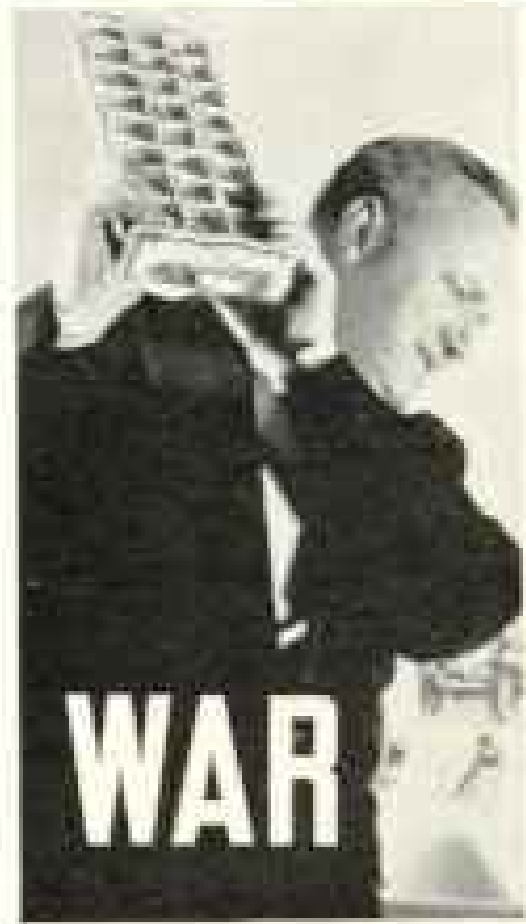
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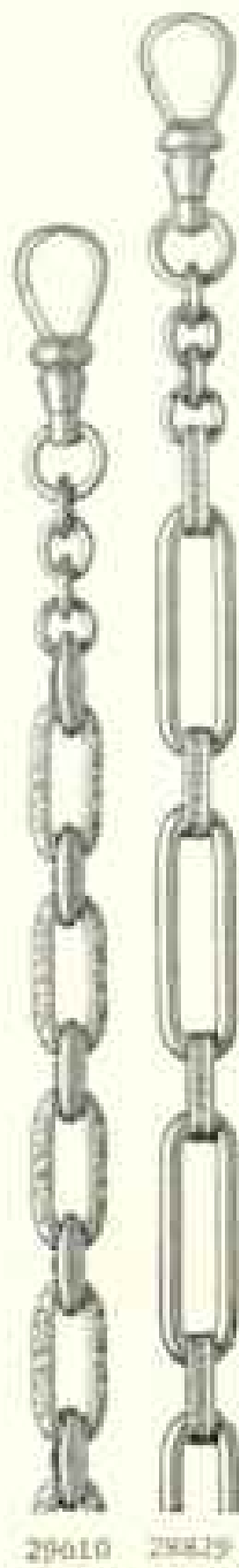
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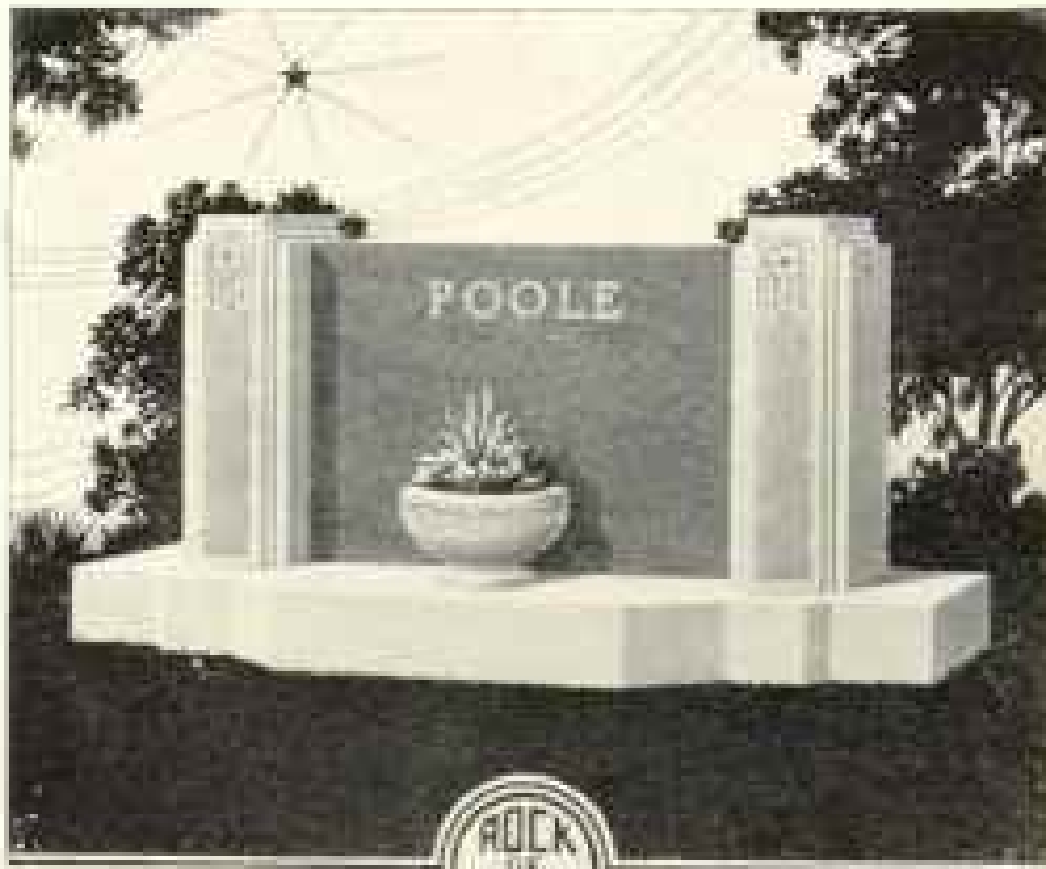


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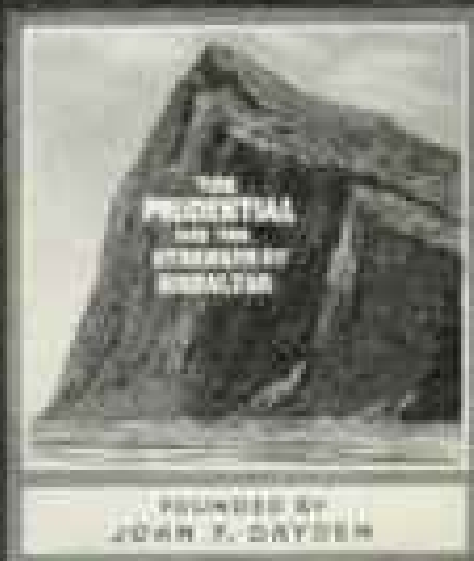
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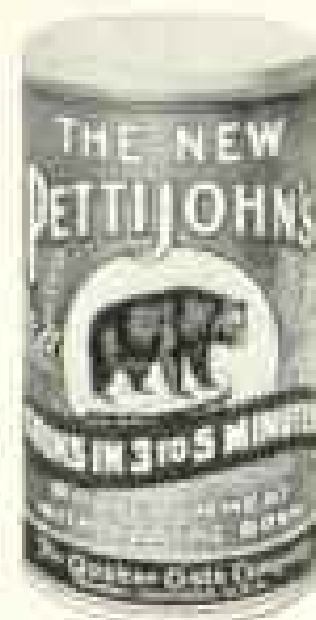
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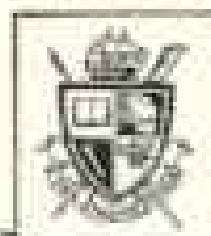
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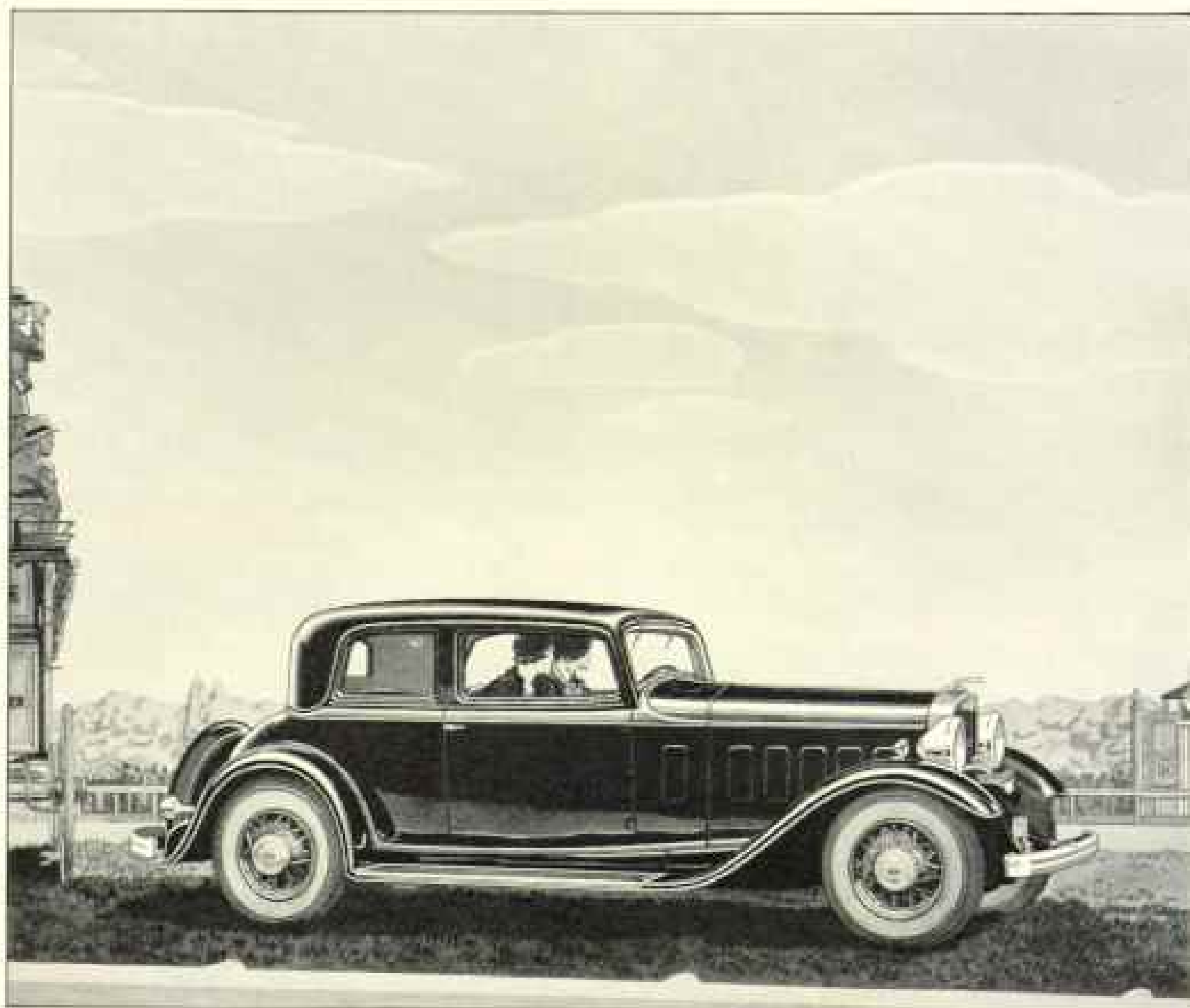
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