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CONTENTS

TWENTY-FOUR PAGES OF ILLUSTRATIONS IN FULL COLOR
AND A SPECIAL MAP SUPPLEMENT OF ILLINOIS

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THE NATIONAL GEOGRAPHIC MAGAZINE

ILLINOIS, CROSSROADS OF THE CONTINENT

By JUNIUS B. WOOD

AUTHOR OF "FLYING THE WORLD'S LONGEST AIR MAIL ROUTE," "RUSSIA OF THE HOUR," "SEEING AMERICA FROM THE 'SHENANDOAH,'" ETC., ETC., IN THE NATIONAL GEOGRAPHIC MAGAZINE

With Illustrations from Photographs by Clifton Adams, Staff Photographer, and a Special Map Supplement of Illinois

WITH mighty rivers for strokes, Nature outlined Illinois as the heart of a continent. The Union sketched this same map and made it a State. In the more than a century since then, life has changed and the frontier has disappeared, but the fundamentals which destined Illinois to be the heart of a great and growing Nation are the same.

Before civilization came, wandering tribes, the birds and beasts, following the trails of land, water, and sky which converge from Atlantic and Gulf and radiate to distant Pacific and frozen north, paused to rest between rivers and lakes in what is now Illinois.

The pioneer and woodsman crowded forward in flatboat and covered wagon. After them came the steamboat and railroad, and now the airplane follows the trail of the birds—the birds, all that remain of the wild life which so quickly disappeared. Pathways of the Nation and continent cross in Illinois—a destiny which Nature has fixed.

Nature endowed the State with a fertile soil to nourish mankind and stored treasures of minerals beneath to feed man's machines of travel and industry. More than all, it blessed the State with a rugged, healthful climate, which plays so large a part in fixing the temperament and destiny of peoples and nations. What man has made of these factors is the story of Illinois to-day.

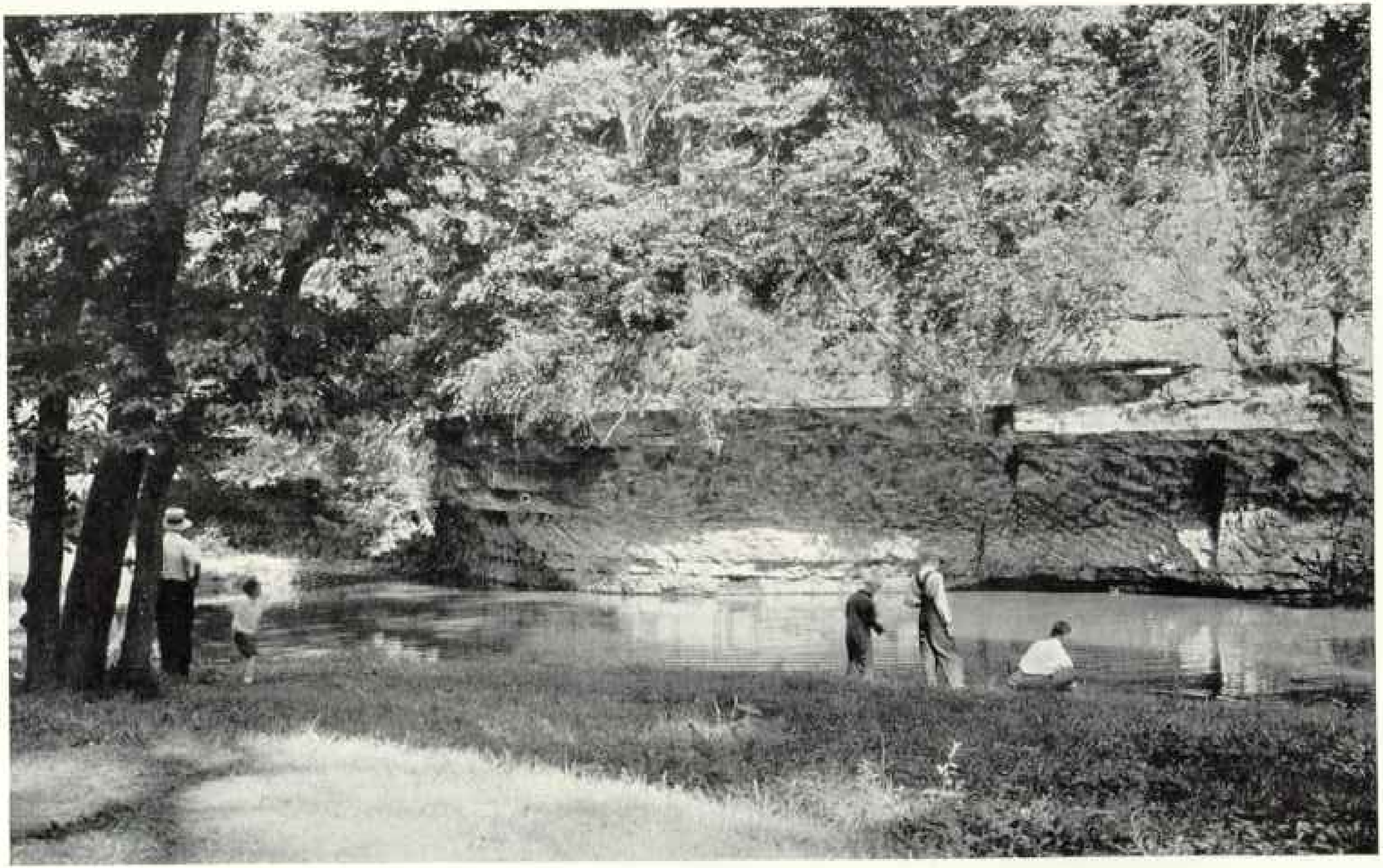
Glimpse it for a moment as from an airplane winging northward, over criss-crossed arteries of concrete and steel and water, with towns and villages knotting them into a network. Forests and orchards of fruit give way to somber mines of coal. The earth is carpeted for miles with waving corn. Cities and tall stacks of mills become thicker. There is a broad belt of green pastures alive with dairy herds. Then comes a great, throbbing city under a pall of smoke, with humanity snuggling closer and climbing higher. Here acres of emerald parks intersperse drab-roofed squares, and finally a burst of graceful towers edges an inland sea.

Every village, every hamlet, has its story, some in the dim past, others in the thriving present. Traces of colonial days are few in Illinois, and towns show true to type, as one rolls over the smooth concrete highways. But each adds its mite of story, and there is no easier way to see them than by jogging north, over the aptly named Meridian Highway, through the center of the State, 385 miles from southern tip to northern border.

In the course of this journey the traveler will see the aspect of Nature change as in few other States. In "Egypt"—so named by the pioneers because of its fertility—pecans, cotton, tobacco, magnolias, bald cypress, and lotus are growing; in the north, sugar beets, hickory, tamarack, and forests of white pine brave the biting

SPANS OF STEEL LINK ILLINOIS WITH THE SOUTHLAND

Much-traveled highways which lead from Chicago down through the State cross the Ohio River into Kentucky by means of this Brookport-Paducah Bridge. Its piers are built high enough out of the water to allow river boats to pass comfortably beneath it without the necessity of a draw-span.

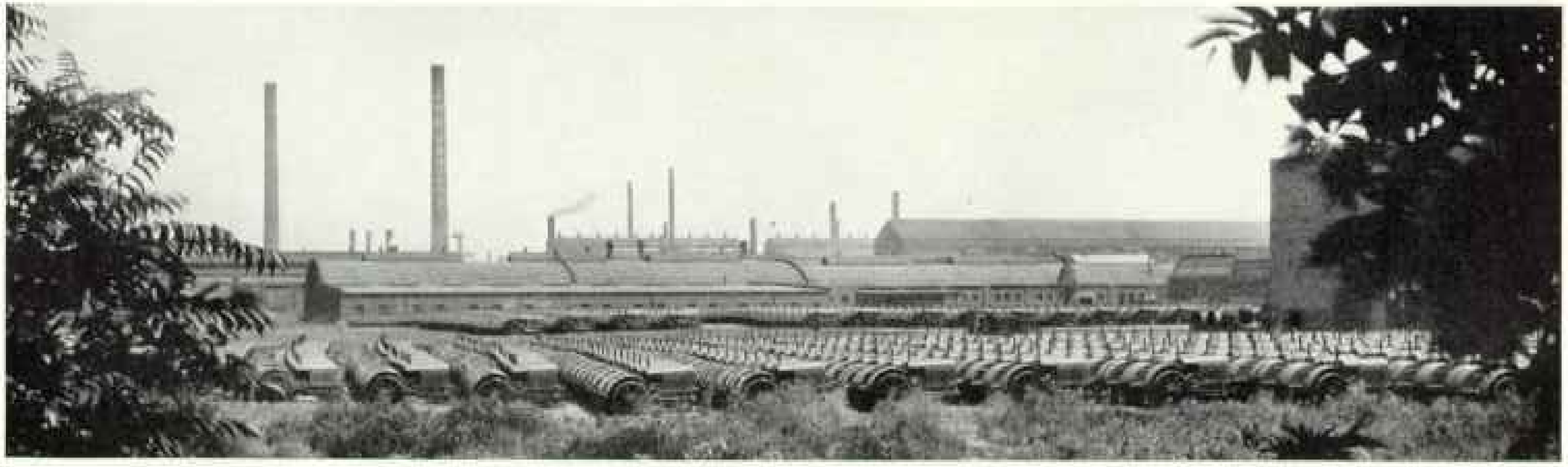


PINE CREEK WINDS BENEATH FERN- AND VINE-DRAPED BANKS

Its course leads through the comparatively new White Pine Forest State Park near Oregon and Polo. Acquisition of this area has been advocated for 30 years by conservationists. It contains the only appreciable stand of white pine in the State.

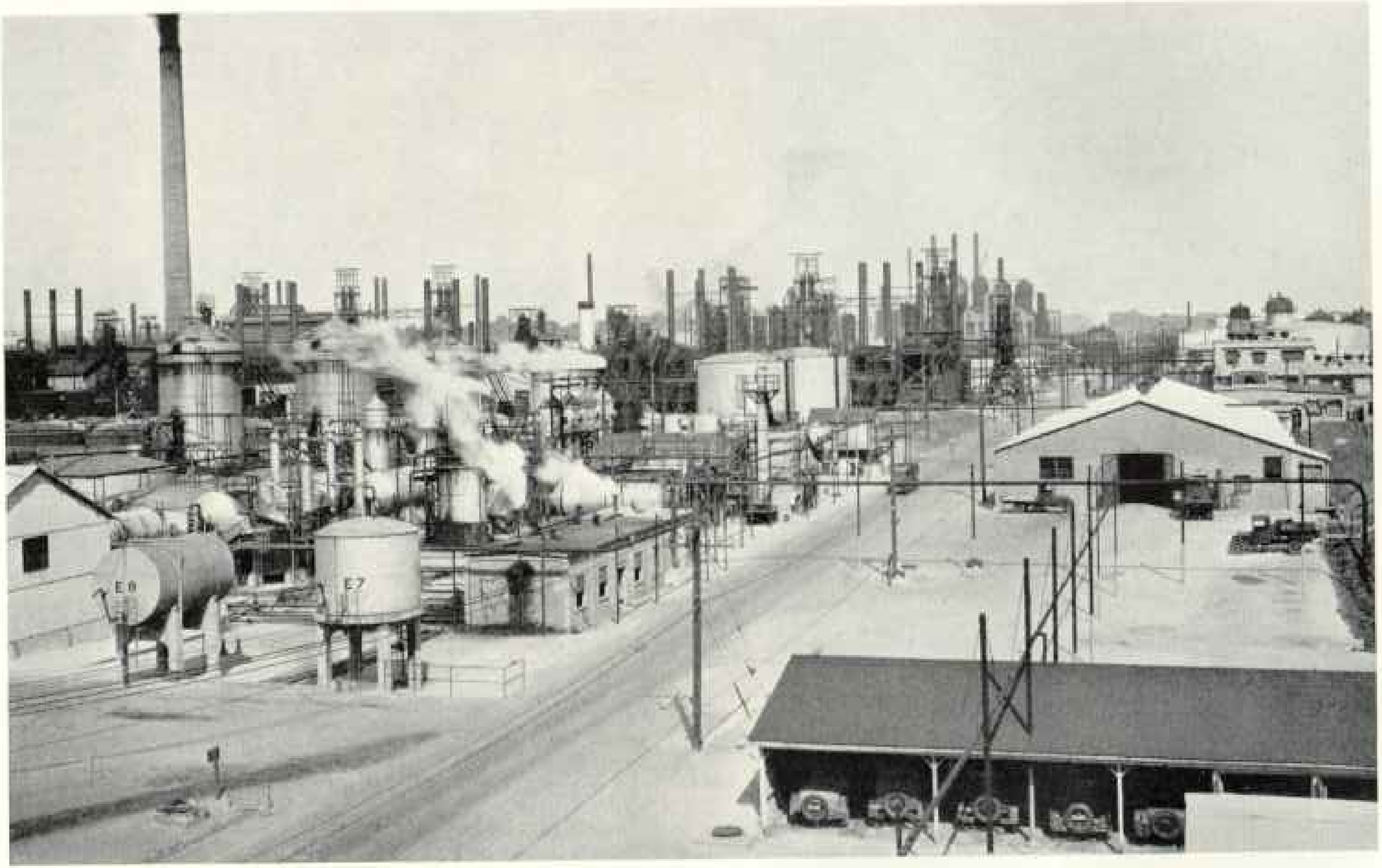
MOVABLE DAMS AID NAVIGATION ALONG THE OHIO RIVER

Between Pittsburgh and Cairo 46 such dams have been constructed by the Corps of Engineers, United States Army. They consist of a row of heavy oak wickets faced at the top with steel and firmly hinged to a concrete base. These are raised or lowered by a derrick boat to accommodate the stage of water.



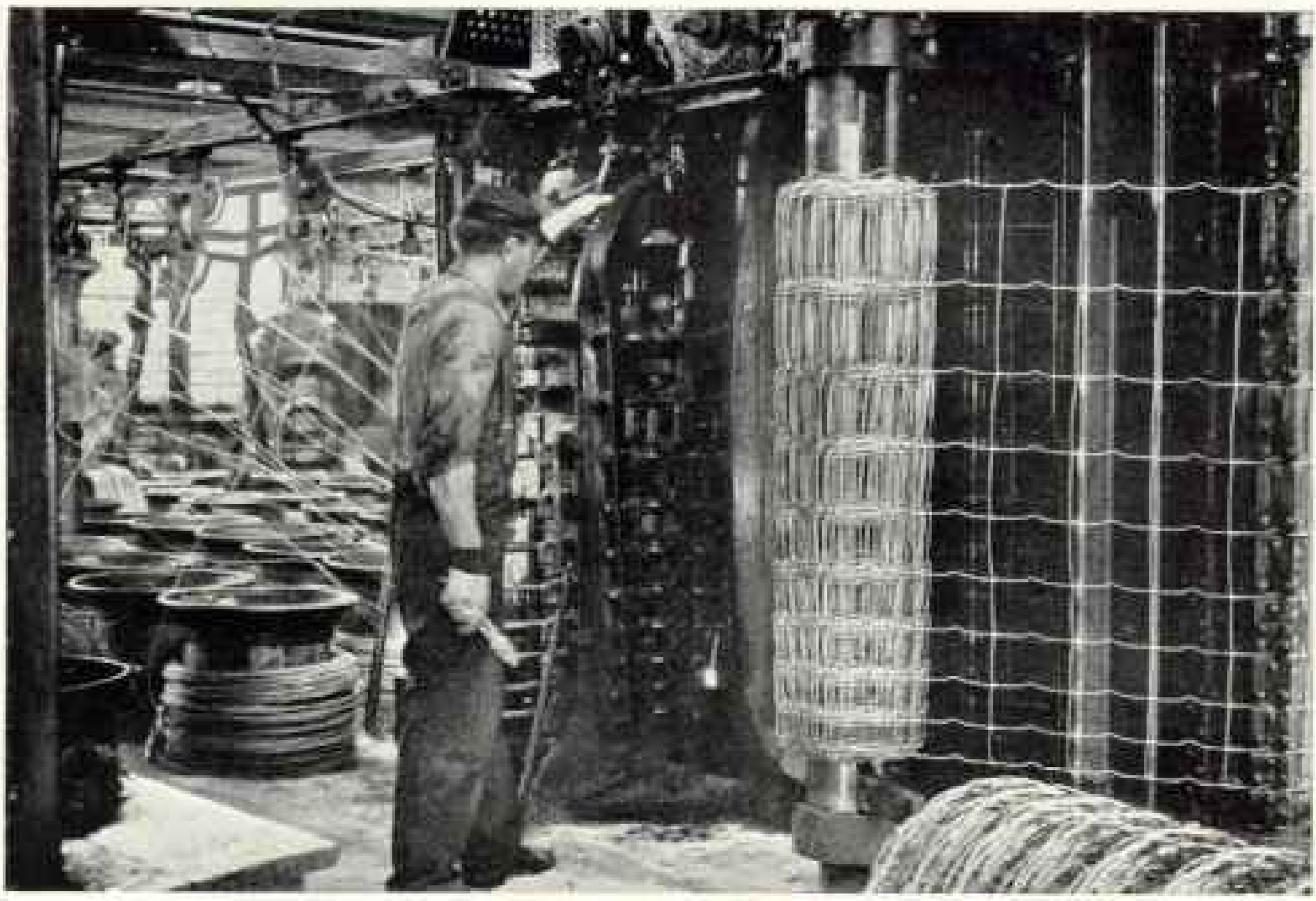
ILLINOIS LEADS THE UNION IN PRODUCTION OF FARM IMPLEMENTS

The value of the State's annual production of agricultural machinery exceeds $100,000,000. A storage yard full of tractors awaiting shipment near Chicago.



THROUGH THOUSANDS OF MILES OF PIPE, OIL COMES TO ILLINOIS REFINERIES

The crude product is moved from mid-continent fields by powerful pumps and, passing under the bed of the Mississippi River, is stored in large aluminum-painted tanks. Here, at Wood River, near Alton, it is converted into gasoline and other petroleum products for shipment over the country to retail stations (see text, page 533).



A JOLIET MILL WEAVES WIRE INTO FENCING

The so-called square-mesh fabric type was invented in Illinois about 1877 and the State now manufactures a considerable part of the Nation's steel fencing.

winters. Most of Kentucky and Virginia are north of Cairo, while Boston is farther south than Zion. In the south the frost is usually gone by the end of March; in the north it keeps the farmer guessing until May.

The proposed trip will be an easy one, for no other State has more miles of concrete roads. The automobilist who starts his car in New York, heads across the continent to Seattle, down the Pacific coast to Los Angeles, over the wide open spaces to New Orleans, and then back through Richmond and Washington, will have covered less than the 8,000 miles that are paved with cement concrete in Illinois. In one year, more paved highway was added than the distance from Chicago to Portland, Maine, and 2,500 men and 10,000 horses were employed at the task.

Illinois gave a new type of road to the world. The little town of Bates, southwest of Springfield, is famous among engineers on account of a $200,000 patchwork road in 64 sections, each of a different material, thickness, width, and type of construction. Vehicles were kept moving over it for two years, until every section was worn out. The tests showed which type was the most durable and most economical.

THE SOUTHERN TIP IS THE LOWEST SECTION OF ILLINOIS

Cairo is both the southern tip and within a few miles of the lowest spot in Illinois, only 279 feet above sea level. It is a city rich in memories. There Gen. Ulysses S. Grant had his headquarters from September, 1861, to April, 1862.

When the Illinois Central Railroad pushed across the State, Cairo, satisfied that the Ohio River never could be bridged, saw itself a metropolis where trains and boats would always meet. Charles Dickens was one who bought a lot in the city of dreams. Before he crossed from England and made the journey west to see it, the temperamental river had moved and it was far beneath the water. He blamed Cairo, and Cairo has never forgiven him for what he wrote.

Few of the graceful old river steamers remain, both rivers have been bridged, and Cairo lives in another age. It is a transfer point between water and rail for the Gov-

A ROADSIDE MARKET WHICH SPECIALIZES IN MELONS

The growth of automobile travel has been responsible for the existence of thousands of similar roadside stands. They enable many small farmers to market their fruit and vegetables direct to consumers. More than 300 carloads of watermelons are shipped out of Illinois annually.

ernment barge line to New Orleans and, in winter, the northern terminal. A single tow of long, squat barges with a powerful tug can carry the grain produced on 18,000 acres. They bring up the products of the Southern States and of distant lands—sugar, coffee, bauxite, sulphur, burlap, sisal—and carry back the grain and manufactures of the Middle West (see Color Plate VI). Like the pirogues and flatboats from Illinois, which 80 years ago drifted down the river with flour, smoked meat, and corn-juice "moonshine," these steel barges plod eight miles an hour—no faster than Marquette paddled in his birch canoe. But the rattle of the electric truck has replaced the song of the roustabout, and one close-tied fleet of barges carries the freight of a dozen splashing river boats.

ALONG THE MERIDIAN HIGHWAY, GOING NORTH FROM CAIRO

The highway leaves Cairo, curving through the Ozarks. Back in the hills, families are living in primitive log cabins. "Egypt's" fields of cotton, which dare frost but escape the boll weevil, change around Anna into orchards of apples, peaches, and pears and beds of asparagus and strawberries. This is one of the Nation's "pie-apple" belts.

Beauty spots are preserved as State forests and parks. Bald Knob, 1,030 feet high, crowns a hardwood tract. Another reserve contains the only stand of shortleaf pine in the State. Fern Cliff Park has a wealth of fern-covered bowlders and waterfalls, and in Giant City Park Nature has lined great square rocks like streets. At Tunnel Hill the Illinois Central has bored a 7,000-foot tunnel as part of the 169-mile cut-off between Edgewood, Illinois, and Fulton, Kentucky.

Crucible clay of the highest grade comes from around Carbondale, north of Anna, and 54 of the 102 counties in Illinois produce coal, most of which is mined in adjacent Franklin and Williamson counties.

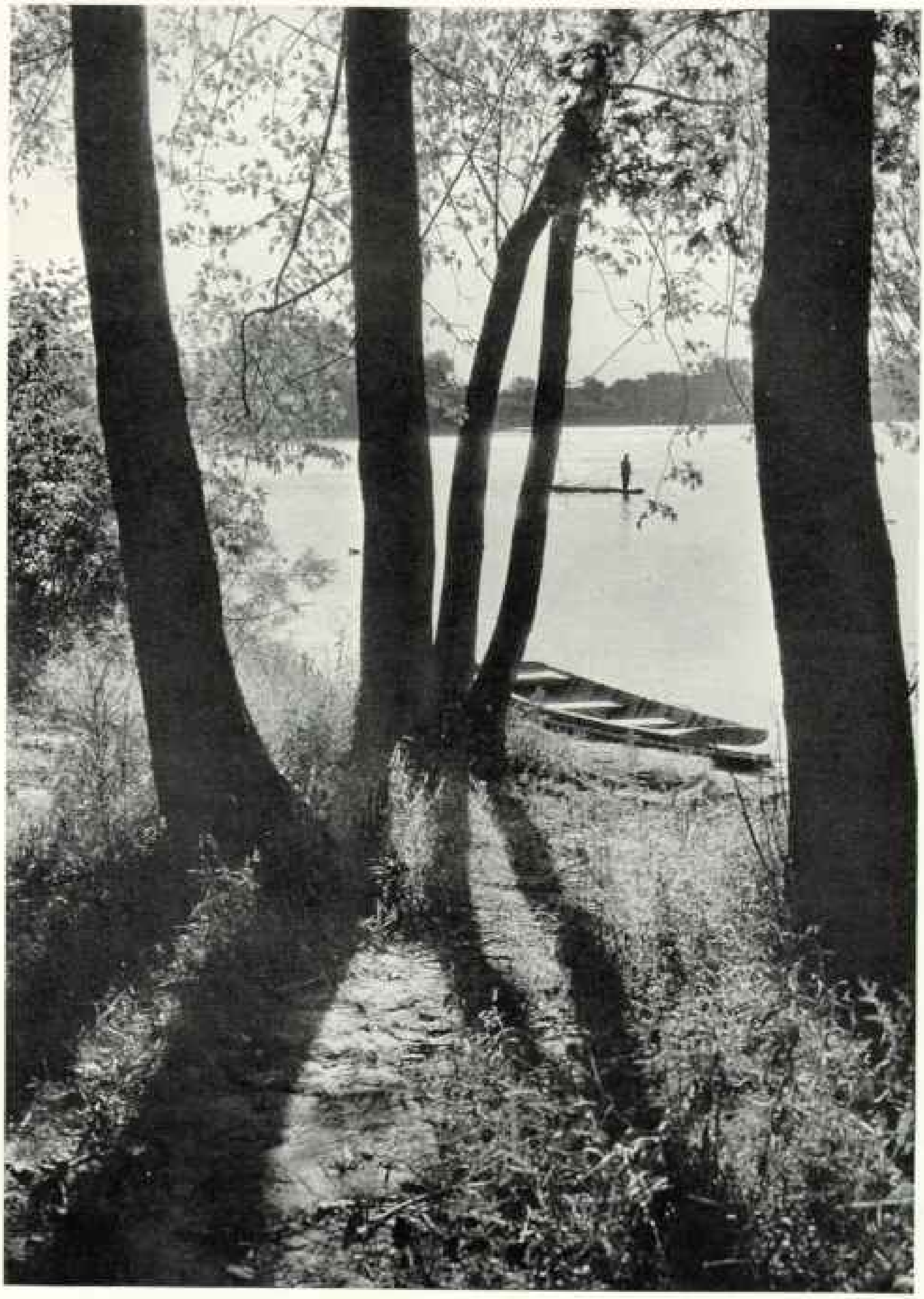
Marion, where Robert G. Ingersoll studied to be a lawyer and where Gen. John A. Logan made the speech which kept southern Illinois in the Union, is 19 miles east. Near it is the town once known as "bloody"

THE ILLINOIS RIVER PROVIDES "SEASHORE" SPORT FOR YACHTING ENTHUSIASTS OF THE PRAIRIE STATE

Near Peoria the stream widens to lakelike proportions, and here, on summer evenings and holidays, hundreds of sportsmen embark in pleasure craft of all kinds. The sailboats well out in the stream are racers of the "Star" class and are lining up for a Sunday-afternoon test of speed.

THE UNIVERSITY OF ILLINOIS MAKES ITS INFLUENCE FELT IN EVERY PHASE OF THE STATE'S LIFE (SEE TEXT, PAGE 574)

To its campus at Champaign-Urbana come the youth of town and country to train for a more useful citizenship. There are now more than 11,000 students enrolled in its numerous colleges and courses, and this broad walk is thronged during intervals between classes. At the left is the Women's Building and in the distance University Hall.



DESPITE THE ADVANCING TIDE OF INDUSTRY, THERE REMAIN MANY QUIET AND ALLURING STRETCHES ALONG THE ROCK RIVER

Near Milan, summer cottages line the banks of the river. Their owners are for the most part residents of the near-by industrial and civic trinity of Moline, Rock Island, and Davenport (see text, page 544).

Herrin. Politics has changed and the barber shops and stores now have signs in their windows, "This place will be closed at noon for prayer."

ILLINOIS BASES HER LASTING PROSPERITY ON COAL

Benton is farther north, over a straight seam of coal from 7 to 14 feet thick, estimated to contain two and a half billion tons. It is the center of vast mines, five of which in different years have held world records for production. Orient No. 2, at West Frankfort, often bringing to the surface between 14,000 and 15,000 tons a day, is one of the largest coal mines in the world. It is electrically equipped, and its locker rooms and baths for miners, a requirement under the State law, could lave a regiment from black to white without overcrowding. The deepest bituminous mine shaft in the country, more than 1,000 feet, is near Assumption, Illinois.

Adventurers searching for gold have settled continents, but the lasting prosperity of nations rests on structural material and baser ores—coal, iron, oil, copper, limestone, and the humble clay and sand. Pennsylvania and West Virginia, and in some years Kentucky, produce more coal than Illinois, but they rank below it in untouched deposits of bituminous.

Mills and furnaces are built near coal, the base of the State's industrial prosperity. Iron and copper come from across the Great Lakes by the cheapest transportation in the world. In the value of its mineral products, Illinois ranks seventh among the States.

Our automobile highway now crosses the almost-forgotten trail followed by Col. George Rogers Clark in 1778. Patrick Henry sent this youth of 25 and a band of Kentucky frontiersmen to establish the vast Northwest Territory as part of Virginia. They came down the Ohio and unfurled the Stars and Stripes, for the first time in Illinois, over Fort Massac, now a park near Metropolis.

Fields of wheat and oats alternate with corn, and oil replaces coal under the surface, as the road runs north through Centralia. Oil was discovered in Clark County 26 years ago, and once the State produced more oil than Pennsylvania. It still produces some 6,000,000 barrels a year, but it is as a refining and distribution center that Illinois is most important to the oil industry. The pipe lines radiate to the Atlantic, the Gulf, and Canada from Wood River and Roxana (see page 527).

One of these lines follows the old trail of the covered wagon between Vincennes and Cahokia. The first mail in Illinois came along this route in 1805. Towns were spaced off every 25 miles, which then was a good day's journey.

At Olney is one of the five game havens in the State and the home of the late Robert Ridgway, formerly curator of the Division of Birds in the United States National Museum and a world authority on these feathered creatures. With 365 varieties, he rated Illinois rich in bird life. Among the many volumes on ornithology of which he was the author was one book which few of the industries accepting it as a world standard realize was created to describe birds. For 21 years Dr. Ridgway devoted his spare time to preparing "Color Standards and Color Nomenclature," distinguishing some 4,000 colors and shades, 1,115 of which are named and the variations between designated by symbols.

THE OLD STATE CAPITOL AT VANDALIA IS NOW A MUSEUM

Returning to our north-to-south highway, we come to Vandalia, due north of Centralia. Here is the old State Capitol Building of 1820-1837, later a county courthouse, and now a museum. Its architecture of a past age contrasts with the drab two-story buildings around the Vandalia city square. On the spring morning of my visit three busloads of swarthy gypsies and their children also arrived—gypsies riding in motor buses over a smooth paved road which less than a century ago was a trail through forests, with an occasional settler's cabin and Indian tepees where now there rises a standardized town every few miles!

Twenty miles southwest of Vandalia is Greenville, once the smallest town in the United States to have a Federal building. It is the home of one of the largest regalia factories in the country, originator of standardized goats, two-humped camels which smoke cigars, exploding golf tees, and other trappings which make lodgework

hilarious. Industry is as versatile as the wants of man.

ILLINOIS, A FLOWER STATE, SHIPS ROSES TO CALIFORNIA

Illinois is a flower State—a fact which is seldom realized because the blooms which make its reputation are grown in greenhouses for commerce. It markets 200,000,000 flowers a year, shipping roses to California and peonies, carnations, gladioli, and chrysanthemums to other distant States. The hardy peony, 12,000 buds to the acre and 15 acres to a farm, must be harvested in a single month. A new variety sells as high as $100 a plant. The climate belts encountered between southern and northern Illinois lengthen the crop, and a field will be blooming in one section months after those in another have been cut.

One of the big Illinois nurseries is at Pana—24 acres under glass. Another, at Lincoln, has 22 acres covered, and there are more around Chicago.

Illinois runs to big wholesale nurseries. One of the largest propagating establishments in the world is at Omaga. It has distributed to other nurseries a hundred million shrubs, vines, creepers, and trees grown from seeds and cuttings. On one tract of this nursery are 14,000,000 evergreen seedlings covered with muslin to reproduce the dim sunlight of fine forests.

The highway, which has been cutting the Corn Belt, now circles an overgrown kiosk in the center of Decatur, Lincoln's first home in Illinois and the home of the first G. A. R. post, in 1866. A towering corn refinery here reminds the traveler that more than half of the Nation's corn products are refined in Illinois. Indians were growing corn in the Illinois Valley before Columbus saw his first cornfield.

CORN FINDS ITS WAY INTO A GREAT VARIETY OF PRODUCTS

Corn, like much of Illinois, is typically American. Half of the Nation's cotton and one-fourth of its wheat are exported, but only one per cent of its corn leaves our shores. Seven-eighths of the immense crop is fed to stock. The rest finds its way to our tables or to industry. The use of corn meal is decreasing, as housewives desert their ovens and bakeries discourage corn bread.

Illinois does not raise as much corn as Iowa, but it raises more than any single country outside of the United States. It also "cans" more, that industry centering at Hoopeston, pioneer "dry" city.

Refineries take two-fifths of the corn that is marketed. Few who bite into "corn on the cob" realize the wealth of products which chemists and machinery extract from a kernel. "Sparklers" for Fourth of July, high explosives, face creams, soap, artificial rubber, and silk, varnish, tanning extracts, radio batteries, paper, textiles, carpets, mucilage, and iron castings all derive valuable ingredients from corn. Cornstarch is used in kitchen and laundry; corn oil goes into the frying pan, in a salad dressing, and in a medicine; corn syrup serves from breakfast hotcakes to evening ice cream, and corn sugar is given to babies and diabetics and has a rôle to play in surgical operations and in the manufacture of "moonshine," vinegar, and milk acids.

Even the lowly cornstalks are made into paper and artificial silk; but paper, silk, and canned corn are not admitted under the aristocratic label of *corn products*.

THREE TOWNSITES RICH IN LINCOLN ASSOCIATIONS

Lincoln, first of 24 American cities of that name and of 17 more which are modifications, is off the main highway. The Emancipator helped to plan it, and christened it himself when the railroad came, in 1852, by breaking a watermelon over a wagon-wheel. Lincoln also surveyed the near-by townsite of Petersburg, and the deserted village of Old Salem, where he lived in 1831, is now a State park. The two-story log tavern where he wooed Ann Rutledge, the Offut store where he wrestled Armstrong, the Lincoln and Berry grocery where he clerked, and the Onstot and another log cabin in which he lived, are restored. He led his company of woodsmen from there in the Black Hawk War of 1832, ruefully commenting, on his return, that he had fought a war and never fired a shot.

Bloomington is the center of McLean County, for years the banner agricultural county of the Nation in acreage production. It now is one of the two counties in Illinois which have 4,000 farms. Fifteen counties in the State each had more than that 25 years ago. Land which brought

FILLING A 30-FOOT POTTERY KILN AT MONMOUTH

After the clay has been molded to the desired form, it is placed in containers, which are stacked in kilns and fired with crude oil for 50 hours at very high temperature. It is then cooled for another 50 hours, and the finished products are kitchen and dairy utensils and garden ornaments. The pottery made here and at near-by Macomb has achieved a high reputation in many parts of the United States.

Photograph by F. R. Oakley

PEORIA FISHERMEN LAND A 26-POUND PADDLEFISH

It measured four and a half feet when taken from the Illinois River. The strange protuberance is used for stirring up mud, where the sluggish fish finds the minute organisms on which it feeds. The paddlefish, or spoonbill, occurs in the Mississippi River and some of its tributaries, occasionally attaining a length of six feet. In certain Chinese rivers it grows to be 20 feet long.

$400 to $500 an acre in the Corn Belt ten years ago now can be had for $200. However, out of close to a quarter of a million farms in the State, 86 per cent have an automobile, 12 per cent a truck in addition, 22 per cent have electricity or gas, but 57 per cent do not have a sink or pump in the kitchen for the housewife!

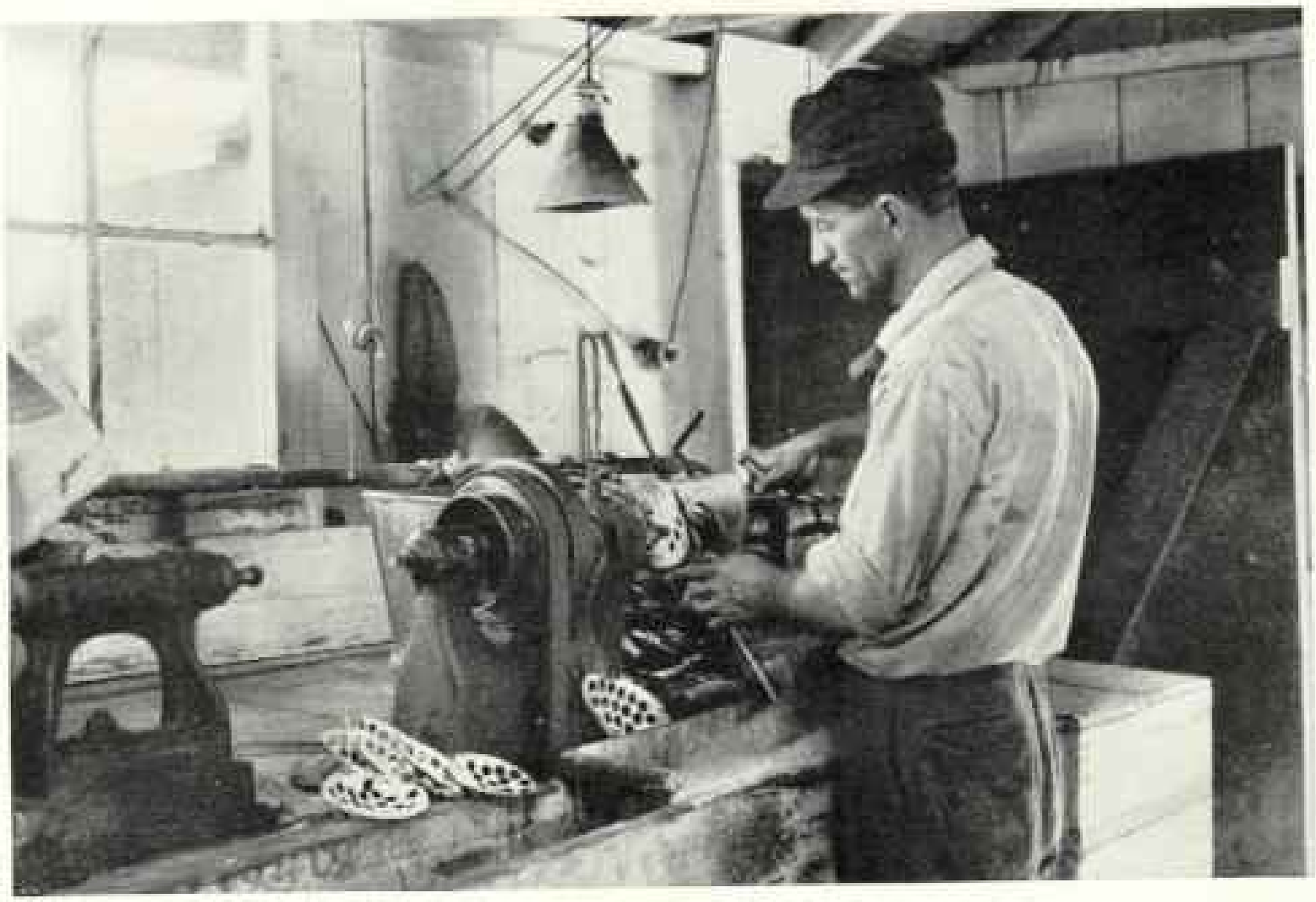
Once Illinois was the leading agricultural State in the Nation; but, as farm prices have fallen and cities have grown, its acreage and livestock have shrunk. Its scientists gave the world a new agriculture based on permanent soil fertility, and it made coöperative marketing and coöperative grain elevators a success. It makes the machines for modern agriculture, manufactures food products, and it has become the food distribution center for the United States, if not for the world.

FROST-RESISTING CORN BEING DEVELOPED BY MACHINERY

Hundreds of acres in McLean County now raise seed corn for other fields. Corn is corn, as in the days of the Indians, but America has improved it. Tourists along the road this summer may notice, in one of the experimental fields, apparatus resembling a glass diving bell, a moving derrick, and machine shop. It makes artificial frost. The derrick lifts the case high and sets it over four growing stalks. The frost is turned on, like the first blight of winter. Agronomists tabulate the time and temperature, and the workshop moves on to another species in the sunny field (see illustration, page 542).

"Interesting, but what's the value?" asks the man who knows his corn from a can. A new variety will be developed which can withstand frost, and millions of acres where the seasons were believed too short to grow corn can then be cultivated.

Bloomington preens itself as the birthplace of the Republican Party, as do Ripon, Wisconsin, and Jackson, Michigan. It was here that Lincoln delivered his "Lost Speech," in the old Major block, May 29, 1856. It was "lost" to the extent that the newspaper reporters were too excited to take notes. A lawyer did, but the



CUTTING "PEARL"-BUTTON BLANKS FROM MUSSEL SHELLS

The shells are soaked in huge vats of water for several days, then are held in specially designed tongs while a cylindrical blue steel saw cuts out the button "blanks." Cutting is facilitated by jets of water sprayed on the saw as it turns through the shell. The button blanks are sold to finishing plants, where the disks are turned and polished and holes are bored in them (see, also, illustration, page 538, and text, page 543).

speech was not published until many years later.

La Salle, the explorer, who with Tonti—his intrepid and romantic young Italian associate with the iron hand—breasted the Illinois River a few years after Marquette and Joliet had paddled their canoes northward again to Lake Michigan, left his name to a city.

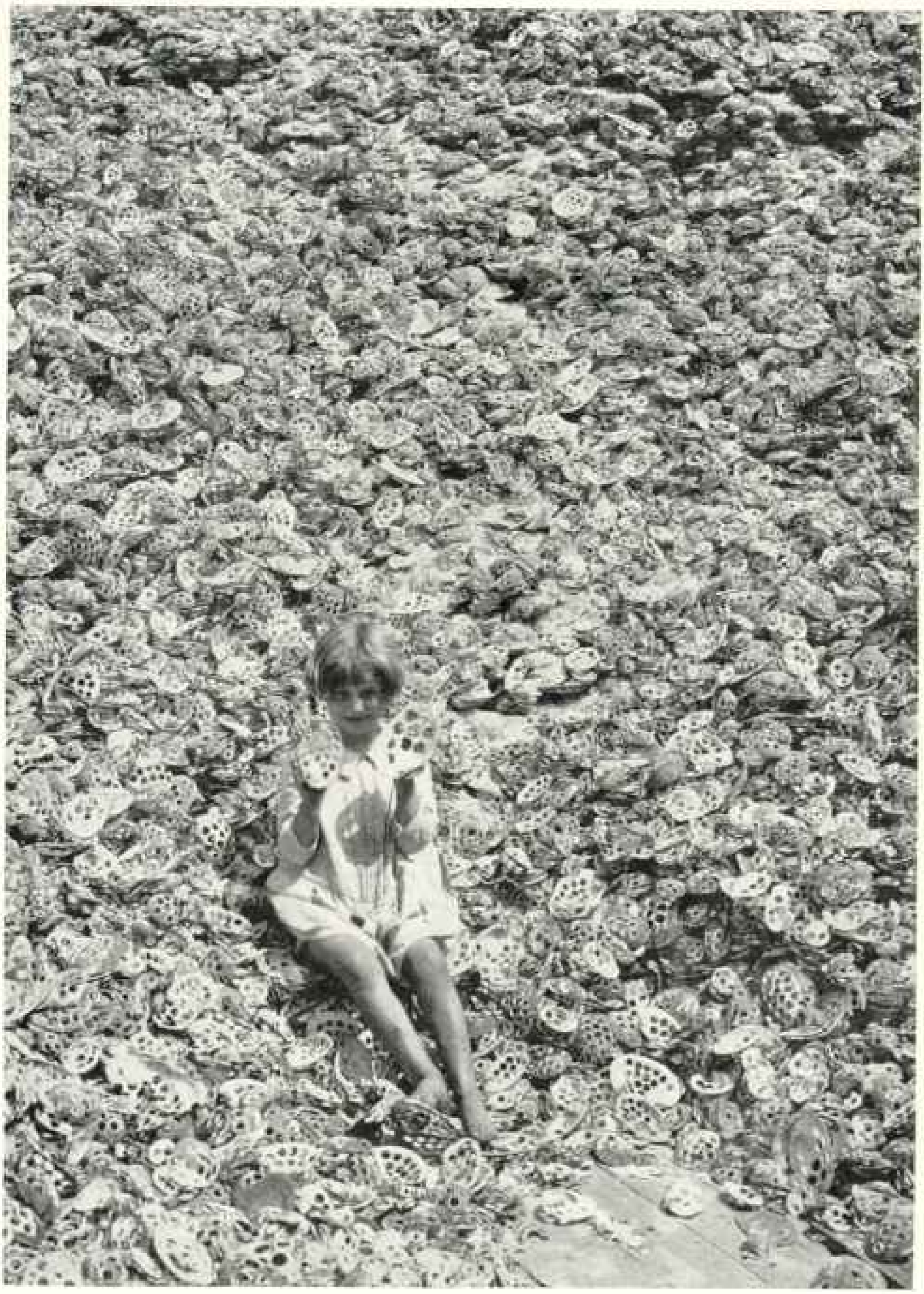
The dairy country, which stretches on into Wisconsin, begins here, but the chief wealth of the district and of the cities of Ottawa and Streator is derived from the shale, clay, and silica sand outcroppings. Big stacks belch smoke from factories that make everything, from marbles to splinterless windshields, toothpaste and washing powder, bricks and Portland cement. Clocks, sulphuric acid, paper, and cucumbers come from this valley, where smaller rivers join to form the Illinois.

TWO ACRES UNDER GLASS DEDICATED TO THE HUMBLE CUCUMBER

Hothouse cucumbers, tomatoes, lettuce, radishes, rhubarb, and mushrooms come from Illinois. The largest single greenhouse in the State, two acres under glass, is at Ottawa, growing the unsung cucumber, which is shipped from Illinois as far as Spokane and Boston, to Texas and Florida.

Illinois is a leading State for the pampered cucumber. In its warm home it receives attention never dreamed of by its forefathers, who were only good enough for filler between hills of corn. Cultivation and breeding in 25 years have produced an appetite-teaser with a dark-green coat, smooth and even, sweet and brittle inside. Eight swarms of bees minister to an acre of vines, spreading the pollen. They are put in the greenhouses in autumn, when their hives are stored with honey for winter. Cucumber blossoms give little honey, and the bees, frantic as greyhound racers chasing a tin rabbit, wear themselves out pollinating cucumbers for further salads.

In 1673, when Marquette and Joliet, the first white men to come up the Illinois River, reached the point where Utica is



TONS OF "CLAM" SHELLS HAVE YIELDED THEIR CROP OF "PEARL" BUTTONS

Perhaps you are wearing one of the 25,000,000 buttons which were punched from this pile of shells. The raw material is purchased from fishermen along the Mississippi, Illinois, and Sangamon rivers, who gather the mussel (clam) shells by the ton. In 1930 the Illinois River alone produced 400 tons of these shells. The refuse heap of a large plant at Meredosia (see, also, illustration, page 537).

now, smoke was rising from 74 long cabins of the Illini Confederation of Kaskaskia, Cahokia, Michigamea, Tamaroa, and Peoria tribes, friendly Indians, who were not nomads, but who cultivated fields. Joliet wrote "charbon de terre" on his crude map, the first recorded coal on the continent.

In 1674-1675 Marquette returned and founded a mission and called it Kaskaskia. In 1680 the French built their first fort, Crève Coeur, supposed to be impregnable, farther down the river, near Peoria; and Fort St. Louis, predecessor of St. Louis, was started near Utica, two years later. This is now beautiful Starved Rock Park, where the last Illini, fleeing Pontiac's avengers, perished (see Color Plate I).

Twenty miles west of La Salle is elm-covered Princeton, once home of the Bryants, where William Cullen visited, and of Owen Lovejoy, abolitionist and "underground railroad" operator. Illinois had its "underground railroad" before any rails of steel were laid, and Princeton was an important station.

A few miles north, the smooth road crosses the old Sauk Trail, over which Indians carried skins from the Mississippi to the French trading post at Detroit. In later years, when the English paid a cash bounty for every rebellious Colonial's scalp, hair was more valuable than furs.

A little farther on, the trail crosses what was the original boundary of Illinois when it became a Territory, in 1809, a line running straight west from the southern bend of Lake Michigan. When the Statehood bill was passed, in 1818, the southern half favored slavery, and an accommodating Congress, at the request of Nathaniel Pope, the lone delegate, moved the boundary 100 miles northward, to 42° 30', adding several thousand square miles of territory, including what is now Chicago and 14 rich counties, which later saved the State to the Union.

HISTORY AND INDUSTRY VIE FOR HONOR IN DIXON

The road detours to Dixon, town of corsets, shoes, and condensed milk, favorite products of the cities in this tier of Illinois. Here John Dixon ran a ferry and inn in 1829, sold whisky for 50 cents a gallon, and bedded man and beast for another 50 cents. Abraham Lincoln, Jefferson Davis, and Zachary Taylor were among the names on his register. The blockhouse where Lincoln served during the Black Hawk War is here.

The road winds through the beautiful scenery along the Rock River, past a statue of Black Hawk by Lorado Taft (see page 567), to Rockford, which had its beginnings as a sawmill in 1834. Now its factories supply much of the product which makes Chicago a furniture mart for the Nation — machines boring square holes, carving flowers, and shaping dimpled legs.

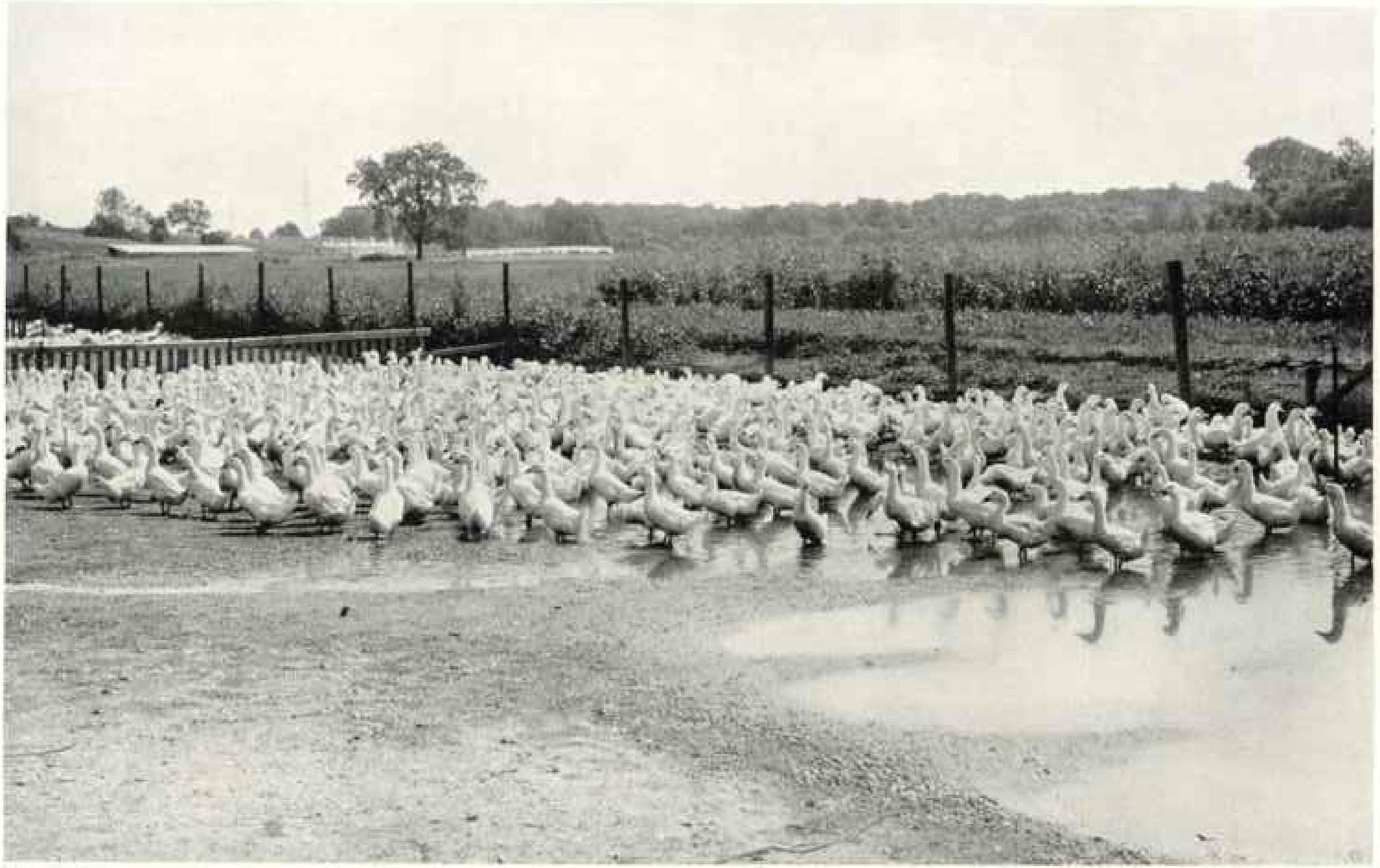
The machine to knit socks at 10 cents a pair—days that are gone—was invented here. A more modern knitting machine picks and ties 1,000 ends of yarn and rings a bell for human help if it fails in five attempts.

GALENA EXPERIENCED AMERICA'S FIRST MINING RUSH

Only a few miles more of the long day's ride and the Wisconsin line is reached. Illinois has other scenic highways. The road from Rockford to Galena, for example, goes through Apple River Canyon and rises over Terrapin Ridge, where Charles Mound, 1,241 feet above sea level, is the highest point in the State. It is in what geologists call a "driftless" area, where the hills were not leveled by the ice cap crawling down from the north.

The Mississippi River, first highway of the Middle West, has been reached four miles below Galena, and we drift down its broad bosom, glimpsing the changes since the canoes of explorers and flatboats of voyagers followed the same trail. In Galena, Grant worked in his father's leather store; Elihu B. Washburn was his friend, and other Washburns started as millers. Here, too, James J. Hill, the "empire builder," checked freight before he conceived railway systems. Grant's prim brick house recalls those days (see illustration, page 570).

Indians were mining lead here before Spain started its quest for gold. In 1721 Philippe Renault, associate of John Law in the Great Mississippi Bubble, brought 500 Dominican slaves and 200 French artisans to work the silver, but found only lead. The negroes kept digging for 100 years, and in 1828 the community saw America's first mining rush, resulting in a city of 30,000 tents of canvas and bark.

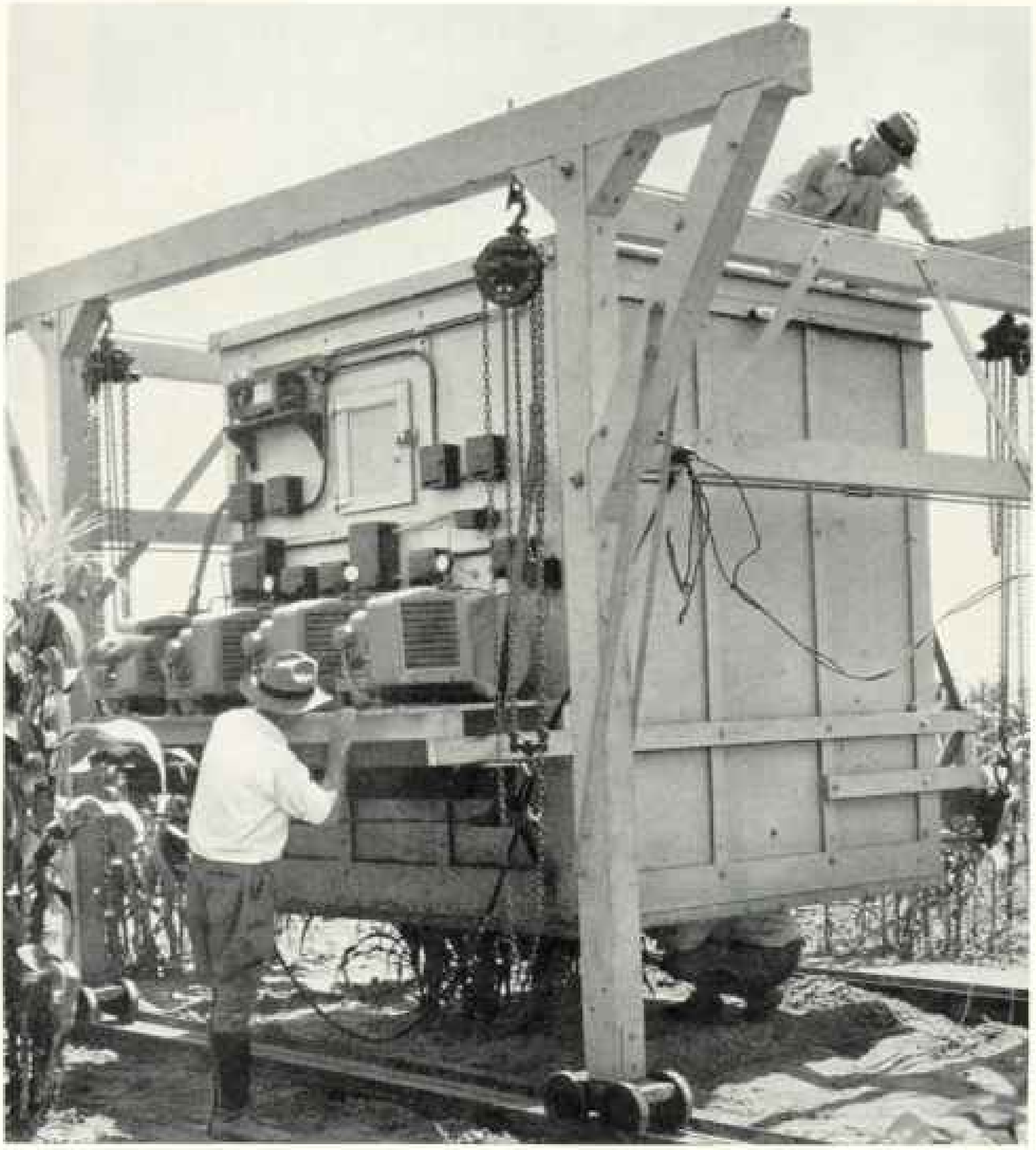


A FLOCK OF WHITE PEKINS ON A DUCK FARM NEAR MONTICELLO

As many as 80,000 ducks are raised on this establishment each year. They are hatched in incubators and fattened for the city markets on a special diet.

AN OLD-FASHIONED FERRY PLIES THE WABASH NEAR ST. FRANCISVILLE

Illinois is bounded on three sides by rivers, and ferries take the place of bridges in many places. The paddle-wheel boat provides power for the barge. A heavy chain, stretched from shore to shore, enables boats to resist the downstream pull of the current. The crossing is being made from Illinois into Indiana.



AN ELECTRIC REFRIGERATOR DEVELOPS FROST-RESISTANT STRAINS OF CORN

A refrigerating chamber is lowered over the stalks of corn to be treated and they are exposed to a certain degree of cold for a time each night. It is hoped that, by relating the results of such experiments to the proper kind of soil, fertilizer, and handling, there will be evolved parent plants for a cold-resistant commercial strain. Already, on a large seed farm near Bloomington, a variety of corn has been produced which can withstand a temperature nine degrees below freezing for three hours each night without injury. The work is being done by the State universities of Illinois and Wisconsin in coöperation with the United States Department of Agriculture.

Galena to-day has hardly 4,000 souls, but its lead mines are modern. At one time therewere plans to make it a separate State, Manitoumie (Land of God), an island of white men surrounded by Indians. Every winter farmers from Egypt came up the river to work in the mines. They were called "suckers" for their trouble, thus giving rise to the nickname, Sucker State. The modest wood violet is the State flower—another christening gone wrong—but the selection of the sturdy oak as the State tree was a better guess.

Above the high banks of Savanna is a Government proving ground, with storehouses which have held Army supplies

CITIZENS OF THE STATE CAPITAL ENJOY A SUMMER DIP

Constructed as a memorial to its soldiers and sailors, the municipal swimming pool at Springfield is one of the finest in the country. As many as 2,500 people have used it in a single day, and the water is changed by a filter process every few hours.

worth $150,000,000. The State rescue work here is more visible and more altruistic—a life-saving station for fish. Illinois has three other life-saving stations—at Havana, Meredosia, and Anna—where the lost and erring ones that get stranded in bayous and sluggish sloughs are reclaimed. The State also has a law to protect mussels, more laws to protect ducks, and even more to protect peaceful citizens.

With rivers and lake touching all sides and one of the greatest fishing rivers of the country in its center, Illinois leads other Mississippi Valley States in commercial fishing. Its life-saving stations reclaim 20,000,000 fish a year, while eleven hatcheries add 67,000,000 minnows to lakes and streams. Varieties run from a minnow which will catch mosquitoes to carp, which Eastern chefs can disguise under many fancy names and prices.

Mussel digging has declined in importance, but still pays more than $100,000 annually, not including the value of the by-product manufacture of "pearl" buttons. Mussels are valued at river-bank prices. It was an Illinois digger who sold a pearl to a Mount Carmel jeweler for $500. The jeweler took it to New York, where it brought $2,000. Then it returned to Illinois by way of Paris, and its price in the necklace of a Chicago millionaire's bride was $25,000 (see, also, pages 537-8).

A RETREAT FOR MIGRATORY BIRDS; A MECCA FOR HUNTERS

Nature made Illinois a retreat for migratory birds, and State refuges lend encouragement. Each year 15,000 pheasants and 50,000 pheasant eggs are distributed here (see Color Plate IV). The marshes of the Illinois River are a duck hunter's Mecca. Ducks' air lanes lead from as far away as Great Bear Lake, on the Arctic Circle, to the Gulf, in the south.

Twenty-five clubhouses rise within five miles of Beardstown—not makeshift bunks under a leaky shed, but imposing establishments, with annual membership fees from $1,500 to $6,000. Each has its own duck reservation and comfortable shooting covers. A traveling flock of ducks may number 10,000, and hunters have estimated as many as 300,000 in a single "hole"—so

many that the birds must take wing in relays.

A law forbids luring wild ducks with food, but there is no law against a club feeding the tame Judas flock which it keeps as a decoy. One club uses 10,000 bushels of corn a year—a fair meal for a couple of dozen tame quackers!

Beardstown, named for a ferryman, claims historic as well as duck fame. Here Lincoln gave the almanac a place in criminology by proving that the moon was about to set on the night the State's star witness said he saw a murder when the moon was shining brightly.

The Black Hawk War had not started when John Deere, blacksmith, came to the Indian city of Saukenuk, now Rock Island, in 1830. Seven years later he finished the first steel plow. Plows were used in antiquity, but the steel plow was agriculture's greatest step forward in several thousand years. The big works in Rock Island and Moline and in Davenport, across the river, produce much more than plows nowadays, but the Deere family name survives.

Rock Island took its new name from the rocky island which is now occupied by the Government arsenal. The railroad bridge here was the first across the Mississippi.

A few miles away is a park with a natural watchtower, where Black Hawk and other Sauk and Fox chiefs stood in 1833 and looked down on the river which they were to cross, never to return, the last tribe in Illinois. History tells how five years later Black Hawk was brought back and buried on this spot, where he was born. A truer story is that ghouls dug up his body in Iowa and exhibited it around the country until his relatives appealed to the courts. It was destroyed by fire in a warehouse.

Controversy has flared as to whether the settlers could have coped with the handful of Indians. It was called a war, and Black Hawk, ally of the English in the scalping forays in 1812, was pictured as a dangerous savage. The Federal Government coöperated in and legalized the ousting of the Indians, but nothing could legalize the final attack upon and slaughter of the tribespeople while they were crossing the river. The Black Hawk memorial (see page 567) may be both penance and payment.

The 75-mile Hennepin Canal connects the Mississippi and Illinois rivers at Rock Island. Kewanee, a center of power distribution and furnace manufacture, is near. Less known to fame is a factory for canvas and leather gloves, headquarters of the largest manufacturer of work gloves and mittens in the world, making enough in a year to give a pair to every adult in the United States, the Nation's hundred million toiling hands.

RICH NAUVOO ONCE A CENTER OF MORMON ACTIVITY

Nauvoo seems to hang over the majestic lake which the Keokuk Dam forms in the Mississippi River (see illustration, page 572). Its population has shrunk from 15,000, when it was the State's largest city, to less than 1,000. It is without a railroad, but it is the richest town for its size in Illinois. The Mormons built sturdy red brick houses here in the turbulent days between 1838 and 1844, and those of Joseph Smith and Brigham Young still stand.

The tabernacle, which was to have had a 200-foot tower, was never finished, though it was used for a single service before the covered wagons resumed the greatest migration in American history, to a new empire in Utah. The tabernacle limestone has gone into a Catholic rectory and the old powder house is a convent! The inn, the only hotel ever "ordered by revelation from God," with the same furniture, in which Mormon elders and Icarians slept and sat, has been preserved. The old jail in Carthage, the county seat, where Joseph Smith, founder of the church, was murdered by a mob, has been purchased by one branch of the church; and Mormon missionaries, before they scatter to distant parts of the world, pass a night in the shrine, with its blood-stained floor and memories.

The Icarians, a French Communist colony, followed the Mormons, but only their descendants and vineyards remain. Political economy was tested along the river. Geneseo was founded by coöperative Congregationalists, their theories surviving in municipal ownership, while coöperative colonists from Oneida, New York, with laws against smoking and swearing, started Galesburg, and founded Knox College in 1837.

THE ILLINOIS STATE CAPITOL AT SPRINGFIELD

The fine granite and limestone building was begun soon after the Civil War, but not completed for nearly half a century. The city is rich in memories and associations of Abraham Lincoln.

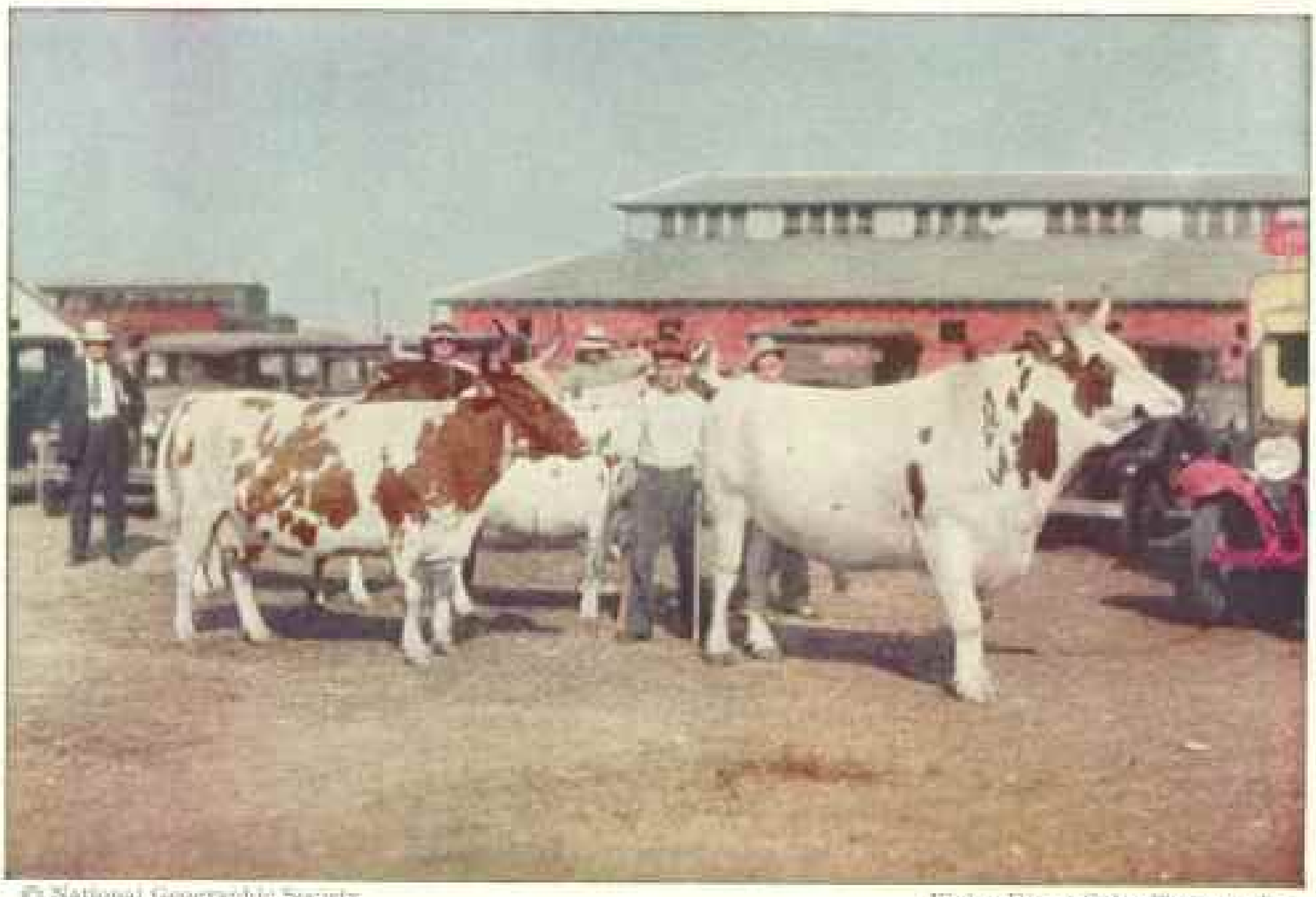
© National Geographic Society Finlay Direct Color Photographs

FROM STARVED ROCK, LA SALLE LOOKED UPON THE GENTLY FLOWING ILLINOIS

Here, high above the water, the great explorer and his friend Tonti built Fort St. Louis in 1683. The site is now included in a 900-acre State park, and the engaging view it affords westward along the river is enjoyed by thousands of visitors.

A LOG-CABIN HOME IN THE HEART OF "EGYPT"

A district comprising several counties in southern Illinois is known locally as "Egypt." Paradoxically, the country so termed is for the most part rough and hilly, a continuation of the Ozark uplift of Missouri.



 Finley Direct Color Photographs

BOVINE ARISTOCRATS DISPLAY THEIR FINE POINTS AT THE KANKAKEE FAIR

These blue-blooded Ayrshires are among the hundreds of thousands of dairy cattle on the farms of Illinois. The State's enormous corn crop makes it well adapted for cattle raising.

SILOS AND BARNS LOOM LARGE ON THE CORN-BELT LANDSCAPE

Fertile fields, an equable climate and a favorable location combine to make Illinois an important agricultural State. Nearly every farm is equipped with one or more silos in which to store winter food for cattle.

 Finlay Direct Color Photographs

LIVESTOCK WORTH MORE THAN A MILLION DOLLARS PASS IN REVIEW

The State Fair at Springfield attracts exhibits of purebred stock from all over Illinois and most of the other States in the Corn Belt.

WATERWAYS AIDED THE DEVELOPMENT OF THE PRAIRIE STATE

This 75-mile canal extends from Hennepin on the Illinois to a point below Rock Island on the Mississippi. Here, near Milan, it broadens considerably and is partly covered by a mass of yellow lotus.

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THE DEPARTMENT OF CONSERVATION MAINTAINS NUMEROUS GAME FARMS

At Yorkville, quail and pheasants are bred for restocking State game preserves. The group in the enclosure includes ring-necked, silver, golden and Amherst pheasants.

WHERE CORN RULES AS KING OF CROPS

Some 9,000,000 acres of the black prairie soil of Illinois are planted in corn. The crops in two recent years exceeded 500,000,000 bushels each. Most of the corn is fed to livestock on the farms. A State Fair exhibit.

 Playlay Direct Color Photographs

GRAPES OF GREEN VALLEY

While viticulture is not a major agricultural factor in Illinois, there are many farm vineyards. The three baskets of luscious Concords are from Tazewell County.

SULPHUR, WATER-BORNE FROM GALVESTON, IS TRANSFERRED TO RAIL AT CAIRO

Three-thousand-ton steel barges traveling in fleets of eight or ten carry large quantities of freight between Gulf and lower-river ports and the cities of Illinois. This inland waterway traffic was greatly stimulated by the transportation emergencies that came with the World War.

 Finlay Direct Color Photographs

"COTTON BLOSSOM II," STILL IN SERVICE AFTER 53 YEARS ON THE RIVER

The old showboat is tied up at Mercdosia. Behind her is the *Grace Dorsey*, her pusher. The showboat idea is experiencing a revival of popularity and in summer this veteran trouper plies the waters of the Mississippi, Ohio, and Illinois Rivers, presenting old-fashioned melodramas.

DURING THE WORLD WAR THOUSANDS OF MEN TRAINED HERE FOR NAVAL SERVICE

On the shores of Lake Michigan, hundreds of miles from the ocean, Great Lakes Training Station was the center where approximately 125,000 Middle Western youths prepared themselves for their country's defense. The administration building in the background.

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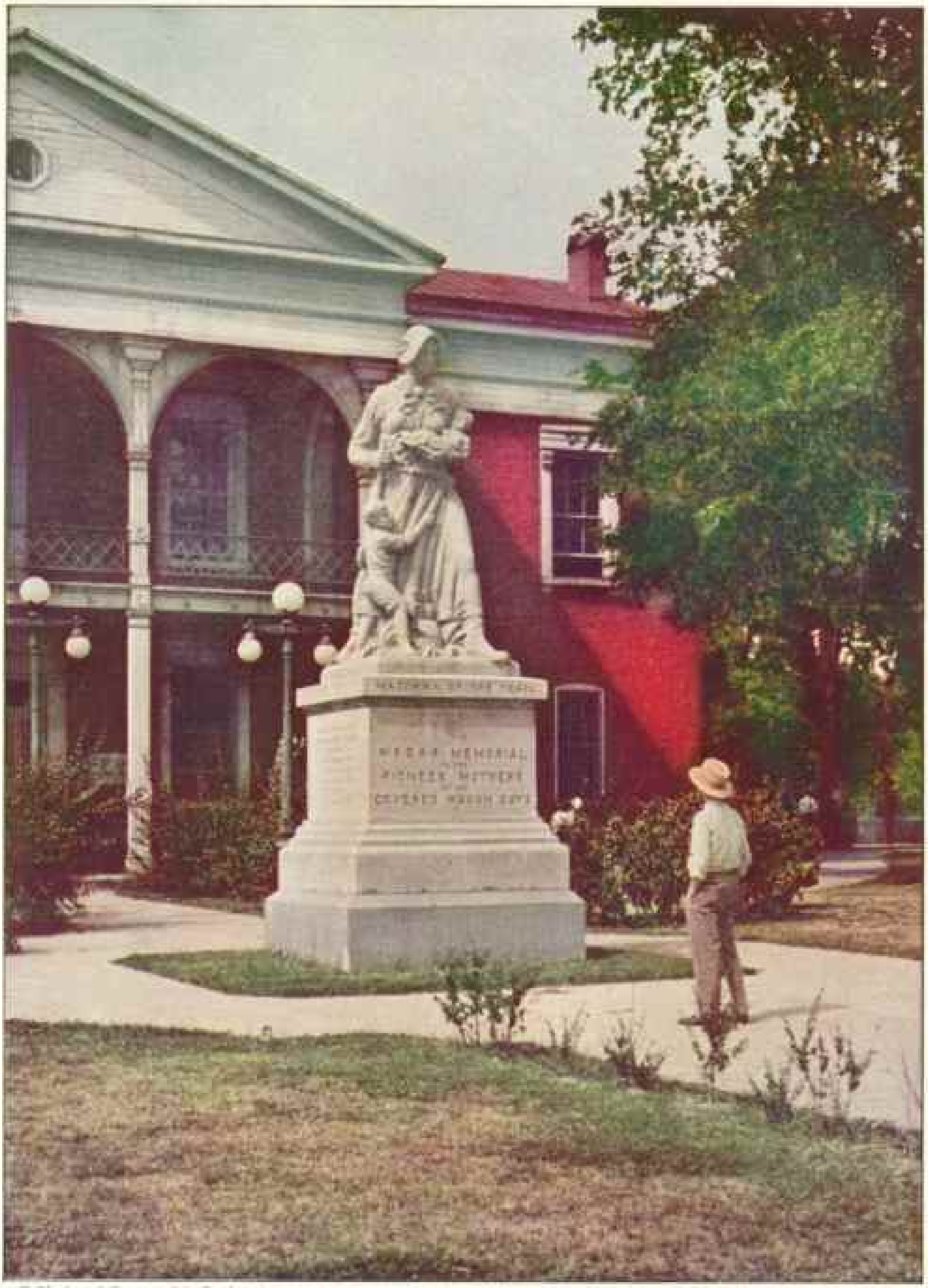
PAGEANTRY ENABLES CITIZENS OF BLOOMINGTON TO RECALL PIONEER DAYS

McLean County was settled a century ago by emigrants from Eastern States. In the summer of 1930 their descendants held a centennial celebration, as a part of which buckskin-clad men and bonneted women reënacted important scenes from early history of the city.



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A "MADONNA OF THE TRAIL," COMMEMORATES THE PIONEER MOTHERS OF COVERED-WAGON DAYS

This memorial is one of several monuments erected throughout the country by the National Society, Daughters of the American Revolution. It stands before what was once the State Capitol in Vandalia.

From the river a haze of distance and memory envelops Quincy, now a city of factories, recalling Mark Twain and Charles Dazey, who wrote "In Old Kentucky." It has a monument to George Rogers Clark, who came through this Chippewa village when he conquered the Northwest. The city was founded on Inauguration Day, March 4, 1825; the county was named Adams; the city came next, and a baby was christened John.

CALHOUN COUNTY PRESENTS MANY CONTRADICTIONS

At Grafton the Mississippi is flowing north to meet the Illinois, the future water route which will connect Chicago with the outside world by way of New Orleans. The 40-mile-long delta between the rivers is Calhoun County, premier apple county and an anomaly in a State preëminent for hard roads and railroads, above and "under ground." It has no railroads, no bridges over either river, and boasts that no negro ever stopped overnight within its borders. It is exclusive and narrow, only five miles across at one point. Its farmers stay home with their apples, except when a single road to the north or to the steep hill to the ferry is passable in dry weather.

On the cliffs above Alton a giant painting of the hybrid Piasa (pronounced pie-a-saw) looks down on the river—human head, deer horns, panther teeth, turkey wings, eagle claws, lizard body, and snake tail ending in a Satanic prong. Thrifty builders quarried away the rock and bird which awed Marquette, but Boy Scouts have painted a new edition of the monster which has no duplicate.

Alton claims the largest lead smelter in the world, the best-paying terminal railroad in the country, and one of the largest ammunition plants. It has a glassworks covering 80 acres, a brickyard which turns out a quarter of a million bricks every day, and flour mills with 3,000 barrels daily capacity. Near Alton are two of the oldest colleges in the State—Monticello Seminary and Shurtleff. When the settlement was located here it was opposite the mouth of the Missouri River, now five miles below.

GRANITE CITY'S STEEL MILL OPERATES UNIVERSITY FOR EMPLOYEES

The Mississippi jogs east, west, and south, past Granite City, Madison, East St. Louis, and Cahokia, with Belleville in the background—a group forming, with St. Louis, across the river, a metropolitan district of more than a million inhabitants.

Granite ware and a good share of the railroad trucks used in the United States come from Granite City.

Except to the technical expert, steel mills, the glowing metal, smoking stacks, and aroma of cooling plates are much the same, wherever encountered, but the mill in this city has a social activity which is unique.

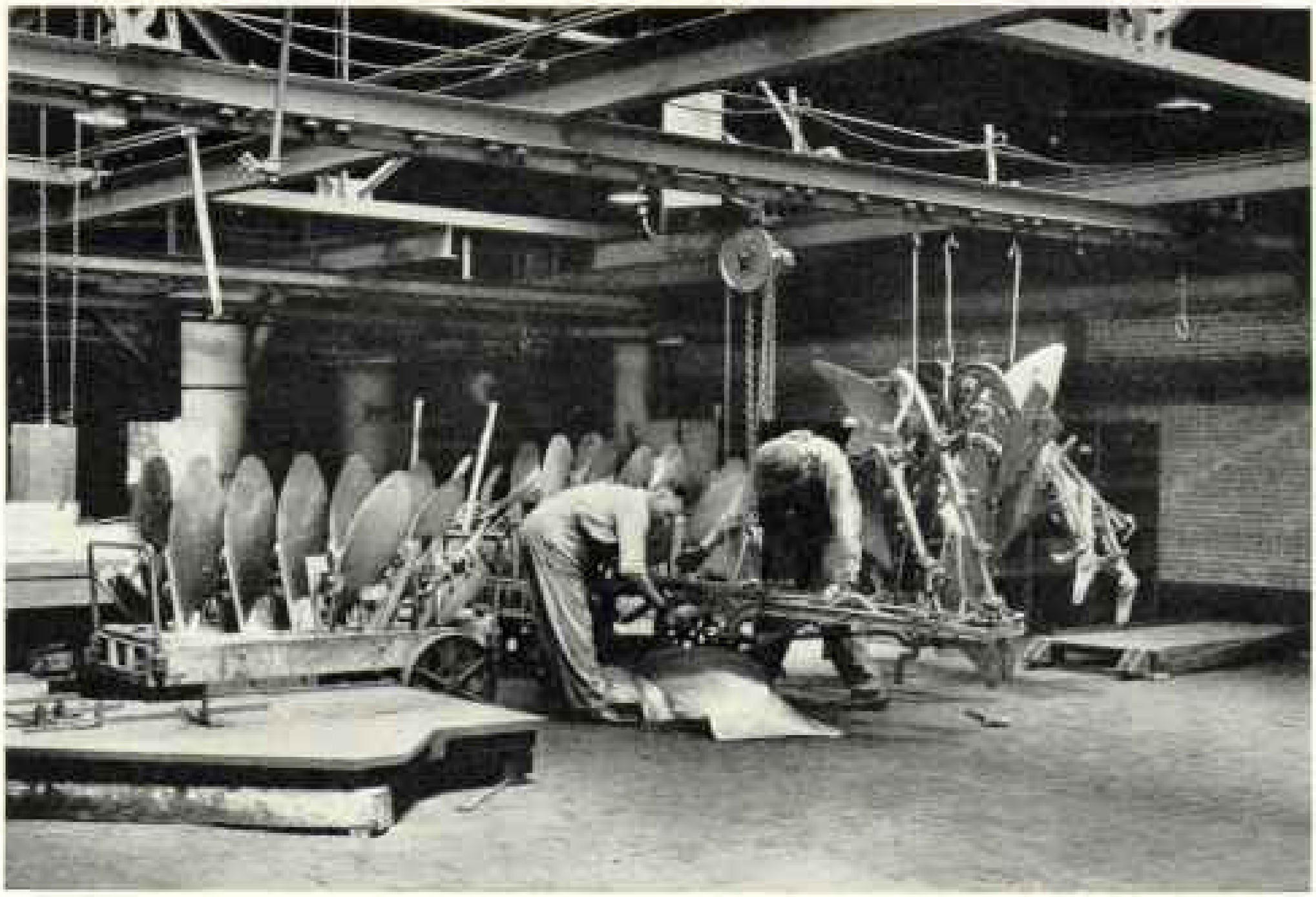
It has a school for employees, a faculty of twelve, and yearly enrollment of 200 students, whose curriculum includes intermediate, high school, university extension, and special engineering and trade courses. The school is approved by local and State educational authorities, graduates of its intermediate school can enter high schools in the State, and the company's high school qualifies for engineering colleges. Apprentices complete the intermediate course, four hours a week for four years, on company time. Each year a loan scholarship, $250 a year for four years, without interest or restrictions on future employment, is awarded to a high-school graduate who goes to some university. Several other Illinois corporations have similar educational programs for their workers.

TINY CAHOKIA IS A TREASURE LAND FOR AMERICAN ARCHEOLOGISTS

With its 200 industrial plants, its railroad yards and stockyards greater than any other city of its size, East St. Louis seldom gets credit for the artistic training of Tom Mix, of movie fame, who poked steers in these same yards, or for the Gish Sisters, who clerked here in their mother's candy store. Its unfortunate contribution to recent history was a race riot.

Farther inland is Belleville, leading stove-manufacturing city of the Nation, and the Army's "lighter-than-air" base, in the midst of hundreds of acres of giant white asparagus (see, also, page 568).

Four bridges connect East St. Louis and St. Louis, one of them the largest electric railway bridge in the world. Four miles farther down, at Cahokia, another mighty power plant is at the side of the river, burning coal, but consuming as much water as does St. Louis.



AN OLD CIRCULAR SAW WAS FASHIONED INTO THE FIRST STEEL PLOW

John Deere, a blacksmith of Grand Detour, designed the implement nearly a century ago, because neighboring settlers had difficulty in breaking the virgin prairie sod with their old iron plows (see text, page 544). Here workmen in an East Moline factory are adjusting modern steel plows before they are crated for shipment.

Cahokia is one of the oldest settlements in Illinois. One thousand, perhaps 1,500, years ago, it was a mighty city, one of the largest in what is now the United States. A few miles outside of East St. Louis a park contains the largest man-made earthen mound in the country, 1,080 by 710 feet and 98 feet high, with a base covering about 16 acres. Some 70 smaller ones surrounded it. Four of these mounds were destroyed before the State purchased the others (see illustration, page 572).

Ceramics, many skeletons, flint spades, needles of bone, and copper weapons have been found in the Cahokia mounds.

Such mounds are found in other places in Illinois. Those near Dixon, Lewistown (see pages 573 and 574), and Joliet have been excavated. One hundred skeletons were taken from one.

Parts of a skeleton of a hairy mammoth are in the State Museum in Springfield.

Trappists in 1809 built a monastery in Cahokia, but only the name Monks Mound survives. French settlers arrived here in 1698, 20 years before other French felled the first tree in New Orleans. The church, built in 1798, still is here, the oldest in the State. Lafayette was here in 1825. Pontiac, who fought two English expeditions and kept the French flag flying over the Northwest Territory for two years after it had been ceded to England, in 1763, was shot in Cahokia, in 1769, by an Indian agent of the English, the original Illinois gunman. The French buried him in St. Louis, which came under Spanish control the next year.

KASKASKIA WAS THE STATE'S FIRST CAPITAL, FOR TWO YEARS

The old Kaskaskia of Marquette, on the upper Illinois, was abandoned by Indians and French about 1700. They went south and built a new Kaskaskia at the mouth of the Kaskaskia River. That settlement is under the Mississippi now, and that part of Illinois is west of the river. George Rogers Clark occupied Kaskaskia July 4, 1778. The town was the first State capital, from 1818 to 1820. It had a college in 1720 and a newspaper in 1815.

LUSCIOUS BLACK HAMBURG GRAPES GROW UNDER GLASS ON A LAKE FOREST ESTATE

Practically all of the fruits of the North Temperate Zone grow in Illinois. Peaches, apples, pears, and melons thrive especially in the southern part of the State.

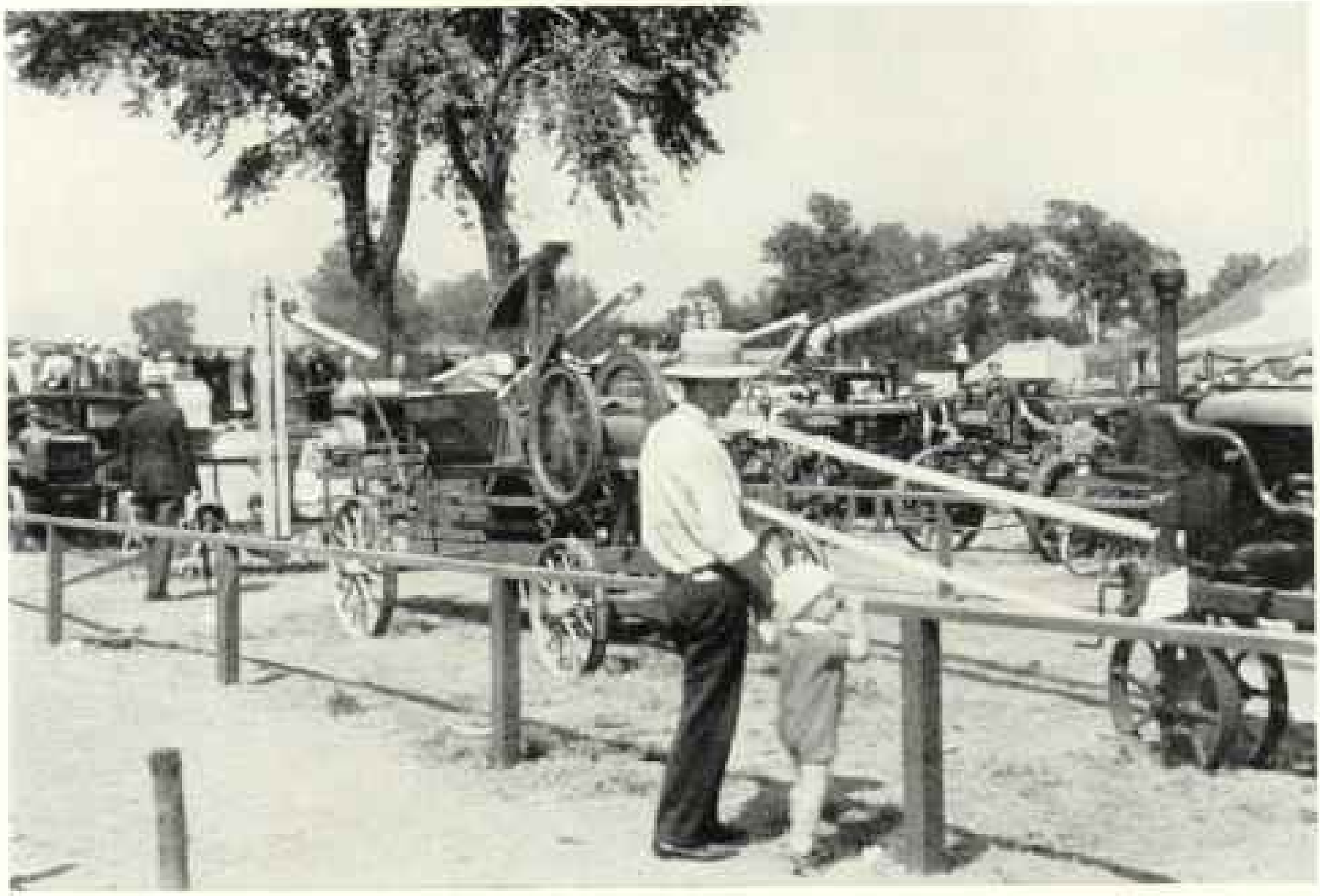
Fort Chartres, a few miles north of Prairie du Rocher, in 1718 was a wooden stockade, which was replaced by France's strongest fortification in the Mississippi Valley in 1756. The English colors were run up over this stronghold on October 10, 1765. By 1772 the river had moved in for more than a mile and carried away one of the bastions. The English then moved to Fort Gage, 17 miles down the river, near Kaskaskia. Fort Chartres is now a State park, with the old powder house restored and walls partially rebuilt.

BUTTER, WATCHES, AND SUNDAY-SCHOOL PUBLICATIONS SPREAD ELGIN'S FAME

Illinois has been crossed and circled, but other spots of interest are within its 200 miles girth. Elgin, in the fertile Fox River Valley, is known around the world for butter, watches, and Methodist and Brethren Sunday-school publications.

Once the price of butter for the Nation was fixed by the Elgin Board of Trade, through which the rich dairy country stretching into Wisconsin marketed its products. Each week a special train brought the butter brokers to Elgin, but the "butter board" now meets in Chicago.

The tick of grandfather's watch at its ear is baby's first machine and a watch ticks off our minutes to the grave. Few know of the centuries of development which have resulted in perfecting it. Possibly a timepiece, from the Neanderthaler's smouldering cord to the delicate instru-



THE STATE FAIR ATTRACTS MANY EXHIBITS OF FARM MACHINERY

Farmers from all parts of Illinois come to Springfield to see the newest and best agricultural methods and equipment demonstrated (see, also, illustration, page 563, and Color Plate III).

ment of to-day, is man's oldest machine; for, since the earth took form, time, in measurements growing finer through the ages, has governed all that moves and breathes. Civilized man now works, plays, and sleeps by the watch—a slave to the minutes.

A large proportion of the watches made in the United States come from Illinois, from three of the Nation's eight major factories, located at Elgin, Springfield, and La Salle. A watch is man's effort to record the revolving earth, which does not vary as much as one second in 100,000 years, and in 6,000 years of effort human hand and brain have not developed a timepiece which equals Nature.

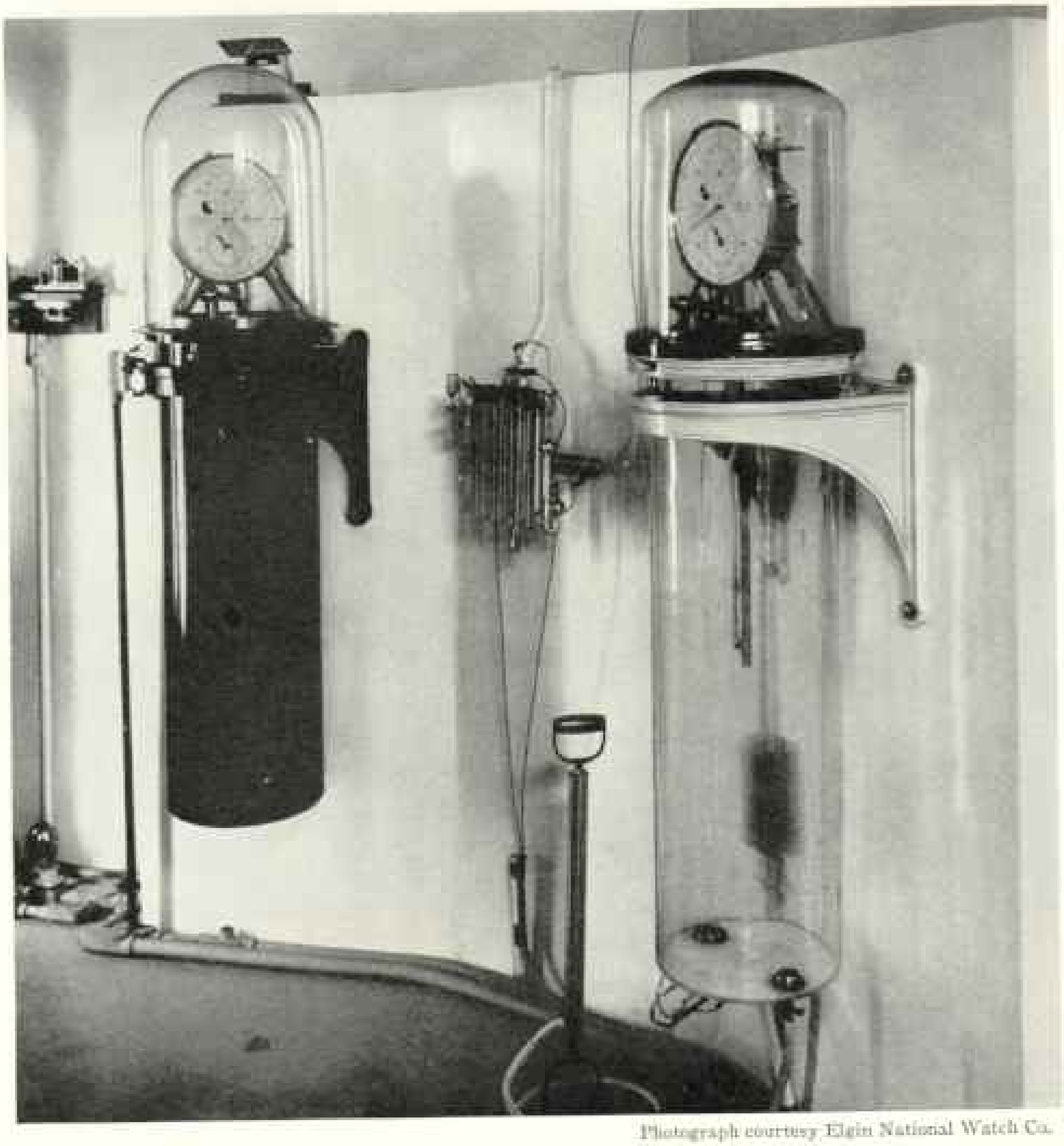
THE STORY OF THE WATCH AND ITS DEVELOPMENT

The first clock, with wheels and weights, has been credited to Verona in the ninth century. Springs had been invented long before, but it was not until 1504 that Peter Henlein, prisoner in a Nuremberg monastery after a drunken brawl, made a timepiece of one-man size. It was six inches in diameter, of iron, so heavy that only the "night watch" could carry it; but the name and the ring through which it hung on his belt live in the watch to-day.

In 1581 Galileo, observing the swaying lamps in Pisa's Cathedral, evolved the pendulum, by which clocks could be regulated. Watchmakers were studying in many lands, and in 1658 Dr. Robert Hooke, in London, made the first hairspring of metal, replacing pig's bristle. Watches no longer varied an hour in every 24, and a minute hand was added.

Hairsprings are now made by drawing steel wire through holes in diamonds—holes so fine that a pound of steel can be stretched into eight miles of spring, with a corresponding increase in value from $5 to $62,000. A good watch movement has as many as 211 pieces, one-third of them screws, some so small that 1,500,000 weigh only 3 pounds. Rubies are sliced, 500 sheets to an inch; then cut smaller than a pinhead, and holes are drilled, in which pivots revolve.

From the 10-pound watch of Henlein to a tiny movement weighing a few ounces is a long jump. Henlein worked two years on the first watch. It took three years to



Photograph courtesy Elgin National Watch Co.

WITH THE AID OF THE STARS, THEY KEEP PRACTICALLY PERFECT TIME

The two standard Riefler clocks in the Elgin Observatory are mounted on piers separate from the building in which they are housed, in order to eliminate vibration. They are wound electrically every 30 seconds and can be regulated to a fraction of a second. Their time is carefully and frequently checked by astronomical observations.

finish the first one in Elgin, after Benjamin W. Raymond, a mayor of Chicago, founded his factory, in 1864, on the principle of standardized parts which any watchsmith could replace. The factory now produces more than a million movements each year; but, with all its machinery, 3,773 separate operations and from 8 to 10 months' work are necessary on each one.

Each year's million movements are regulated by that greatest of timepieces, the spinning earth. An astronomical observatory, protected from Nature's emotions, stands on a gravel hill in Elgin. Between two of the lenses of its telescope is a grillwork composed of eleven lines of filmy spider's web. At night observations are taken on some twenty stars, each so many millions of miles away that their positions are approximately fixed with respect to our planet. As each star crosses its line on the grillwork, the astronomer presses an electric button. He tests his human

FARM MACHINERY IN THE MAKING

Parts for farm machinery, dairy barn fixtures, haying tools, etc., are cast in this iron foundry at Harvard, Illinois. The white-hot fluid metal is being poured into molds.

equation on another apparatus, timing the triangle of eye, brain, and hand.

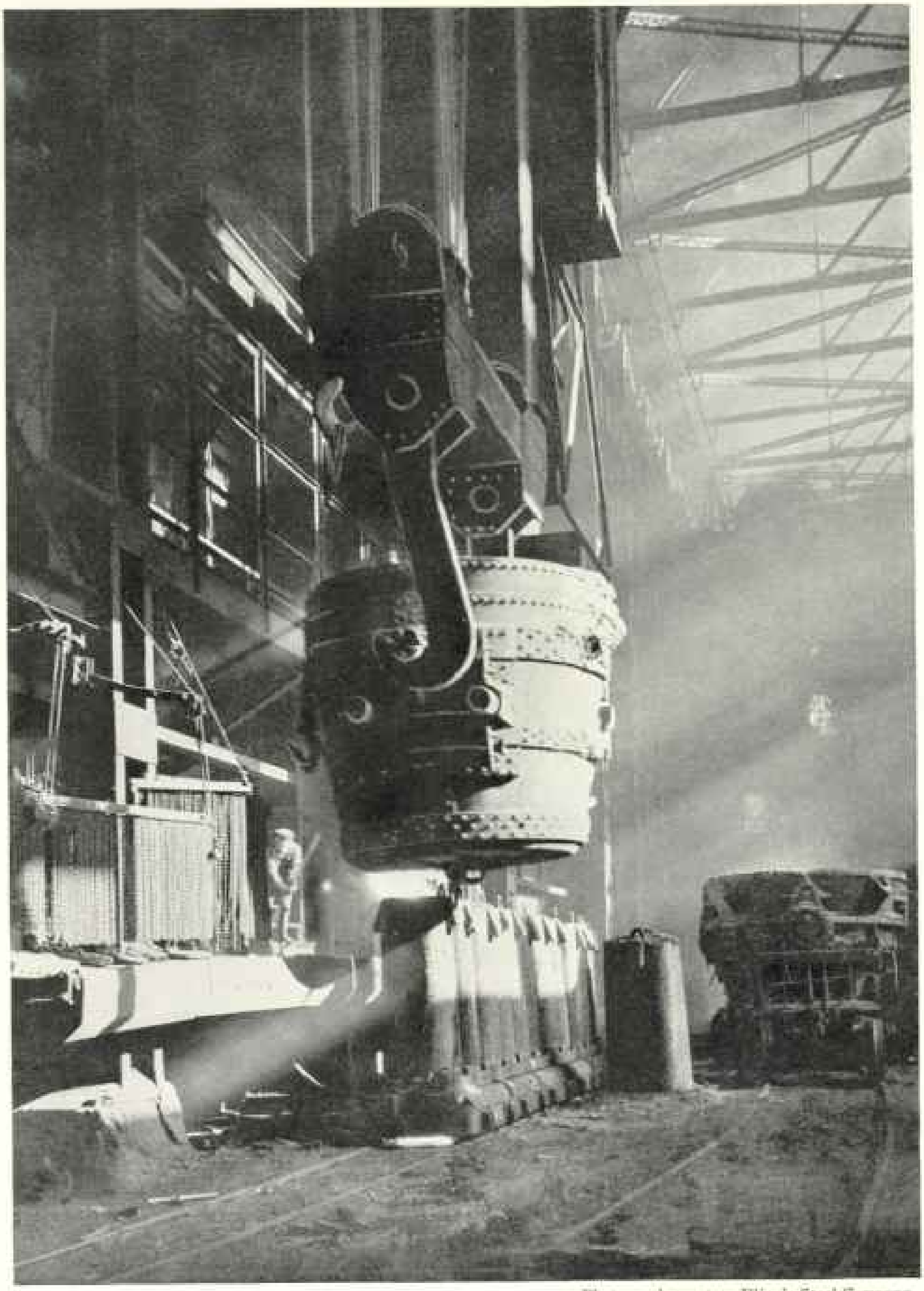
If correction for human frailty is made, the same star will not vary by a fraction of a second from night to night. Each tick of four master clocks in the observatory is reproduced by wires to a clock 40 miles away, at Wabash Avenue and Wacker Drive, in Chicago, one of the few clocks in the world which are never wrong.

Other clocks, the painted sidewalk variety, which are right twice a day, at 8:18, do not memorialize Lincoln, as popular fancy imagines, but have their hands in that position merely as a symmetrical tail to the jeweler's name, which is invariably above. Other legend-shatterers have not mellowed the reason why a choleric king changed IV into IIII. But an adult does not read the numbers. Each of eight figures on the four 21-foot faces of the clock in the Wrigley Building tower is a II, and few who glance only at the hands, 398 feet above the street, notice anything missing.

HOMES OF BARBED WIRE, WALL PAPER, AND BROOMS

Barbed wire, which changed much of our Western Plains to farms, stabilized trench warfare, and has caused more profanity and more torn clothes than any other device of civilization, was invented in De Kalb in 1872. Jacob Haish and Joseph F. Glidden argued for the honor, but John W. Gates capitalized it. A community house and theater have been built in St. Charles, Gates's early home, by the heirs.

Near-by Joliet, a steel mill city, also turns out wall paper, 300,000 miles of it a year, and the State penitentiary, like a cluster of immense tanks, is a model



Photograph courtesy Illinois Steel Company

STEEL MANUFACTURE IS IN THE FRONT RANK OF THE STATE'S INDUSTRIES

Tilting a 250-ton open-hearth furnace to discharge its newly made run of steel into a giant ladle, from which it will be poured into ingot molds on the track below. The ladle is operated by an electric crane. The region about the foot of Lake Michigan, being a convenient meeting place for fuel and iron ore, is one of the country's most important steel-manufacturing centers.

BILLIONS OF TONS OF COAL UNDERLIE THE FIELDS OF ILLINOIS

One of the largest electric shovels in the world strips away the 30 to 50 feet of earth above an extensive coal vein in the Duquoin field. The shovel can handle 16 cubic yards of dirt at one bite. More than sixty-one million tons of coal were mined in the State in 1929.

of such institutional architecture. Paris claims the largest broom factory in the United States.

Pontiac, in addition to the reformatory which started the State's shoe industry in 1870, holds one of the largest Chautauquas in the country, in a grove where the Indians, too superstitious to fight on a meat diet, not so many years ago boiled sugar before starting on the warpath.

In Danville, home of the late "Uncle Joe" Cannon, other Indians boiled salt at their springs, but the salt industry now is eclipsed by "strip" coal mining and brick-making from what is stripped, two industries in which the State excels. Sterling gave birth to one of the early gas engines, when kerosene was replacing candles and gasoline was a waste. It now makes candy and fat-reducing machines.

If not actually the first, one of the first, successful projections of motion pictures on a screen took place in Waukegan in October, 1895, the invention of Ed Amet, a local photographer.

Carrollton shows the spot where Lincoln made a joke of his duel with Shields by using his sword to cut jimson weeds. North Chicago and Highland Park have two of the finest private laboratories in the country—one electrical and presided over by Dr. Clarence W. Balke, who invented balkite, and the other producing rare vegetable chemicals for drugs. Woodstock

Photograph by A. F. Mustard

ILLINOIS-RIVER ICE IS STORED AWAY TO KEEP PEORIA COOL IN SUMMER

Artificial ice has to face competition from the natural product, which is sawed into blocks on the river and hauled up an incline to a sawdust-filled storehouse.

makes typewriters. Rosiclare is the home of fluorspar mines, the seams of which are vertical instead of horizontal. Blackburn University, at Carlinville, is one of the few institutions where every student works for his tuition.

PEORIA AND PEKIN PRODUCE ALCOHOL, ROSES, AND ORGANS

In the days when distilleries flourished, Peoria, second largest city in the State, contributed a large share of the Government's whiskey taxes. Peoria, and Pekin, across the river, still make alcohol and malt, but the big distilleries have been converted. They produce solvents, but no longer from whiskey's grim by-product, fusel oil. Breweries and distilleries were located near pure water, and Peoria insists that its water—it still has the water—is the purest in the State. The city midway between Chicago and St. Louis, with 14 railroads and a promised waterway, says that it is the practical center of population of the United States. Caterpillar tractors come from Peoria, and roses, organs, and corn products from Pekin.

Springfield, the State capital, is the national shrine of Lincoln. One of the largest collections of Lincolniana is in the cramped nave of his tomb, in beautiful Oak Ridge Cemetery. As his body was brought here from Washington to find a final resting place in Illinois soil, a sorrow-

SILICA SAND OF FINEST QUALITY COMES FROM THE VICINITY OF OTTAWA

A large part of the State's production of nearly two and a half million tons of this mineral is mined along the Illinois River Valley. Among other uses, it plays an important part in the manufacture of glass and in blasting, cutting, and grinding steel. One of several silica quarries near Ottawa.

ing nation paid tribute along the way. The old Lincoln home is also here (page 566).

DYNAMIC CHICAGO, A GIANT AMONG GREAT CITIES

In the northeast corner of Illinois is Chicago—vibrant, intense giant among great cities, dynamic with the spirit of growing youth. Its residents are confident of its destiny.

The forces of Nature and the paths of man, which mold the State, center in Chicago. There national roads of earth, water, and air converge. In less than a century it has grown from a frontier stockade in a swamp to fourth place among world cities.

The traveler away from Chicago is always told about his city. Chance acquaintances, from Kamchatka to Tierra del Fuego, exclaim, "So you have lived in Chicago without being shot!" and dubiously feel his vest to see if it is bullet-proof.

Chicago is pictured as a wicked, turbulent city, a wilder West than the movies ever staged; yet the percentage of crime is lower than that of many cities with a more righteous reputation. Its crime and gunmen, while not to be smiled at as playful diversions, are no more representative of the city, or of any other city, than the ejecting of a stray disturber is the story

Photograph courtesy Illinois Steel Company

A BESSEMER CONVERTER IN ONE OF THE LARGE STEEL MILLS OF SOUTH CHICAGO

The pyrotechnic display comes when impurities in the molten metal at the bottom of the converter are being burned and blown out by a blast of air. The finished product is Bessemer steel. The invention of this process marked the beginning of a new era in the steel industry.

of a convention's deliberations. They are surface growing pains of a lusty young city. Whatever happens in Chicago has, in newspaper parlance, "news value," and the sensational and bizarre are remembered after the serious and prosaic are forgotten.

Chicago lacks the glamour of age; it has no ancient ruins nor even time-stained buildings. A cross stands where Marquette landed, the first white man to cross the portage between lake and river; but that was only 258 years ago. Of those buildings that stood on downtown La Salle Street 35 years ago only one remains.

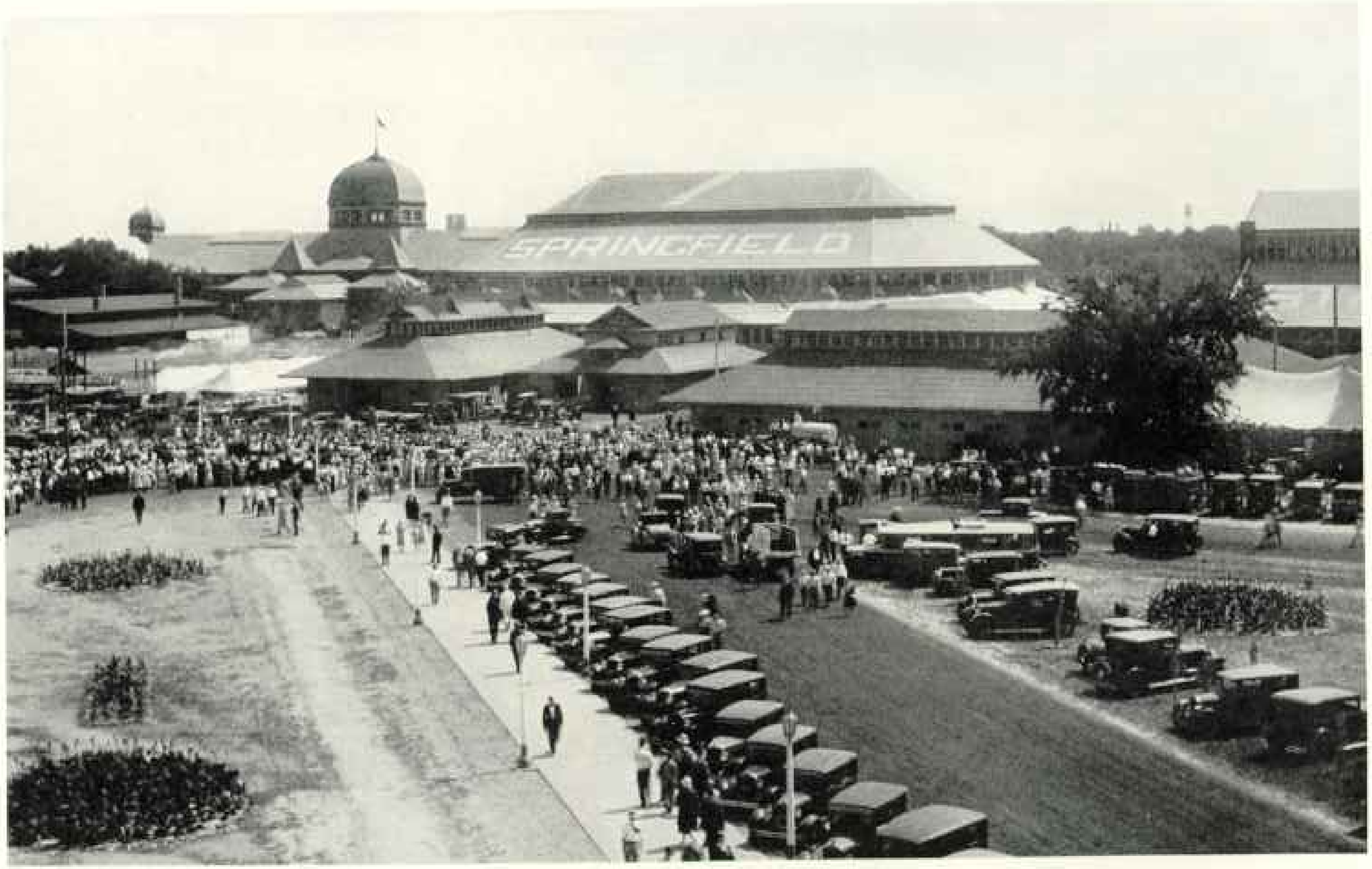
The white population around Fort Dearborn was massacred on August 15, 1812. In 1833 Chicago was a town covering 2½ square miles. The first steamboat and the first Sunday school had arrived the previous year. On March 4, 1837, it had 4,000 inhabitants and was incorporated as a city with 10½ square miles. It was swept by fire on October 9, 1871. To-day it spreads over 210 square miles, with more than 3,350,000 inhabitants. Chicago's yesterdays are the boyhood of its men to-day.

BOULEVARDS BUILT ON LAND RECLAIMED FROM THE LAKE

Standing on the portico of the Field Museum of Natural History, one gazes on

ROCK RIVER, RISING IN A WISCONSIN LAKE, FLOWS THROUGH ILLINOIS TO JOIN THE FATHER OF WATERS

The valley through which the river finds its way to the Mississippi presents a fascinating variety of scenery. Rugged cliffs, wooded slopes, and wide, grassy spaces succeed each other over a course which once was familiar to voyageur and Indian. Looking westward along a bend of the river from a point near Oregon.



A GROUP OF BUILDINGS OF THE ILLINOIS STATE FAIR AT SPRINGFIELD (SEE, ALSO, COLOR PLATE III)

The fairs, of which many are held throughout the State each year, serve a combined business and social function. The infinite variety of products exhibited and advertised attracts numerous buyers, while carnival shows, band concerts, and sporting events draw crowds of amusement-seekers.

SPRINGFIELD IS STEEPED IN LINCOLN LORE

One of several Abraham Lincoln shrines in Springfield is the homestead in which the Lincoln family lived from 1844 until their departure, in 1861, to occupy the White House at Washington. After the death of Mrs. Lincoln, in 1882, the house was deeded to the State by Robert Todd Lincoln and now contains many relics of the famous Illinoisian. (See, also, text, pages 561-2.)

a pinnacled city stretching into the distance. It rises higher with the weeks. In front is a green park—only a few years ago a débris-strewn beach with a railroad on wooden trestles—cut by broad driveways, lagoons, and islands and spotted with the ornate structures of the Art Institute, Shedd Aquarium, Adler Planetarium, Buckingham Fountain (see Color Plates X and XIII) and the peristyles and pylons of boulevard entrances. A world's fair, commemorating a century of progress, is to be held here in 1933. On the other side of the museum is a stadium rivaling those of ancient Greece.

Boulevards, over land reclaimed from Lake Michigan to give the city a front yard, stretch to the north and to the south. The Museum of Science and Industry, founded by Julius Rosenwald, is to occupy the rebuilt Fine Arts Building of the World's Fair, held in 1893.

Miles of broad roads and promenades skirt the water, with its superb beaches, backed by green parks, which afford facilities for rest and recreation enjoyed by few cities. With more than a hundred parks and playgrounds, more than 200 public and private golf courses, and miles of forest preserve, all Chicago can enjoy fresh air, while the lake, with its unlimited bathing beaches, boating and yacht clubs, provides unusual aquatic diversion (see Color Plates IX and XIII).

Some years ago Chicago began to outgrow itself, and the Chicago Plan for a City Beautiful was adopted. New streets have been cut and old ones widened, at

stupendous cost. The Chicago River was unkinked as part of the developing waterway to the Gulf (see illustration, page 583).

A distinctive style of architecture, to which has been given the name "Twentieth Century American," has developed here. The city restricts the primary height of buildings to 264 feet, but towers comprising not more than one-sixth the bulk of the building may soar to the clouds (see Color Plates IX, X, and XIV).

CHICAGO IS ILLINOIS INTENSIFIED AND DRAMATIZED

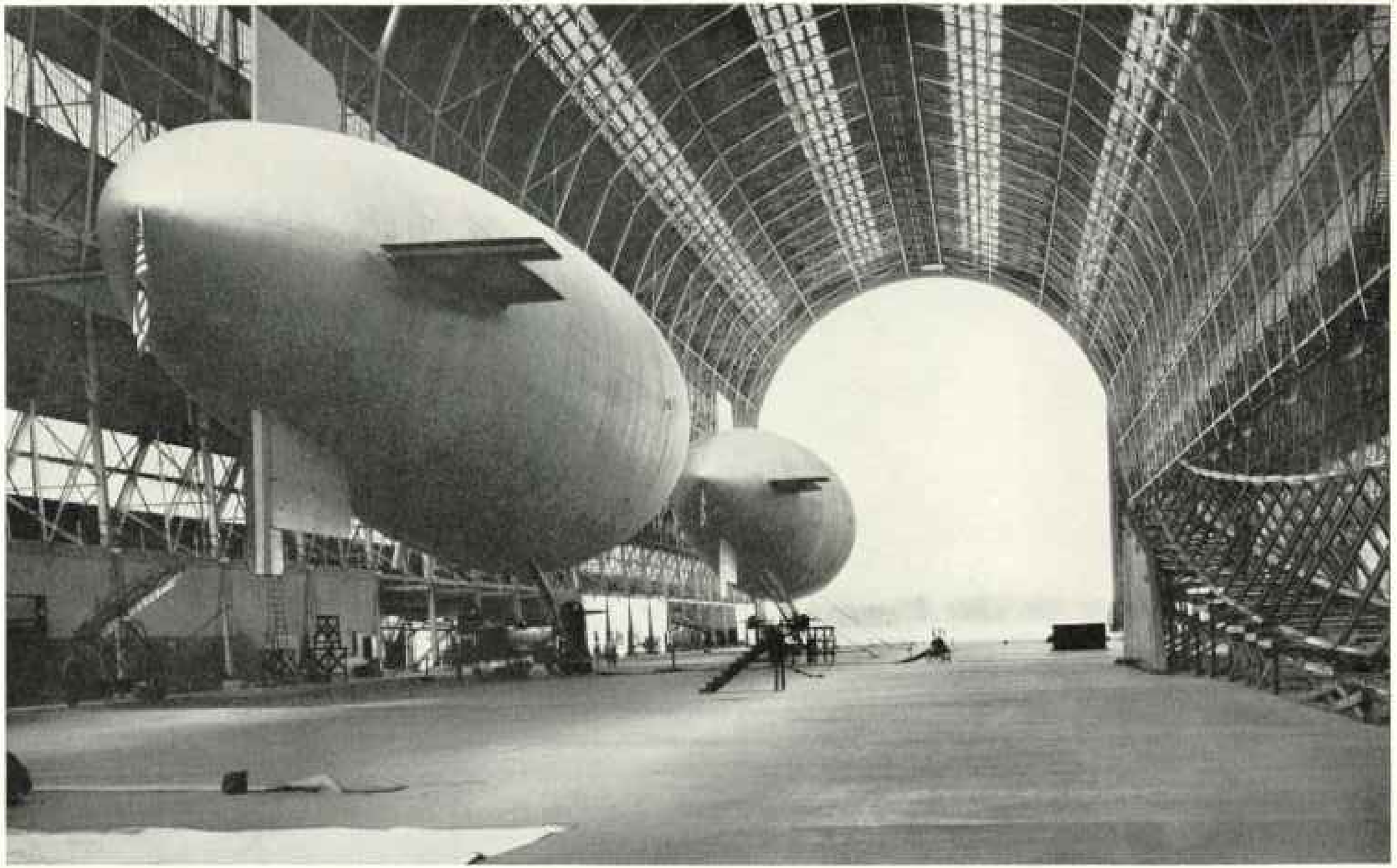
On a part of the near North side, where only a generation ago Captain Streeter's schooner, stranded on a sand bar, was the only habitation, a Gold Coast district has risen on land which then was lake—towering hotels and apartments, factories and warehouses, and, until last year, the largest commercial building in the world, the American Furniture Mart. Another, the Merchandise Mart, now is larger.

A HEROIC IMAGE OF BLACK HAWK BROODS OVER THE LAND WHERE ONCE HE ROAMED

Although never an hereditary or elected chief, the famous Indian was for some time recognized war leader of the Sauk and Fox tribes and was always hostile to the whites. The statue, which was executed by Lorado Taft, is near Oregon and faces up Stillman Valley, where one of the worst Indian massacres in the history of Illinois took place.

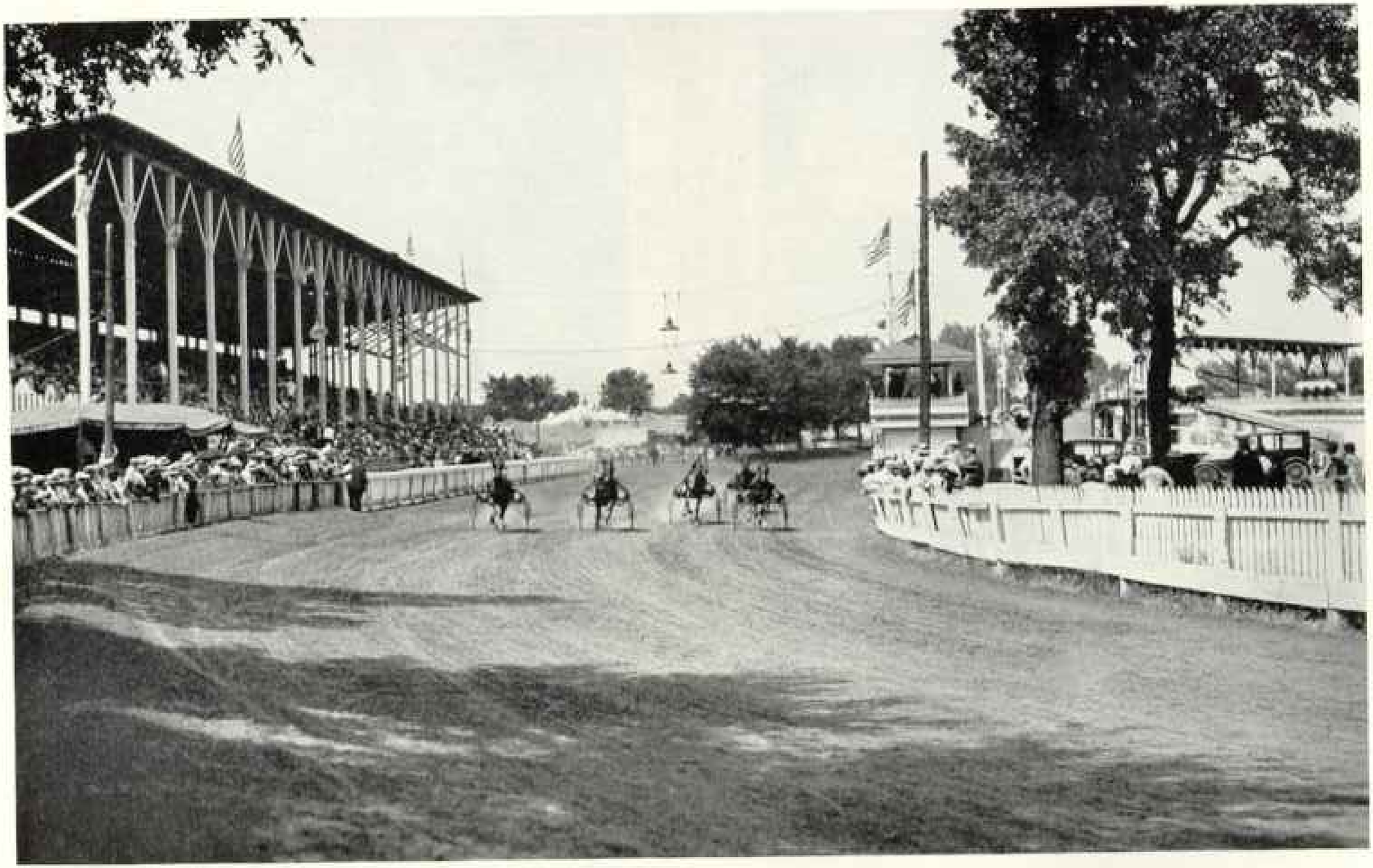
A pride in bigness, or even the home needs of Chicago, do not produce these. The city's central location creates them. Chicago has a hotel with 3,000 rooms, and one of the largest indoor sports stadiums. Convenient location brings a million visitors to national conventions each year. The booster who delights in "bigger" also adds that it has a plebeian gas tank which could be dropped like a candle snuffer over the 28-story Times Building in New York.

It is a city of contrast. Its people reflect it, make the throbbing city theirs. Scholars mix in politics and business men are artists. The city is the same structural panorama. In the corridor between Chicago and the Indiana line more industry and high-pressure recreation are mixed than in any similar area in the world—steel mills, oil refineries, railroad shops, foundries and factories, with country clubs, two race tracks, and a dozen golf clubs, one with 1,400 caddies, wooing devotees to fresh air and sunshine. Under its pall of smoke, smell of stockyards, and hum of aggressive materialism, Chicago has art,



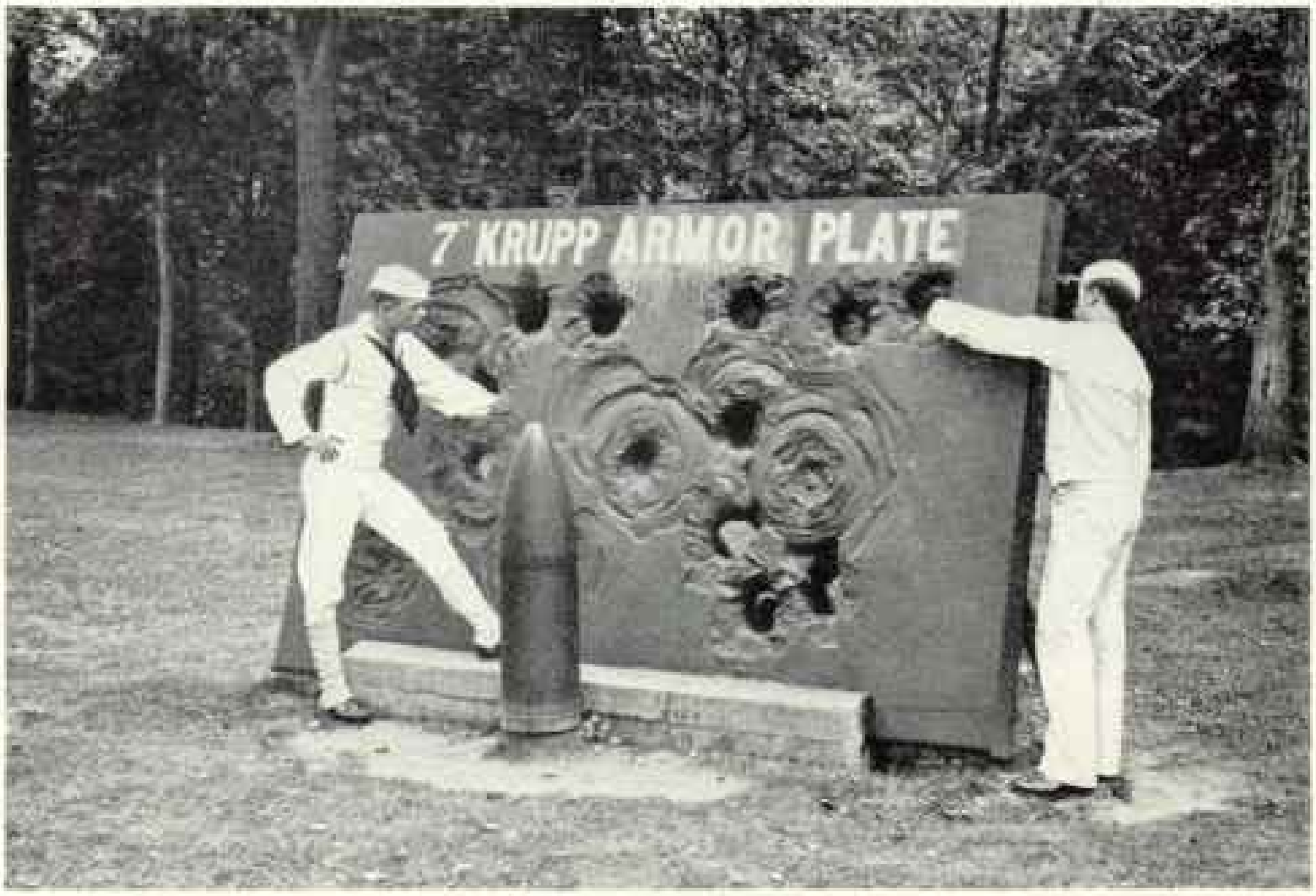
THE GIANT DIRIGIBLE HANGAR AT SCOTT FIELD

Two small training dirigibles of the non-rigid type hardly make a start toward filling the vast interior. It is 150 feet wide, 150 feet high, and 819 feet long. The double doors, which weigh 40 tons each, are opened and closed by electricity. The field is not far from Belleville, in the southwestern part of the State (see, also, text, page 553).



HARNESS RACING REMAINS A POPULAR SPORT AT CORN-BELT FAIRS

Although the horse and buggy have nearly disappeared from city streets, they still hold a place in the rural districts. Trotting races evoke enthusiastic interest from visitors to the annual Interstate Fair at Kankakee (see, also, Color Plate II).

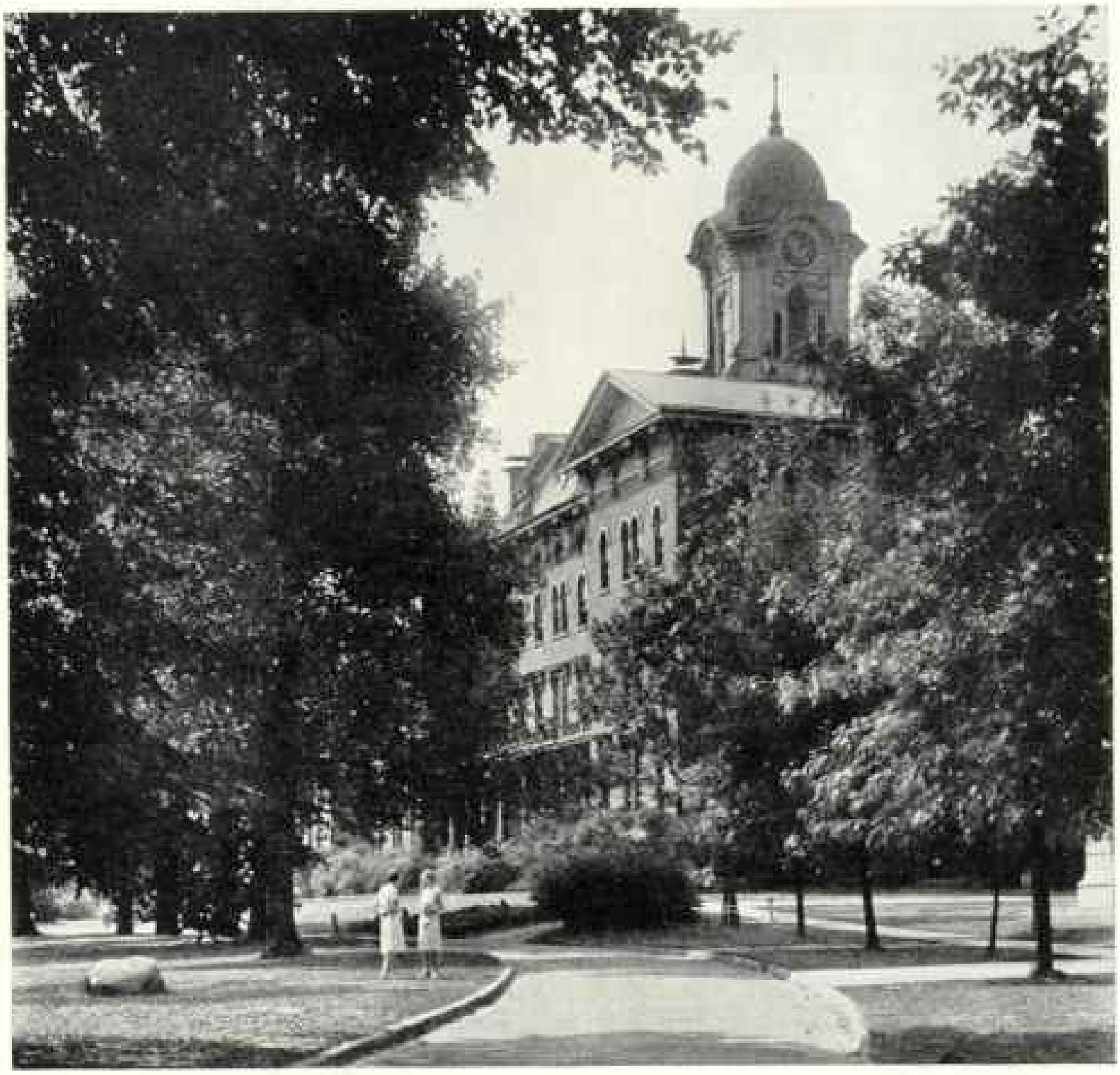


BOYS WHO ARE LEARNING TO BE SALT-WATER SAILORS FAR FROM THE SEA

Great Lakes Training Station, on the shores of Lake Michigan, near Waukegan, is the Navy's chief inland school (see, also, Color Plate VII). Two recruits are noting the effect of shellfire on a specimen of armor plate.

ADMIRING NEIGHBORS PRESENTED THIS HOUSE TO GENERAL GRANT

They gave it to the famous Union soldier at the close of the Civil War. His son, Robert Dent Grant, returned it to the city of Galena for a memorial to his father. It is visited by thousands yearly.



THE OLDEST BUILDING ON THE CAMPUS OF THE STATE NORMAL UNIVERSITY

This school, near Bloomington, was established in 1857 and offers 14 different curriculums, designed to train teachers for various levels of the public-school system. Some courses cover a period of four years and lead to the degree of Bachelor of Education.

science, music, education, and other factors which add to the comfort and contentment of humanity. It is Illinois intensified.

Chicago is a musical city. One of its music schools is among the largest in America. Its symphony orchestra ranks with the world's best, and it is only one in a city of excellent orchestras. Stockyard plants, mills, stores, and even newspapers have orchestras and choral societies of employees which never give public concerts. Its opera company, which has done much to develop American talent, has a skyscraper home to help make it self-supporting. In summer, opera is heard under the trees in the beautiful Ravinia Amphitheater. Typical of Chicago, guiding spirits of these musical activities are three men whose days are given to law, public utilities, and merchandise.

With more students than any other school of its kind, the Art Institute gives Chicago an assured place in art circles, but the fact that it has more sustaining members than most similar institutions shows a city's appreciation of art.

CHICAGO'S PUBLIC LIBRARY CIRCULATES 14,000,000 BOOKS A YEAR

Chicago reads as it hustles. The American Library Association classifies it among the great reading cities of the world. Its public library, revived by a donation from England after the fire, circulates 14,000,000

Photograph by H. M. Anschutz

A DAM NEARLY A MILE LONG HARNESSES THE MISSISSIPPI BETWEEN HAMILTON, ILLINOIS, AND KEOKUK, IOWA

The mammoth structure forms a lake 40 miles long to the north and develops 150,000 horsepower, most of which is "sold down the river." The St. Louis area is the chief consuming region.

A PEOPLE WHO LIVED BEFORE THE DAWN OF AMERICAN HISTORY BUILT THE CAHOKIA MOUNDS

The State of Illinois has preserved the rare examples of early civilization by declaring the region about them a State park. The largest of these mounds, near East St. Louis, covers an area greater than that of Egypt's mightiest pyramid (see text, page 554).

Photograph courtesy Dr. Don F. Dickson

FRIENDS BURIED FOOD AND DRINK WITH THESE INDIANS FOR USE ON THE JOURNEY TO THE HAPPY HUNTING GROUNDS

Thousands of flint and bone implements and ornaments have been found within the mounds at Lewistown. Near almost every skeleton are pottery vessels, which presumably contained food and drink for the deceased. Many burials have been uncovered, and a structure has been erected to shelter them from the weather, so that the remains have been left lying just as they were interred. (See, also, illustration, page 574.)

Photograph courtesy Dr. Don F. Dickson

PRE-COLUMBIAN CITIZENS OF ILLINOIS UNEARTHED AT LEWISTOWN

The remains represent the Illinois River, or "Bluff," culture, one of six archeological cultures that have been found within the State. Location and arrangement of the bones would indicate that the site was an ancient village cemetery. The mound in which these excavations were made was crescent-shaped originally and measured 550 feet along the curve, with a height of from 30 to 35 feet (see, also, illustration, page 573).

books a year, though the number on its shelves is smaller than that in the New York City Public Library or in the Library of Congress. For completeness in their special lines and for patronage, students coming far to consult them, Newberry Library of humanities; the Crerar Technical and Scientific Library; the Fine Arts Library; the Library of Architecture and the Postgraduate Library of the University of Chicago are among the noted reference libraries of the world.

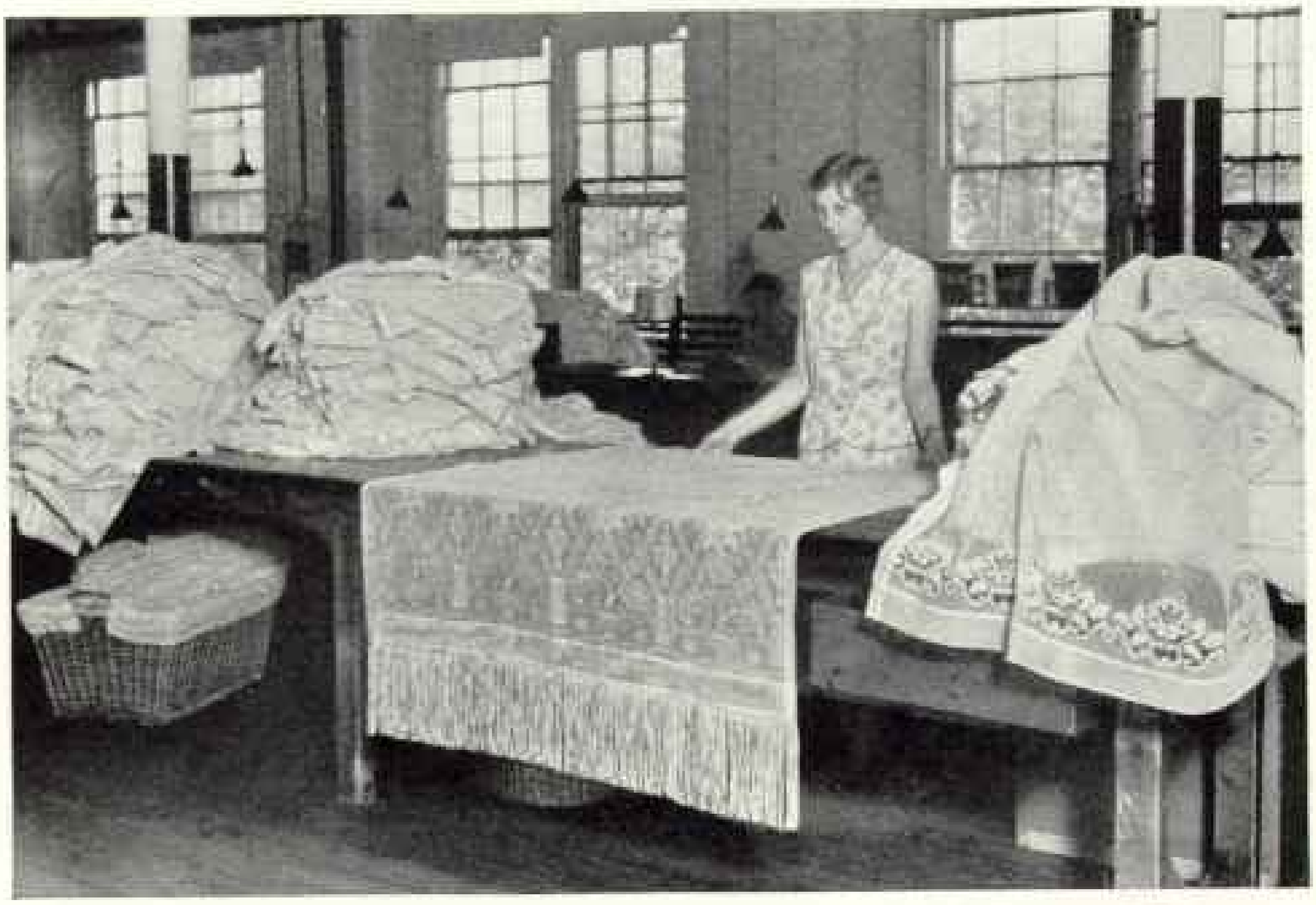
Libraries and schools and, more than all, the harmony of environment have made Chicago an educational center of North America. Attendance figures and faculty rolls of colleges, or even a world-famed name, do not determine eminence in educational facilities; but, in studies made by the Association of American Universities, 28 universities were given the highest rating, and three are in Illinois—Northwestern, Chicago, and Illinois—while no other State has more than two.

Chicago shelters nine universities and colleges, nine theological seminaries, seven law schools, five medical colleges, five schools of commerce, and three dental colleges. Of 71 accredited law schools in the United States given the highest rating, four are in Chicago, with New York and Boston next with two each.

The unendowed university of the streets, where orators always have an audience and ideas are more often bizarre than sound, flourishes in Chicago. Washington Square, fronting the Newberry Library, and the artesian spring in Washington Park have the largest attendance of these open-air night schools. A suggestion that they be suppressed aroused loud protest in this city of unrestrained argument. A more staid development is the public forum, held in four halls, with a weekly attendance of 20,000.

ILLINOIS IS JUSTLY PROUD OF NOTABLE MUSEUMS

"Is there a museum or art gallery?" is a sight-seer's first question in a new city. Illinois has such institutions to show the passing ages, several of them outstanding



SHARP-EYED INSPECTORS SCAN LACE CURTAINS MADE AT ZION CITY

In search of flaws in the thread, the expert slowly draws the lace over the surface of a smooth, dark table. Long-staple cotton is used for this manufacture, and the intricate designs are secured by means of punched cards, which are placed in the machines and regulate the direction of the thread.

in their lines. All of the flowers and birds that once graced the sand and marshes which now are Chicago survive in the glass cases of the Academy of Science, in Lincoln Park. The State Natural History Museum in Springfield goes back even farther. A wall in one of its halls is faced with stones starting with the Archæan age, which the curator says was more than a billion years ago, and rising in strata to the Pleistocene age, less than 1,000,000 years ago. At the side of each stratum are paintings of the contemporary animals which roamed the earth.

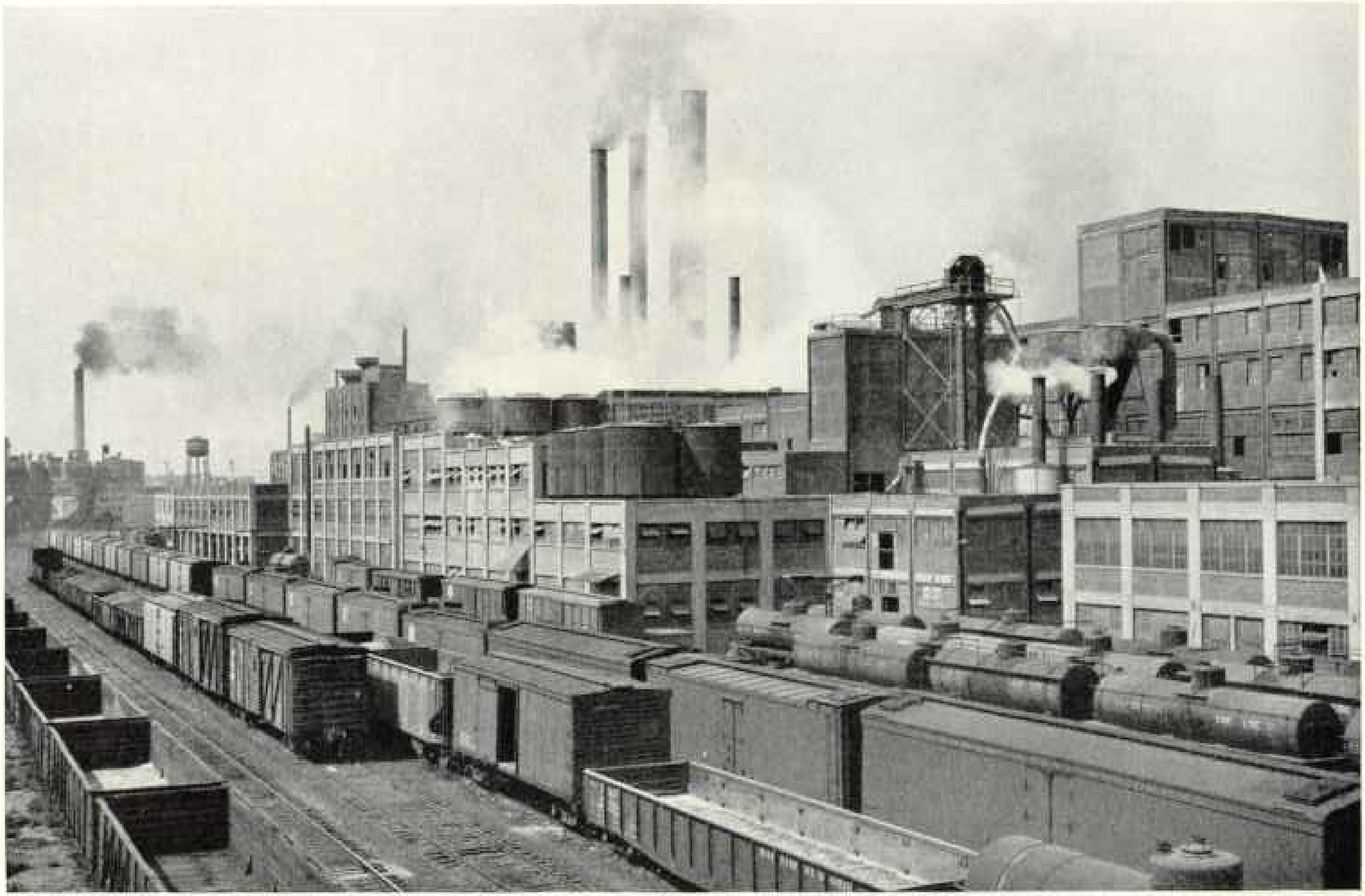
Two of the finest Egyptian collections in the world are in Chicago.

Field Museum of Natural History, on the lake front, annihilates both time and space. Its frozen Arctic, with polar bears and seals and a path of chilly blue stretching to the midnight sun, is only a step from an Indian jungle, with rhinoceroses emerging from the marsh or a group of startled Queen of Sheba antelope on a rocky mountain side of Ethiopia. They are so real that the visitor, the roar of the city streets still echoing in his ears, is whisked into the distant, lonesome wastes, thousands of miles from Chicago, glimpsing life from a forgotten past and in unknown lands.

The visitors themselves, 3,000 a day, are as interesting as the exhibits. A school of wide-eyed youngsters, piloted by teacher and guide, clusters around the mummies. That undertakers profiteered under the Pharaohs was discovered when X-ray photographs were taken. "And you can see, children, how he broke the poor man's bones to put him in a smaller casket," the teacher explains, pointing to the print.

A rural visitor gazes at blackened kernels of wheat which grew in Mesopotamia 5,500 years ago, and others only 900 years younger from Egypt. Wheat in that dim past was little different from to-day.

A Thespian stands in front of the skeleton of a 25-year-old man, stone implements at its sides, who, 25,000 years ago, lived in what is now France. The bones of a dinosaur as large as a corncrib and the skull of a mastodon found in near-by Indiana may be 45,000,000 years older.



VAST FACTORIES CONVERT THE PRODUCTS OF THE STATE'S CORNFIELDS INTO MARKETABLE GOODS

An immense plant at Pekin extracts from the grain cornstarch, corn oil, and corn syrup. Nearly eighty-one million dollars' worth of corn products, produced in 1927, gave Illinois first rank among the States for that year (see text, page 534).

INDUSTRIES OF ENORMOUS MAGNITUDE CENTER ABOUT THE STOCKYARDS OF CHICAGO

Of this phase of Chicago's activities, the term "greatest in the world" may well be used. The yards encompass miles of streets and hundreds of miles of railway tracks and receive millions of head of livestock each year. Not only slaughtering and meat-packing are associated with them, but many by-products as well. Here originated the apt phrase that "within 15 minutes after going in, a pig comes out as hair, sausage, hair oil, and the binding for a book" (see text, page 581).

CHICAGO HAS RÉCLAIMED HUNDREDS OF ACRES FROM LAKE MICHIGAN

Some of the made land along the lake shore has been built up with sand brought from the near-by Indiana dunes. Near the center of the picture are Soldiers' Field, the Field Museum, and Shedd Aquarium (to the right). On the island just offshore the Planetarium houses within its circular walls a fine astronomical museum. (See, also, Color Plate X.)

CAREFULLY PLANNED GOTHIC BUILDINGS GIVE THE UNIVERSITY OF CHICAGO AN OLD-WORLD APPEARANCE

Prominent among the structures are the new Medical Group, in the left foreground; the Chapel, at the right, and between the two the Harper Memorial Library. Stagg Field is in the middle distance, at the left. Generous gifts of money and its wise expenditure have made Chicago University one of the best equipped in the country. It takes just pride in its graduate courses.

Photograph from Wide World

SKI EXPERTS GATHER FROM AFAR AT FOX RIVER GROVE, NEAR CARY

Some of the best-known skiers of the country, among them holders of international titles, compete in the annual meets here. The man shown in mid-air covered 148 feet on this leap.

Madagascar, Philippine, North American Indian, Chinese, Tibetan, Melanesian, and Malayan exhibits are among the most complete in the world. The collections of meteorites, of jewels, and the model of the moon are equally noteworthy among a million and a quarter objects in the museum. Many of them are priceless, but those that can be appraised are valued at $45,000,000, housed in a $7,000,000 marble model of the Erechtheum Temple of ancient Athens.

A SQUARE MILE OF PENS AND PACKING HOUSES

Once a year Chicago has its livestock and horse show, two shows in one. Prize winners from other stock shows throughout the country are there for final judgment. It is the winter parade of the stockyards, the home of the meat industry, for which Chicago is famed the world over.

More than a fourth of the livestock which leave their happy homes for 67 markets in different parts of the United States come to Illinois, to be reshipped alive or to continue their journey as dressed meat and in brightly labeled cans. The Union Stockyards and the Livestock Exchange are the centers of the meat industry, a square mile of pens and packing houses.

Each second that a watch ticks off, a hog is being whisked into Chicago's insatiable mill, to emerge eventually in an attractive assortment of ham, sausage, pickled feet, lard, brushes, oleomargarine, chewing gum, candy, pepsin, pancreatin, soap, cosmetics, glue, buttons, knitting needles, and even sacks of fertilizer, to grow more corn and raise more hogs.

DIVERSEY BEACH, IN LINCOLN PARK, ONE OF CHICAGO'S POPULAR BATHING PLACES

Lake Michigan's cooling breezes serve the purpose of a giant electric fan for the people of the Illinois metropolis during summer heat.

When cattle and sheep join the grim procession to the kitchens of the world, they fly past at a rate of two each second. This is in Chicago alone. There are other big packing plants in Illinois, including the big yards in East St. Louis.

Railroads once ridiculed the idea of refrigerator cars, and the pioneer Chicago packers built their own. Biographies of these pioneers are more stirring than fiction: Philip D. Armour, Gustavus F. Swift, the two Cudahys, and Nelson Morris. One-third of the Nation's meat packing is done by the four concerns which they founded, the main plants of three being in Chicago.

STOCKYARDS TEEM WITH COLOR AND MOVEMENT

To the slaughterhouse products of grandfather's day have been added fertilizer, glue, leather, oleomargarine, combs, buttons, toilet preparations, teething rings, drums, candy, glycerin for medicine and explosives, half a hundred rare pharmaceutical preparations, as well as meat of endless distinctions, including 60 canned varieties alone.

The "yards" teem with color and movement. Over it all is the throb of animal life and the unforgettable aroma of soap works, fertilizer plant, and livestock pens, which to the nostrils of a returning Chicagoan, just as the rice paddies speak to the son of Nippon, tell him he is home.

Its gates are a human kaleidoscope. In the passing procession are girls who manicure the fingers of other girls who stuff frankfurters; barbers who trim tails for mattresses and ears for "camel's-hair" brushes; men who pass their days in the cooling rooms of perpetual winter, and others who tend giant 12-carload kettles which boil soap for two weeks at a tem-

© Chicago Aerial Survey Company

THE CHICAGO BRANCH OF NORTHWESTERN UNIVERSITY

The tall central structure houses the Colleges of Medicine and Dentistry, while the smaller towered building next to it is the home of the Schools of Commerce and Journalism. Just beyond them, toward Lake Michigan, is the Law School. The other departments of the University are located in Evanston, a few miles north along the lake shore.

perature of 140°; women who each year use 36,000 miles of twine tying the ends of 75 of the 2,000 recorded brands of sausage; bearded rabbis, who prepare kosher meat which must be blessed every three days; the packers whose fathers started the business; stock-raisers in coonskin coats which never saw a college; hundreds who wield only keen knives, for knives still are the chief machinery of the meat business; genuine cowboys on ponies whose hoofs never leave paved streets, and bespectacled scientists studying to discover another useful grain of something in the unsuspecting cow.

A pound of suprarenalin, price $5,000, is extracted from a gland found around the kidney, and 135,000 sheep are required to produce the pound. The pancreas glands of 15,000 steers will yield a pound of insulin.

By-products of the packing industry are so important—19 per cent of the income—that the big packers now can pay more for a live steer than they receive for its dressed carcass. Only 54.3 per cent of the weight is meat.

Like bunches of driftwood on a slow-moving river, the animals are driven through the streets of the yards and up

ENGINEERS HAVE PERFORMED A MAJOR OPERATION ON THE CHICAGO RIVER

The straight new channel is at the left; the natural curving course will be filled in to facilitate a better arrangement of railway tracks and to permit new avenues of approach to the South Side.

into the plants. Steers file into a narrow runway. A man with a sledge walks above. One swing of his hammer and the stricken steer slides out. It rolls to the skinning beds, where two men with knives pare off the hide. Cattle usually are killed soon after they arrive at the yards. The beef is chilled for a couple of weeks and then is ready for the market.

Hogs have a restroom and shower bath before they tumble into the chamber of their last squeal. A hind leg is caught with a piece of chain; the other end drops on a hook on the edge of a big, solid wheel. As the porker rises, its throat is cut, and the slow-moving circle, like a Euphrates water wheel, slides the carcass into a trough to be scalded and scraped.

EVERY TRAVELER CHANGES CARS, BOAT, OR AIRPLANE AT CHICAGO

"All out! Don't forget your parcels or umbrellas!" the brakeman calls. Chicago has been reached. No passenger rides through on train, airplane, or boat. Railroad systems which comprise more than half the mileage in the United States terminate in Illinois, most of them in Chicago. It is the greatest railroad city in the world. Across the State, East St. Louis, on the Illinois side of the Mississippi, is the largest transfer point on the river.

Geographical location has made Illinois the State which Nature chose as the crossroads of a continent. In the air, it is the same. The transportation trinity will be complete when the deep waterway through the Drainage Canal and the Des Plaines, Illinois, and Mississippi rivers is finished, putting Illinois on a water highway from Atlantic to Gulf. The St. Lawrence-Great Lakes waterway would bring ocean steamers to Chicago's fresh-water docks.

THE WORLD'S GREATEST RAILWAY CENTER ONCE TRIED TO KEEP RAILROADS OUT

Illinois has more than 12,000 miles of railroad and is exceeded only by Texas; but Illinois has four times as much railway mileage as Texas per square mile of area. The latticework of steel rails is closer over Pennsylvania, though its total mileage is less than that of Illinois.

Throughout the 24 hours of each day, passenger trains enter or leave Chicago faster than one every minute and five freight trains do the same every three minutes. If they traveled straight instead of over the city's maze of tracks, they would go more than twice around the world each day. Mileage of tracks and movement within the city limits are almost beyond comprehension. For operating purposes, the Chicago terminal district is a moon-shaped crescent with a 40-mile arc, stretching across Lake Michigan from Waukegan, Illinois, to Porter, Indiana.

It is easier to visualize the old voyageur paddling down the Lake Michigan shore, leisurely camping where now is Chicago or digging in until the river thawed, and then carrying his canoe over the portage, than it is to picture these thousands of trains each day pounding into one city, breaking apart like strings of beads, then being restrung—35,000 cars coming together again into other trains and speeding out into the distance.*

Chicago, which is to-day the greatest railroad center in the world, actually tried to keep railroads out. They scared livestock and scattered soot on the Monday wash—a united family issue! The Illinois Central, which has electrified its priceless right of way on the lake front, came into the city on miles of trestle out in the lake.

Earlier than that—in January, 1836—the Galena and Chicago Union Railroad (Galena being a more important city than Chicago at that time) received a charter. By 1848 the road of thin straps of iron and smoothed logs for rails had been started from outside the city limits to Elgin. Chicago gave permission for a temporary track across the city's fields to the Chicago River so the *Pioneer*, the road's locomotive, which arrived by boat on October 10, could get to the railroad. There was a gala day two weeks later. City officials and prominent citizens walked to the city limits, where all the rolling stock—the *Pioneer* and six freight cars fitted with seats—took them on a thrilling ride over the railroad's entire six miles.

This was the farthest west of the transcontinental railroads. As part of the hilarity, a farmer's wagon was unloaded and the grain hauled back to Chicago. That was the first of the many millions of bushels of grain which have poured through the world's greatest grain market. It also was the beginning of the 8,463 miles of the Chicago and Northwestern Railroad.

For many years the *Pioneer*, 27 feet long and weighing 10 tons, speeded up to 25 miles an hour on a wood diet. This daddy of to-day's giants, which are 75 feet long, more than 200 tons in weight, with a speed of 85 miles an hour, now has a place of honor in the rotunda of the Northwestern passenger station.

CHICAGO'S ONLY DOWNTOWN SUBWAY IS RESTRICTED TO FREIGHT

Illinois had a $6,000,000 dream of State-owned railroads in 1837. The legislature authorized the building of 1,340 miles. Towns which did not get a railroad were to have a steamboat, and if there was no stream the State would build a highway. Fifty-eight miles of railway, from Meredosia to Springfield, were opened in May, 1842. The line was sold to a private company. Farmers stole the strap rails to make sled runners and wagon tires. The owners put broad wheels on the locomotive and ran it across country until a posse, alarmed by the strange tracks of an immense animal in their fields, started out with shotguns and overtook it stuck in a bog. There it stayed.

* See, also, in the NATIONAL GEOGRAPHIC MAGAZINE, "Chicago To-day and To-morrow" and "America's Amazing Railway Traffic," by William Joseph Showalter, for January, 1919, and April, 1923, respectively.

WABASH AVENUE BRIDGE FRAMES A TRIO OF SKYSCRAPERS

The Wrigley Building (with clock) hides all but one buttressed side and the flag on top of Tribune Tower. In the left background, Medina Temple, headquarters of Illinois Shriners, raises its mosquelike superstructure.

 Finlay Direct Color Photographs

SUMMER HEAT SENDS THRONGS OF CHICAGOANS TO LAKE MICHIGAN'S BEACHES

The Oak Street public bathing beach is one of many along the lake shore. In the background, residences which earned for this region the title of "Gold Coast" in the waning years of the last century, are now dwarfed by modern hotel and apartment buildings.

Fillius Direct Color Photograph

CHICAGO IS JUSTLY PROUD OF MAGNIFICENT MICHIGAN BOULEVARD

Flanked on one side by a panorama of imposing buildings and for long stretches on the other by parks and beautiful Lake Michigan, this is a street with few peers. The massive structure at the left is the mammoth Stevens Hotel, with the Blackstone and Congress Hotels respectively a block and two blocks beyond. The equestrian statue of Gen. John A. Logan rises in the middle distance.

Finlay Direct Color Photograph

IN HEROIC BRONZE, THE STATE'S GREATEST CITIZEN PRESIDES OVER A PARK WHICH BEARS HIS NAME

Sculptured by the master hand of Augustus Saint Gaudens, this fine portrait statue of Abraham Lincoln commands widespread admiration. In 1920 a replica presented by the American people was placed in Parliament Square, London. Lincoln Park extends for about five miles along the lake shore and includes various recreational facilities.

AN ENGLISH GARDEN ON A LAKE FOREST ESTATE

This attractive suburb with a population of between six and seven thousand is one of the richest towns in America. It is about 30 miles from downtown Chicago.

 Finlay Direct Color Photographs

ATTRACTIVE SUBURBAN HOMES LINE THE NORTH SHORE

Wealth and culture are apparent on every side in the beautiful communities which reach along the shore of Lake Michigan from Chicago almost to the Wisconsin State line.

COLORED LIGHTS PLAY ON THE BUCKINGHAM MEMORIAL FOUNTAIN

A major display is given three evenings a week for a period of one hour during the summer months. At such times the fountain uses 5,500 gallons of water a minute.

© National Geographic Society Finlay Direct Color Photographs

CHICAGO IS PARTICULARLY WELL SITUATED FOR YACHTING

The Great Lakes offer thousands of miles of cruising area, while canals and rivers make even the distant Gulf of Mexico attainable. A new yacht basin off Lake Shore Drive.

Finlay Direct Color Photograph

TEMPLES OF COMMERCE IN STEEL AND STONE

Much of the ground on which Chicago is built was originally marshy, but this fact has not deterred the builders of skyscrapers. From left to right the towers crown the Pure Oil, Union Carbide and Mather Buildings, 335 Michigan Avenue, the Wrigley Building, Tribune Tower and Medina Temple (see also Color Plate IX). The motor cars are in an automobile park on ground reclaimed from the lake.

Finlay Direct Color Photograph

FATHER TIME REVIEWS A THRONG OF HASTENING FIGURES, SYMBOLIC OF MAN'S JOURNEY THROUGH LIFE

The "Fountain of Time" was conceived and executed by Lorado Taft and represents the first step in the realization of Chicago's plan to beautify the old Midway of World's Fair fame. This colossal piece of sculpture is at the western end of the mile-long boulevard which connects Washington and Jackson Parks.

A FAMOUS SPORT OF OTHER DAYS STILL HAS ITS DEVOTEES

Robin Hood and William Tell did not take their archery more seriously than do some of the young ladies of the Lincoln Park Archery Club. Three afternoons each week during the summer tests of marksmanship are held on a 100-yard range along the lake shore.

 Finlay Direct Color Photographs

CRACK FLYERS GATHERED IN CHICAGO FOR THE 1930 NATIONAL AIR RACES

More than a thousand airplanes landed and took off during the ten days of the meet, and commercial and military aces thrilled half a million spectators with their exhibitions of speed and skill. These planes are a contingent representing the United States Navy.

Chicago's gesture to keep railroads out was but a passing flurry compared to the years of struggle which have followed to keep them in step with the city's needs. Track elevation was secured after a long fight; electrification has only begun, and, with two exceptions, passenger stations are archaic eyesores in a modern city. The Panama Canal and "Pittsburgh-plus" have given Illinois high freight rates despite its abundance of railroads. The greatest transportation city has talked for 20 years of a subway to pour more people into the congested Loop, but its only subway is for freight—40 miles of track under the downtown streets, in a tunnel built for automatic telephones when they were a novelty. Elevated and surface companies say they give the longest ride in the world for one fare, and, as evidence of efficient operation, declare no railroad crossing is as busy as the elevated at Wells and Lake streets, where 244 trains cross every rush hour. Fares increase and more straps substitute for seats.

MAIL PLANES MUST BE DISPATCHED IN SECTIONS FROM CONGESTED AIRPORT

Although Chicago and its environs have many private landing fields, the city has been backward in meeting aviation's needs for a municipal field. The airport at the hub of the Nation's airplane lines, far on the outskirts of the city, is already strained to its capacity. Planes circle patiently over it, awaiting their turn to land; but necessity—the destiny of the crossroads—makes Chicago a Nation's air center.

When the mail is heavy, planes are dispatched in sections, like trains, seven or eight trailing over a single route. Eleven lines for passenger, express, and mail, with 46 scheduled flights every 24 hours, radiate from there, reaching from coast to coast, from Canada to Argentina.

As a distribution point, Chicago is the center of the country for many things besides food—dry goods, general merchandise, jewelry, musical instruments, millinery, shoes, groceries, candy. It is a fresh-produce terminal, 30,000 cars of fruit from California alone being distributed there. Its pantry normally has on ice half a million tons of meat, enough butter and eggs to supply the Nation for six weeks, and cheese for seven. It is the largest grain market—400,000,000 bushels a year—and annual tradings in futures have reached 31,000,000,000 bushels, six times the crop of the Nation.

CHICAGO'S PARCEL-POST MAIL LEADS THE NATION

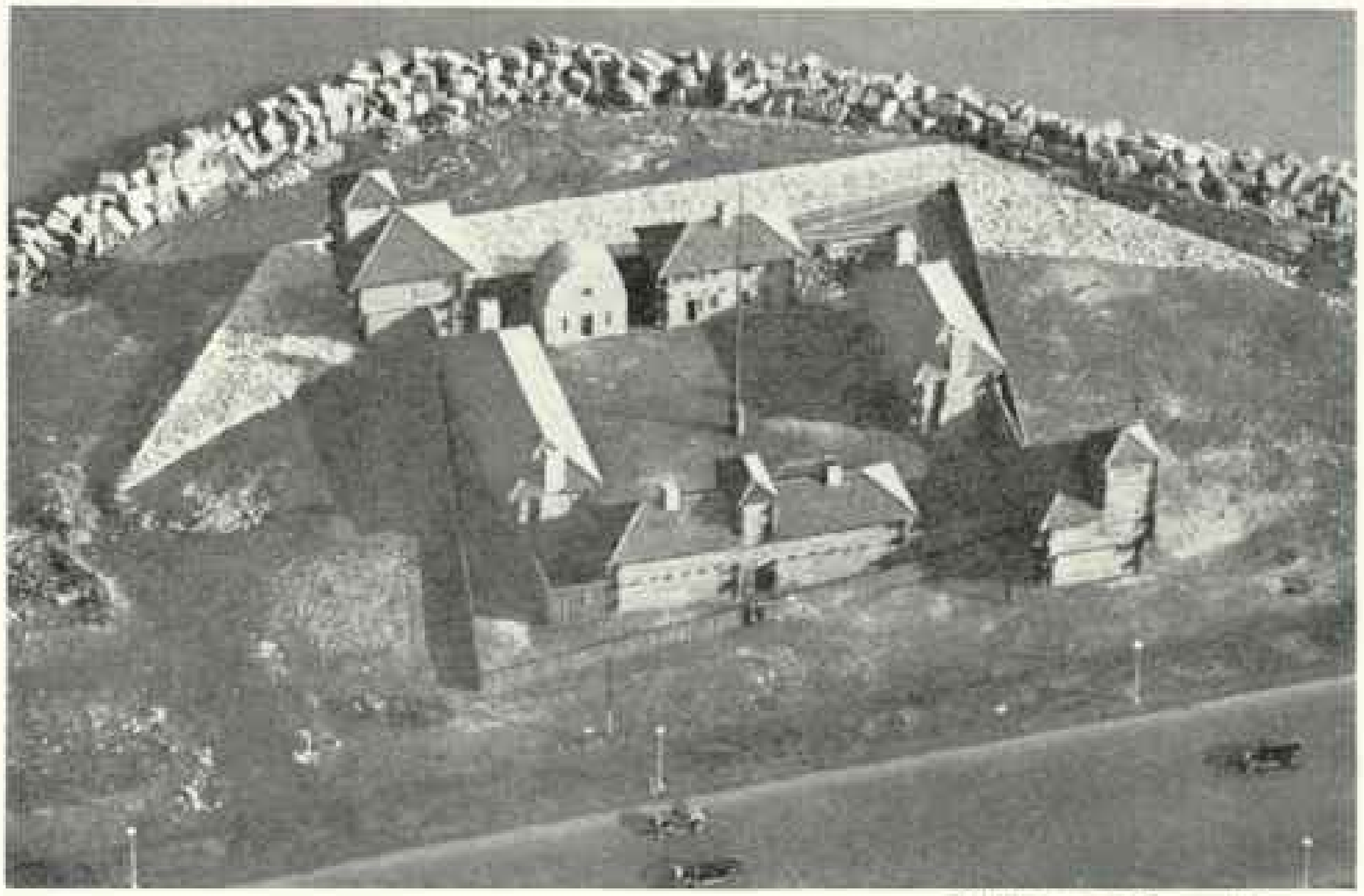
Wholesale and mail-order houses run to size as well as quality. Postal zones have made Chicago a domestic mail center. Its postal authorities say their 100 carloads of parcel post a day equal the shipments from New York and Philadelphia combined. The postage bill of the big mail-order houses alone equals that of an average city. No other city handles as many domestic money orders.

Such practical reasons, rather than local springs of literature, make Chicago a publication home for various magazines which are edited in other cities. Poets and authors have lived and drawn their inspiration from Illinois and the Middle West, and they have produced a literature exalting character and country; but in this age a writer does not belong to a State, hardly to a Nation. In the editing of scientific and technical periodicals, however, Chicago has a position, and more books of largest circulation in the United States—the telephone directories—are printed here than in any other city. Printing ranks third among the State's industries.

Food products form one-fourth of the five and a half billion dollars' worth of articles which are manufactured in Illinois each year. Steel mills and foundries are a close second. A majority of the telephones used in America are manufactured in Illinois. In one of these factories the advent of the talking movie brought an immediate increase of 5,000 employees. It also put that many theater musicians out of work.

Our Government classifies 333 industries in the United States, an easy number to remember, and all except 13 are represented in Illinois. Sacramental wine is one of those omitted, and possibly, if the Government inquiry had been more thorough, the other twelve also would have been found, making Illinois the 100 per cent typical State.

Chicago is the teeming hive of industry, but many cities and towns contribute their share to make the big State total. In nearly 40 industries Illinois leads every other State. The list shows some strange neigh-



© Chicago Aerial Survey Company

A REPLICA OF FORT DEARBORN, THE FRONTIER POST AROUND WHICH CHICAGO DEVELOPED

In 1933 the city will commemorate its centenary. The birthday party will take the form of a "Century of Progress" celebration, to be held on a series of man-made islands in Lake Michigan (see illustration, page 578), and one of the historic features will be this reproduction of a famous stronghold.

bors: Pullman cars, professional instruments, agricultural machinery, surgical appliances, meat packing, and suspenders.

The State's wealth is put at 22½ billion dollars, almost equal to the three Pacific Coast or the six New England States. Wealth of the States in this young Nation rivals kingdoms of old, and that of Illinois is two-fifths the total wealth of Germany. The greatest marvel is its rapid growth, for 136 years ago Gen. Anthony Wayne bought the entire area from the Indians for one cent an acre—$363,000, the price of the State.

Illinois was the frontier then, and the population center for the Thirteen States was about 20 miles east of Baltimore. Each decade it has moved westward, 557 miles in 130 years, close to the 39th parallel and only 7 miles farther south than where it started. The 1930 computation is not yet completed, but the 1920 census left it in Indiana, a few miles east of the Illinois line. The center of industry is close by. As the East has become industrial, the agricultural center of the Nation has passed through Illinois, reached Missouri, and is now probably near the geographical center in Kansas.

Resting in one of the most fertile valleys of the world, Illinois adds the comforts of life to the charms of Nature. Beneath the surface of this valley are the minerals which civilization demands. Nature endowed it to become the food mart of the Nation and the center of the richest industrial area in the country. Transportation has made it a world crossroads. When New York was only 18 hours' journey from it by train, half the population of the United States was within one night's ride from Illinois. San Francisco is now only 18 hours distant by airplane, and more of the population is nearer to Illinois than to any other State.

As the people of Illinois have prospered they have made it beautiful—a pleasing place to live. Where the Nation's highways cross is the hospitable heart of the land.

FLYING THE "HUMP" OF THE ANDES

By Capt. Albert W. Stevens

United States Army Air Corps

Aërial Photographer, National Geographic Society Latin America Air Survey, Author of "Exploring the Valley of the Amazon," in the National Geographic Magazine

With Illustrations from Photographs by the Author, with the Coöperation of the Argentine Army Air Corps, Chilean Army Air Corps, and Pan American-Grace Airways

UNTIL recently, if I had been invited to participate in a transatlantic flight I would have firmly refused. Everything is relative. And now, after a certain flight, late in last October, across the Cumbre, south of Aconcagua, I would agree to cross the ocean half a dozen times rather than cross the Andes under the weather conditions that existed on that occasion. We got through, but what a trip!

Let me hasten to explain that the regular passenger on the South American air lines hasn't the remotest chance of getting mixed up in such a hair-raising business. When you get on a large air-liner at any of the modern airports between here and Buenos Aires, whether on the east coast or west coast, you have a feeling of security.

But don't try to get permission to ride the plane that is used exclusively for mail and company employees across the Andes, for no guarantee whatever will be given you. The mail must go,* and it gets through usually on the first attempt; but on those occasions when the pilot is forced back for more fuel after hours of battling for an opening between crags and clouds, you may be sure that you would never have enjoyed being with him.

FLYING THE "HUMP" IS AVIATION'S HARDEST RUN

When the assertion is made that flying the "hump," as the Cumbre is called, is the hardest run in aviation, one has in mind the fog-enshrouded ridges of the Alleghenies, the blizzard-swept passes of the Cascades, the Sierra Nevadas, and the Rockies. Uspallata Pass, with the Cumbre as the divide, has, on occasion, on a single flight, everything that is known elsewhere in the weather line—fog, clouds, rain, hail, snow, thin air, cold air, and terrific wind currents.

A hundred miles to the south is a somewhat easier pass, the Paso de Maipú, located on the southern side of the huge extinct volcano of the same name. This pass is more than a thousand feet lower than the Cumbre, and its approaches are more gradual on each side of the divide; yet this pass has claimed its first mail plane, for last July the French aviator Guillemet was caught in descending air currents in a snowstorm and forced into the basin of the Laguna del Diamante, where he cruised vainly round and round until forced to land near the ice- and snow-covered shore of the lake.

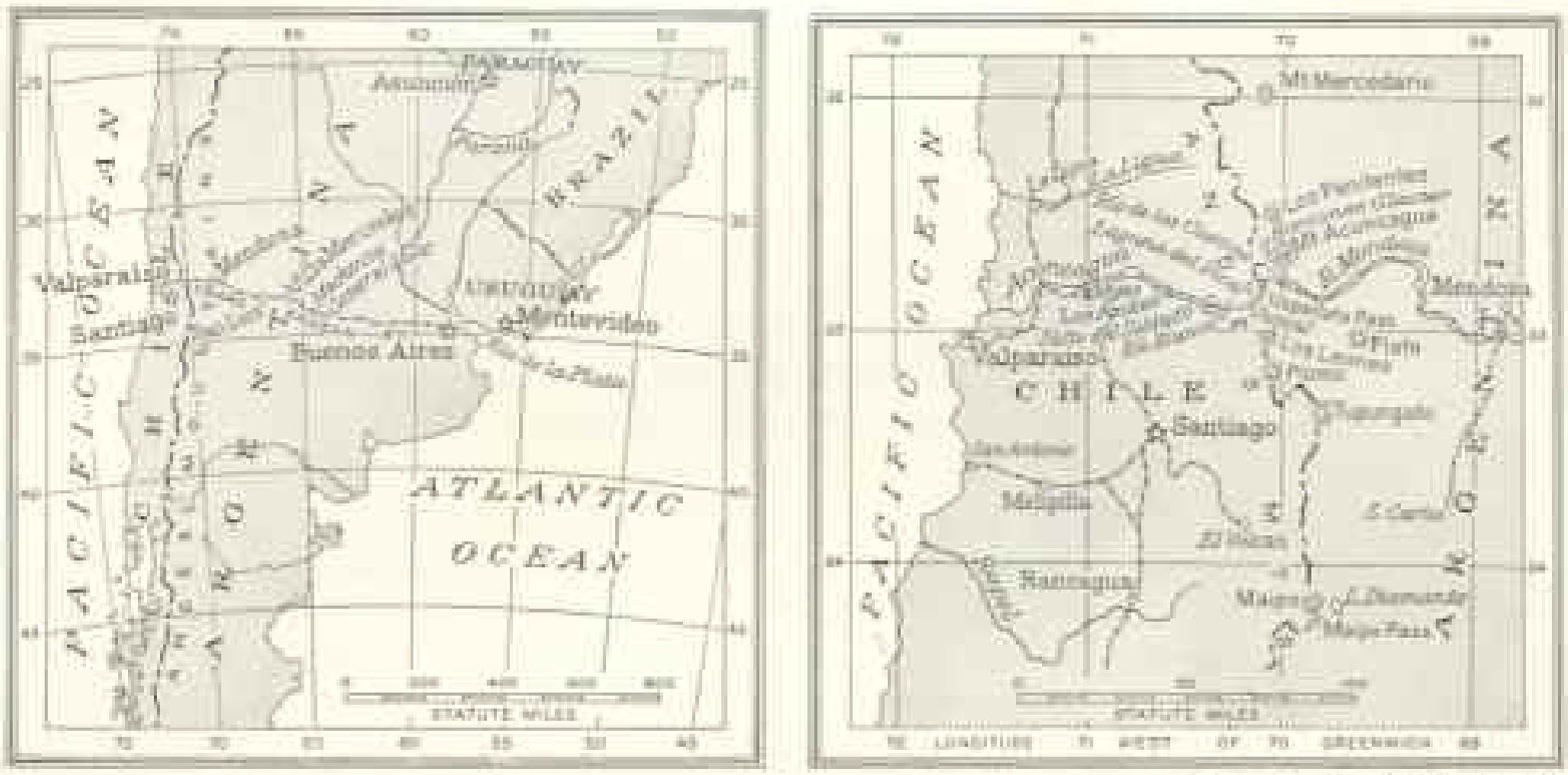
The plane turned over, but Guillemet was unhurt. For more than four days and nights he plodded doggedly through the lonely, wind-swept canyons, finally reaching shelter and food at the hut of a sheepherder. He had a very narrow escape from death by exposure.

Four times a week the Americans fly the Andes, largely by the northern route of the Cumbre, or Uspallata Pass, except when weather conditions permit them to make a high-altitude, direct-line flight between Santiago and Mendoza. Twice a week the French cross with mail, using the southern route. It would be idle to try to compare the ability of the various pilots; all of them must be unusually capable, and they more than earn the high wages that prevail.

SAN MARTÍN'S VICTORIOUS ARMY ENTERED CHILE BY USPALLATA PASS

Uspallata Pass, though higher, is a shorter route between the capital of Chile and the wine center of western Argentina. It was through this pass (pages 602-5-9), over a century ago, that San Martin descended into Chile with four thousand soldiers to deal the Spanish forces a blow from which they never recovered.

* See, in the National Geographic Magazine, "Flying the World's Longest Air-Mail Route," by Junius B. Wood, and "On the Trail of the Air Mail," by J. Parker Van Zandt, for March, 1930, and January, 1926, respectively.



Drawn by A. H. Rumstead

THE ROUTE OF TRANSANDEAN MAIL AND PASSENGER PLANES

The detail sketch, to the right, shows the main peaks of the Andes in the vicinity of the route of the mail plane from Mendoza, on the Argentine side of the "hump," to the Santiago flying field (Los Cerrillos), on the Chile side.

Some 25 years ago a railroad was started in the pass from both sides simultaneously. After many seasons, during which the final summit was still passable only by trail, a two-mile tunnel was driven through the ridge of the Cumbre at the 11,000-foot elevation. On the ridge itself, nearly two thousand feet higher, stands the famous statue of the Christ of the Andes* (see illustration, page 609).

The pass itself conforms to the general contour of the Cordillera, in that it slopes rather gently up from the east and drops abruptly off to the west. From the ridge of the Cumbre it is a plunge of 6,000 feet to the bottom of the canyon at El Juncal. From a high-flying airplane the pass itself, a deep black canyon nearly cutting through the enormous ridge of the Andes, is an interesting study.

The most extraordinary feature of all, on a clear day, is the presence, only 11 miles from the pass, of the highest mountain of the Western Hemisphere—Aconcagua, 23,098 feet in elevation (see text, page 615). But, close as the mountain is, you may fly across the pass for weeks at a time in winter and never be aware of the proximity of the peak, even though you know exactly where to look.

*See "The World's Highest International Telephone Cable," in the NATIONAL GEOGRAPHIC MAGAZINE for December, 1930.

My first trip across was in a trimotored Ford, flying at 19,000 feet. The day was beautiful and clear and the great chain of the Andes glistened with dazzling whiteness far to the north and south (page 601).

ACONCAGUA FLIES A BANNER FIVE MILES LONG

In startling contrast to the vast snow fields lying below us, the black mass of Aconcagua projected skyward 5,000 feet higher. Blown eastward from its summit by prevailing winds was a pure-white banner cloud nearly a mile high and five miles in length, a gigantic flag that has waved for thousands of centuries, and that in all likelihood may be seen by man, if man then exists, thousands of centuries hence (see page 622).

Beyond could be seen to the north the white mass of Mercedario (see page 607), a mountain reaching up to 21,883 feet and so difficult of access that I can find no record that it has ever been climbed.

To the south were Cerro de Plata and Cerro del Plomo, and 50 miles distant the dome-shaped Tupungato, almost as high as Aconcagua and, because of its shape, carrying a far greater amount of snow (see page 624). Ahead were the four peaks of Los Leones, so rugged in character as to defy climbers, even though three of them are less than 20,000 feet in height.

PLAZA BRITÁNICA BRINGS A BIT OF ENGLAND TO BUENOS AIRES

The 207-foot clock tower presented to the city by British residents is built entirely of materials from Great Britain. Facing it on the left is the *Retiro*, the principal railway station in the city, and at the top of the picture lies the flying field. A military parade may be seen in the foreground. This is one of a series of the first aerial photographs of Buenos Aires made from a commercial plane in six years (see text, page 599, and illustration, page 598).

At our elevation, 6,000 feet above the ridge of the Cumbre, the air was relatively calm and quiet, though blowing steadily from west to east. We moved along almost as steadily as a big ocean-going steamer. As we passed Los Leones we lost altitude gradually, our speed increased somewhat, and it was not long before the snowy wastes gave way to brown hillsides, and finally to the green valley of Santiago.

Jacob Gayer, of the National Geographic Society photographic staff, and I looked forward with eagerness to the return trip, but unfortunately difficulties arose which made it necessary to go back to Mendoza by train. With my usual readiness to blunder into difficulties, I left the train with two companions near El Juncal and went ahead to make some ground views. We passed a pleasant August afternoon, a trifle wet through wading in snow, to be sure, and got some views of the canyon.

AN ICY PLUNGE TO NO AVAIL

I did not then know that I was to cross the Andes 15 times in a few weeks, and that eventually the plane in which I was a guest passenger would be trapped by clouds in the very canyon we were photographing.

GOVERNMENT BUILDINGS DOMINATE THE HEART OF BUENOS AIRES

In the foreground is the Plaza Colón, with its monument to Christopher Columbus presented by Italian residents. Just beyond it stands the *Casa Rosada*, the home of the Argentine President. It faces Plaza de Mayo, the most important public square in the city, with a memorial column at the center commemorating Argentina's Independence Day, the 25th of May, 1810. From the farther side of this park the famous Avenida de Mayo, recently widened at enormous expense, leads to the Plaza Congreso and the domed Congress Building, near the top of the picture.

As evening fell, we started back to the train at El Juncal with visions of a warm meal and a change of socks. Just then the train appeared around a bend and whizzed by us. Frantically my companion and I plunged into the Aconcagua River, waist-deep in its icy current. Gaining the far side, we scrambled up snow banks and slide rock in a last-minute effort to head off the train as it came slowly up the steep grade of the cog road on its way to the tunnel.

DELAYED BY REVOLUTION

We were still gasping in the thin air of the mountain side and clawing our way upward when the train went by a second time. Wet, tired and hungry, and a whole lot wiser, we had to cross the river a second time in the dark to get back to El

Juncal, where we spent the night. The next day we were fortunate in catching a special train and resumed our journey to Buenos Aires.

I had resolved to return to the Andes, but the revolution in Argentina made air travel a bit difficult. I finally got permission to go in the Panagra mail plane on a Tuesday morning. But on Monday evening firing broke out again, and for hours the post-office building was a target for shells and machine-gun fire.

Instead of getting away with the mail at 8 o'clock the next morning, it was almost 4 in the afternoon before we left Buenos Aires. It was clearly impossible to make Mendoza, but the policy of the mail pilots is to start, anyway, and get as far as possible. Darkness overtook us at General Soler Flying Field, near Mackenna and a little more than halfway to Mendoza.

A MOONLIGHT FLIGHT INTO THE ARMS OF THE LAW

Across a tiny campfire left by some sheep-herders, Thompson, the pilot, remarked on the general emptiness of his stomach and the reluctance he felt at spending the night in the airplane.

About 9 o'clock the moon came up. For an hour I watched it get higher and higher in the sky, and finally ventured the opinion that it was light enough to fly by. "No sooner said than done," remarked Thompson. "Crank up and let's go." So, without any of the accessories for night flying, we took off, and at 1 o'clock in the morning were over Mendoza (see page 630).

Thompson made one circuit low over the town to let the agent know we needed an automobile sent out to the field. It was fortunate for us we did not make a second circuit of the town, for the local garrison had been roused by the first passage of the plane and were waiting to greet it with machine-gun fire when it approached again! You can't blame them, for it was a time of unrest and revolution, and how did they know but that we carried explosives intended for themselves!

Fortunately, the Argentinians were a good-humored lot, and after a brief inquiry dropped the incident, so far as the pilot was concerned. Not so easily did I get by. Carrying a big aërial camera in an airplane is against all rules and regulations, and such permission as I had obtained before the revolution no longer held good, because of the sudden removal of those previously in authority.

However, by talking long and earnestly, I managed to obtain my release late that afternoon and was ready early next morning for a flight back to Buenos Aires. I did not know that my Mendoza acquaintances were to change their minds and telegraph to Buenos Aires, and that soldiers were waiting at the flying field, 600 miles away, to seize me and my equipment.

PHOTOGRAPHING THE ANDES AT 300 MILES' DISTANCE

Serenely, I chatted with Thompson while he climbed the plane higher and higher, so that I could make at regular intervals exposures of the distant range of the Andes (see pages 634 and 635).

The day was quite good, and even at 200 miles the Andes could be seen in detail. Higher and higher we rose, passing the 20,000-foot mark. Struggling for the last thousand feet possible with the load we carried, Thompson had the plane tilted almost to stalling speed. Fortunately, the west wind at this elevation is quite strong, and we still made excellent time eastward. At 300 miles I could still make out Tupungato, Plata, and Aconcagua, with the town of Villa Mercedes some 30 miles away.

Twenty miles farther on I could see Tupungato and Plata only through a red viewing filter. Later they disappeared altogether, visually, but the camera caught the very tops of the peaks on the last negatives exposed over General Soler Field, as it afterward proved when we developed the film. The filter used on the lens was such a deep red that one could not see through it; yet the film used was so red-sensitive that exposures were secured in a twentieth of a second.

Landing at Buenos Aires, I found myself in trouble again. It was fortunate for me that Gen. José Justo was a member of the National Geographic Society. At 10 o'clock that night the general appeared, with a number of fellow officers, at the flying field, and, after some discussion and questioning, he told me I was free to go, and—most marvelous of all—that I could make some aërial views of Buenos Aires, provided an Argentine officer was carried in the plane, and provided the field was notified in time, so an army plane could be

CLEAVING JAGGED FOOTHILLS, THE RÍO MENDOZA DROPS TO THE PAMPAS

No vegetation grows in this rugged and desolate waste, and because of the comparatively low altitude it is virtually snow-free in winter—black and forbidding the year around.

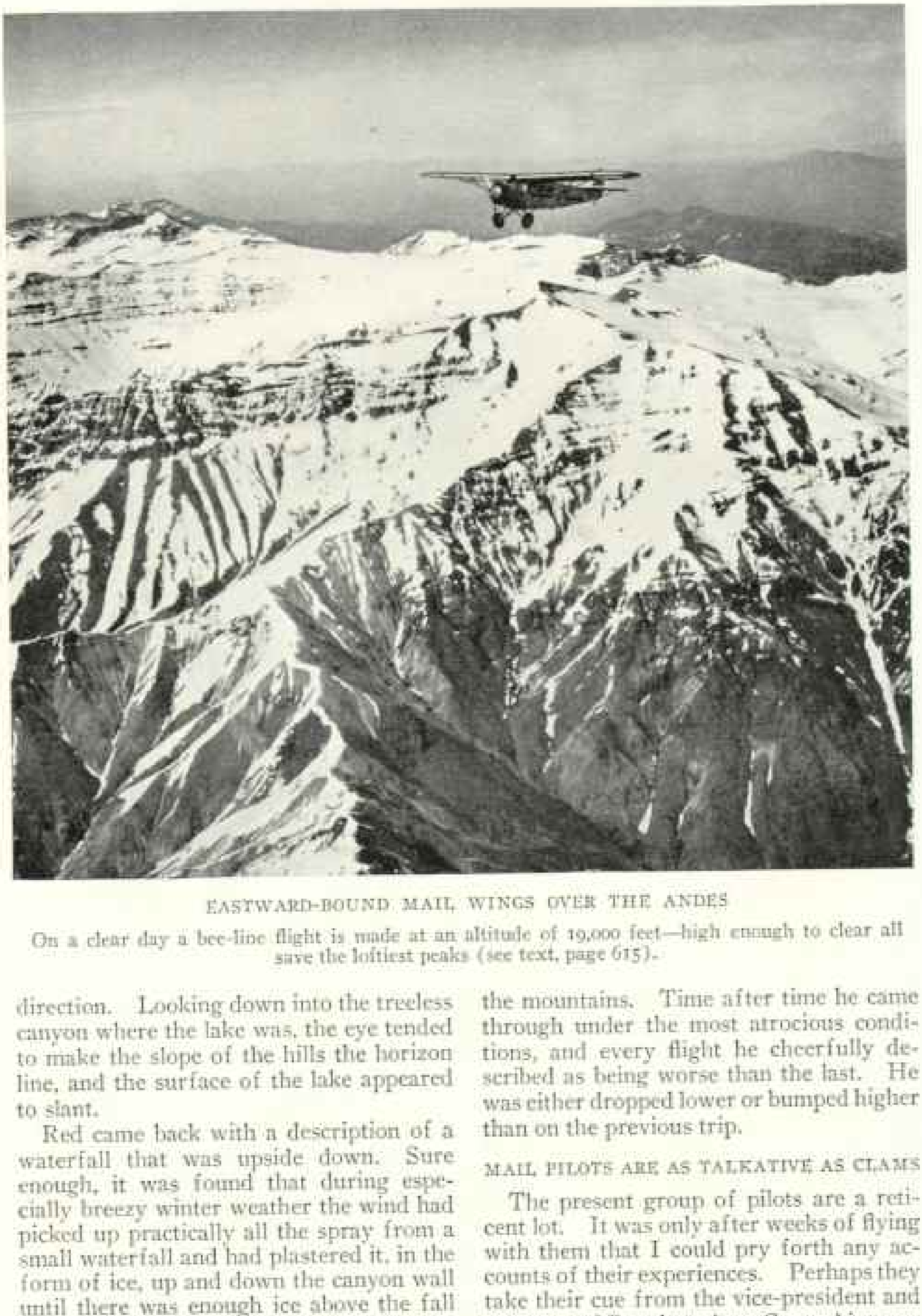
sent as escort to forestall the possibility of soldiers firing on us.

Doubtless this last precaution was well taken, for no civilian plane had flown over the city for six years. Suffice it to say that we cruised at 600 feet elevation over the city the very next morning and, though it was rather smoky, made a fair collection of pictures of the parks and plazas (see pages 597 and 598).

"SLANTING LAKES" AND "WATERFALLS UPSIDE DOWN"

The negatives developed, inspected, and shipped to the States, I was off again to Mendoza, 600 miles across the flat plains of Argentina. We flew above herd after herd of cattle and occasionally over racing South American "ostriches," or rheas. I smiled as I recalled the fanciful tales of Pilot Red Williams, who claimed he had dived his plane at one of these big birds and got it running so fast that when it inevitably crossed its legs it rolled straight away like a ball, without further need for propulsion!

It was Williams who spied the pond full of red ducks, which another pilot later identified as a species of flamingo. Not to be outdone, this pilot gave Red directions just where to look in the mountains for a "slanting lake." The lake proved to be a real one, located in the foothills where the ground sloped uniformly in one



EASTWARD-BOUND MAIL WINGS OVER THE ANDES

On a clear day a bee-line flight is made at an altitude of 19,000 feet—high enough to clear all save the loftiest peaks (see text, page 615).

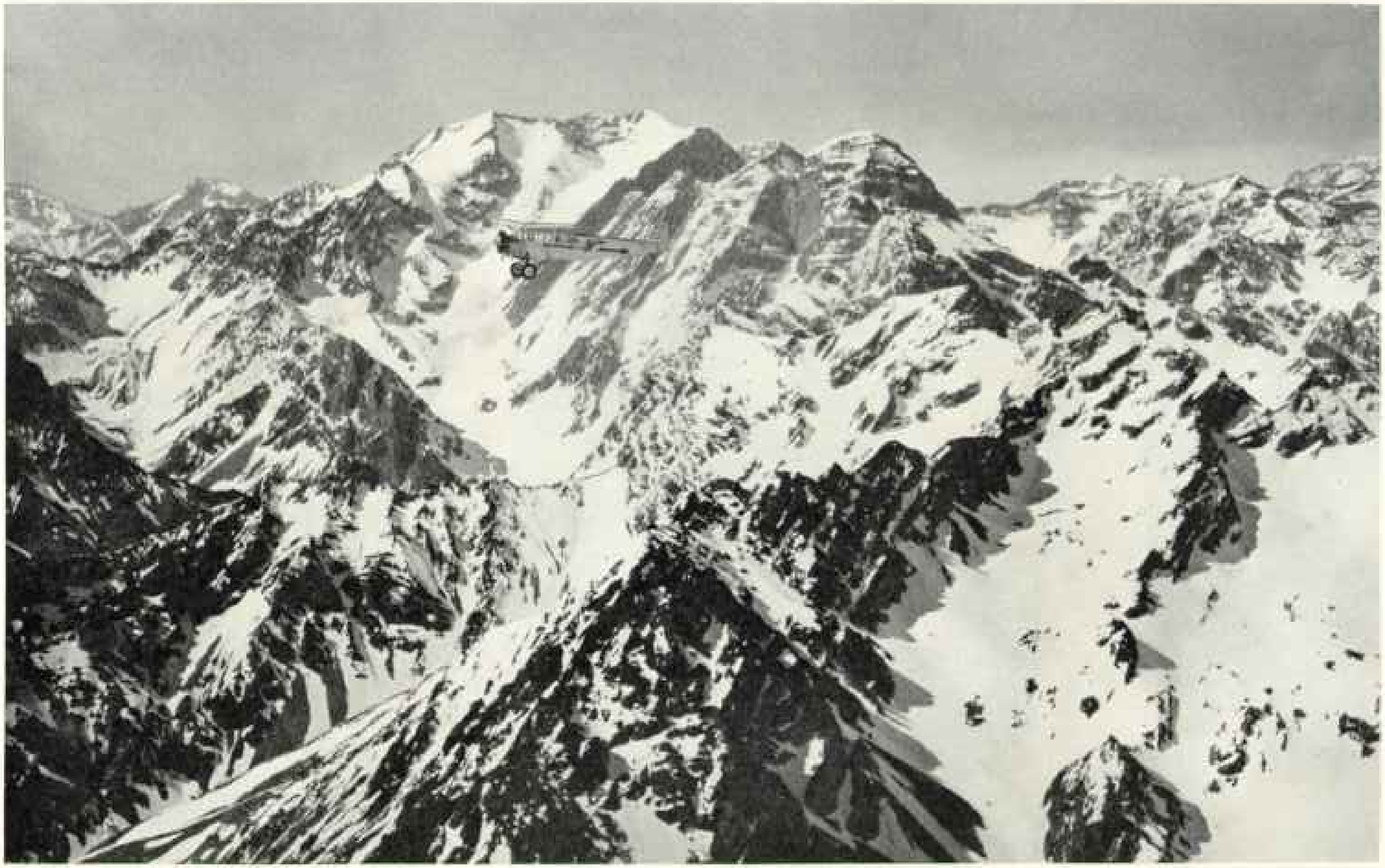
direction. Looking down into the treeless canyon where the lake was, the eye tended to make the slope of the hills the horizon line, and the surface of the lake appeared to slant.

Red came back with a description of a waterfall that was upside down. Sure enough, it was found that during especially breezy winter weather the wind had picked up practically all the spray from a small waterfall and had plastered it, in the form of ice, up and down the canyon wall until there was enough ice above the fall to give Red faint grounds at least for his claim.

Red, though no longer on this mail run, was one of the best pilots that ever flew the mountains. Time after time he came through under the most atrocious conditions, and every flight he cheerfully described as being worse than the last. He was either dropped lower or bumped higher than on the previous trip.

MAIL PILOTS ARE AS TALKATIVE AS CLAMS

The present group of pilots are a reticent lot. It was only after weeks of flying with them that I could pry forth any accounts of their experiences. Perhaps they take their cue from the vice-president and manager of Pan American-Grace Airways, Harold Harris, who is as eloquent as a clam when it comes to talking about the thrills of flying.



BETWEEN THE RUGGED WALLS OF USPALLATA PASS THE MAIL PLANE FLIES AT AN ALTITUDE OF 17,000 FEET

This is not a photograph of a mountain side, but of one canyon wall from a position in another airplane as far away from the plane photographed as it was possible to get without striking the canyon side.

LIKE SURF OF A MIGHTY SEA, THE ANDES BREAK IN GIANT WAVES

The elevation of the ridges in the foreground is about 18,000 feet. In the middle distance looms Aconcagua, and at the upper right Cerro de Plata. This photograph was taken at an altitude of 20,000 feet, from a position over the huge snow-walled amphitheater that forms part of the western face of Tupungato (see text, page 596, and illustration, page 624).

MENACING PEAKS WALL THE TRANSANDINE RAILWAY

In this canyon Pilot Travis flew desperately through cloud, fog, and rain, but kept clear of the rocky sides (see text, pages 619, 627, and 633).

Yet Harris has held a whole flock of world's records, was the first to fly the huge Barling bomber, made a flight in a hermetically sealed airplane cockpit under compression, and in the course of his duties as chief test pilot at Dayton helped give the famous Caterpillar Club a good start by crashing at the end of a parachute through a grape arbor in a back yard of Dayton. But try to get Harris to tell about his experiences, and in half a minute he will have you talking about the weather and how long it may be before the swimming is good.

It was Johnny, one of the mechanics, who told me how he and Van Law, of the Lima office, literally passed out "cold" when trying to get across from Mendoza with Harry Colliver. For hours Colliver cruised back and forth, seeking an opening between the clouds and the mountains. Finally he started climbing, and, though at last the altimeter showed over 24,000 feet, the clouds were still above them.

"It was then," said Johnny, "that I went to sleep. Such a nice sleep, too! How long Colliver flew I do not know. And when I woke up, at lower altitude, I had turned blue!" Van Law had also become unconscious. Colliver was using oxygen from the tank which is provided for all mail pilots, for it won't do for the pilot to get "goofy."

Needless to say, passengers other than company employees are never carried at such altitudes.

SPEED, 85 MILES AN HOUR; POSITION, UNCHANGED AFTER 2½ HOURS

Last October, ordinarily a fine month, proved unusually stormy and cloudy. On Tuesday, the 14th, Cliff Travis started from Mendoza with the mail. It was clearly impossible to get under the clouds, so he attempted to get over them. Higher and higher he climbed, until from 24,000 feet he could see over the Andes and note that the air was free from clouds over Santiago. At an elevation of 22,000 to 24,000 feet, he kept his plane pointed westward with a speed of 85 miles an hour, and at the end of two and a half hours he had not changed position 10 miles!

The next day he resolved to get under the clouds. Climbing warily through Uspallata Pass, he found himself in a raging

WINTRY BLASTS TURN A CLOUD WINDMILL OVER USPALLATA PASS

This unusual wheel formation, with spokes revolving slowly from east to west, probably was produced by the antics of intermittent air currents among the high peaks.

snowstorm as he approached the ridge of the Cumbre. Cliff had to fly as low as 25 feet from the ground to be sure of visibility, for to lose his position in such a place would be fatal.

In effect he was flying the plane in conformation with the contour of the ground, and as he got to the ridge where the statue of the Christ of the Andes is located, he dived down the other side. And such are the swirling air currents of this spot that a particularly violent down draft dropped him just as he passed the statue. "I saw the snow kicked up ahead by my landing wheels; it was surely a good thing that there were no rocks projecting through the snow bank on the ridge at that point!"

Thompson told me that under very similar conditions he missed the ground by ten feet as he passed over.

DROPPING 4,000 FEET IN 20 SECONDS

Two days later Travis crossed to Mendoza in clear weather. On Friday he returned to Santiago, and as the weather was still clear he flew across the Cumbre with plenty of clearance. Such good days are useful to get acquainted with the pass, so that one may know it in all its details in bad weather, and Travis started down into the canyon as he approached El Juncal.

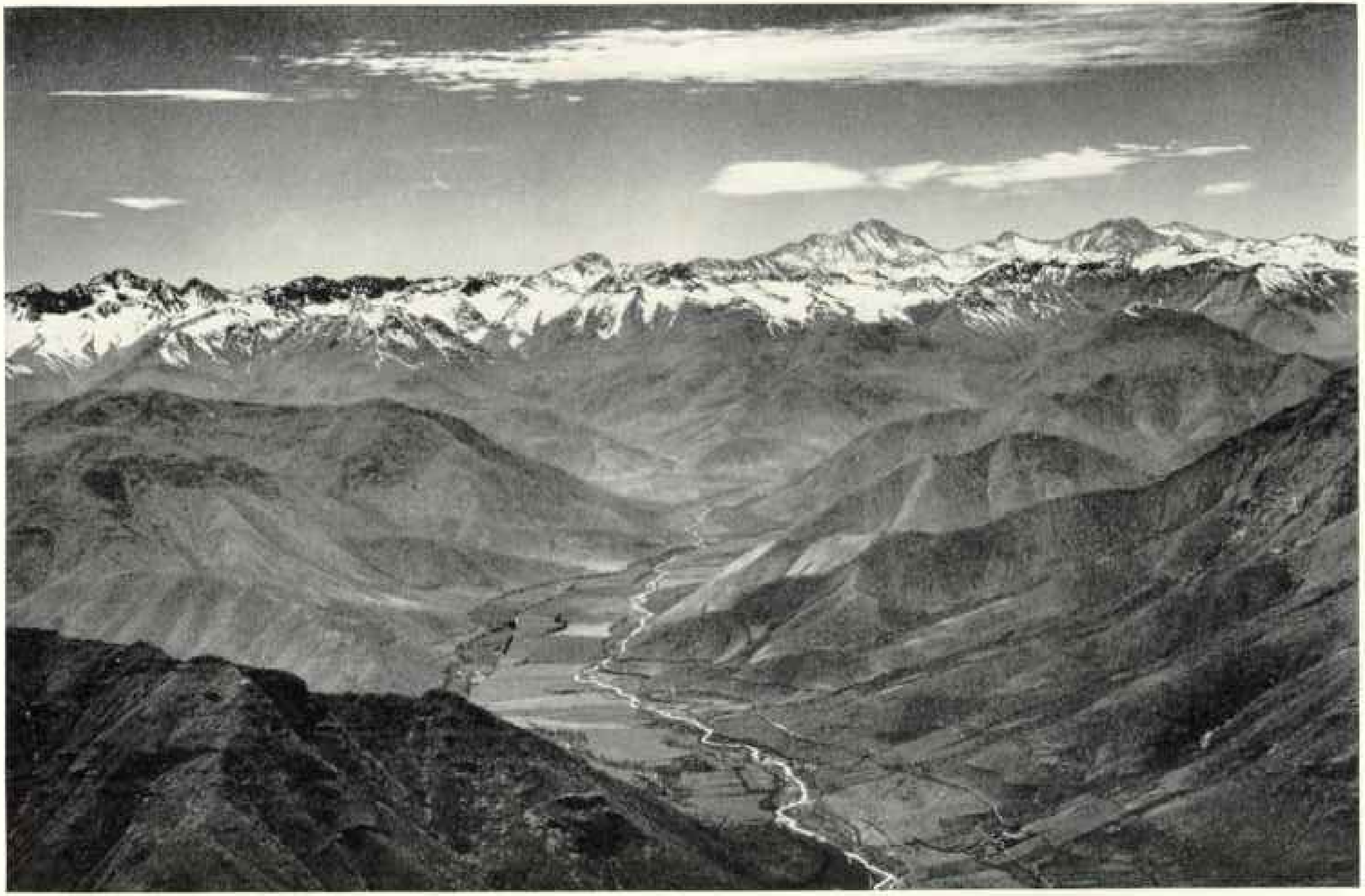
Without warning, his plane seemed to be yanked from beneath him. The wings and fuselage literally groaned under the terrific strain of impact of the descending air current. His safety belt still held, but it stretched enough to let his head hit the compass, cutting his scalp badly. He still had more than a mile elevation above the bottom of the canyon, and, as he was now particularly anxious to get home, he started to cut across a high ridge, or "dog-leg."

"Just then," said Travis, "the whole mountain side seemed to rise before me. This time there was no sudden jar, but a sensation as in a rapidly descending elevator. In less than 20 seconds I was nearly at the bottom of the canyon, and my altimeter showed that I had dropped 4,000 feet in that time."

Travis landed shortly after at Santiago; the compass was found to be damaged beyond repair. In the rear compartment of the plane was a 14-pound can of emergency rations. When the plane hit the first bump, this can struck the corrugated duralumin

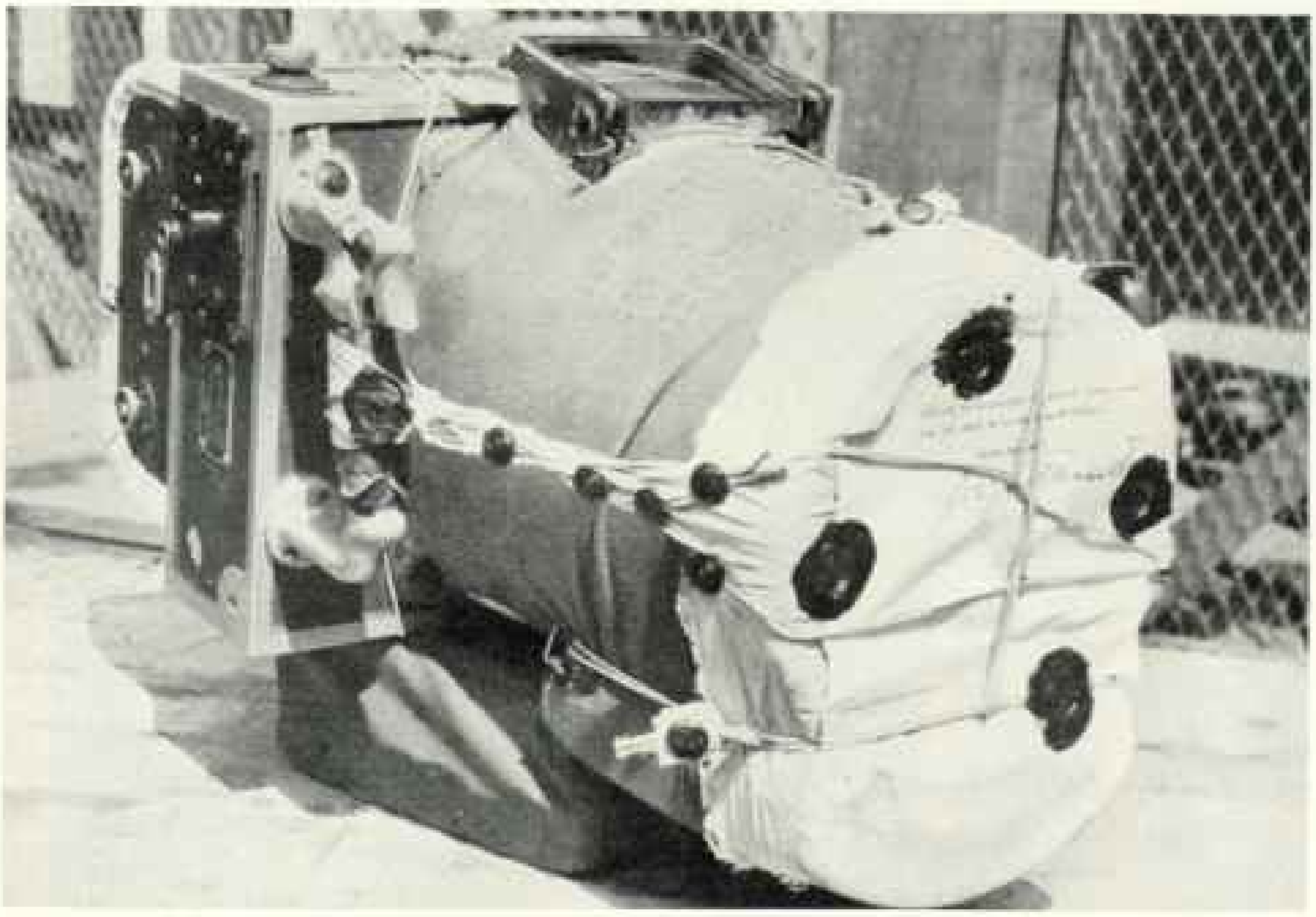
ACONCAGUA THRUSTS ITS BLACK PYRAMID NEARLY A MILE ABOVE THE MAIN RANGE OF THE ANDES

Seen from certain positions in the air, the peak resembles an island surrounded by white-capped waves. In the foreground is Laguna del Inca, nearly 10,000 feet above sea level, but more than 13,000 feet below the summit of the towering giant in the right background.



NORTH OF ACONCAGUA, MERCEDARIO LIFTS ITS HEAD 21,883 FEET

Difficult of access, because it is far from railroad and trails, this mountain is little known and probably has never been climbed. The photograph, taken from the west side of the mountains, shows the characteristically abrupt drop of the range.



ARMY REGULATIONS REQUIRE THE SEALING OF AERIAL CAMERAS ON INTERNATIONAL FLIGHTS IN SOUTH AMERICA

Exceptions were made, however, through the courtesy of the Argentine and Chilean governments in order to permit photographic surveys for the National Geographic Society of Aconcagua, Tupungato, and other lofty peaks in the vicinity of Mendoza and Santiago (see text, opposite page).

roof of the baggage compartment and cut a ten-inch hole through the metal. The ration can was smashed in by the impact. It speaks volumes for the strength of this American-made airplane that thorough inspection failed to disclose where wings or fittings had loosened to the slightest perceptible degree.

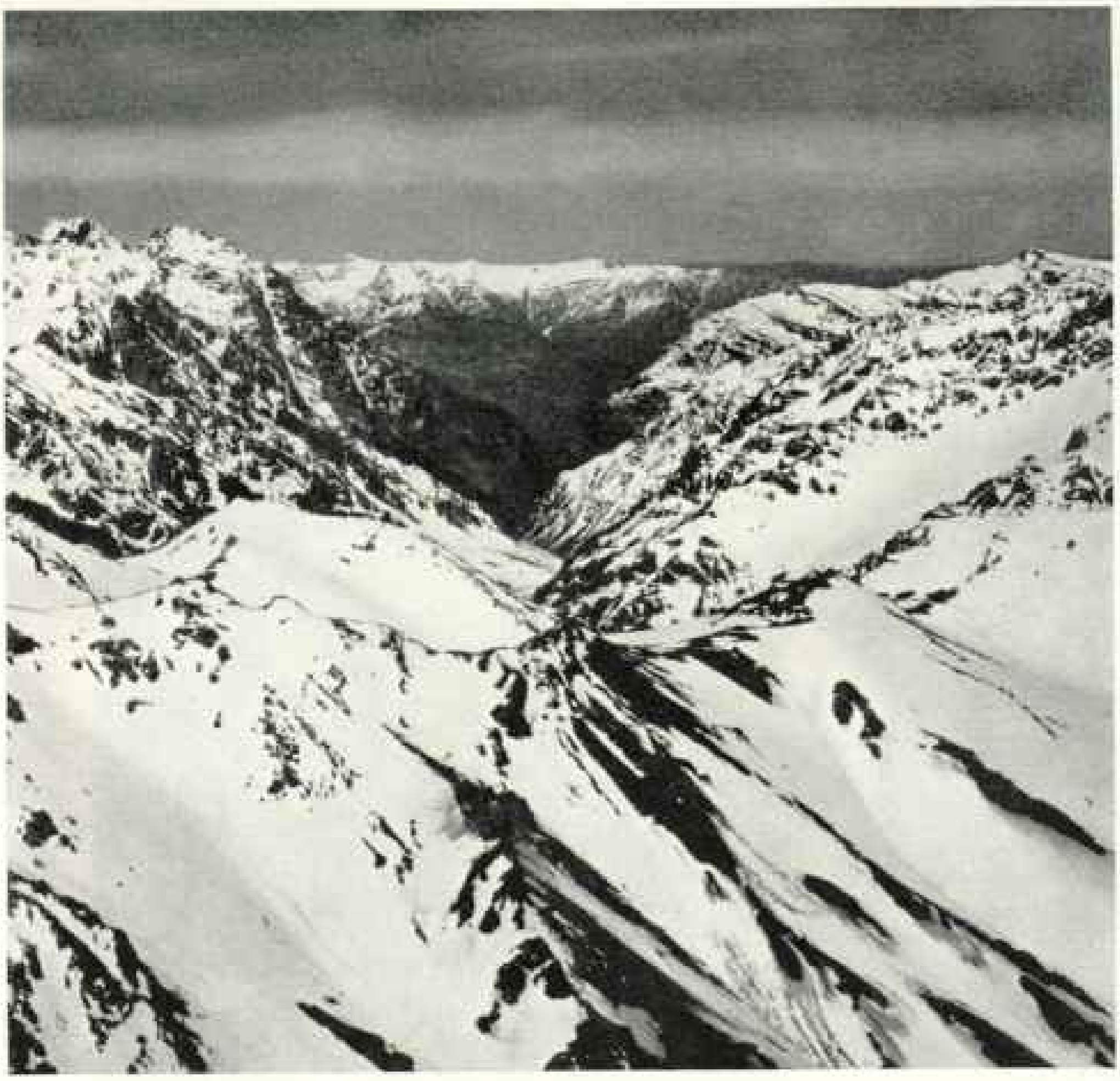
CHILEAN ARMY PILOTS GENEROUSLY AID THE AUTHOR

While these things were happening to Travis, I had been flying on clear days with the Chilean pilots, Lieutenant Donoso and Captain Solminhoc. The Secretary of Aviation, Col. Arturo Merino, had been very kind in providing the best equipment and men for the work. We made flights to Maipú, to Tupungato, and to the divide just west of Aconcagua. Since Aconcagua is entirely in Argentine territory, Lieutenant Donoso had instructions to approach it no closer than the frontier.

When I saw from the map that we were just about over the continental divide, I signaled Donoso to turn south. At that time we had an indicated elevation of more than 20,000 feet. As we turned south, it was apparent that we were in the grasp of a terrific current of air, for we were going sideways even faster than we were going ahead. In a couple of minutes we were blown miles into Argentine territory, and had lost elevation to such an extent that we were in imminent danger of crashing on one of the northwestern spurs of Aconcagua.

Donoso immediately did the only thing possible: he turned the plane westward in a steep glide, got back over the divide, dropped into a snow-clad canyon, and followed it all the way back to Santiago.

My chief recollection of these flights in the Chilean Army planes was that it was terribly cold in the open rear cockpit. I froze my nose to the extent that it peeled for weeks, and time after time I feared from the numbness of my hands that I had frozen them, even though I wore heavy gloves. I can readily believe how wind



CLEAR WEATHER MAKES EASY THE FLIGHT OVER THE TOP OF THE "HUMP"

Slightly to the right of the exact center of this view of the summit of Uspallata Pass (see, also, page 593) may be seen the statue of the Christ of the Andes, a tiny figure silhouetted against the nearer edge of a small oblong of smooth snow which resembles somewhat the wing of an airplane. This photograph was made in clear weather, several days prior to the perilous flight, when Travis and his companions passed over the ridge of the Cumbre in blinding snow, clouds, and fog. They were trapped twelve miles to the west, in the depths of the canyon shown in the extreme distance (see text, pages 619 and 627).

and low temperature have driven all but a mere handful of climbers from the north-west face of Aconcagua (see page 617).

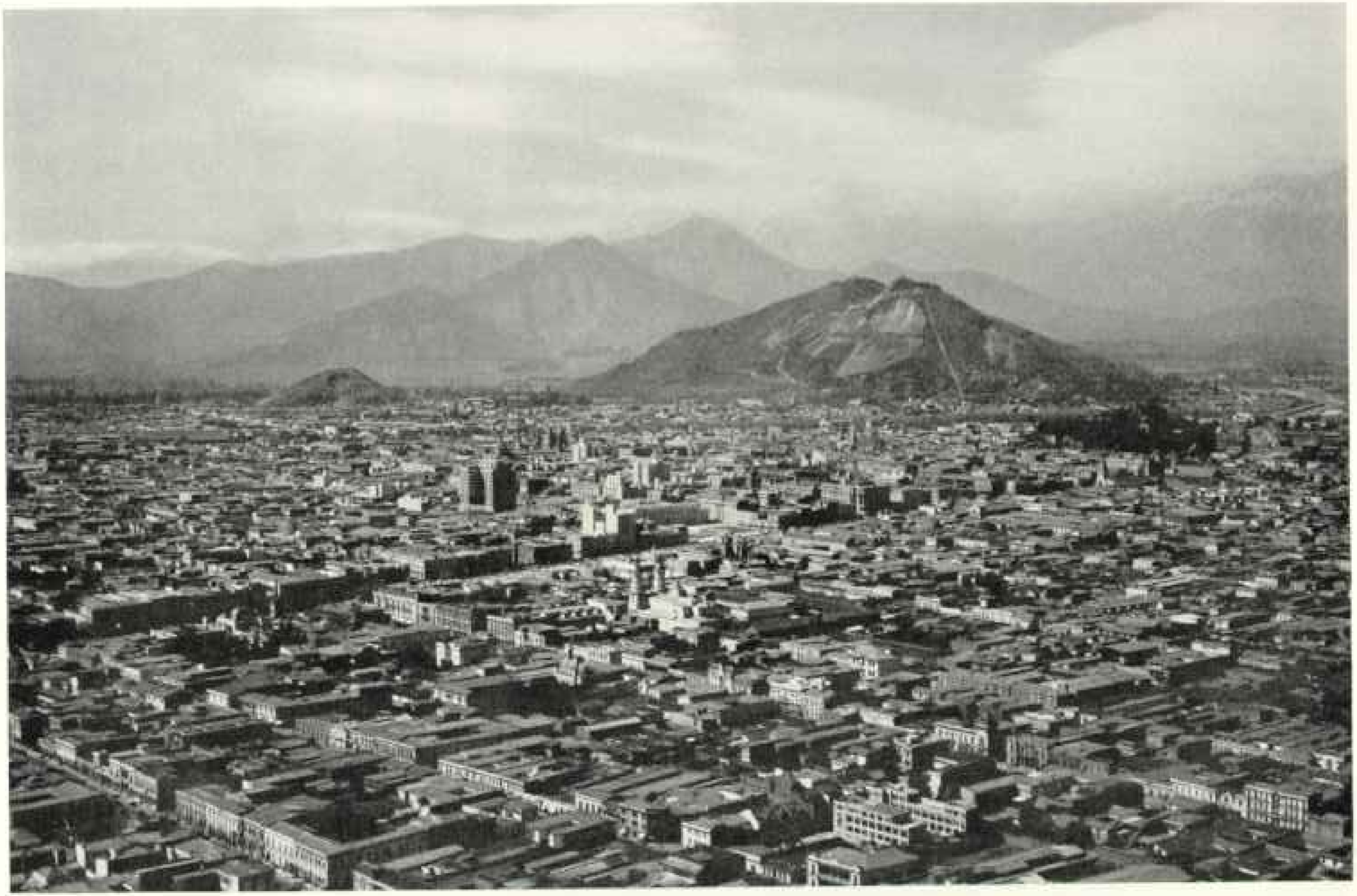
OFF TO PHOTOGRAPH ACONCAGUA'S SUMMIT

Photography has always been conducted with the greatest difficulty on the upper slopes of Aconcagua. Accounts of expeditions tell how precious views of the summit were lost when confusion of mind at high altitude caused climbers to make two exposures on some plates and none on others; also the fine sand, driven by the ever-present winds, penetrated camera and plate-holders, ruining emulsions.

It required several weeks to get joint permission from the Argentine Government, the Chilean Government, and the Pan American-Grace Airways to permit the Mendoza - Santiago mail plane to be flown to the very summit of Aconcagua. This airplane was fitted with a motor having a supercharger of extra-high ratio, designed to give great power at high altitude.

THE ANDES AS SEEN FROM AN AIRPLANE ABOVE SANTIAGO

To the left rises the huge mass of Mercedario, touching the clouds (see, also, page 607). Aconcagua (right center), although visible from the sea at Valparaiso, is not visible to the inhabitants of Santiago because the foothills of the Andes hide it from view; it is necessary to attain an altitude of two miles above the Capital City before the highest peak of the Andes comes into view.



MAGICALLY GROWING SANTIAGO HAS REACHED THE BASE OF SAN CRISTÓBAL

Only a few years ago the hill in the nearer right background stood alone in the midst of a barren plain. To-day the life of the city sweeps around it. The summit has been made into a delightful park, with zoölogical garden, tea rooms, etc. (see, also, illustration, page 612). Even at a distance the colossal figure of the Virgin stands out above the eminence.

FROM SAN CRISTÓBAL A STATUE OF THE VIRGIN OVERLOOKS SANTIAGO

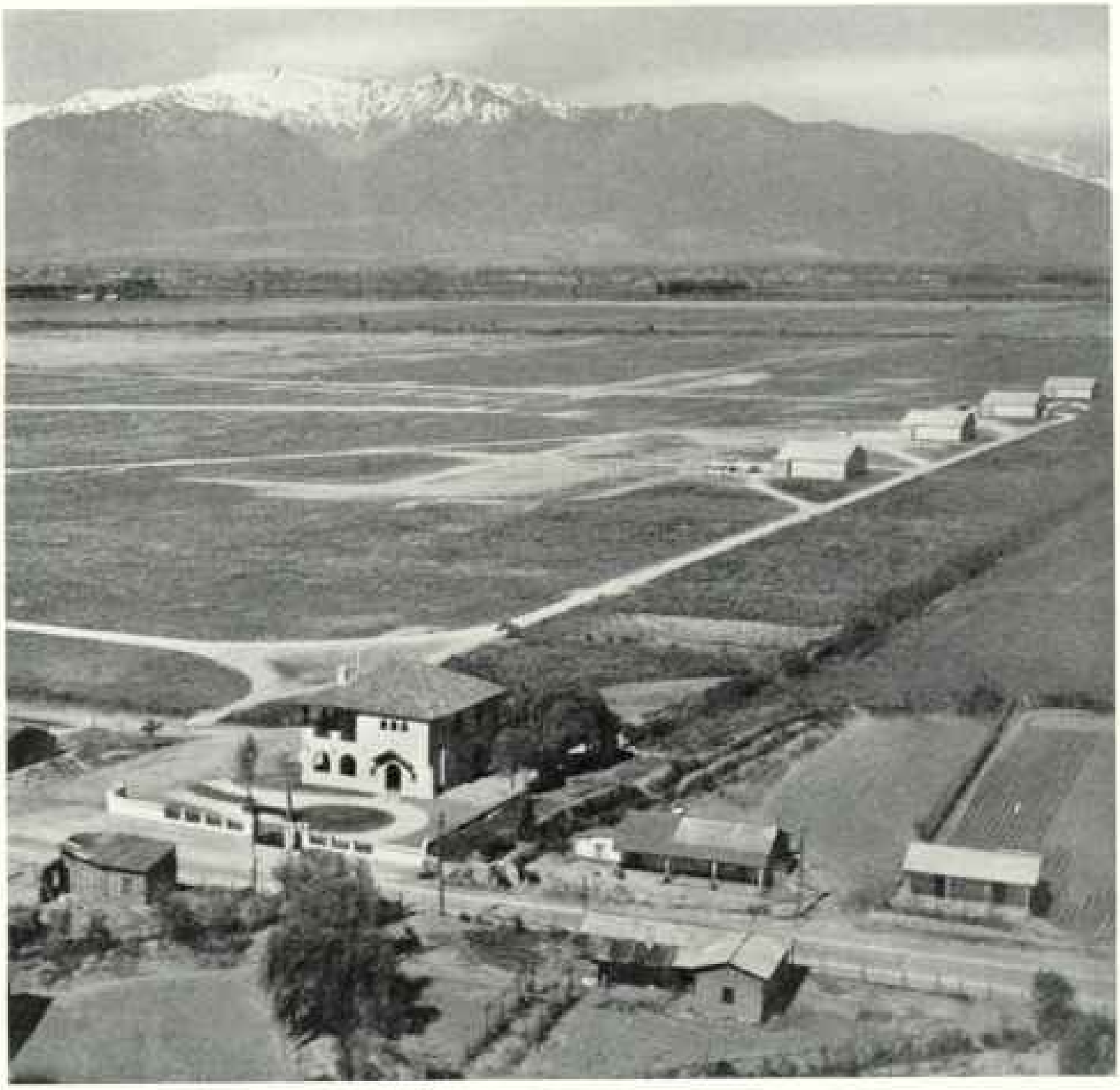
Zigzag trails, a winding automobile road, and a cable railway lead to the summit of this hill, which towers 900 feet above the capital city of Chile and affords a magnificent vantage point for the sight-seer (see, also, illustration, page 611). A roof garden and a charming park contribute to the comfort of visitors.

Finally, with all arrangements made, Robinson, operations officer of the mail line, and I take off early on a clear spring morning.

We climb rapidly and set a course that takes us past Aconcagua on the north. Still climbing, we circle the mountain to the right and continue until we pass around it twice. We close in on the northeast side of the peak, when we get caught in a descending current, and to our chagrin see the mountain shoot skyward as we drop off to the east. There is no use in trying to climb against that current. The only thing to do is to get out of it, and "Robby" has to run with the gale for 10 miles before the rate-of-climb meter shows that we are gaining altitude.

It is a long, slow pull back against the wind. We have been nearly an hour making that 10 miles back to Aconcagua, climbing all the time. We are approaching it along the south face, with the idea of getting close to it on the west side, where the wind currents will probably be upward.

This is our third circuit of the tremendous mass of rock and ice that, so close are we, seems to fill completely one side of the heavens. The air has grown even colder, and I am aware that both hands are getting numb, and that I have lost feeling in one toe. I beat my hands and wiggle



PLANES THAT FLY THE "HUMP" COME TO REST AT LOS CERRILLOS

This landing field, on the outskirts of Santiago, is used by the Pan American-Grace Airways as the western terminus of the Buenos Aires line and as the southern station of the air route through Chile. The Andes rise abruptly from the level valley only a few miles from the hangars.

my toes frantically, for it is no light matter to be frostbitten.

THE OXYGEN TUBE'S MAGIC EFFECT

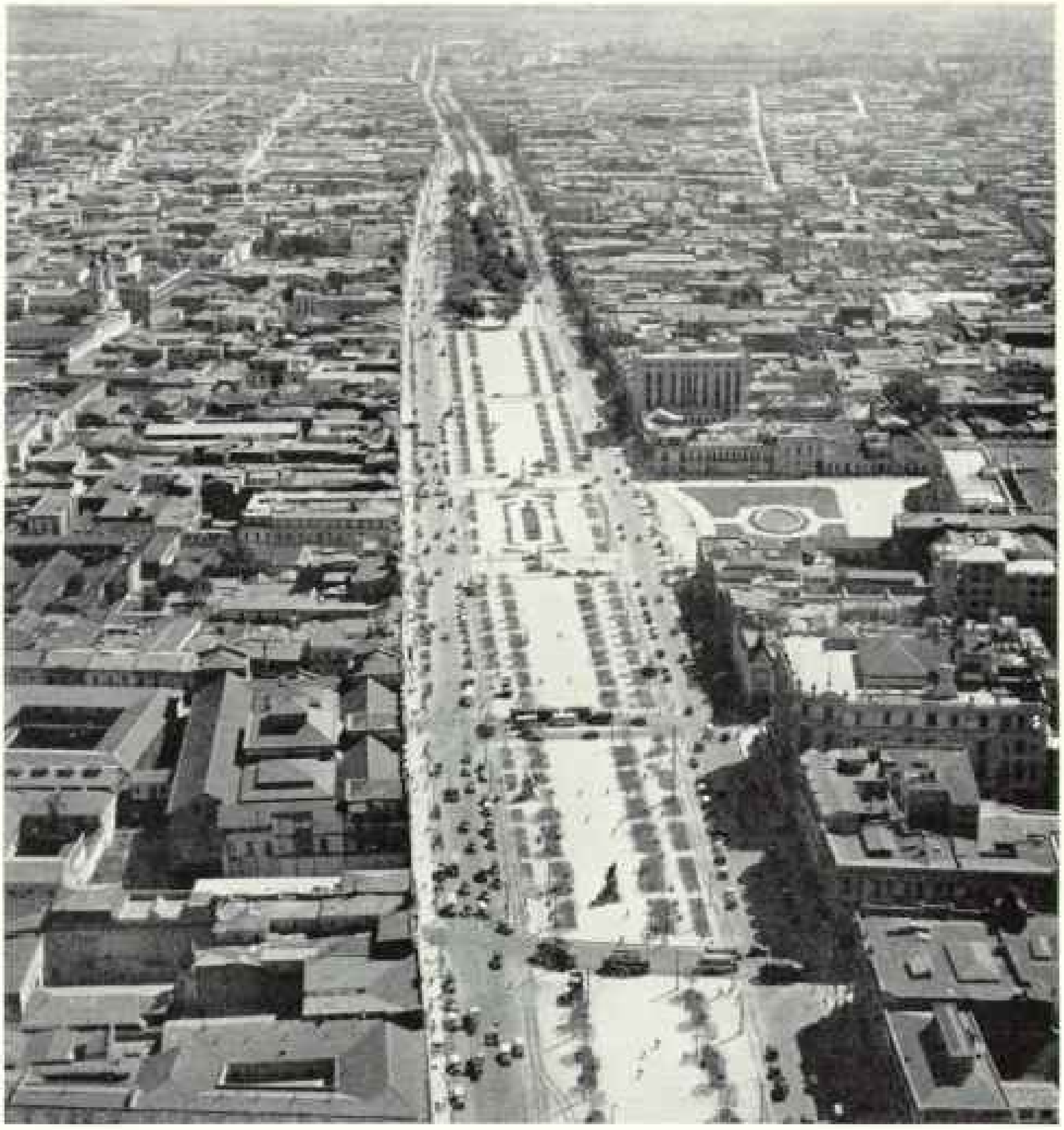
I reach for the oxygen tube and turn the valve wide open. I suck the precious gas in deep breaths and its effect is magical; I tingle throughout my whole body, and in less than a minute I can feel warmth coming back to my chilled extremities.

The sky brightens and I can now detect little irregularities in the exhaust of the motor of which I had previously been entirely unaware. But I shut the oxygen off again, to save it as long as possible, for my tank is very small, and it is sure to run out. And then . . .

I have often, on other flights, purposely disconnected the oxygen supply for a minute to see what happens.

The symptoms caused by lack of oxygen are unmistakable. First, the hearing goes, and then black specks begin to float before the eyes and the sky appears dark and gloomy. At the same time the knees weaken, and a person, if standing, will collapse to the floor of the plane. If sitting, he will fall over in a faint. But if, just before passing out, he can force himself to breathe very deeply and get his lungs very full, he will gradually come out of his coma, even with a limited oxygen supply.

If he has simply dropped the tube or pulled a connection, the effect of an ample



SANTIAGO'S ALAMEDA MERITS ITS NAME, AVENUE OF DELIGHT

This boulevard, of an average width of 325 feet, traverses the city in practically a straight line for more than three miles. On both sides run broad driveways for motor cars, and inside these the tracks of the street railway. The middle portion, a walk, with a succession of little parks, flower beds, and plants, and, at short intervals, monuments commemorating the great men of the country, has been aptly called the Chilean hall of fame.

supply of fresh oxygen is simply marvelous. The motor, which has been silent, though running, suddenly bursts into a full-throated roar; the sky runs a beautiful dark blue; one can actually feel strength flowing back into legs and arms.

NO TIME OR PLACE FOR EXPERIMENTING

This is no place to experiment!

We are now going north and are on the west side. The wind is drifting us closer and closer, and Robinson keeps a wary eye, ready to dive away should the unexpected happen. He has kept a respectful distance on the lee side of the peak, for there are the powerful down-drafts. But we expect a lift on the windward side, and the closer we get, with safety, the more will the wind assist us.

We dare not cross directly over the peak, because we are at the stalling point. To climb at this altitude, the angle is so great

that our air speed is back to 60 miles an hour; therefore, we have no margin of control. If a powerful air current hits us, we can only dive to get control, and if the dive fetches us too close to the gigantic cliffs, where even more terrific currents will be found, we may meet disaster. Besides, if we go directly over we cannot get a picture, for I can shoot only at an oblique angle through a window.

So we get no nearer than 1,000 feet. If we were closer, the camera would be out of focus, for aërial cameras are focused for a distance and cannot be used for close-ups without special adjustment.

LOOKING DOWN ON THE TOP OF THE WESTERN HEMISPHERE!

We are level with Aconcagua; the summit is exactly even with the most distant horizon. The altimeter swings just above 23,000 and Aconcagua is reported to be 23,098 feet. A close check; it was not to be expected that it would be so close. Usually temperature errors or other errors make the result markedly different. Perhaps the errors have compensated.

Now we are getting up. We rise as if in an elevator. We are holding elevation. The peak sinks. We shout, hoarsely, with the prospect of success. Now we are above. We can see the valleys and mountains over the highest summit of Aconcagua. Up, up, and now we start to drift past the summit (see page 618).

The altimeter shows 23,600 feet. We are more than 500 feet above Aconcagua. Marvelous for a commercial airplane, especially with all the weight of cameras we have, more especially because we have two windows open. These open windows hold us back. With them closed we undoubtedly would make another 1,000 feet.

I shoot negatives as fast as I can. The rewinding of the crank must be done with care, slowly and steadily. At this altitude, because of the rarity of the atmosphere, too much speed will result in static electricity markings on the film. So I must pull the camera in each time, lower it, wind it, and raise it to the window again. The work of handling the heavy camera at this altitude seems tremendous. It seems to have increased in weight threefold.

I reach for the oxygen again, but nothing comes from the tube. My container, of small capacity, is empty. Robinson's tank is bigger and he is not suffering as yet.

My head begins to ache; I am shaken by waves of nausea; my breath comes in painful gasps; all the symptoms of seasickness and others besides. Where is the sea? Saw it a while ago, a dull leaden streak, way off to the west, far beyond the foothills of the Andes. Can't see it now; can't see much of anything.

What is that black mass at one side? Oh, yes, the mountain. I shout to Robinson that the film is used up. My voice is strained and distorted and, in an effort to make it carry in the thin air, I raise it to a blood-curdling shriek that startles me.

Robby has had enough, too. Four hours at high altitude is plenty, and he is only too glad to head the machine toward Santiago.

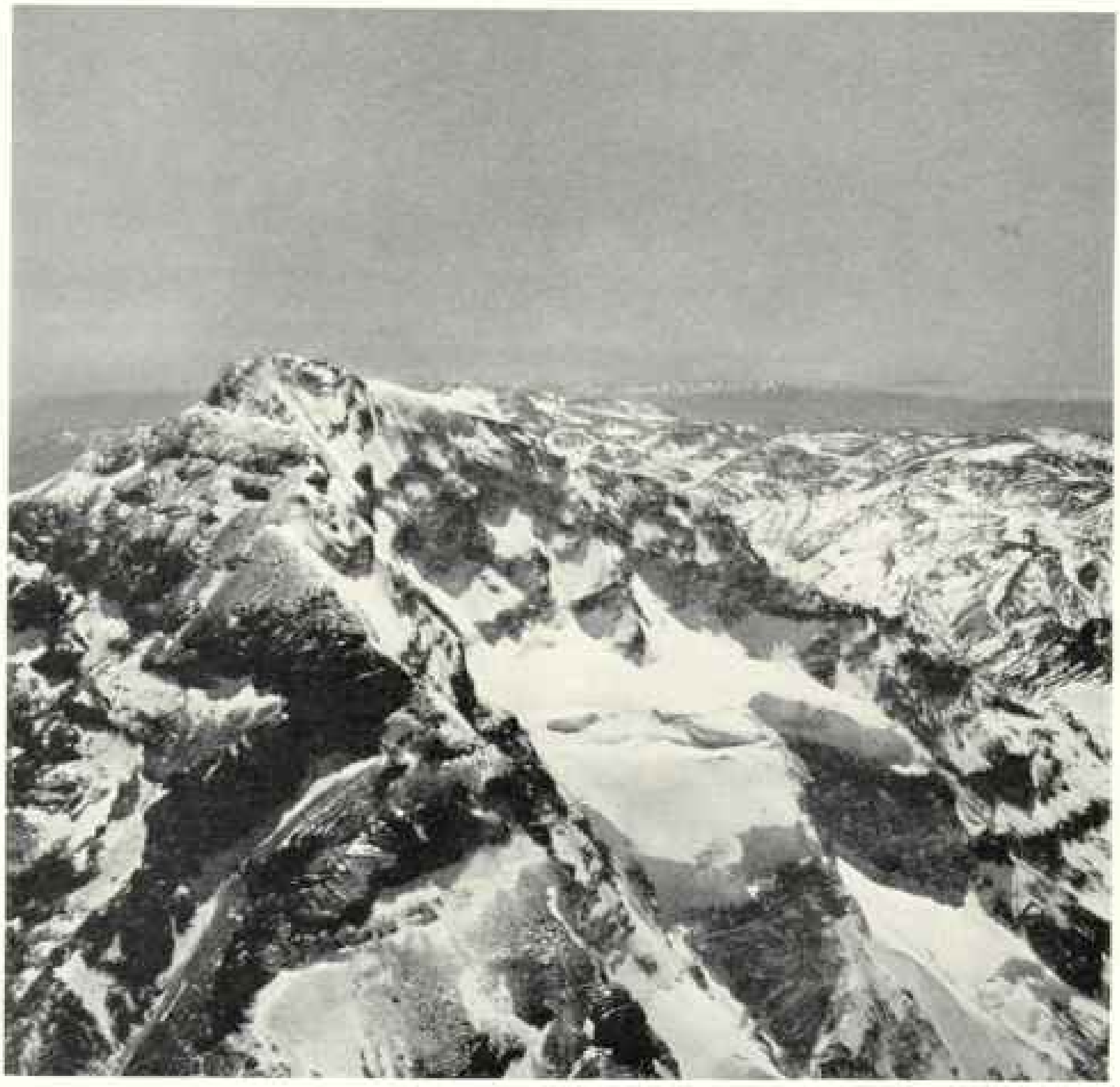
How good the air feels at 19,000 feet, the elevation at which passengers cross! Seems like sea level by comparison with the air a mile above us. The snow-clad slopes end, the browns of the foothills appear. We are back at Los Cerrillos.

AN AVIATOR MUST ACT FASTER THAN HE THINKS

A few days later I again turned to the mail plane, with the idea of getting close views of the frowning cliffs of Los Leones and of Los Penitentes, on one of the regular runs across the Andes. The Chilean and Argentine governments obligingly granted the necessary permission to start from Santiago, land in Mendoza, and return to Santiago with an aërial camera. These permissions took a few days to get, and when they had been obtained the weather had become very bad. However, I decided to go to Mendoza on the chance that it might clear the next day.

We left at 7:30 in the morning, from Los Cerrillos Field, at Santiago (see page 613). Cliff Travis and I were alone; there were no company men that needed to go on that particular day. Long gray clouds formed layer after layer parallel to the Andes. Through them, like islands, projected the summits of the foothills.

Travis wormed his way through the spaces between layers, always working upward. The altimeter showed 6,000 feet as we neared Los Andes. At 8,000 we entered Uspallata Pass. At 10,000 we were halfway to the Cumbre, and still climbing.



BEETLING CLIFFS MAKE ACONCAGUA UNSCALABLE FROM THE SOUTH

Tremendous snow fields, their abrupt faces hundreds of feet high, overhang sheer walls of rock. In the background the craggy ridges give way to bare foothills which slope to the level pampas.

It was pretty thick weather, but I had been over with both Thompson and Travis before when it was nearly as bad.

Travis and I had carried on a conversation for the first half hour, but now he fell silent. Except for an occasional shrug of his shoulders, as if taking a very deep breath, he showed no sign of strain. Yet, from the intentness with which he peered quickly from side to side and ahead, I felt that he was about at the point where he would either push through or turn back. Suddenly he turned his head and remarked quietly, "I think we are going to make it."

Now the altimeter showed 11,000 feet. The plane, of course, had the power to climb much higher in the time that had elapsed, but the thick clouds overhead prevented. The only channel was a layer of air, heavily mist-laden, adjacent to the canyon walls.

As we passed high over El Juncal and approached the pit west of the Cumbre, it seemed to get unusually dense before us, and thin wisps of vapor began to appear under us. Travis hugged the wall to our right, with right wing slightly lifted, apparently ready to turn in a flash if the mists closed ahead of him.

Then happened something that made me ready to believe any story of air currents that I had ever heard. We were flying at

ONLY INTREFID CLIMBERS HAVE STOOD ON THE PINNACLE OF THE NEW WORLD

This northwest face of Aconcagua has been conquered. Mattias Zurbriggen, of the Fitzgerald Expedition, was the first to reach the top, completing the ascent on January 14, 1897. Since that time a number of others have performed the feat. Dr. Paul Güssfeldt fought his way up the mountain to an altitude of 21,000 feet in 1883, but through misfortune failed to gain the summit (see, also, illustration, page 623).

100 miles an hour, with wings almost level. In less than a tenth part of a second, almost as fast as the click of a camera shutter, our wings were vertical. The movement was astonishing beyond words. In another fifth of a second we were plunging almost straight down. Travis had instantly kicked bottom rudder and dived the plane into control, and then out into the middle of the canyon.

To be an aviator—not merely a pilot—you must think fast and act even faster, if you are to continue to live! Your reactions must be instinctive at times, for the action required is faster than the clearest mind can transmit to nerves and muscles. Yes, I know this was a very simple maneuver in clear air; but try it in a somber, mist-filled canyon, with jagged rocks rushing up at you, and with the knowledge that a single false move means instant destruction!

CLIMBING, TWISTING, AND TURNING OVER CANYON WALLS

Now Travis climbs again, levels off a bit, and again hugs the wall to our right. The canyon opens a little and he executes a climbing turn with motor full open. For a moment, as we circle, I am bewildered;

FOUR HUNDRED FEET ABOVE THE TOP OF THE WESTERN HEMISPHERE

Looking down obliquely upon the summit of Aconcagua. At this elevation the author found his oxygen supply exhausted and had great difficulty in operating his camera (see text, page 615).

I have no idea which way is east or west. Suddenly I see that we are headed for the statue on the Cumbre; we can actually see over the ridge (see page 609).

From the position of the throttle lever, the angle of the plane, and the air speed, I know that we are climbing strongly, but the rate-of-climb meter on the right shows a rapid descent. Suddenly the statue disappears and a wall seems to rise in front of us. Travis spins the plane to the left and starts another climbing turn. He turns his head slightly with the remark, "Struck a down-current that time."

We have completed a half circle and are heading back to the ridge. Travis suddenly levels off and points with his free hand to the rate-of-climb meter. The hand has swung way over to the other side. We go up as in an elevator, and in a moment more Travis has to nose down to prevent getting enveloped by the clouds overhead. He swoops down on the ridge, the statue flashes by, and we are in Argentina!

From now on it is a slow, gradual descent to Mendoza, and before we get to the flying field we are out of the clouds and in dazzling sunshine.

"Trip was a bit thick," I remarked. Travis didn't bother to reply. He was scratching away at a report pad and grumbling something about hiring a small boy with a flock of rubber stamps. Finished, he jumped into another plane, shouted,

"See you to-morrow," and was off for Buenos Aires, 600 miles away. He had no way of knowing, nor had I, that our return trip was to be the "hair-raisingest" of all—to the extent that the railroad people in the canyon were to telephone frantically to the Santiago papers that the mail plane was about to crash.

I looked back at the mountains and wondered about some of the accounts that I had pried out of the boys of this run. How Travis, with throttle cut and diving with an air speed of 140 miles an hour, had observed a rate of climb of 800 feet per minute. How Colliver, with throttle part on and diving at 180 miles an hour, had watched his plane go tail first up toward the clouds overhead. These terrific drafts last only 10 or 15 seconds, fortunately. One begins to see why Travis hit his wheels on the bump when he had only 25 feet of clearance (see text, page 605).

FLYING "BLIND" FAST MOUNTAIN PEAKS

And it is not only at close quarters that queer things happen in the Andes. Robinson flew back in October from Buenos Aires and decided to go over the clouds from Mendoza to Santiago. He was able to get to 24,000 feet, but this proved to be not quite enough, for less than halfway across he found the clouds still higher.

As he was above everything, he pushed on. Gradually he started to lose altitude. Ice built up on the leading edge of his wings. Next his engine slowed down a bit, and in a few minutes he was down to less than 20,000 feet, "in the soup," as the pilots call it. He could do nothing but plug on, flying "blind."

Completely surrounded by white vapor, he fancied from time to time that he could see dark shapes rush by beneath him. He thought they may have been mountain tops. Very likely they were.

Now, the peculiar part is that it was very cold at that altitude: the strut thermometer showed 35 degrees below zero, centigrade. Ice is supposed to form on wings only at temperatures within a few degrees of the freezing point. A possible explanation is that the high clouds contained quantities of fine snow crystals, which built up by impact on the leading edges. It was found on landing that ice still clinging to the metal had reduced the air inlet to the carburetor, causing the loss in engine power. The building up of ice on the wings has never been satisfactorily accounted for.

There is one ambition, common to all the pilots of the mail line, that has never been satisfied, and that is a trip across the Andes, on a clear night, by moonlight. What could be more glorious! If in the daytime the view is marvelous beyond description, under the dazzling rays of the sun, a flight across these mighty peaks and snow-clad mountain valleys by the light of a great full moon would be something never to be forgotten.

Though with modern motors and planes such a flight would be quite safe to undertake in clear weather, there is no justification for a commercial company to cross the Andes at night. If the opportunity ever occurs, there will be plenty of volunteers.

I watched the French plane come in at Mendoza and saw the pilot, enveloped with heavy clothes and with face covered by leather mask, step stiffly from his open cockpit. He seemed cold and tired. He stripped off his headgear and smiled faintly at my questions. "The weather over the mountains, yes, it is not the best." Hang it; will I ever find a pilot who will frankly admit that the weather is bad?

A GROUND VIEW OF A GREAT AËRIAL ADVENTURE

It is a good thing that we are not able to look into the future. Could I have seen what the papers of Santiago were to print the next evening, I would have slept very poorly. Let us look at the account of the Spanish correspondent, who wrote the following lurid articles following hasty telephone messages from the railroad operator at Rio Blanco:

AN AIRPLANE THAT WAS COMING FROM THE ARGENTINE DID NOT ARRIVE YESTERDAY AT SANTIAGO

Los Andes.—We are informed by our correspondent in Rio Blanco that at 5 o'clock to-day there appeared, flying over the canyon of Rio Blanco at an altitude of no greater than 100 meters, a plane painted with the colors red and black and bearing Number 9723, which appears to belong to the Panagra Line, and was in flight from Argentina to this country.

Right from the beginning it could be noticed that the plane was flying with great difficulty, struggling against the strong storm which at that time was reigning in the Cordillera.

SOMETIMES ACONCAGUA ALONE OF ANDEAN PEAKS PIERCES THE CLOUDS

Though vapors blown from the Pacific mantle all the surrounding mountains, the proud giant holds its majestic head above them.

As it passed the railway station the plane made various sharp-angled turns to avoid collision against the mountain sides, which were completely covered with fog to such an extent that the pilot had no visibility whatsoever.

After having made several turns toward the Cordillera, the plane again returned, passing over Rio Blanco at scarcely 10 meters above the town. Possibly the weight of the rain on its wings impeded it from gaining any higher altitude.

A group of railroad employees, police, and some neighbors of this settlement, seeing that the pilot was in such a difficult situation, began to signal him with scarfs and sheets in an attempt to indicate to him a small open place where he might have attempted a landing.

It appears that the pilot could not effect such a landing and waited until there was a little more visibility, thus avoiding a catastrophe that was sure to happen had he tried to land.

At 6 o'clock he was seen again flying toward the south on a route that would take him to Santiago. Five minutes later the storm increased in a very extraordinary form.—MINING, *Correspondent.*

Information secured in the airdrome of Los Cerrillos has caused us to know that the arrival of this plane from Mendoza was announced for 4 o'clock, and up to the latest hours of that night it had not arrived; neither was there any news of where it could be found.

LATER.—Undoubtedly our readers will be interested in the dispatch from our correspondent in Los Andes, who informed us that in the late hours of Friday evening a red plane was flying over Rio Blanco, struggling desperately against a snow and wind storm which was reigning in the region of the Cordillera. More recent information established the fact that the unknown pilot was successful in his struggle against death, which was ready to overtake him around El Salto del Soldado, because about 6 o'clock the red plane passed over Los Andes in the direction of the airport of Los Cerrillos.

WITHOUT NEWS

We, on our part, made that day various investigations to confirm the arrival of this machine in Santiago, but up to the last hours no airdrome of the city had any knowledge of the landing of this audacious pilot, who was defying death by crossing the tempestuous skies in his red-winged eagle.

Because of the lack of more complete details concerning this flight, which the atmospheric conditions made fantastic, we had to limit ourselves to the information furnished us by our correspondent concerning Plane 9723. This number was left engraved on the retinas of the eyes of the inhabitants of Rio Blanco, who were unable to help the poor pilot in his formidable duel with the

THE AUTHOR IN THE OPEN COCKPIT AFTER A SUBZERO FLIGHT

With the plane flying over vast ice fields at altitudes exceeding 20,000 feet, the man who handles the camera endures extraordinary hardships (see text, page 615).

stormy Cordillera, which seemed to have desired to close the route as a punishment for the audacity of the pilot.

But impossible. In vain the hurricane tried to crush the wings of this man-bird and in vain the snowy peaks stuck out their tentacles to enfold him in a mortal and icy arm. The pilot won. His brave and optimistic heart, closed to the clouds and to the storm, was full of that sun which is born in the confidence of his iron-gloved hands, guiding the controls.

The plane was flying, tossed by the wind, between dense clouds and horribly rocky peaks. In the thunder of the storm the voice of death was insistently calling to the pilot from the north, from the south, from the ground, and from the skies, points that in this moment meant the same thing—oblivion!

But the valiant pilot was not listening to the voice that was filling the skies with a funeral chant above the roar of the storm. Everything was in his expert hands, which with a practiced maneuver of the control stick drove the plane out of danger toward hope and life.

The red plane, which alarmed with its fantastic flight the simple mountaineers of Rio Blanco, left Mendoza piloted by the aviator Travis. This was the man who in a magnificent flight crossed the dangerous range of the Andes in the face of a tempestuous storm. He struggled fully two hours with death, but about 7 o'clock the eagle with the red wings, under torrents of rain which at that time were falling over the city, landed in the field at Los Cerrillos.

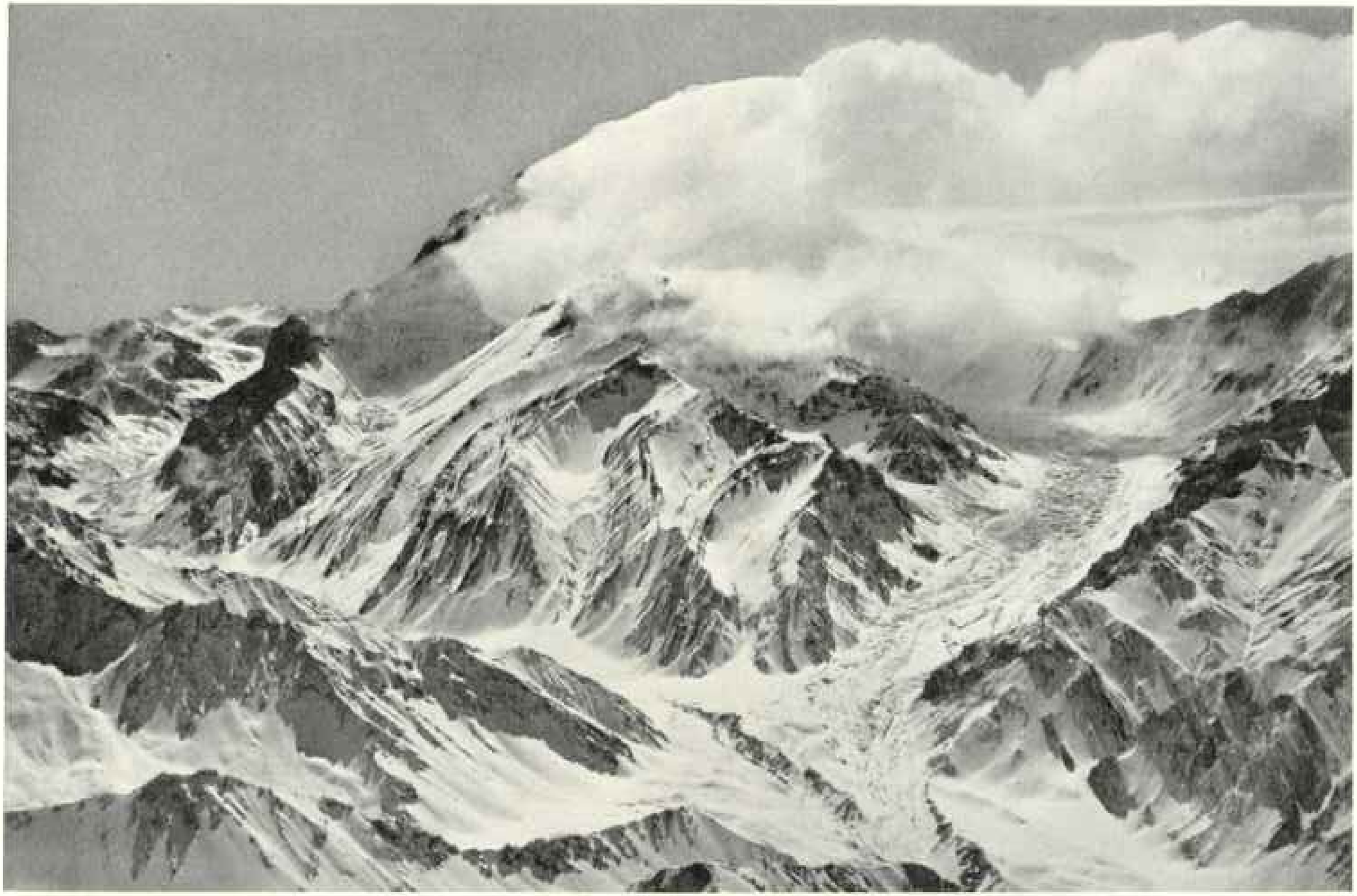
AS IT HAPPENED IN THE AIR

Whew! Scares me just to read about it. If that correspondent got so excited while he was still on the ground, what a story he could have written if he had only been in the plane with us! Now, let's see how the trip looked from our viewpoint.

To-morrow comes. I am out at the flying field at Mendoza before 2 o'clock in the afternoon. The mechanic enlists the services of half a dozen Argentine soldiers, and we push the "hump" monoplane out of the hangar.

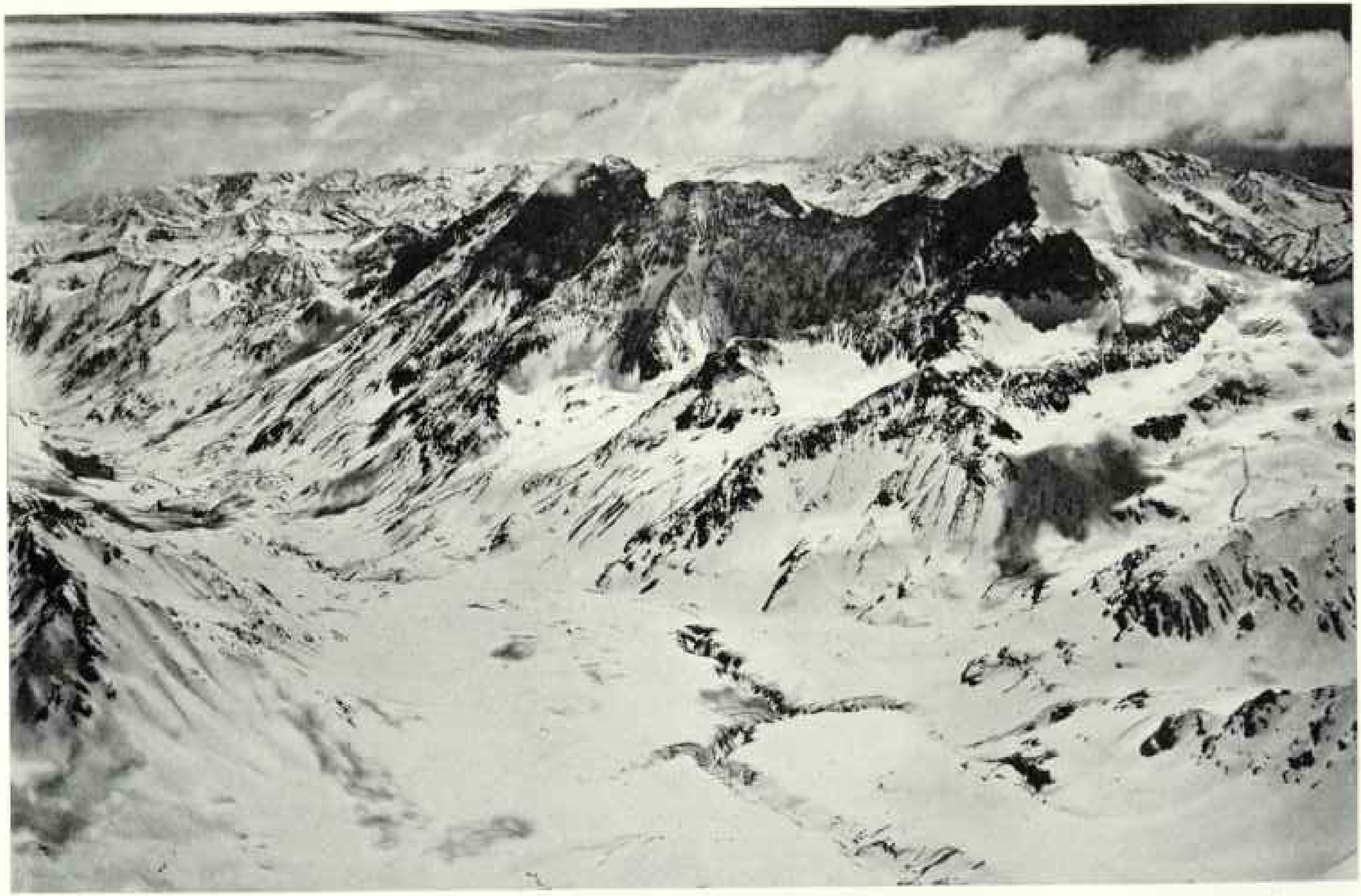
The mechanic has started warming up the motor, when, without more than a half-minute of warning, the moderately brisk wind from the mountains has increased to a gale. I jump for a strut as one wheel rises several inches off the ground.

The mechanic hurriedly cuts the switches and scrambles to help. We call frantically to the soldiers, and it needs everyone to hold the plane. With great difficulty we



FROM ITS ICY SUMMIT ACONCAGUA WAVES A FIVE-MILE BANNER OF FREEZING CLOUD (SEE TEXT, PAGE 596)

The highest point in the Western Hemisphere, seen from an elevation of 19,000 feet above the canyon of the Rio de las Cuevas. To the right and to the extreme left are branches of the Y-shaped Horcones Glacier, which winds toward a great open valley among rocks and screes, precipices, snow slopes, and waterfalls.



UP THE AWESOME VALLE PENITENTES DR. PAUL GÜSSFELDT STRUGGLED IN HIS FIRST ATTEMPT ON ACONCAGUA, IN 1883

From the floor of the defile the palisade of rock rises almost sheer to a height of more than 3,000 feet. The explorer wandered about for days in what appeared to be a cul-de-sac, eight times passing the huddled skeleton of some adventurer who had come into the frozen wilderness in search of fabled hidden treasure. Fourteen years later a German expedition from Santiago came upon the same skeleton (see, also, illustration, page 617).

THE ROUNDED SUMMIT OF TUPUNGATO AS SEEN FROM AN AIRPLANE FLYING AT 19,500 FEET

First climbed April 12, 1897, by Stuart Vines and Mattias Zurbriggen, of the Fitzgerald Expedition, Tupungato, while not as high as Aconcagua, is almost as difficult to ascend, because of the frequency of storms which sweep over its broad slopes. The upper end of the main Tupungato Valley, on the southeastern side of the mountain, terminates not in a glacier, but in a lake of brown water, which perhaps gave rise to stories of a "lake of gold" in the Andes.

STORMS AT SUBZERO TEMPERATURES SWEEP ACROSS THE HIGH ESCARPMENTS AND THE DEEP GORGES OF THE ANDES

The valleys are filled from the deep snowfalls of winter, and the winds cause drifts of great depth. Over the rugged, sawtoothed ridges a prevailing west wind drives fine, powdered snow high into the air and sweeps down again in tremendous gusts into the valleys on the east. The weather in high mountains is always terribly uncertain, not only to climbers and explorers, but to the travelers who seek the lower passes. Many parties have been overwhelmed by sudden blizzards in crossing from Argentina to Chile.

SAN LUIS GREETS NATIONAL GEOGRAPHIC FLYERS

The arrival of the huge land plane used in the final leg of a 12,000-mile aërial photographic survey from Washington to Santiago de Chile (see "Skypaths Through Latin America," in the NATIONAL GEOGRAPHIC MAGAZINE for January, 1931) caused great excitement among the inhabitants of an Argentine pampa town.

Photographs by Jacob Gayer

A "FLIGHT" AT LOWER ALTITUDES

Scores of trips over the towering Andes have made this airplane mechanic somewhat blasé, but his precarious perch on the narrow back of a countryman's donkey provides a new thrill in life.

get it back in the hangar again. Clouds of dust rush by the structure; overhead the wind sock sticks straight out; the field is a smother of flying sand.

We rush for steel pins and ropes, because there is room for only one plane in the hangar, and the incoming plane must be staked down when it lands.

"TAKING OFF" IN A GALE

Travis is a bit late; the gale has held him back a little. He lands cautiously and keeps headed into the wind until men can reach him and help him turn. His plane is staked down, and the "hump" plane, surrounded by men, is shoved out again and its motor started.

I grab Travis by the arm, point to the snow blowing off the summits of the Andes, and remind him that probably all the clouds along the Pacific coast are being forced by the wind against the far side of the mountains. Cliff grins a bit, shrugs his shoulders, and reaches for a cigarette. My arguments die to a mutter and I start to load my apparatus aboard.

After all, this is the mail plane, not the passenger plane. However, there are passengers, but these are men connected with the company. One of them, Shannon, is an excellent pilot and has been flying on the eastern coast for months. It is his first view of the Andes. The other man, Randall, is an engineer, and air travel is new to him. He is going to get an eyeful to-day.

In a few minutes we are all inside the cabin and are taxiing down wind in the thickest cloud of dust that I have ever seen surround an airplane. The propeller throws the dust back to the tail and the gale spreads it out and hurls it forward again.

One by one the clinging soldiers and mechanics drop off; they are fairly smothered. So, when we get far enough down the field, there is no one to help turn us round. We will unquestionably turn over unless some one hangs on the windward struts. I am nearest to the door and I open it cautiously to climb out. I have it open only an inch when the gale whips it out of my grasp. Bang it goes, cracking all four glasses of the window.

Shannon jumps out behind me and we close the door carefully. But Randall feels he ought to help and he opens the door again. Bang! and this time it comes off its hinges. I am just near enough to grab it before it bounces into the rotating propeller.

Now we are stuck! The men come running up, still panting and gasping, and we get the plane turned round and back to the hangar. Here we take a door from another plane and hastily screw it in place. Thirty minutes are lost. Again we get down the field, with everyone smothered in dust as before; but this time we take off.

Only a hundred feet along the ground and we are in the air. Travis climbs steadily. Up we go, higher and higher. Mendoza, however, remains under us. The gale is so strong that at climbing angle we are making no headway whatever against it.

After some 45 minutes the altimeter shows 17,000 feet, and Travis levels off. Now we slowly leave Mendoza behind and approach the Andes. Another 45 minutes and we have almost reached the Cumbre. We have had to reduce elevation to less than 14,000 feet, because of the fine snow that is blowing off the surrounding summits.

A WILD PLUNGE OVER THE TOP, WITH DISASTER BECKONING BELOW

As we sight the statue we still have a comfortable margin of height, apparently, to clear it. After all, this is not so bad as it looked from Mendoza.

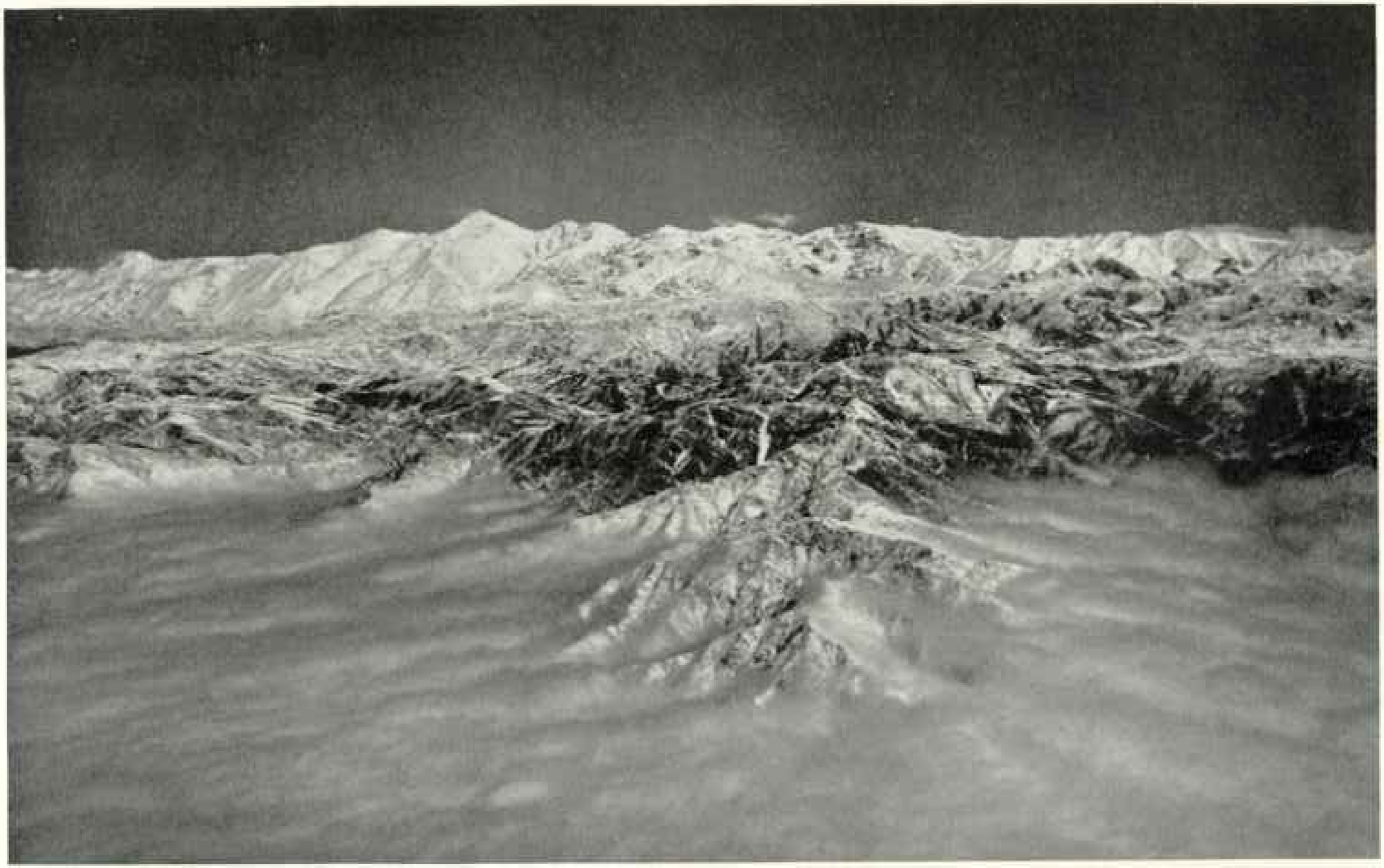
Randall and Shannon are both nodding—a characteristic effect of altitude on people not used to it. I pound them on the back and tell them to hold on, for we are approaching the bowl where old Boreas himself wields a mighty stirring rod.

The boys get a good grip on their seats and I grasp some of the fuselage bracing. I am not particularly alarmed now, for I think the conditions are not half bad; in fact, I look forward to the expected plunge with pleasure.

Years ago, in Idaho, I rode over a 40-foot dam on the Payette River in a rowboat, and I can still recall the sensation as I saw the bow of the boat stick out over the brink into clear air, and how, as the bow dropped, I sailed into the air, clinging frantically to the stern. The neighbors always claimed that they found finger-prints in the solid wood after that trip. I now wonder if it is possible to leave finger-prints on metal tubing. . . .

UP THE SOUTH WALL OF THE CANYON OF THE RÍO DE LAS CUEVAS MARCH LOS PENITENTES

Viewed from the lower levels, the smaller outjutting rocks in the foreground suggest a procession of monks moving toward the portals of a cathedral.

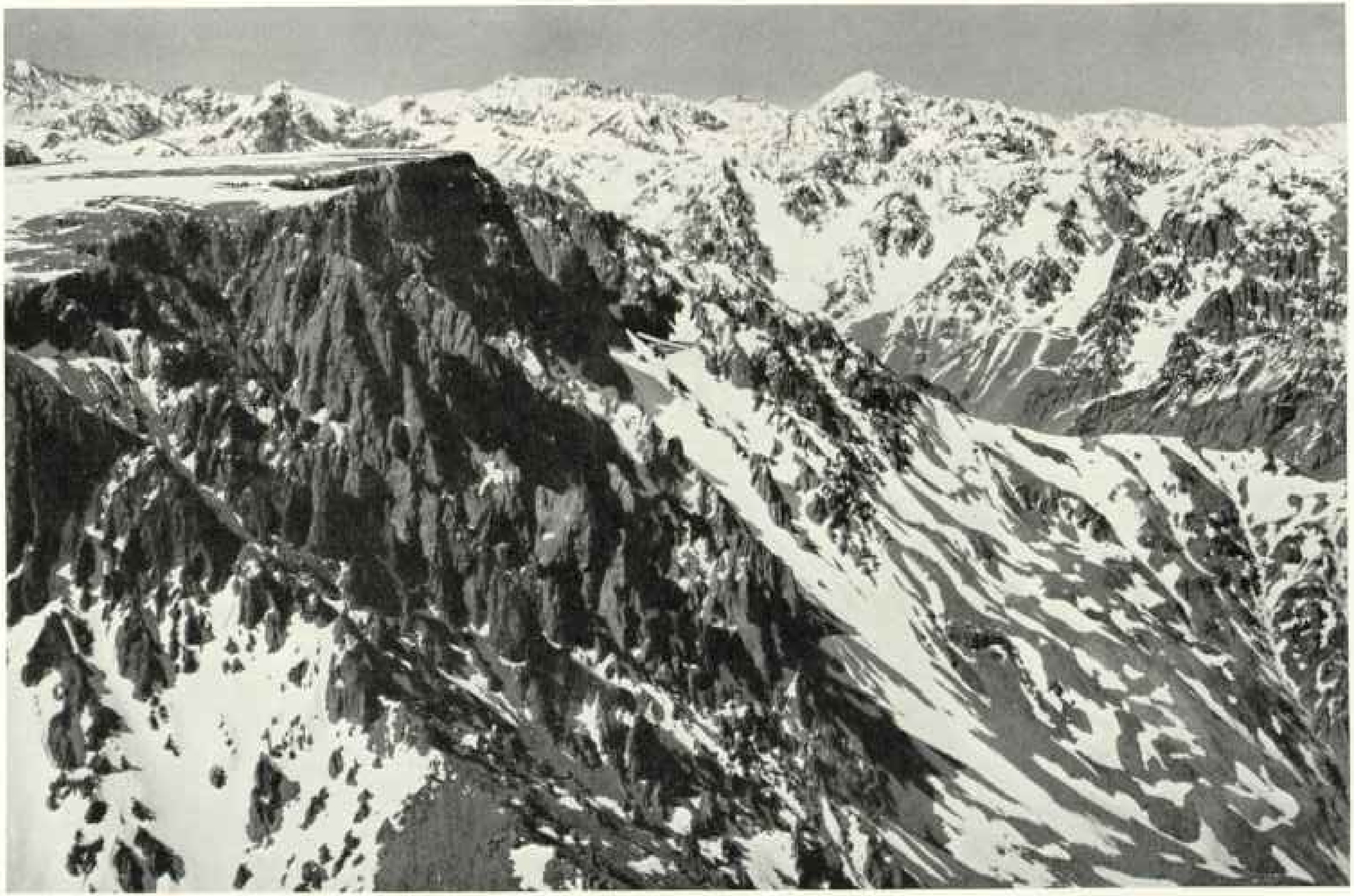


CLEAR SUNLIGHT GLEAMS ON SNOWY PEAKS THAT PIERCE THE CLOUDS

As the aviator flies over the canyon of Rio Mendoza, he sees the dazzling panorama of high Andes stretching away to the southeast. A sea of vapor several thousand feet above the lower levels hides the country immediately beneath the plane.

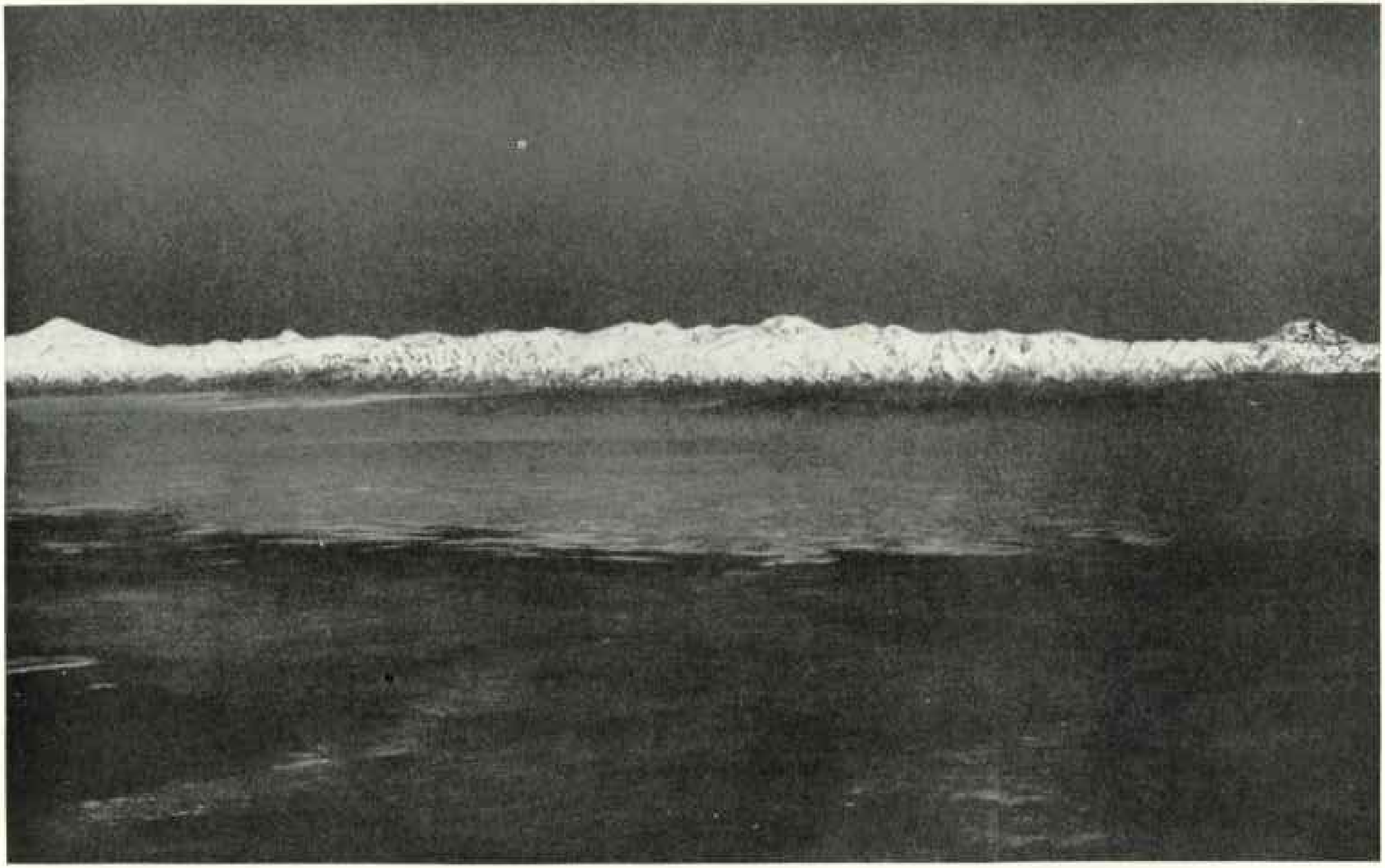
MENDOZA, THE WINE CENTER OF ARGENTINA, LIES ON AN ARID PLATEAU 2,500 FEET ABOVE SEA LEVEL

The city, which is connected by rail with Santiago and Buenos Aires, has increased enormously in importance since the establishment of Trans-andean air lines. Its flying field provides the take-off for the westward flight over the "hump." Water for irrigating the numerous vineyards in this vicinity is brought down from the snow-clad Andes, which attain their greatest height near here.



THIS 2½-MILE-HIGH PLATEAU ON THE RÍO MENDOZA AFFORDS A POSSIBLE LANDING FIELD

However, because of the thinness of the air at such altitude, the pilot of the mail plane, discernible near the center of the picture, would be forced in case of emergency to climb hundreds of feet and come down upon his eagle's perch at considerable speed to avoid a crash. Not far from here the Andes start their slope to the foothills of the east side.



THE ANDES RANGE, WITH ACONCAGUA, AT THE EXTREME RIGHT, 142 MILES DISTANT FROM THE CAMERA

At the left rises Tupungato (see, also, page 624) and at the right center Cerro de Plata (see page 603). The horizon line covered in this photograph corresponds to the three inches of horizon between Aconcagua and Tupungato in the picture on page 634, which was made at a distance of 287 miles. Note especially the snow-clad foothills here as compared with the haze-obscured mountain bases on page 634. Less than two hours elapsed between the taking of these two pictures.

Travis gives a shout. "Hold everything, boys, . . . here we go!" We are right over the ridge. Some mighty force has seized the plane and hurled it downward. It doesn't drop; it is flung. Suitcases, mail sacks, rolls of newspapers—everything back of me comes up to hit the roof of the cabin, and much of it drops in a shower on my shoulders.

Travis has pulled the throttle way shut and has headed the plane almost straight down into the basin west of the Cumbre.

For the first time, I get a good look ahead, and to my horror the pit is filled with clouds. It is impossible to circle in that pit and come back again. There is just one narrow channel of clear air, and that is next to the steep slope that we are diving down. Down, down we drop, more than 6,000 feet, to the valley floor.

Do the clouds reach the bottom of the canyon? No, there is a ceiling of 100 feet. On each side are the black canyon walls, spotted with patches of snow. We know that these walls extend for more than two miles in height, and that the clouds are solid and undoubtedly extend even higher.

There is only one thing to do now, and that is to fly down the canyon and hope that the air is open at the bottom all the way.

Randall covered his face with his hands after our first plunge, but now he has recovered himself and sits quiet and composed. Shannon shows no alarm; he doesn't realize how long this canyon is. Travis shows absolutely no sign of nervousness. So far as I can see, I am the only one in the plane who has a hunch that the going is sure to be worse before it gets better.

There is one reassuring thing—the engine purrs along as sweetly as ever.

The minutes slowly pass and conditions are still the same. The summit of Uspallata Pass is some 14 miles behind us; El Juncal is 8 miles behind. On our left is the opening where the canyon of the Rio Blanco intersects the canyon that we are in. We fly on past, and now we observe that ahead of us the clouds have come clear to the floor of the canyon, obliterating even the railroad track from view.

We are approaching the wall of fog very fast. Travis edges over to the left and his wing gets perilously near to the canyon wall. He gives full throttle. Suddenly he rolls the plane to the right, with its wings straight up, and pulls the stick hard back into his stomach. We speed around in a sickening, shuddering turn. I see the opposite canyon wall flash by, not 10 feet from our landing gear.

The plane quivers and sinks, dropping leadenly from loss of flying speed; but Travis kicks bottom rudder and rights it just before we strike the creek bank.

We are now headed up the canyon, and I wonder how Travis expects to climb out of the pit back into Argentina, with no visibility to make climbing turns. The matter is soon settled, for when we have gone some five or six miles we see that the clouds have closed to the canyon floor. We are trapped.

Again Travis makes one of those terrible, shuddering turns and we are on the way back down the canyon.

Twelve times in an hour did Travis whip the plane around in a distance that could not have been much more than four or five times the width of the wings. Each time we missed the canyon wall by the same narrow margin that we did the first time. On one occasion, as we swung in the opposite direction of flight, we were enveloped in mist, and I don't know how close we came to the rocks.

NO CHANCE TO TURN

From the way that he looked at the three tiny fields where the Rio Blanco comes in, I knew that he was figuring on landing. These fields were each about 200 feet square and separated by fences of rock. On a slanting bank, as they were, it was going to be some trick to get by with a successful crack-up.

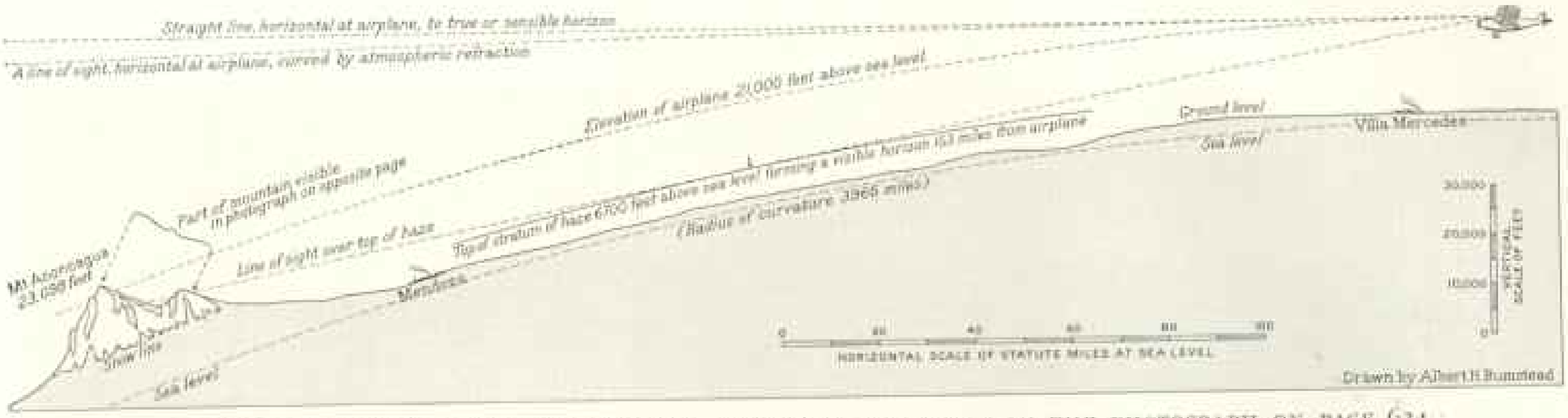
I got the mail sacks forward, covering with them all the windows except those ahead. I passed flying clothes to Shannon and Randall for padding. There was nothing to offer Travis; he would need freedom of movement to the last second. The idea was that when we crashed there would be less danger from broken glass, and some one would probably be conscious enough to drag the others out of the wreck.

Still Travis kept flying up and down the canyon. He had now completed his twelfth turn.

Below us we could see people waving and signaling along the railroad, but we paid scant attention to them. As we approached the fog-closed end of the canyon, Travis flew lower and lower, until we were

THE FIRST PHOTOGRAPH EVER MADE SHOWING LATERALLY THE CURVATURE OF THE EARTH

This unusually interesting photograph of the Andes, including Mount Aconcagua (identified by a white line below the base) at a distance of 287 miles, was made from an airplane, at an elevation of 21,000 feet, by Captain Stevens in the course of his camera survey of the Andean Chain for the National Geographic Society. The mountain range, which shows clearly in the photograph, could not be seen by the photographer at the time he made this picture (see text, page 599). Captain Stevens used a lens of 20-inch focus and an infra-red screen which admits to the sensitive photographic plate light that is invisible to the eye. The length of the exposure was 1/20th of a second. Almost exactly in the center of the range Mount Tupungato is distinguished. In the foreground is Villa Mercedes, Argentina.



A DIAGRAM ILLUSTRATING THE CURVATURE OF THE EARTH, AS SHOWN IN THE PHOTOGRAPH ON PAGE 634

The snow-clad mountains in the illustration on the preceding page form a background that brings into view the surface of a stratum of haze which obscures the lower portions of the snow (see illustration, page 632).

The top of the stratum of haze, at an elevation of 6,700 feet above sea level, conforms closely to the sea-level surface of the earth and does not share the irregularities of the ground, 4,000 feet below.

The haze forms a *visible horizon* 153 miles from the camera, and 70 miles of this *visible horizon* appear laterally in the photograph. Although this horizon is only 1/360th of the circumference of the earth, its curvature can be plainly seen.

The *sensible horizon*, as distinguished from the *visible horizon*, is the line where a plane surface, level at the point of observation, meets the sky. The white line ruled across the sky in the photograph indicates the position of the *sensible horizon*. Although the highest of the mountain peaks in the photograph are at a greater elevation than the camera, they appear below the *sensible horizon*, due wholly to the curve of the earth's surface.

Due to refraction, the path of a ray of light through the air is not straight, but curved downward by a maximum of about 1/7th the amount of the earth's curvature, depending chiefly on the density of the air. The effect of this refraction is to make the earth seem a little less curved than it is, and to make distant objects appear a little higher. This fact has to be taken into account in trigonometric leveling for determining elevations.

At the distance of Mount Aconcagua, 287 miles, the earth curves 54,900 feet from a straight horizontal line, but only 47,100 feet from a curved line of sight that is horizontal to the observer.

The short white line under Mount Aconcagua shows the position of sea level, above which the mountain rises to a height variously computed at from 22,800 to 23,100 feet, with 23,098 as the figure most frequently adopted.

TAKING THE THRILLS OUT OF AVIATION

Pilot Travis prefers the perils of flight over the Andes to the drudgery of making official reports (see text, below).

very close to the ground. At last it was evident that he wasn't going to turn this time. In fact, we no longer had any chance to turn, for the canyon had narrowed.

Holding his controls steady, Travis plunged right into the fog. The last I saw was a canyon wall some 10 feet from our left wing; the other wall had disappeared. The seconds went by. It seemed that we could actually feel the presence of those black rocks on each side of us.

Four seconds—five seconds. We have traveled a sixth of a mile in fog so dense that we cannot see beyond our wing tips! Five seconds is a long, long time in a canyon under such conditions.

Gradually the fog thins below; we dimly see the ground. Now the fog thins to each side, and we are still clear of the rocks. We are through one of the bottle necks, at least. Will there be another?

Ahead is Salto del Soldado, where the railroad runs through a tunnel and where the canyon has a bottom of solid rock, split by a fissure only 60 feet in width at the top. If the clouds are down to the top of that rock, we are trapped, surely. But when we get close enough we see that there is sufficient space to fly over.

After that we began to breathe easier, and from then on it was only a question as to whether we would be forced to land near Los Andes or whether we could get through to Santiago. The rain, which had drenched the plane in the narrow canyon, fell fully as hard, and twice clouds that actually touched the ground forced Travis to leave the foothills entirely and follow the railroad track along the lower level.

It was plenty dark when we sighted the hangar at Los Cerrillos, Santiago. Not only were the hangar doors open, but all the company officials were there.

When Travis brought the plane down on that rain-soaked field and taxied to the cement apron, the mechanics hurriedly pushed it in, and then stood gravely around, for once quite speechless.

Travis clambered out on his way to the little hangar office, and as he passed Shannon I could hear him mutter something. I cocked my ear to hear any important comment he might have to make on what undoubtedly was his most dangerous passage of the Andes, and heard him say, "Confounded report books: . . . buy some rubber stamps yet . . ."

STRÖBECK, HOME OF CHESS

A Medieval Village in the Harz Mountains of Germany Teaches the Royal Game in Its Public School

By Harriet Geithmann

"STRÖBECK, the chess town? It is in the Harz Mountains, near Halberstadt, only a step off your route from Berlin to Weimar," encouraged our commercial attaché, in the shadow of the Reichstag.

However, though we were going into the land of Grimm's Fairy Tales, we had in our knapsacks no seven-league boots with which to cover the distance in a "step." We resorted to more modern but equally magical means of transportation—took an 18-passenger express plane from Tempelhof Field and floated down to Leipzig an hour later. There, after picnicking with the swallows and the swans at the station, we boarded an afternoon train for Ströbeck.

At dusk, four hours after we had left Leipzig and its industrial fair fluttering with ribbons, we were deposited, somewhat bewildered, at a little brick station surrounded by yellow stubble fields and a few old elms. Not a sign of a town could we see.

STRÖBECK VISITORS MUST BE GOOD WALKERS

"Where's Ströbeck?" we asked the agent with some concern, as the train disappeared around a bend and left us in the shadows.

"Over yonder, where you see the gray church spire among the green trees. It's only a half hour away by foot," he replied with a quizzical smile.

We answered the question in his eyes. "We came to Ströbeck to see the children play chess in the school."

With no taxis or other means of transportation in sight, we left our bags of souvenirs at the station and started off with our knapsacks.

Presently a peasant woman strode past us with a child's wagon, in which she was hauling a bit of freight. We implored her to carry our knapsacks into the village. None too eager, she loaded them on and then rattled off over the country road paved with cobblestones from the fields.

When we asked how much her fee would be, she replied curtly, "Gar nichts," which meant "Nothing at all."

We soon discovered that she was giving us a lesson in walking while assuming a disdainful attitude which seemed to suggest that if we ever dared to lag behind, she and our knapsacks would disappear forever into the shadows of Ströbeck. There was no pity in the glances, few and far between, which she deigned to throw over her blue shoulders at us.

Finally we landed breathless in front of the village inn, the Gasthof Schattenberg, on the edge of a public square. We were in Ströbeck, the only place in all Germany, if not all Europe, where the royal art of chess is taught year after year in the school.

Frau Schattenberg emerged from the gloomy dining-room and escorted us to our bedrooms. These were comfortable enough, if one could keep his eyes off the walls, on which splotches of cobalt blue, purple, and lavender were bitterly opposed to one another.

Adjoining our simple quarters was the huge entertainment hall devoted to chess, the best room in the house. The walls were decorated with paintings and mottoes illustrative of *Schachspiel*. On the tables were the chessboards, ivory pieces and pawns and other precious sets, hand-carved and charcoaled by local artists.

We were much impressed with one old-fashioned chessboard, which we were made to understand was not exhibited to everybody. It illustrated the character of the village and on it we read the inscription that it was given to Ströbeck by the Elector of Brandenburg on May 13, 1661.

STRÖBECK WAR MONEY WAS "CHESSBACKS"

Our host, Herr Schattenberg, noted our interest and presented us with some of the paper money printed and used by Ströbeck during the World War—25-, 50-, and 75-pfennig slips and half-marks—all of which were gayly illustrated with chessboards and colored chessmen. One of these half-marks has a cartoon of Uncle Sam

© "Photo-Union," Paul Lamm

IN THIS TOWER, LEGEND SAYS, STRÖBECK CHESS BEGAN IN 1011

Natives of the village are proud of the Schachsturm, where they believe the royal game has been played for more than 900 years (see text, page 649). A picture of the one-time prison, bearing the locally accepted date of the birth of the tradition, was used on some of Ströbeck's war-time paper money.

looking disdainfully across a chessboard of stars and stripes at the crestfallen king. Another bears a picture of Bismarck as *Der Welt Schachmeister* (the world chess master).

"Ströbeck must be a quiet place in which to sleep, after the seething capitals of Europe," we dared to hope, as we retired between feather beds to roast in August.

False hope! Across the cobblestone way was a tiny bakery shop with a bell on the door. Every time a child was sent for a loaf of bread or a cookie the bell tinkled merrily. Ströbeck's innumerable dog population barked most of the night.

At 5 a. m. the wagons clattered over the cobblestones to the fields: for Ströbeck's 1,400 inhabitants are not only chess-minded

© "Photo-Union," Paul Lamm

EVEN THE GEESE OF STRÖBECK SHOW INTEREST IN CHESS

It is not a game, however, that any goose can play. These little girls, set to guard the flock that will supply the family with feather beds, improve the time by doing home work on some of the gambits taught them in school.

Photograph by A. Frankl

WHEN THE LESSON IS CHESS THERE IS NO INATTENTION

Pupils in the Ströbeck school concentrate on their study, for a moment of carelessness means loss of the game. They display perfect sportsmanship, never squabbling over a move (see text, page 640). In mild weather the benches and boards are set up in the playground.

but agriculturally minded as well. Every driver entertained himself by cracking his whip over the brawny backs of his oxen. The geese began to gabble, gabble here and gabble, gabble there, and the hens began to cluck, cluck to their chicks, and the cows lowed all over the town. Ströbeck was up and doing.

We breakfasted on bread, chocolate, and a dash of golden marmalade. Then the Schattenbergs' 18-year-old daughter, Fräulein Erika, a fair-haired, classic maid, took us in tow for a sight-seeing ramble.

Many of the red-tiled houses of the medieval village reminded us of the picturesque cottages of old England. On some of them were black and white targets, and others suggested the influence of chess in their style of architecture.

"Alles alt," muttered Erika ever and anon, as we exclaimed over the architecture.

On the fringe of the village we found men and women in a cloud of dust threshing rye, from which the everyday bread of Ströbeck is made. It was harvest time. The fertile fields surrounding the village had been swept clean and the crops of rye, oats, wheat, barley, potatoes, and beets were being stored.

SCHOOL CHILDREN CARRY CHESSBOARDS LIKE BOOKS

Finally we arrived at school, where Erika introduced us and explained our mission to the master, Herr Wilhelm Winne, an apple-cheeked, snowy-haired Teuton. He, in turn, introduced us to his flock of 32 boys and girls ranging in age from 10 to 14. These children carry their chessboards to school as naturally as American school children carry their books.

"This is the only grade in which we teach the children how to play chess," said Herr Winne. "Here we teach the game every week during the last three months of the school year—January, February, and March. The children attend school, however, every month in the year—from 7 to noon in summer and 8 to noon and 1 to 3 p. m. in winter."

In summer everybody works in the fields, for Ströbeck's only business is agriculture.

Like the royal children of the Kingdom of Cyrus, who had to learn the laws of chess "almost with their mothers' milk," so the children of Ströbeck learn early, with their ABC's, to master the rules and regulations of the game.

"Come," said Herr Winne, as he flashed us an engaging smile, "let me call my wife," and he disappeared in the rear of the schoolhouse. When he returned he was accompanied by black-haired, rosy-cheeked Frau Winne, who invited us into her little drawing-room, with crimson geraniums and purple fuchsias in the windows, a woolen tea-cosy in purple and yellow yarn, a French clock in a glass case, and a radio which connects Herr Winne with Berlin, Leipzig, and Hannover. Here she served us apple wine and a cookie or two.

"How many rooms have you here?" we asked Frau Winne.

"We live in twelve and all twelve are in the schoolhouse," she said, and smiled as if she enjoyed all twelve little boxes.

A SCHOOLROOM LESSON IN CHESS

Returning to the classroom, we found the children ready with 16 chessboards—32 devotees of the kingly game. Soon we were forgotten, as Herr Winne explained the laws of the game and the functions of the chessmen. The children set up their black and white pieces in formal array on the checkered battlefields.

"Players with the white pieces make the first move," announced the schoolmaster.

Slowly and carefully the 32 young enthusiasts made their moves, and it was with keen interest that we watched the uniform courtesy that they displayed to their opponents, their quiet and undemonstrative behavior in times of defeat or victory. The fast thinkers won their games in 5 to 10 moves, while the slow thinkers looked long at their men and moved slowly. The average player won or lost his game in 40 to 50 moves. Some were badly beaten and some soon resigned and started all over again. While the games were being won or lost, there was no talking or whispering (see pages 639 and 651).

"Ströbeck is the home of chess," Herr Winne reminded us, as he sent the children back to their lessons. "Don't fail to see the historical chess tower or castle, where the chess champions of the town held their first contests a half century before William the Conqueror landed in England."

SCHWÄLMER FASHIONS COME DIRECT FROM THE 16TH CENTURY

A Rip van Winkle of Hesse might awake to-day from a 400-year nap beside the Schwalm River and find nothing to startle him in the appearance of the people.

 Natural Color Photographs by Hans Hildenbrand

COSTUMES OF ANCIENT STYLE SERVE ON ALL OCCASIONS

The water carrier wears a working-day gown. The other two girls and the young man are resplendent in holiday attire. Muffinlike caps and full skirts, billowed out by voluminous petticoats, dominate the feminine mode, and the knee-length coat is the correct thing for all males.

 Natural Color Photograph by Hans Hildenbrand

DRESSING LIKE GROWN-UPS HOLDS NO NOVELTY FOR HESSE CHILDREN

From tiny tots to grandparents, Schwälmer peasants wear the traditional garb. In appearance, this group in front of the school might be pupils of this generation or of the remote past.

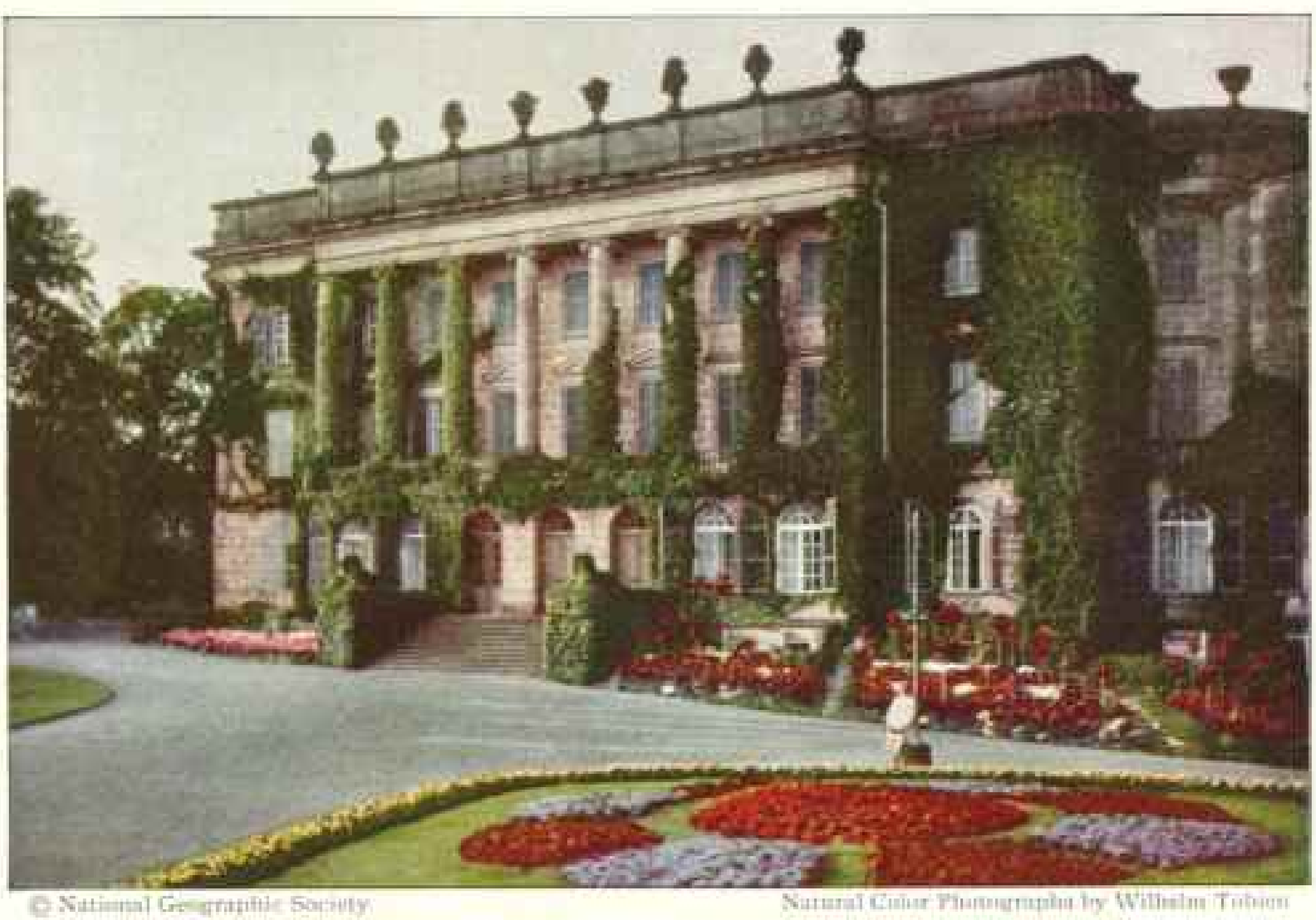
 Natural Color Photograph by Wilhelm Tobien

MOTHERS OF SEGGEHORST SCHOOLGIRLS MUST BE ADEPT AT HOUSEHOLD ARTS

Elaborately hand-embroidered dresses and snowy aprons rich with lace make the characteristic costume of the peasants about Bückeburg exceedingly attractive; but what prodigies of needlework and laundry they demand!

NAPOLEON III LOATHED WILHELMSHÖHE CASTLE

A prisoner of war, he languished within its walls in 1870-71. Many monarchs have been willing or unwilling guests at this palace, formerly a residence of the Electors of Hesse.



 Natural Color Photographs by Wilhelm Tobien

WILHELM II USED THIS CASTLE AS A SUMMER HOME

Standing in a stately park on a hillside overlooking Kassel, it was a favorite resort of the ex-Kaiser. It is a ponderous structure in the classical style, without much architectural interest, but its surroundings are delightful. The upper view is of the front, the lower of a side-wing.

Natural Color Photograph by Hans Hildenbrand

WILDSEDE NATIONAL PARK SMILES A GLORIOUS WELCOME TO VISITORS IN AUGUST

In the midst of the field of blooming heather glows a patch of lupines planted to make the ground ready for grain the following year. German thrift does not permit even the delightful Lüneburger Heide to remain entirely unproductive. The building in the background is the Heidehotel (see, also, Color Plate VII).

Natural Color Photographs by Hans Hildenbrand

MILLINERY SEEN IN THE SPREEWALD RIVALS THE PLUMAGE OF TROPICAL BIRDS

Wendish headdresses, such as that of the young woman on the left, are often two and a half feet wide. Richly embroidered and stiffened to stand out at the sides, they make it impossible for their wearers to sit shoulder to shoulder. The girl at the right, a bride, has on a wedding costume treasured as an heirloom in her family.

 Natural Color Photograph by Wilhelm Tobien

OLD COSTUMES RECALL DREAMS OF BYGONE DAYS

This nonagenarian of Levesen in Schaumburg-Lippe clings to the fur cap and white coat of his youth. His daughter, standing beside him, wears the dress of her district.

Natural Color Photograph by Hans Hildenbrand

INTRICATE EMBROIDERY ADORNS SUNDAY FROCKS

Peasant costumes of the Fulda region are triumphs of needlework. The women take pride in their distinctive dress and create brilliant designs.

Natural Color Photograph by Hans Hildenbrand

ROADSIDE CYCLE PATHS RAMBLE THROUGH THE HEATHER OF LÜNEBURGER HEIDE

German students love to come by train to Schneverdingen on week-ends and to pedal bicycles thence across Wildsede Park to the Heidehotel (see, also, Color Plate IV). At the lower right peep up two mushrooms, large as saucers. They are of a variety particularly prized for their flavor.

 Natural Color Photograph by Hans Hildenbrand

SCHOOL CHILDREN OF LAUENBURG, A VILLAGE NEAR BÜCKEBURG

 Natural Color Photograph by Wilhelm Tobien

NAUMBURG MIGHT SERVE AS A LIVING ILLUSTRATION FOR GRIMM'S TALES

Hereabouts the famous brothers who wrote the fairy stories found their inspiration. Kassel, where they worked for years as librarians, lies just beyond the hills in the background.

Regretfully we left the kindly schoolmaster and proceeded to the tower of chess, in the heart of the village (page 638).

"You see the balcony," said Erika, when she had succeeded in cajoling the key from the keeper and had opened the heavy door. "The tower since the year 1011 has entertained two groups of players, one on the balcony and one on the ground floor."

HOW CHESS BEGAN IN STRÖBECK IN 1011

That this tower should have played a part in the legendary origin of the royal game in Strōbeck is most natural. When Henry the Second of Germany decreed that the Wendish Count of Gungelin be delivered to the Bishop of Strōbeck, to be kept in solitary confinement, the prisoner was straightway whisked off to this stronghold.

The royal captive soon learned how to beguile the lonely hours by playing chess, a game in which he was passionately interested. He chalked out a chessboard on his dungeon floor and carved two sets of chessmen out of wood. Then, being doomed to play alone, this ingenious prisoner made his right hand the opponent of his left, and the game went on.

In due time the Ströbeck peasants who took turns in guarding the door of his cell became interested in the Count's silent maneuvers on the checkered floor and were initiated into the mysteries of the game. They, in turn, taught the rules to their wives and children.

This legend of the origin of chess in Ströbeck is perpetuated on the town's chess-inspired paper money (page 637).

There is, however, another version which is equally interesting. According to the Penny Magazine of December, 1836, published in London by "The Society for the Diffusion of Useful Knowledge," one of the dignitaries of the Cathedral of Halberstadt was exiled to Ströbeck toward the end of the 15th century. The simple people received him with such hospitality that the good man was overcome with gratitude. After considerable thought he decided that he could best express this gratitude by teaching the villagers how to play the royal game of chess. Eventually the exile was granted his freedom with honor and later became the Bishop of Halberstadt. At the zenith of his career he remembered his Ströbeck friends with benefactions. He founded a school and provided that the masters should instruct the children in his favorite game. A chessboard with a set of chessmen he decreed should be given annually as a prize to the best player.

The good bishop foresaw a moral advantage in promoting chess. The villagers soon lost interest in games of chance and concentrated their attention upon the game of skill. Soon mothers taught the game to their daughters, and fathers bequeathed their chessboards to their sons "as a sort of patent of nobility." Each family tried to surpass the prowess of its neighbor.

Presently the fame of the chess players of Ströbeck swept beyond the boundaries of Saxony and across Germany. Chess enthusiasts arrived from all directions to compete with the villagers, and the majority of them went away defeated.

Even gambling on chess once knocked at the door of Ströbeck, but only for a brief interval, after which the game was never again played for money. The story goes that one day Silberschmidt, a student of human nature as well as a master at chess, gave Ströbeck a lesson which it never forgot. He played for the high stakes which the villagers proposed and won from their champion.

The villagers were willing to pay for their losses, but they were most unwilling to grant Silberschmidt a certificate of defeat. "Take the gold," they implored, "but leave us our glory."

"Good people of Ströbeck," returned the stranger, "the money I have won from you I give to your poor and to your school, but on one condition: you must swear that henceforth you will never play for money. The noble science of chess carries its interest in itself; a single game won is a treasure of satisfaction to one's *amour-propre*."

The villagers took the oath, gave Silberschmidt his certificate, distributed his money as directed, and, so far as records show, never again did they play for aught but honor.

In this atmosphere of legendary chess Ströbeck enjoys a quiet, bucolic life. Once a year a chess tournament is held in the village school, usually with 48 contestants taking active part in the tourney. The victors carry off the trophies, which are always new chessboards, and are escorted

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HUMAN CHESSMEN PUT LIFE INTO THE VENERABLE PASTIME

One of the unique features of the annual Chess Festival in Ströbeck is a game played with living pieces.

Photograph from Harriet Caithamm

GRANDFATHER NEVER LOSES INTEREST IN THE CHILDREN'S SCHOOLWORK

Everybody in Ströbeck, from the tot to the most aged, shares the enthusiasm for chess. This veteran champion learned the gambits when he was younger than the little girl with whom he is playing.

© "Photo-Union," Paul Lauun

NOT A CHESS PLAYER'S DREAM, BUT A STRÖBECK FESTIVAL PARADE

Kings, queens, bishops, knights, rooks, and pawns all come to life once a year to make merry in honor of the royal game.

© "Photo-Union," Paul Lauun

THE TEACHER SUPERVISES HIS PUPILS' MOVES

In one grade of the Ströbeck school Herr Winne instructs each day a class of 32 in the fine points of chess (see text, page 640). Many a champion player has received his first lessons from the genial master.

© "Photo-Union," Paul Lamm

WHEN THE CHESS FESTIVAL IS ON, EVERYTHING CENTERS IN THE GAME

Enthusiasts from afar throng the Gasthof zum Schachspiel to help the people of Ströbeck celebrate in honor of their medieval tradition. Championship matches are played at these annual carnivals, and the victors become the pride of their families.

home in honor. Then the village is alive with gay banners and badges, and living chessmen, kings and queens, bishops and knights, and pawns parade the streets (see illustration, page 651). Visitors interested in chess flock into Ströbeck from many points.

While a village merchant waits for customers, he entertains himself with the exciting problems of chess, and when business knocks he lays his chessboard aside only while the purchaser is served. So his father has done before him. So his son will do after he is gone.

Wherever people go in Ströbeck for entertainment and refreshment, they find chessboards and chessmen provided for their amusement. The game is part and parcel not only of the town's educational and recreational hours, but of its business hours. The entire village breathes chess morning, noon, and night, generation after generation.

When a Ströbeck maiden marries a man from the outside world, she must play a game of chess with the chief magistrate of the village before she leaves her native heath, in order to prove that she carries with her the knowledge of the traditions of the community.

When we swung aboard the noon train the day following our interesting sightseeing walk with Erika, we heard the conductor ask the agent, "What brings Americans to Ströbeck?"

"Visiting chess in the schools," came the swift reply.

Not until then did we realize that practically no American travelers visit Ströbeck, and, except for the few words at the command of the schoolmaster, no one in the village can speak English. We had managed somehow, with a smattering of the German language and Erika's fine understanding well mixed with her Old World courtesy.

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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.

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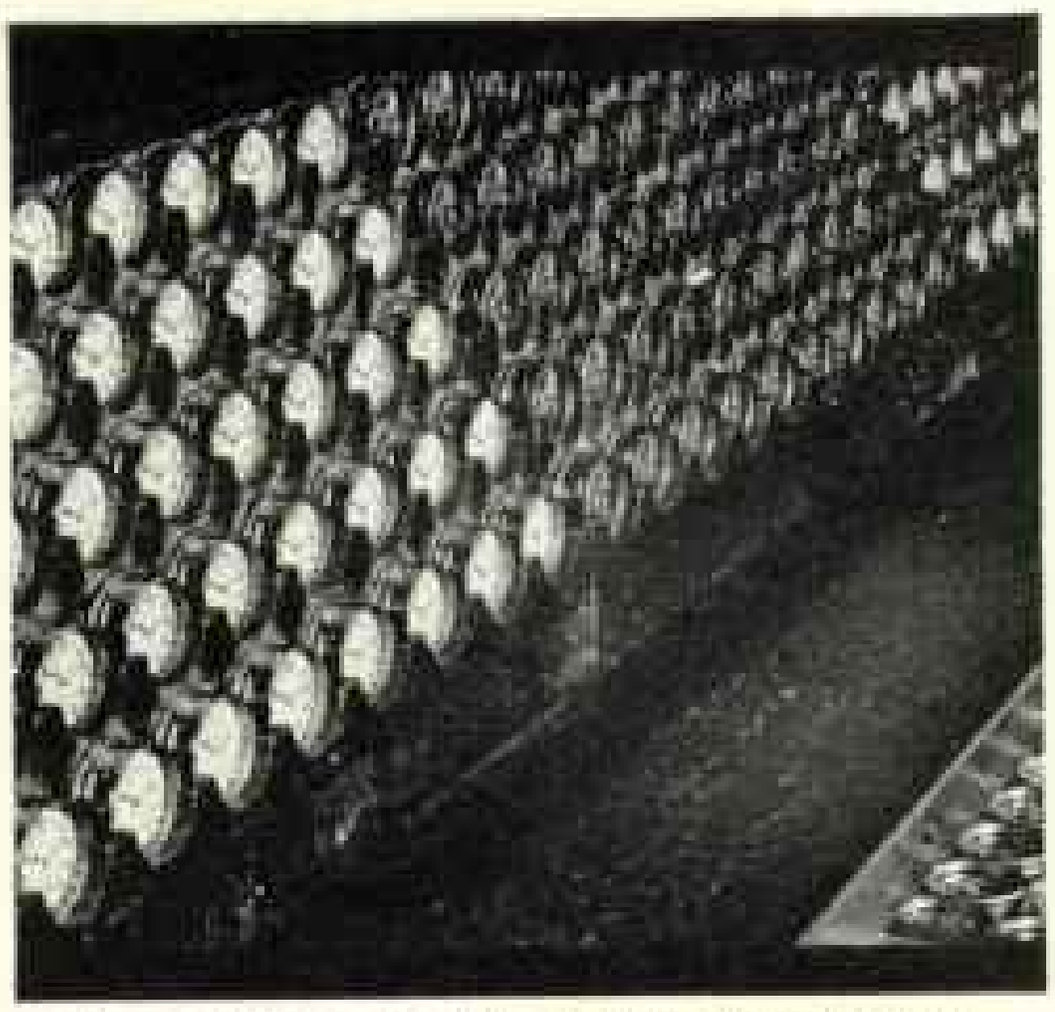

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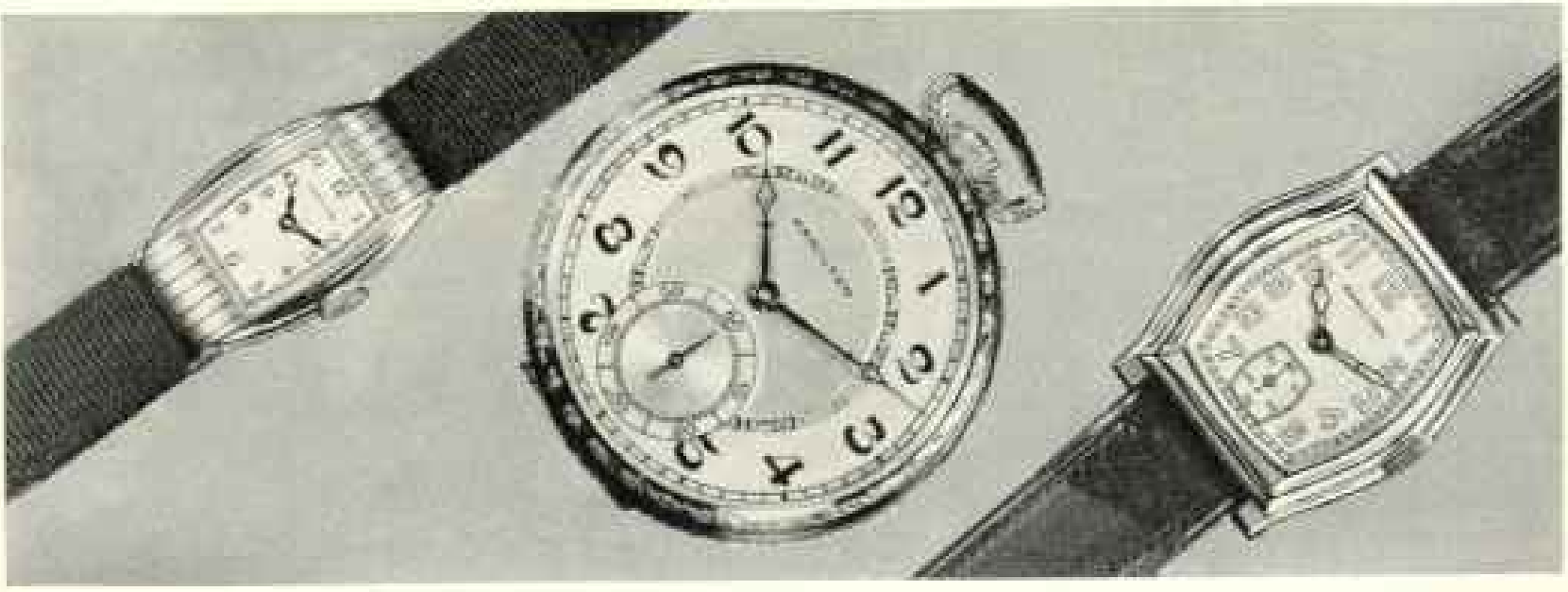

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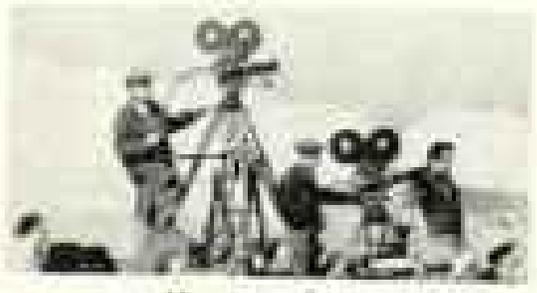

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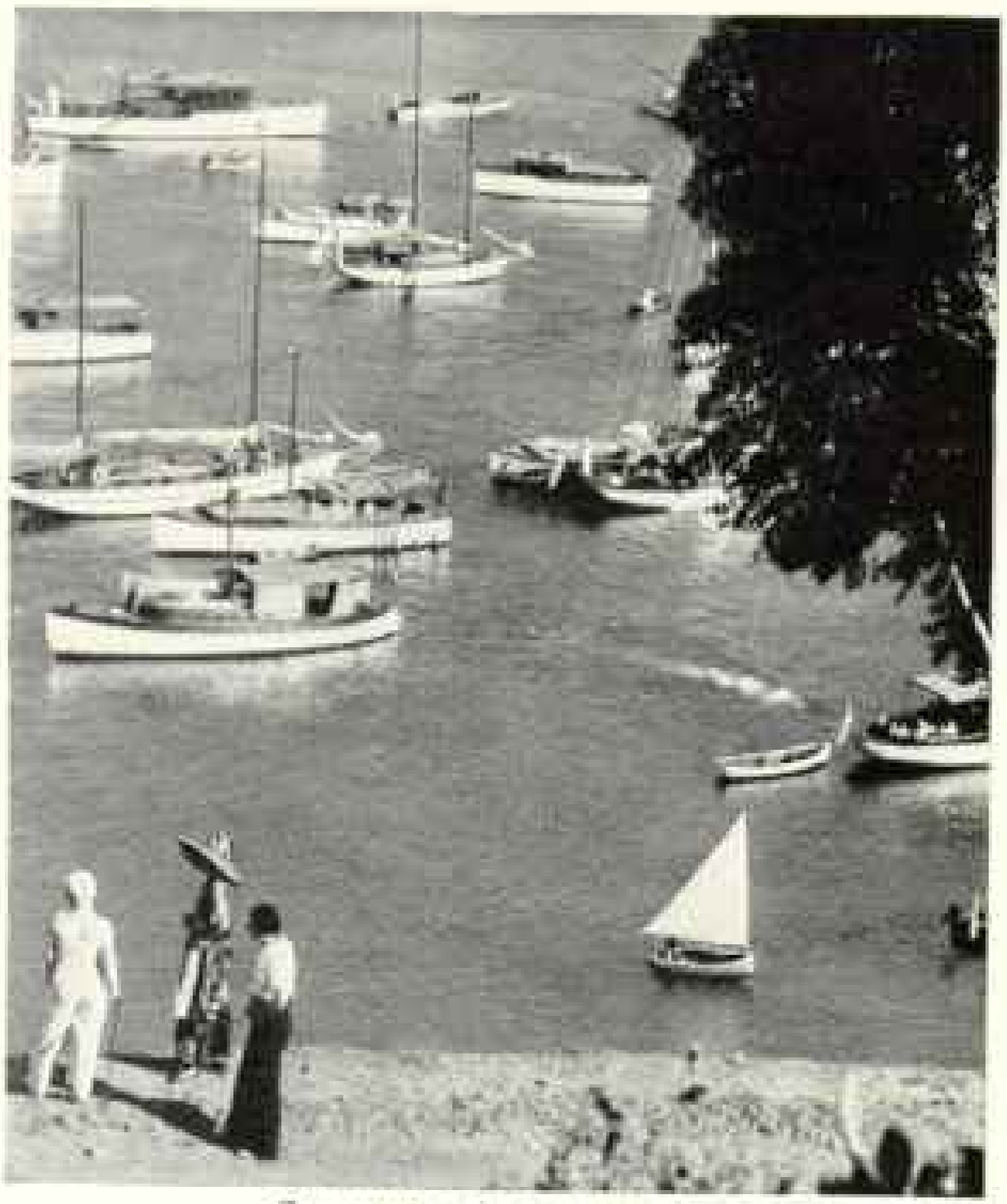

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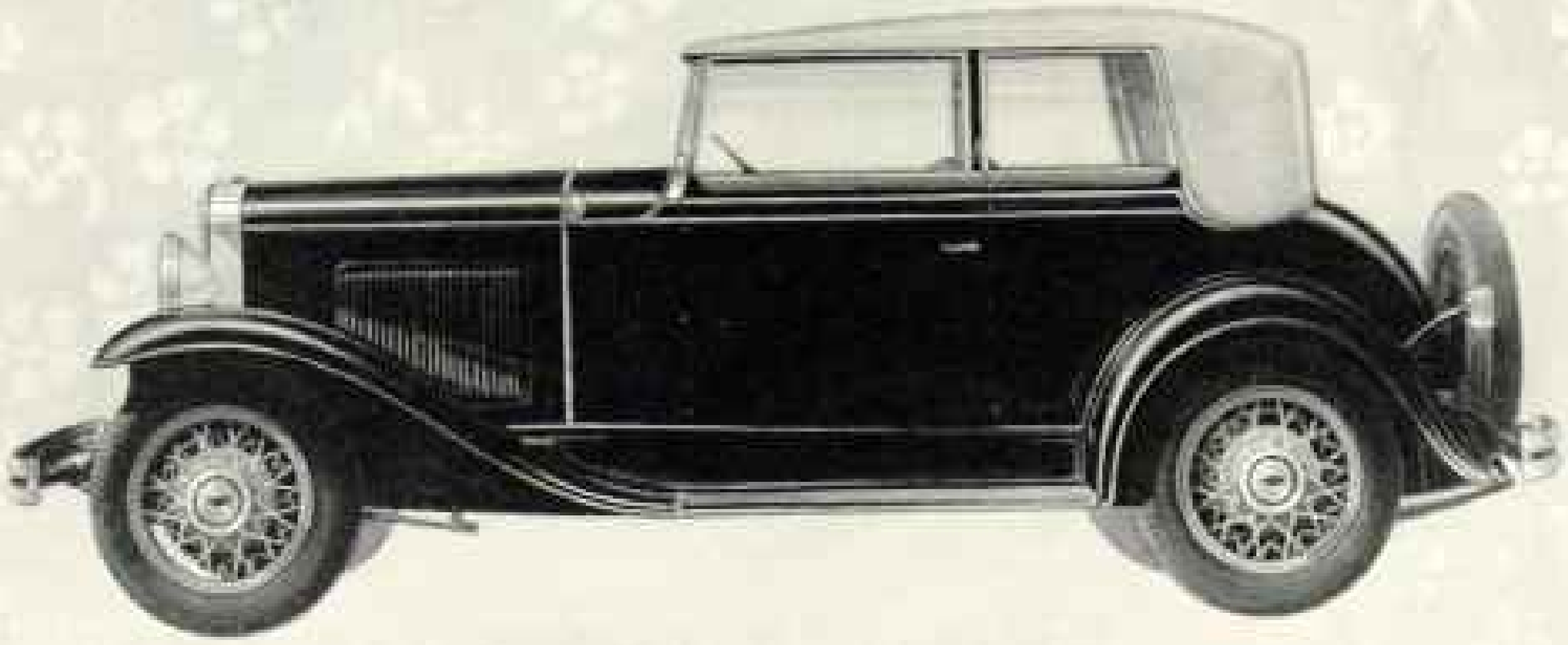

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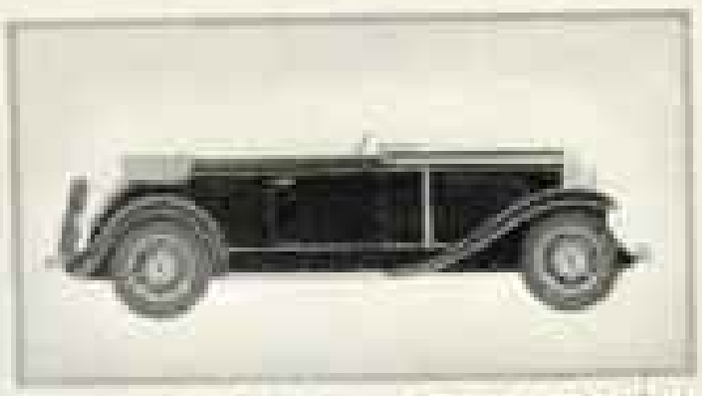

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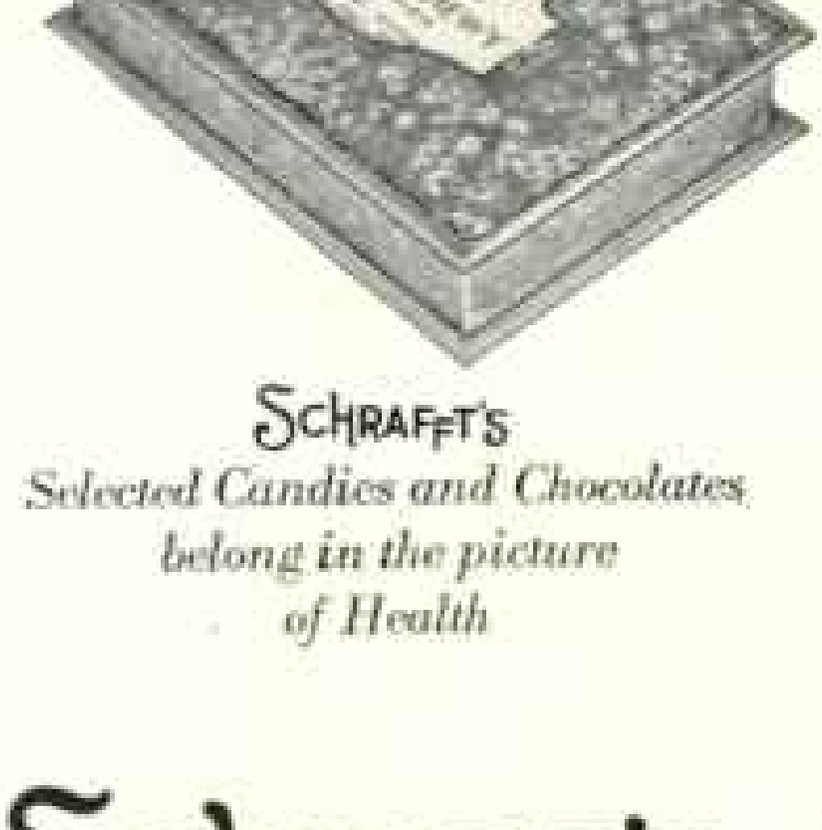

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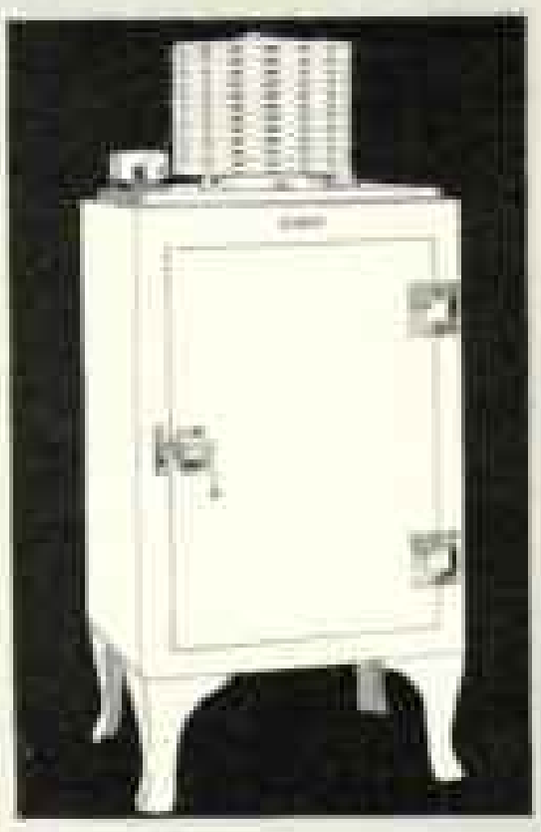

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WHAT YOU SEE YOU GET, WITH FILMO

with a *genuine Bell & Howell FILMO *personal movie camera*

as low as

$92

Filmo Cameras range from $92 to $493.50; Filmo Projectors from $198 to $295. Outfit shown is $361, with Snamm-linked cam.

It's how they looked and the things they did that bring back endearing memories of the children after they've grown up. And it's Filmo movies that recall their childhood as nothing else can do it. For in the clean-cut, brilliant movies that a Filmo makes you have the closest thing to life itself.

Start your movie record of the children now. And learn, too, the tremendous enjoyment there is in movies of the whole family—at home, on vacation, on week-end outings, or at your favorite sport. There is a movie waiting around every corner.

Investigate Filmo. Ask any owner. You will discover that it's the world's preferred movie camera, used and owned by discriminating persons of every nationality. This is because Filmo takes superbly beautiful movies, and with extraordinary ease—characteristics which spring from the superfine materials and workmanship in Filmo's careful manufacture. Why not see your dealer today? Or, write to us for booklet No. 12 on personal movie making. Filmo Cameras use Eastman Safety Film (16 mm.) in the yellow box, obtainable everywhere. Filmo Cameras and Projectors may be equipped (under license) for use of Kodacolor film for movies in full color.

Bell & Howell Co., 1804 Larchmont Avenue, Chicago, Ill. New York, Hollywood, London (B&H Co., Ltd.) Established 1907.

Bell & Howell Co., 1804 Larchmont Ave., Chicago, Ill.
Gentlemen: Please send me booklet No. 12—the fascinating story of Filmo Personal Movies.

Name _____

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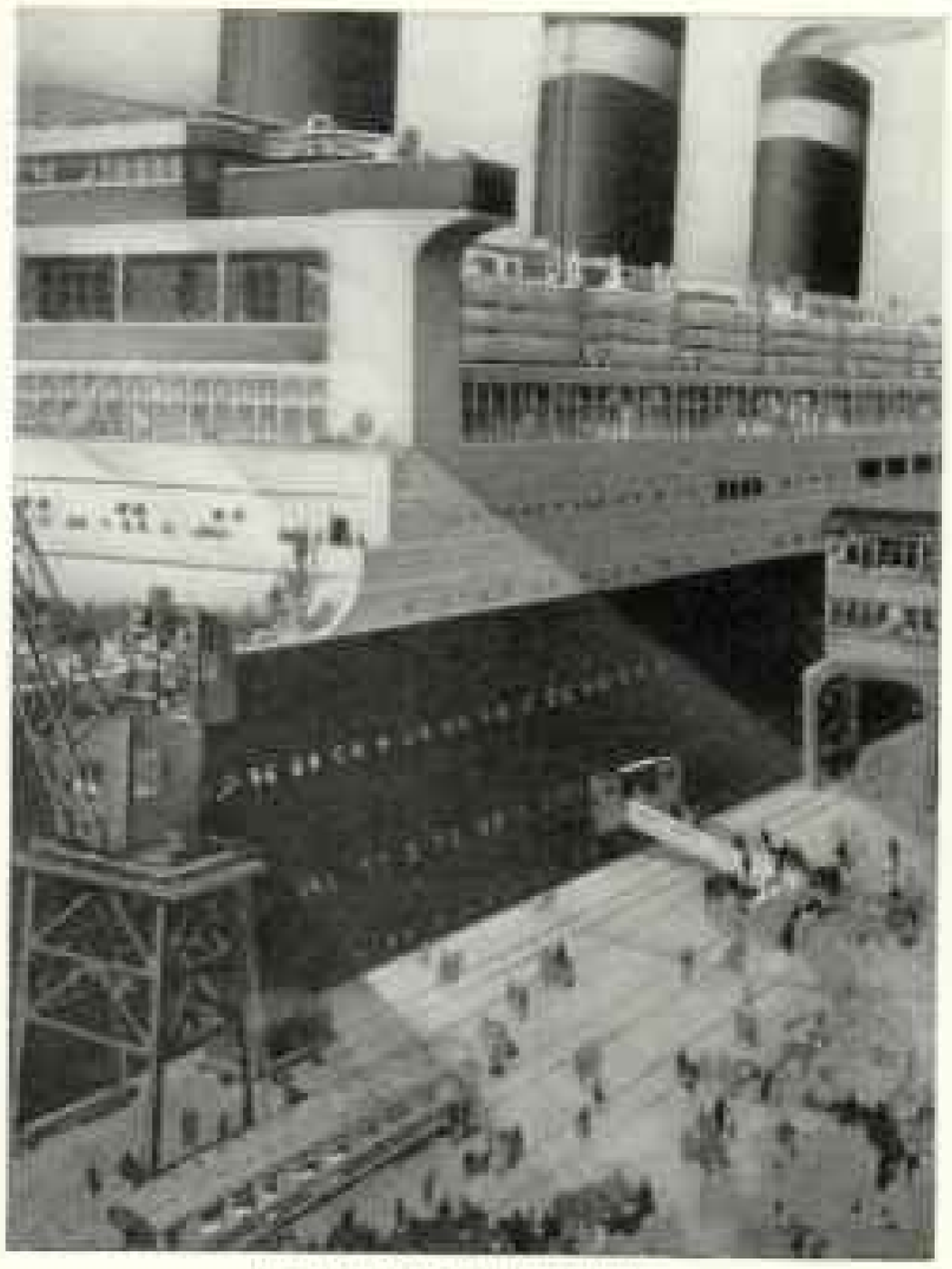
*Filmo personal movie cameras and projectors are made by Bell & Howell, world's foremost manufacturers of professional movie cameras and equipment.

LEVIATHAN

to France and England

MAY 9, MAY 27, JUNE 17, JULY 4, AUGUST 1



LEVIATHAN—at Southampton

Smart folk off to the golf championships, the races and the thrills of Europe . . . bankers, diplomats, debutantes, and stars of sport and screen . . . sail with them on the Leviathan, world's largest ship.

In salons, lounges, smoking rooms, game rooms, staterooms, everywhere, there is the American flair for spaciousness, modern appointments and faultless service . . . *Comfort* at 5-day speed . . . Brilliant Club Leviathan, Ben Bernie dance orchestra, suppers and entertainment, without cover charge or check . . . Pompeian swimming pool . . . Ship to Shore telephone . . . a renowned cuisine under the direction of a famous chef.

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The *Romantic* Journey

Travellers who have roved the seven seas are amazed when they learn of the great inland cruise that awaits them almost at their doors —via the St. Lawrence River into the heart of historic French Canada.

Most water voyages are undertaken for the purpose of reaching some new country, which cannot be seen until you go ashore. But here is a foreign land, the cradle of Canadian history, where the French tongue prevails, which can be visited intimately from the wide decks of luxurious steamers.

Fashionable Murray Bay entrances while it gives opportunity to stretch sea legs ashore and to visit the magnificent Manoir Richelieu.

The canyon of the Saguenay River, discovered 400 years ago by Jacques Cartier, when searching for the fabled route to Cathay, adds a true touch of primeval grandeur.

Breezes from the north that have played through an endless forest of balsam and pine, sweep the decks of your steamer to mingle with the salt tang of the open sea. Service, appointments and meals of transatlantic quality are yours, with the decided advantage of an even keel.

You may embark at Toronto, Queen City of Ontario, visiting the Thousand Islands and shooting the rapids before reaching Montreal, or at any port of call en route.

Write for full information, contained in illustrated literature, dealing with the famous Saguenay Cruises. Also, if specified, the Seven-Day Cruise from Detroit to Duluth and return. Address your tourist agent, or

CANADA STEAMSHIP LINES

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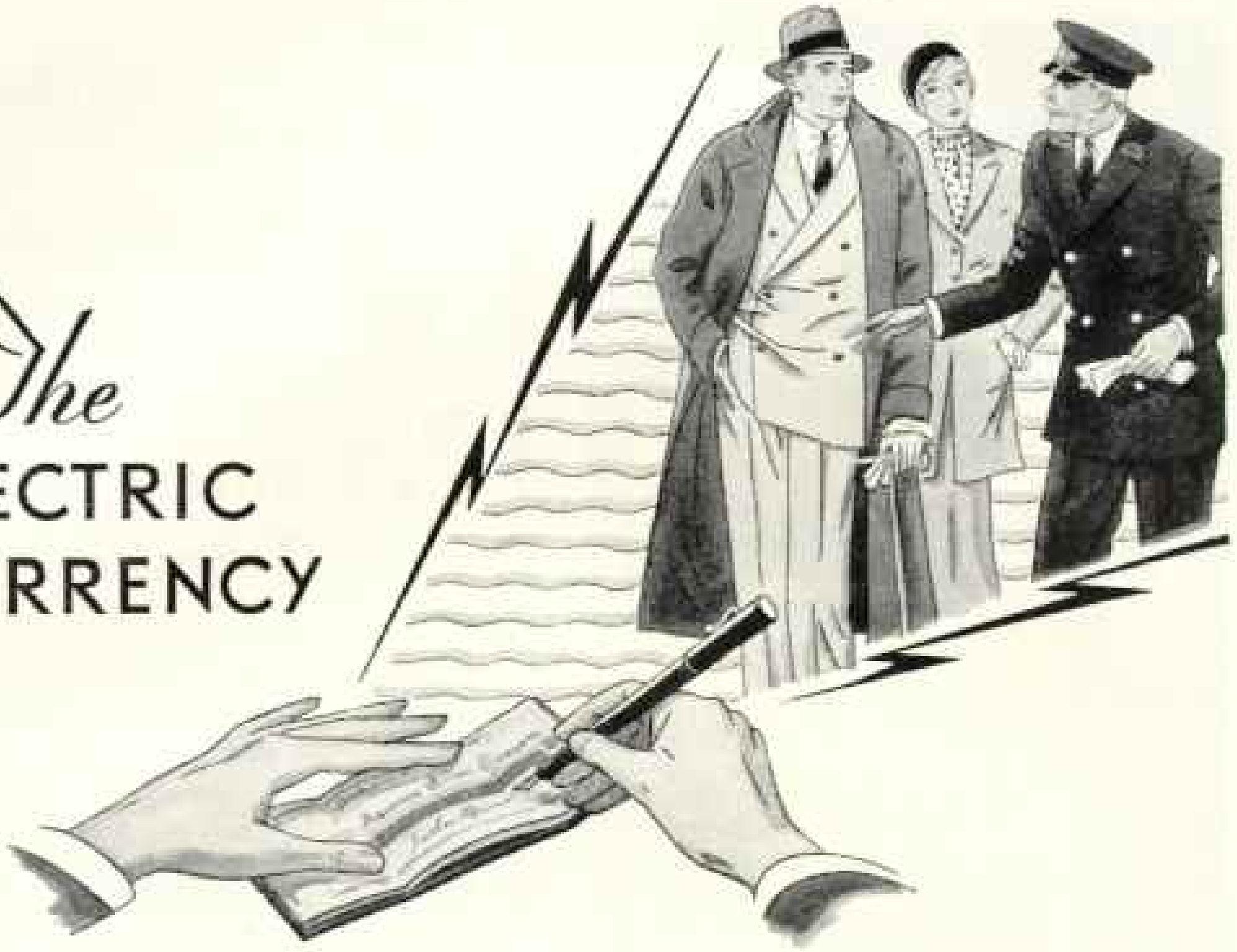

The ELECTRIC CURRENCY OF MODERN TRAVEL

Edison made electricity the servant of the home. Bell made possible the sending of the human voice around the world. Marconi bound together the nations of the earth with wireless. The American Express Service transformed the traveler's hazardous bill-fold to a pocket vault and passbook to service.

Nearly a million American travelers last year carried, from start to finish, the blue American Express Travelers Cheques in the little black folders. They secured them from 17,000 banks (and other agencies) which to date have sold to the world more than $2,000,000,000 worth of these blue Cheques.

American Express Travelers Cheques are recognized as current tender over the counters of trade from Alaska to Cape Horn, from Fifth Avenue to the remotest hotel in the Pacific Archipelago. They have become an international currency in the market places of the globe—and they insure the safety of your travel capital.

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As a passbook to American Express travel service they summon to your command an array of American Express offices and an army of American Express travel men both in the United States and in foreign countries.

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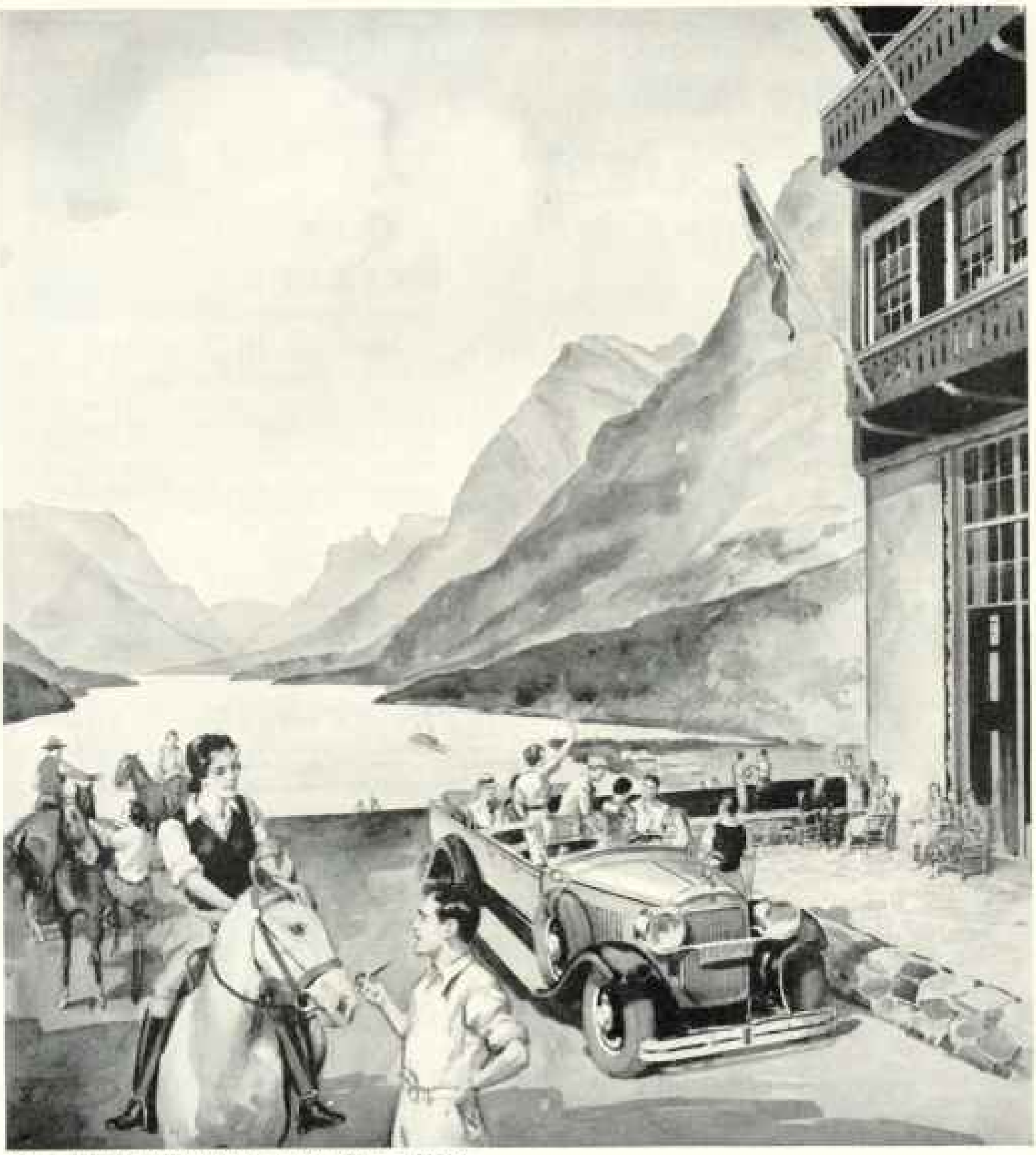
Please send me information on a trip to _____

leaving about _____ lasting _____ weeks.

Name _____ Address _____



Prince of Wales Hotel, Waterton Lakes Park in Canada

The Old West goes international in Glacier and Waterton Lakes Parks

This summer meet up with the Old West in this playground that straddles the Great Divide and the International Boundary—where scenery and sports are equally colorful! Go places in hiking boots, saddle, or bus and launch—do things you've never done before. Ride, fish, climb, camp out, explore—and enjoy true Canadian hospitality! Write Great Northern Vacations, St. Paul.

The New
EMPIRE BUILDER

The Luxurious
ORIENTAL LIMITED

How best to see the *whole* Pacific Coast *on one roundtrip ticket!*

When you go to the Pacific Coast this year don't miss one single place you want to see. No matter where you buy your ticket insist that it include every famous place you want to see *after you reach California.*

Illustrated above is one Southern Pacific roundtrip. You come West by any northern United States or Canadian line, then by Shasta Route down through the Pacific Northwest to San Francisco and Los Angeles. Returning via the Overland Route you can include, among other famous places, Yosemite and Lake Tahoe.

You can reverse the order. Or come West via the Sunset Route through New Orleans or Golden State Route, Chicago, Kansas City, Los Angeles. Send the coupon.

Southern Pacific

4 GREAT ROUTES FOR TRANSCONTINENTAL TRAVEL

O. P. Bartlett, 310 South Michigan Boulevard, Chicago, or H. H. Gray, 531 Fifth Avenue, New York City.

My Pacific Coast destination will be _____ Please send me an itinerary that will include the places I have checked:

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Accommodations for first-class passengers only. Reservations and literature at authorized tourist agents, or Furness Prince Line, 34 Whitehall St. (where Broadway begins), or 565 Fifth Ave., New York City.

ROUND WORLD TOURS—108 DAYS—23 PORTS—$680

FURNESS *Prince* LINE

Prince Line Service has been continuous between New York and South America for 35 years

down the aisles of 4,000 years..

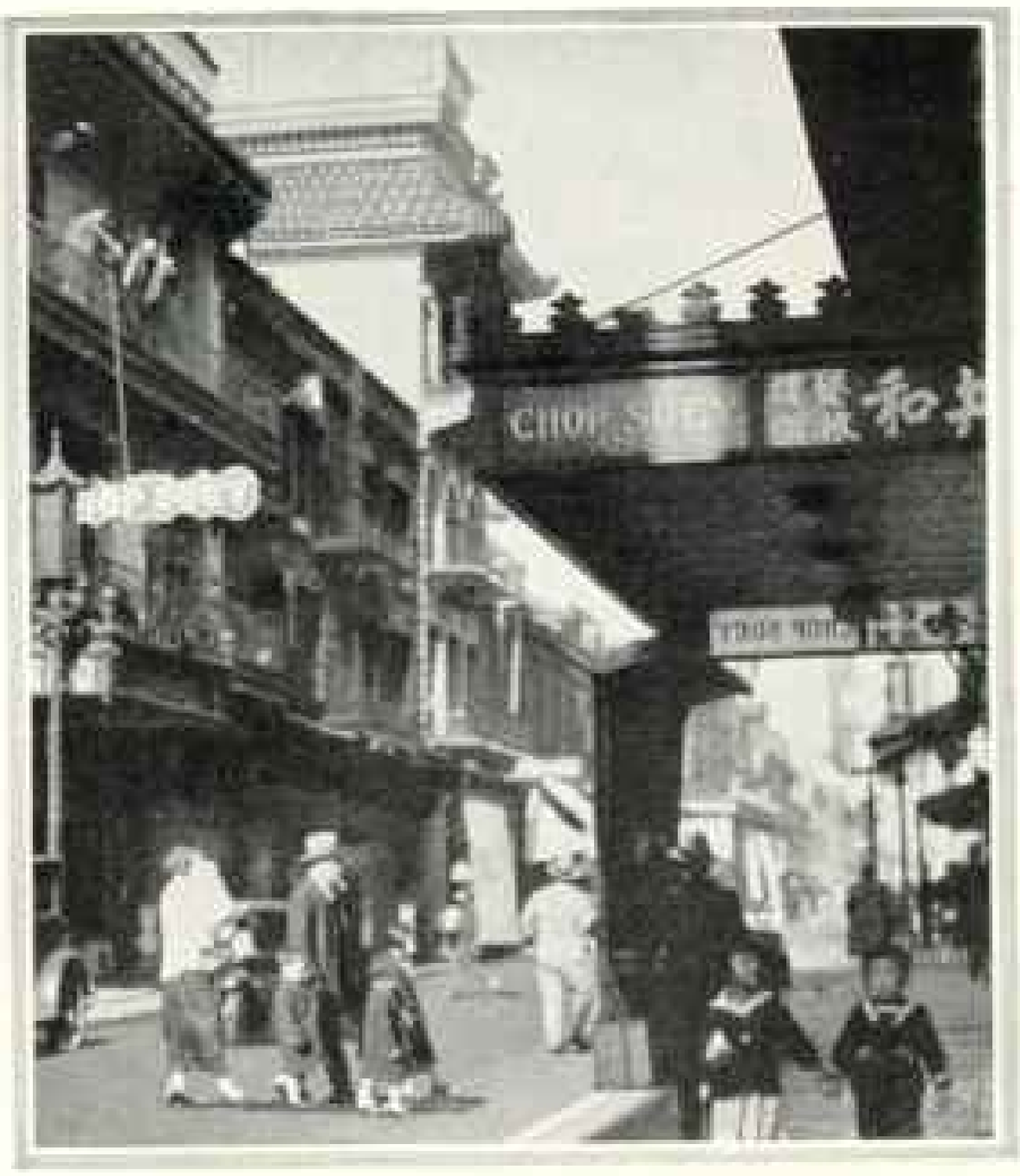
Many of these Sequoia giants are twice the age of the Christian era . . . all of them were old-timers when Caesar crossed the Rubicon!

You may include the Mariposa Grove of Big Trees this summer, on your way to towering Yosemite. All-Expense Tours, including the Mariposa Big Trees, range from 2 to 4 days and $23 to $77.50. Ask your travel agent, or write for scenic folders: Yosemite Park and Curry Co., Box 174, Yosemite National Park, Calif.

YOSEMITE

& MARIPOSA BIG TREES

Here you'll find Vacation's Greatest Thrills



San Francisco's Chinatown—the largest one outside of China

NO OTHER CITY in the world will thrill you with the color and the mystery that San Francisco will. Here is the color of the sea that comes in through the Golden Gate, the ships and men from far off lands. The color of flowers selling on the curbs; fascinating shops, famous theatres, bright cafes.

Here is the mystery of foreign colonies . . . and the spangled past of a pioneer town where only gold was money . . .

San Francisco introduces you to California's most varied out-of-doors. You may splash in the waters of the blue Pacific or in lakes a mile above the sea. You may take your pleasure high in gorgeous mountains or at famed resorts that nestle at their feet, and on the ocean's sandy beach. Lake Tahoe, Yosemite, Feather River, Monterey's peninsula, the Redwood Empire—these are some of the places that you'll see . . .

1931 is California's Fiesta Year, with many splendid celebrations. So come this summer, vacation as you never have before—in the varied land that San Francisco centers. Give yourself, and your family, too, an experience in living that no other region knows.

Use the coupon to get the free illustrated book that makes planning so easy—and such fun.

Carmel Bay—close to San Francisco

Low Fares this Summer

Beginning May 15, low fares will be in effect to San Francisco on all railroads. The Victory and Lincoln highways will be in good condition. Or you may come by air—or by steamship through the Panama Canal.

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CENTER OF THE CALIFORNIA VACATIONLAND

CALIFORNIANS INC., Dept. 505, 703 Market Street, San Francisco
Please send me the free illustrated book: "California Vacations"

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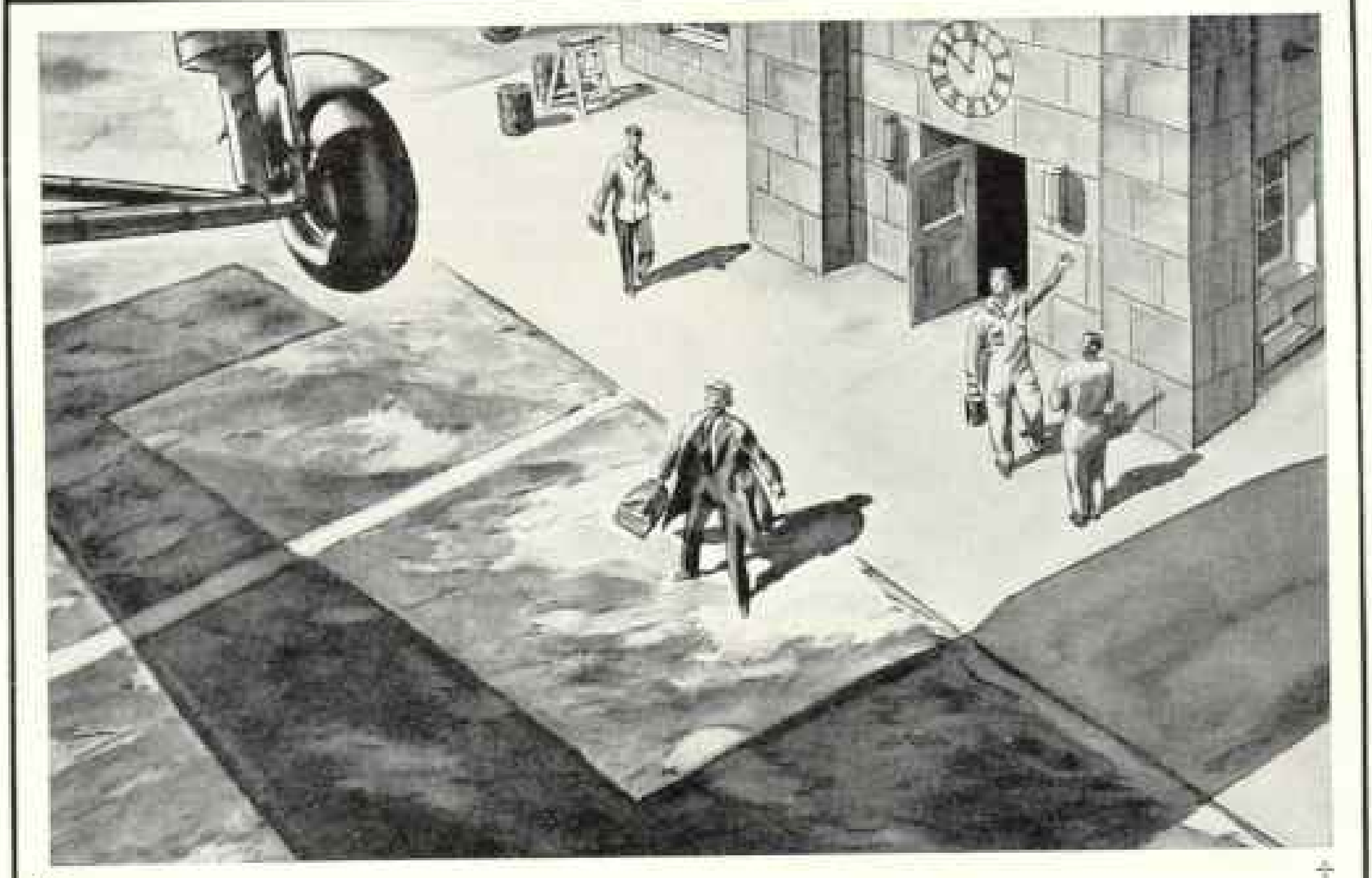


The ten o'clock plane took off at ten . . . then Jim got a Telechron* Clock!

TEN O'CLOCK! Idling motors roar with sudden life. The big passenger plane rolls down the runway. Now it's off — to scud along the skyways and land three hundred miles away — on time. Two minutes late, Jim stays on the ground. His clock was slow!

Modern, efficient America is learning to trust only to Telechron self-starting Electric Clocks. They govern the schedules of the finest air services. They direct the daily activities of thousands of homes and offices. Plugged into ordinary electric outlets, they deliver accurate time—without winding or regulating.

Telechron Master Clocks check generator speeds in power houses and assure Telechron precision. Telechron Clocks and Master Clocks were made for each other. And only clocks marked "Telechron" on the dial can give Telechron service in your home.

At the Telechron dealer's near you (listed in the classified telephone directory) you'll find a rich variety of interesting models. Uprights for table or desk. Tambours for the mantel. Banjos for the wall. Tall grandfather's clocks. Some with mellow chimes, with alarms, with illuminated dials.

Telechron prices range reasonably from $9.75 to $55. The Revere Clock Company, of Cincinnati, manufactures strike and chime clocks with Telechron motors, priced from $30 to $1000.

★ Telechron is the trade-mark, registered in the United States Patent Office, of the Warren Telechron Company.

WARREN TELECHRON COMPANY
ASHLAND, MASSACHUSETTS

THE REVERE CLOCK COMPANY
CINCINNATI, OHIO

No. 320—Mahogany case, 5½" high. $11

Telechron

No. H-803—Colonial design. Mahogany. Chimes. $39
Same pattern. Hour and ½-hour strike. $30

No. 332—Gothic. Mahogany. 8¼" high. $15

Shave Stiff Beards
the small-bubble way

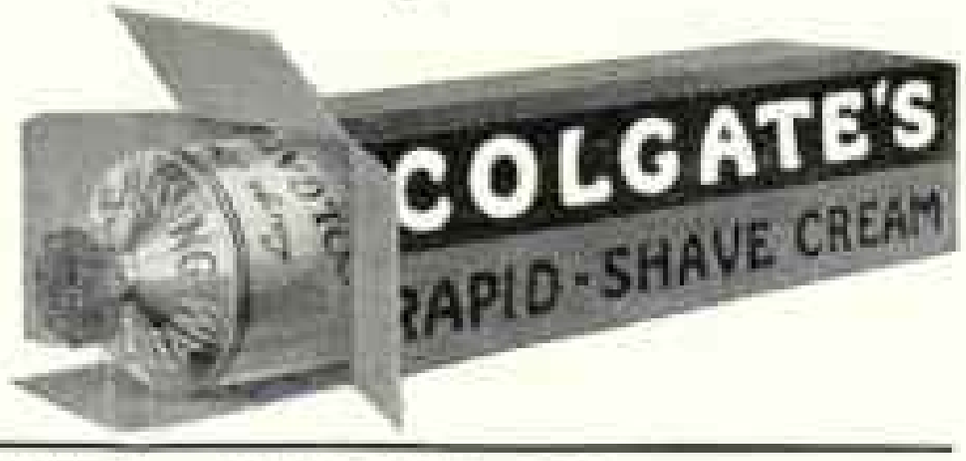
Let Colgate's soften whiskers at skin-line . . . see how much longer shaves stay clean

Stiff whiskers are just like all others . . . once they've been wet to the skin-line with Colgate's. For the razor cuts where the hair is *wet*. That's why Colgate's, by soaking each whisker at its base, leads your razor gently across your skin. Then each hair is cut off *clean*—right at the skin-line . . . with no trace of pulling or tugging.

Colgate's shaves are longer lasting. Here's why: The minute you lather up with Colgate's two things happen; first, the soap in the lather breaks up the oil film that covers each hair. Second, billions of tiny, moisture-laden bubbles seep down through your beard . . . crowd around each whisker . . . soak it soft with water right at the *skin-line* where the razor works. Result: A closer, smoother, longer lasting shave.

FREE!
Colgate's After-Shave

A new lotion. Refreshing... invigorating ...delightful ...the perfect shave finale. Trial bottle free, with your sample of Rapid Shave Cream, if you mail coupon NOW.



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Please send me, FREE, the seven-day trial tube of Colgate's Rapid Shave Cream; also a sample bottle of "After-Shave."

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In so many homes there is someone who, because of age, infirmity or doctor's orders, should not climb stairs. This elevator meets this need and has never failed to give satisfaction.

SEDGWICK Invalid ELEVATOR

Recommended by physicians. Easily and quickly installed. Requires little space. Moderate in cost. Deferred payments plan. Write for illustrated Booklet 153.

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How to Sharpen the Dullest Razor Blade!

Just Grind It With a KEENEX SHARPENER

Instead of merely stropping your razor blade, SHARPEN it with a Keenex Sharpener and you'll always be sure of an easy shave. A real sharpener—not just a stropping machine! Actually grinds a new edge on the dullest razor blade in less time than it takes to strop it. Makes a single blade last a year. Pays for itself several times over in cost of blades. Lasts a lifetime. See it at your Dealer's or write today for Trial Offer for a limited time.

The Keenex Razor Sharpener Co.
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IT'S ASKING A LOT OF A COUPON . . . BUT HERE'S ONE THAT WILL PROTECT YOUR HOME AGAINST

spring rains, summer dirt, mosquitoes, and flies

CHAMBERLIN WEATHER STRIPS
"SINCE 1893-THE STANDARD"

CHAMBERLIN METAL WEATHER STRIP COMPANY, INC.
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Please send me, without obligation, complete information about Chamberlin Home Protection by:

☐ Weather Strips ☐ Screens

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When the Jury "comes in" and you have to "come across"—

THEN *it's too late to Ætna-ize*

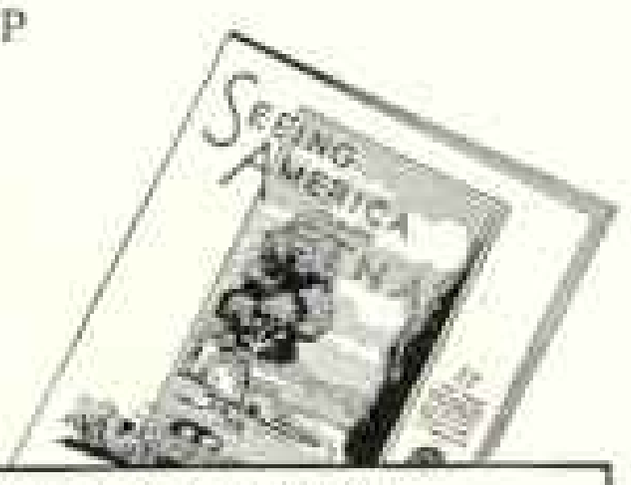
WHEN it comes to a damage suit resulting from an automobile accident, you never know how the Jury will size up the evidence. But you do know that jury verdicts run high.

An Ætna Combination Automobile Policy can be written with Liability and Property Damage limits of *any* amount needed to *protect* you against high damage awards.

Furthermore, an Ætna policy meets every requirement of today's rapidly spreading Financial Responsibility Laws—laws which under certain conditions, *may take away your right to drive*—unless you're Ætna-ized!

25,000 Ætna representatives from Maine to California insure *personal*, friendly service wherever your car takes you.

As an added service for motorists, Ætna is now offering a 48-page book of America's most interesting motor trips. It is called "Seeing America with Ætna" and describes the principal points of interest from the Atlantic to the Pacific. 22 complete tours, each illustrated with a large 2-color map (7½" x 10½"). *Send for it today!*



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SEE THE ÆTNA-IZER IN YOUR COMMUNITY. HE IS A MAN WORTH KNOWING.

The Ætna Casualty and Surety Company, The Ætna Life Insurance Company, The Automobile Insurance Company, The Standard Fire Insurance Company of Hartford, Conn., write practically every form of Insurance and Fidelity and Surety Bonds.

MAIL THIS TODAY

The Ætna Casualty & Surety Co., Hartford, Conn.

Gentlemen: Send me your 48-page Tour Book, "Seeing America with Ætna". I enclose 12¢ to cover mailing costs.

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Where England's Beauty Begins.

Even though Fowey is pronounced "Foy," she is proud of having sent forty-seven ships to the siege of Calais against London's twenty-five. A tumble of ridges and ravines takes you to Falmouth where the Greeks came for hides and the French for revenge.

You can gather wild rose sprays in June on sunny Devon hedgerows. You begin to understand Robert Herrick as you watch the heart of a crimson peony throb and a bee scramble forth a moment later and boom off to another flower.

In palm-bowered Cornwall a day's rain is a news event. You feel as Sir Francis Drake must have felt three hundred years before when you admire the grizzled sea dogs who man the fleets of Britain. The West Countrie of England is as characteristic as Chaucer. An old mansion in which Effingham and Hawkins may have caroused, watches you warily as you drive your ball into a ring of evergreens.

Suggestions, plans, and reservations will be gladly made if you write to

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The price of Guild House Parties includes every necessary expense from time of sailing until you return. Ask for Booklet "E37" of fascinating travel programs.

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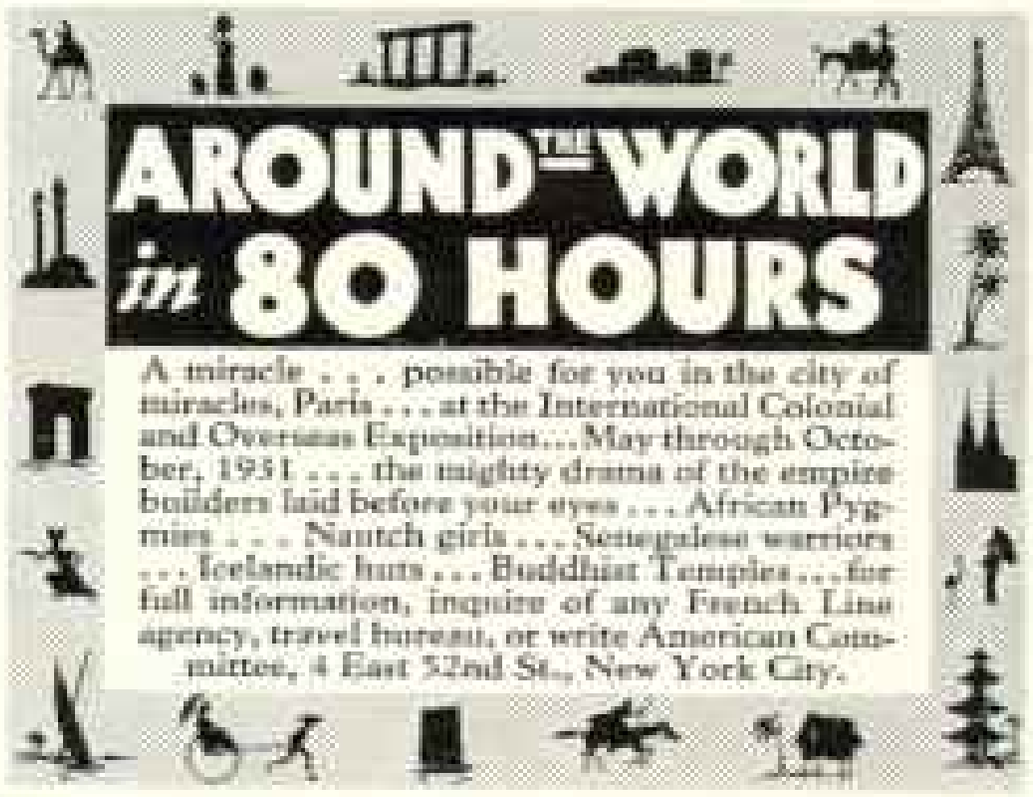
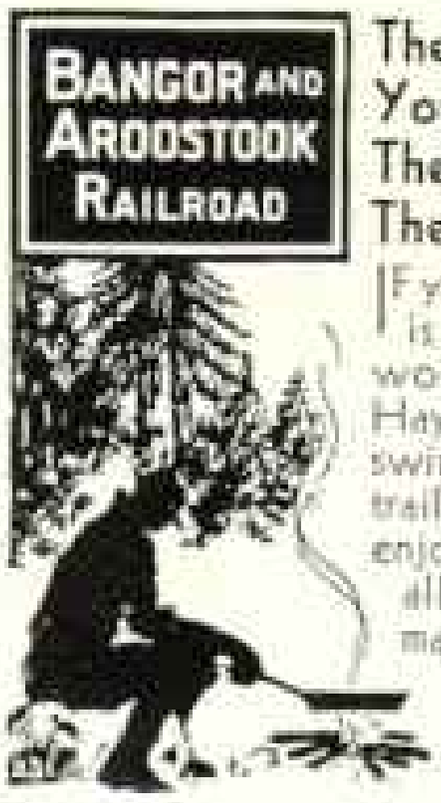




The TIME of Your LIFE in The HEART of The MAINE WOODS

IF you enjoy the outdoors where life is life, you'll enjoy the great Maine woods, lakes, mountains, rivers. Hay fever unknown. Fish, canoe, swim, tramp, climb mountains, follow trails—and sleep in tents, cabins, or enjoy the comforts of a hotel. They're all here; described in our 160-page magazine, "In the Maine Woods." Send 10 cents now for a copy to

Passenger Department
63 Graham Building, Bangor, Maine

"...and you DELIVERED *me right at my* NEW YORK HOTEL"

ALMOST anyone likes to be looked after a little, going into New York. Elderly people and women especially seem to appreciate the way we shoulder all the fuss and bother, baggage and everything.

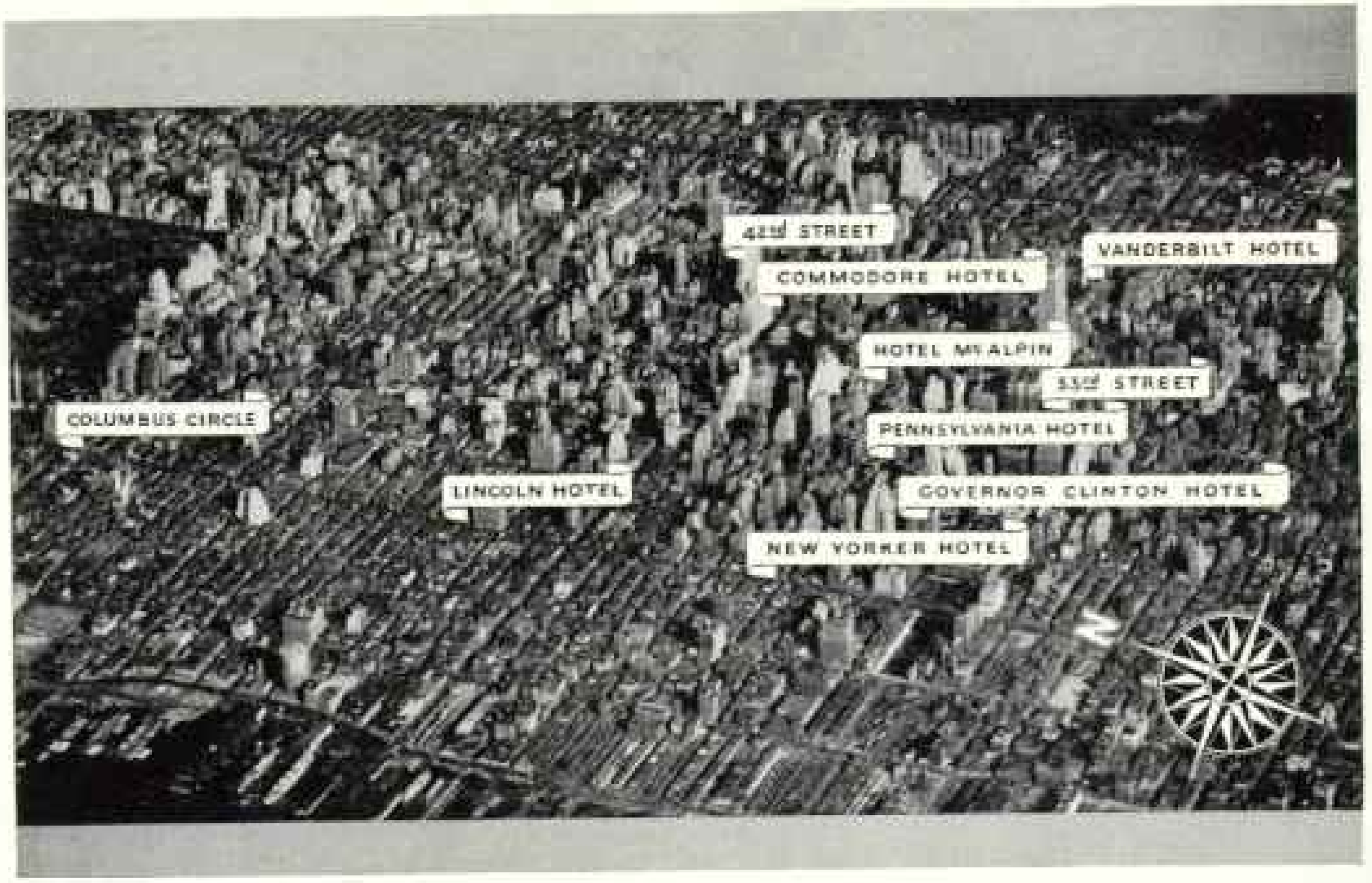
Before the train reaches Jersey City, an efficient young man finds out where you are stopping in New York, tells you about our free coach service and directs you to the coach which will take you nearest to where you want to go. He checks your hand baggage to any hotel where coaches are scheduled to stop, or to the handiest B & O station in New York. When you step off the train, there is the big, easy-riding coach right alongside. In a minute you are on the ferry, crossing the Hudson with the amazing New York skyline before you. Says one recent passenger:

"... you can imagine my appreciation of your service to find myself directly in front of the ——— Hotel, where I was planning to stop. I never touched my baggage after I left Washington, and it is here in my room complete."

Then when you leave New York, your baggage is checked at the most convenient of our stations—at 42d Street opposite Grand Central; Columbus Circle; 33d Street near Broadway; or in Brooklyn near Borough Hall—and it is delivered to you right on the train. The coach picks you up at the station or hotel and whisks you over to the train in no time. The train waits for the coach. If you like, you can go to bed an hour or so before the night train leaves. In the summer, sleeping cars are specially cooled so you may retire in comfort.

Won't you try this service on your next trip to or from New York?

Aeroplane view of New York City, mid-town.



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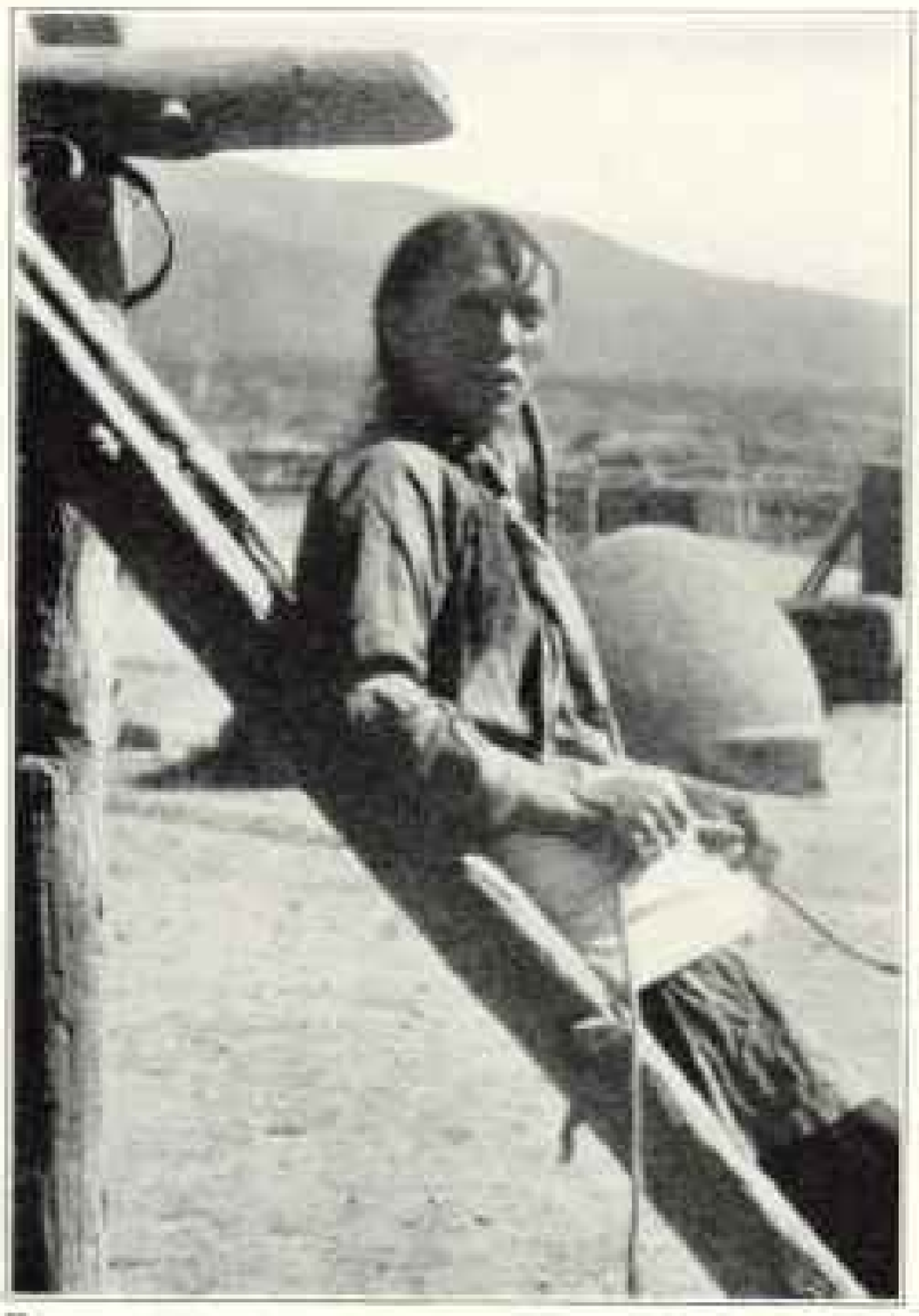
Cincinnati . . . Louisville . . . St. Louis . . . and intermediate points



Now you can go!

—to places you've dreamed of.

To the Far West—even to California where dreams come true.

You can take the Indian-detours —and go to the very rim of Grand Canyon in a Santa Fe Pullman.

You can visit a dude ranch set in a bowl rimmed by painted hills.

You can go—because *Santa Fe Low Summer Fares* bring the Far West scenic regions within your budget.

Just ask for— **CALIFORNIA**
COLORADO
INDIAN-DETOURS
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DUDE RANCHES

clip and mail . . coupon

Santa Fe

W. J. BLACK, Pass. Traf. Mgr.,
Santa Fe System Lines,
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Please send Santa Fe booklets named in National Geographic Magazine.

Name_____

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Leica ...the camera to carry if you want the best of pictures.....

JUDGED by its size alone, Leica is unique. Judged by its mechanical and optical perfection, it is the most remarkable camera of all time Leica is the smallest roll film camera with focal plane shutter. It fits the vest pocket or purse and takes 36 pictures on a single roll of cinema film, double frame size. And pictures enlarge perfectly to 12 x 18 inches or more. See it—at your dealer's—or write for pamphlet 1186.

E. LEITZ, Inc. Dept. 5-G, 60 East 10th St. NEW YORK, N. Y.

Where do YOU stand financially?

NOW is the time to set up your financial program for the next few years—the period in which shrewd, cautious investors by the thousands will build financial independence.

The first step is to determine your present position. Send today for our new free booklet, "Building Financial Independence," which outlines a simple, proven investment program.

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INVESTMENT SECURITIES

Dept. N-131 565 Fifth Ave., N. Y. C. Plaza 3-4200

Waiting for the Stork

Life Publishing Company has graciously permitted the reproduction of William Balfour-Ker's "The Happy Call," first printed in LIFE, December 3rd, 1914.

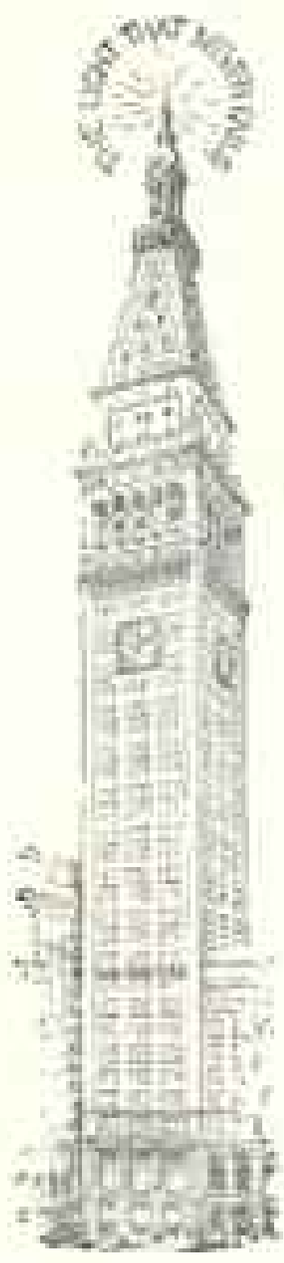
THE nation will pay a special honor to its mothers on May tenth. Presents and tokens of family love will make Mother's Day memorable.

But while more than 2,000,000 women passed safely through childbirth last year, 16,000 died. More than 10,000 of these women might have been saved if they had received proper prenatal and maternity care and skilful assistance. What was not done for them, however, can be done for prospective mothers.

The one way and the only way that a woman can escape some of the hazards of motherhood is to consult a doctor skilled in maternity cases immediately after she receives her first message from the stork, promising a most precious gift.

Or if, for financial reasons, she is unable to consult a physician, she will probably find in most progressive communities a Maternity Center where she will be given sympathetic and expert guidance. She may be told that she needs a change of diet, or more rest. She may require immediate medical or surgical care.

Her doctor or the Center will explain the laws of nature which she must obey in order to avoid needless suffering — perhaps tragedy. And she will be given necessary instructions for safeguarding her baby as well as herself.



Every woman who is to become a mother should have an early physical examination, including a blood pressure test and other tests invariably given in the great institutions which are teaching the world how to avoid dangers and anxieties formerly considered inevitable. These institutions have proved that modern scientific attention will reduce the deathrate among mothers more than two-thirds.

The mother-to-be should remain under her doctor's care, or under the guidance of the Maternity Center, until the stork has kept his promise and this happy message can be sent out—"Mother and child are doing well".

The Metropolitan Life Insurance Company will gladly mail free, "Information for Expectant Mothers", and a booklet describing the work done at a well-conducted Maternity Center. Ask for Booklets 531-N.

METROPOLITAN LIFE INSURANCE COMPANY

FREDERICK H. ECKER, PRESIDENT — ONE MADISON AVE., NEW YORK, N. Y.

The West's tribute to Motherhood—"The Pioneer Woman" by Bryant Baker, at Ponca City, Oklahoma. © Reinhardt Galleries

MOTHER

Her Day, May 10th

Mother is really a young girl at heart. Whether she be eighteen or eighty, on her day give her gifts you would a debutante.

We suggest Whitman's Sampler—from the 17-ounce package all the way up to the great five-pound box. It is a gift of charm and sentiment, yet ultra modern, with a touch of auld lang syne.

Look for it in the stores that display the Whitman's signs.

For name of nearest dealer look under "Whitman's" in Bell Telephone Classified Directory. Any telegraph office will take your order with cash, transmit the order by wire, and deliver anywhere in the United States.

Give

Whitman's

Chocolates and Confections

Salmagundi
A favorite Whitman assortment in a charming art metal box, enjoyed long after the chocolates are eaten.

Prestige Chocolates
Whitman's de luxe assortment of hand-made chocolates packed in a beautiful metal box of unusual shape.

Mother's Day Package
A delightful assortment of Whitman's with a handsome carnation especially for Mother's Day.

YOUR APPETITE SALUTES A MASTERPIECE!

The very first, rich spoonful of Campbell's Tomato Soup quickens your appetite with a bright glow. Here is racy, sunny flavor — the sparkle that refreshes and invigorates. As you continue to enjoy this enticing soup, you decide that it is your favorite. More people accord it that honor than any other soup in the world.

Your choice . . . Every soup you ever want, at its delicious best!

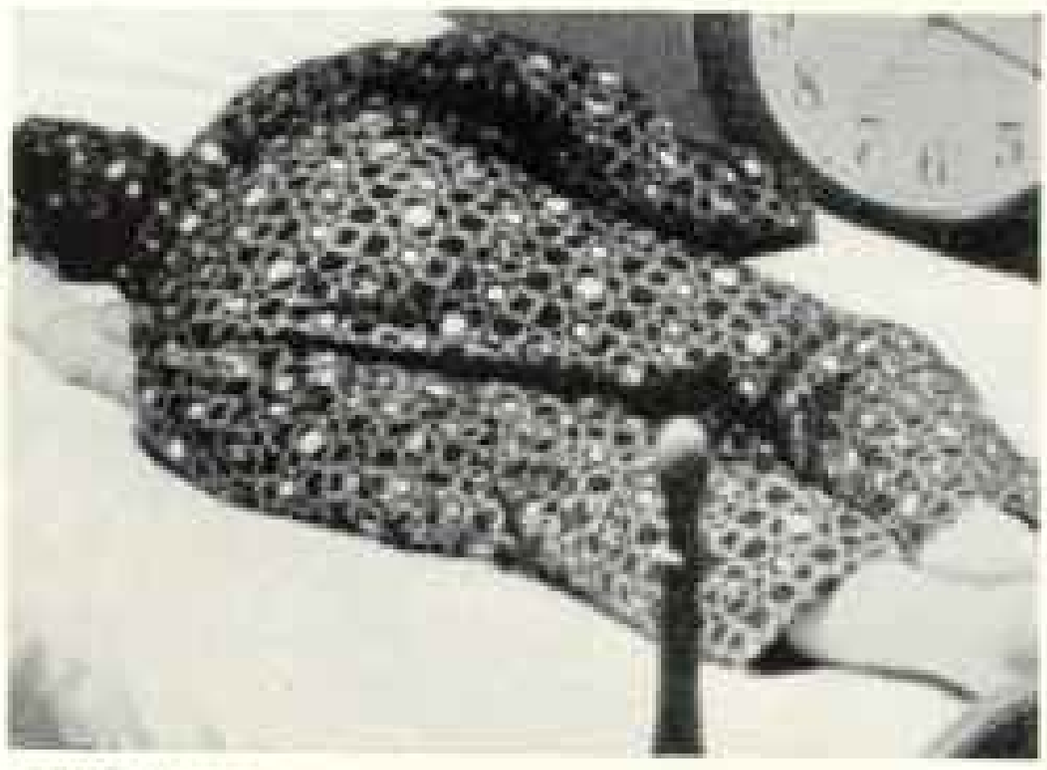
Asparagus	Clam Chowder	Pea
Bean	Consommé	Pepper Pot
Beef	Julienne	Printanier
Bouillon	Mock Turtle	Tomato
Celery	Mulligatawny	Vegetable
Chicken	Mutton	Vegetable-Beef
Chicken-Gumbo	Ox Tail	Vermicelli-Tomato

LOOK FOR THE RED-AND WHITE LABEL

You simply add an equal quantity of cold water, bring to a boil, simmer a few minutes and serve. So easy and convenient.

HEAR THE CAMPBELL'S SOUPS ORCHESTRA EVERY MORNING (8:15 E. S. T. 9:15 Daylight) (7:15 C. S. T. 8:15 Daylight)

Old Ideas Upset . . .



"SWIMMING SPRAWL"—one of the sleeping positions photographed by motion picture camera during the investigation at Mellon Institute.

CAMERA PROVES 10 TO 15 SLEEPING POSITIONS NEEDED EACH NIGHT

Millions of Mattresses now in use are enemies of VITALIZING REST

YOU think you sleep well when you sleep without moving? The less movement, the more restful the sleep? Prepare to discard your time-honored opinions!

A six-year study of sleep, under the direction of Dr. H. M. Johnson, has just been completed at Mellon Institute, Pittsburgh. It was learned that the normal sleeper takes ten or more different positions during the night . . . and changes position from 20 to 45 times!

We "rest in parts." One position rests one set of muscles and organs. Another position rests another group.

Mattresses which sag . . . mattresses which pad down in bumps and hollows . . . these limit the positions which can be taken in comfort. As a consequence, the body fails to get complete rest.

The investigation points to a new type of mattress, the Simmons *Beautyrest* and *Deepsleep*, as ideal. Instead of old-fashioned stuffing, these mattresses have a heart of springy coils, under soft cushioning. They make any sleeping posture completely comfortable. They encourage the kind of rest which builds success!

See the Beautyrest and Deepsleep at any good furniture store. Test their comfort. Isn't this small investment the most sensible you can make?

The famous Simmons *Beautyrest* Mattress on which sleep tests were made. See the inner coils—buried under soft cushioning $39.50

Beautyrest Box Spring to match $39.50

Simmons *Deepsleep* Mattress—another inner-coil type 23.00

Deepsleep Box Spring to match 27.50

Simmons *Ace Open Coil* Spring, suitable with any Simmons mattress 19.75

New *Slumber King* Mattress—a Simmons inner-coil mattress at 16.75

Slumber King Box Spring to match—the first ever offered by Simmons at 18.75

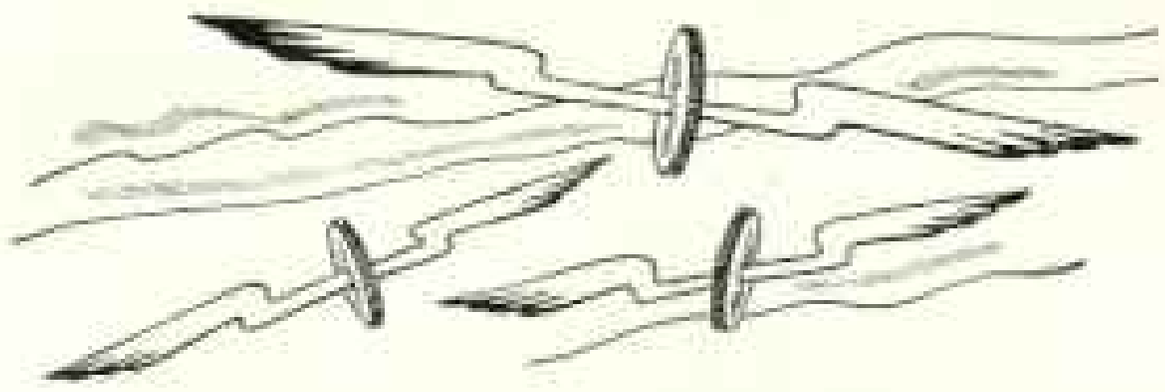
Slumber King Slat Spring 11.75

Send for booklet, "Bodily Positions in Restful Sleep," by H. M. Johnson, Ph. D. It has a message for everyone. Address the Simmons Company, Dept. H-2, 222 North Bank Drive, Chicago, Ill.

SIMMONS

BEDS · SPRINGS · MATTRESSES

PENNIES FOR WINGS



DAY in and day out you take wings by talking over your telephone . . . with friends . . . the grocer . . . the doctor . . . a relative hundreds of miles away . . . and every month you get a bill for this service.

Perhaps a single call made during this period has been worth more to you in time, money or convenience than the whole amount of your bill. But the telephone company makes its charge — not on any such basis — but on what it costs to give the best possible service to its customers.

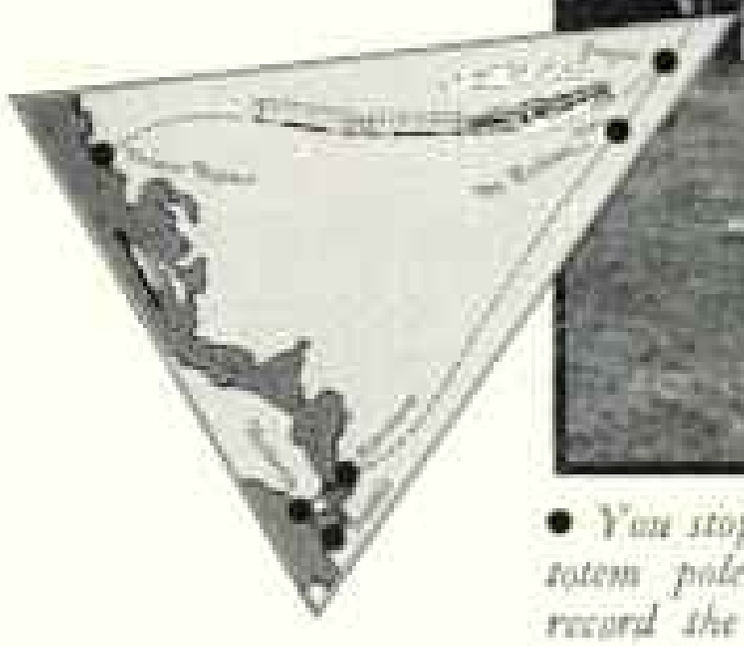
The Bell System has voluntarily taken the position that the telephone business is a public trust. Its policy is to give the best possible service at the least cost consistent with financial safety. The more telephone subscribers there are, the more valuable telephone service becomes to each subscriber. Unlike most other businesses, the telephone industry does not enjoy reduced costs as the number of customers increases. On the contrary, the trend is upward. To offset this, the American Telephone and Telegraph Company takes advantage of every scientific advance and aid to efficiency which can possibly reduce service costs — and these savings are used for the benefit of the subscriber.

The twenty-four Associated Companies in the Bell System are pledged to this ideal . . . to give constantly better telephone service at the lowest possible rates . . . to reduce, by every means in their power, the number of pennies that you pay for wings.

★ *AMERICAN TELEPHONE AND TELEGRAPH COMPANY* ★

The famous 5 day TRIANGLE TOUR *of the Canadian Rockies* • *and* KITWANGA *strange land of the Totem*

• *Here is the route of the 5 day Triangle Tour. Canadian National also operates a daily north and southbound steamship service connecting Vancouver, Victoria and Seattle.*



• *You stop at Kitwanga long enough to see these totem poles. Fascinating and grotesque, they record the history of the Indian aristocracy.*

HERE is a trip through the scenic heart of the Canadian Rockies—and a 600-mile ocean voyage through the famous Inside Passage where the mountains, themselves, come down to the sea.

See Mt. Robson, armoured giant of the Canadian Rockies .. visit Jasper National Park—golf on its championship course—ride over mountain-trails. Travel on to Kitwanga, strange land of totem poles and the famous "River of Clouds." Cruise from Prince Rupert, through the fjords of the Pacific Coast, to Vancouver—returning to Jasper by rail along the roaring Fraser and Thompson River Gorges. Or reverse the order and start at Vancouver. Write for complete information.

Free—to you, at your club or your church—a choice of 50 motion picture travel-stories on Canada. Films, projector and operator provided on application to any of the Canadian National offices below.

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The Largest Railway System in America

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DETROIT
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DULUTH
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KANSAS CITY
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MINNEAPOLIS
604 Marquette Ave.

NEW YORK
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314 So. Broadway

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SAN FRANCISCO
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1329 Fourth Avenue

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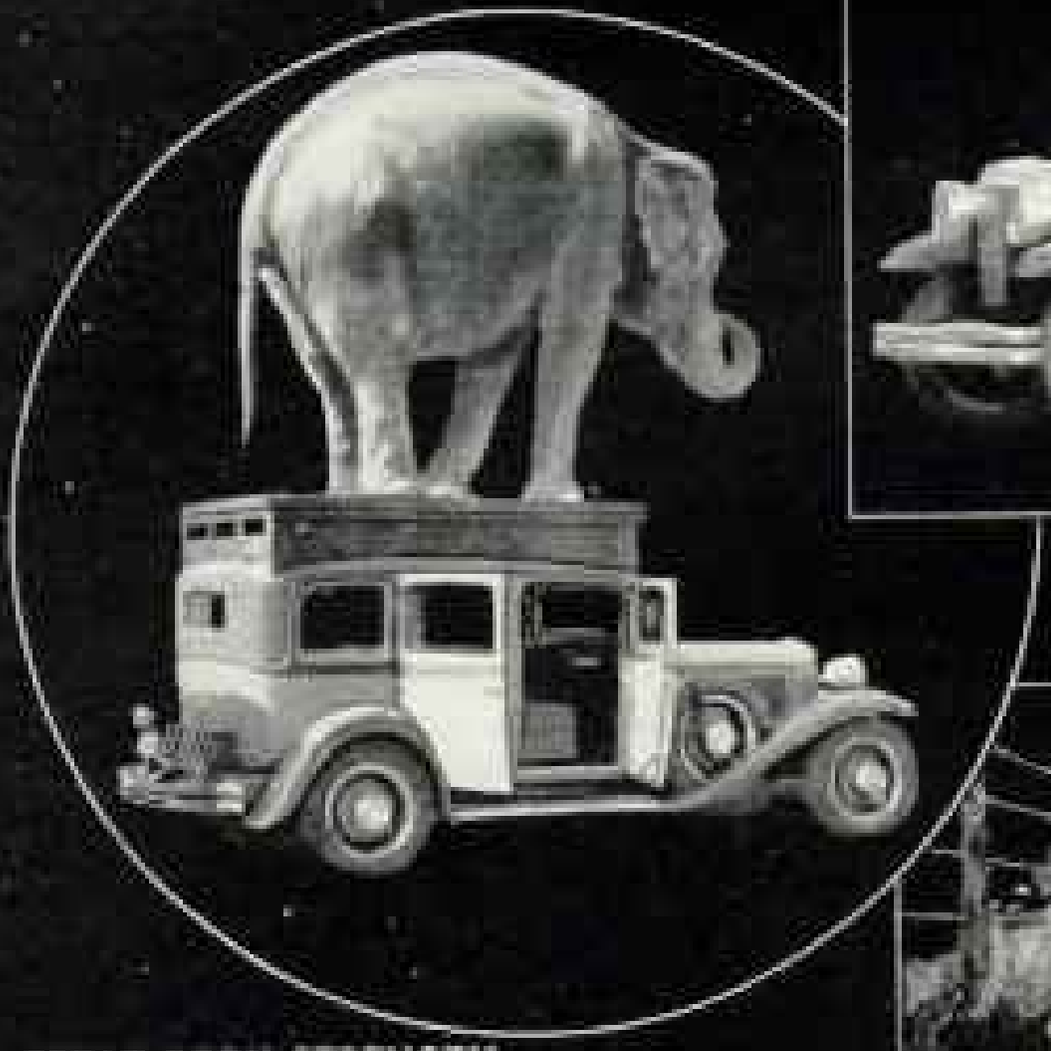
901—15th St., N. W.

CHRYSLER
STRAIGHT EIGHTS



GREAT BODY STRENGTH

DUAL HIGH GEAR PERFORMANCE

THE SAFETY OF PERFECT BALANCE

GREAT BODY STRENGTH: Imagine a motor car able to support on its roof the live weight of a 10,000-pound elephant! A Chrysler Eight did this very thing at Coney Island, N.Y., before a crowd of witnesses who could hardly believe their eyes. Five tons of elephant stepped upon a platform resting on the roof—and nothing happened—nothing bent, nothing cracked, nothing gave way. All doors and windows opened and closed with normal ease, as if there were no strain on the car at all. It was an odd test for a car to go through, but a convincing one — proving the matchless strength and safety of a Chrysler Eight *steel* body. **THE SAFETY OF PERFECT BALANCE:** Another remarkable test pictured here demonstrates the additional safety Chrysler Eights possess because of their low center of gravity. The photograph shows a Chrysler Eight being driven along the side of a sharp embankment, just to prove the real safety assured by low-swung weight and *perfect* balance. Note the sharp angle at which the car is tilted—enough, it would seem, to make *any* car turn completely over, but the *Chrysler Eight* ran safely along on all four wheels! **DUAL HIGH GEAR PERFORMANCE:** Neither pictures nor words can adequately express the great difference between Chrysler Eight performance and other motor car performance. You must sit at the wheel yourself to know what it means for a car to have *Dual High* gears. With an exclusive Multi-Range 4-speed transmission, the Chrysler Eights have *two* high gears—one high gear for phenomenal pick-up and agility in traffic, and another high gear for the open road. Moreover, a quick, quiet gear shift enables you to shift with ease, up or down, *at any speed*, without hesitation or clashing.

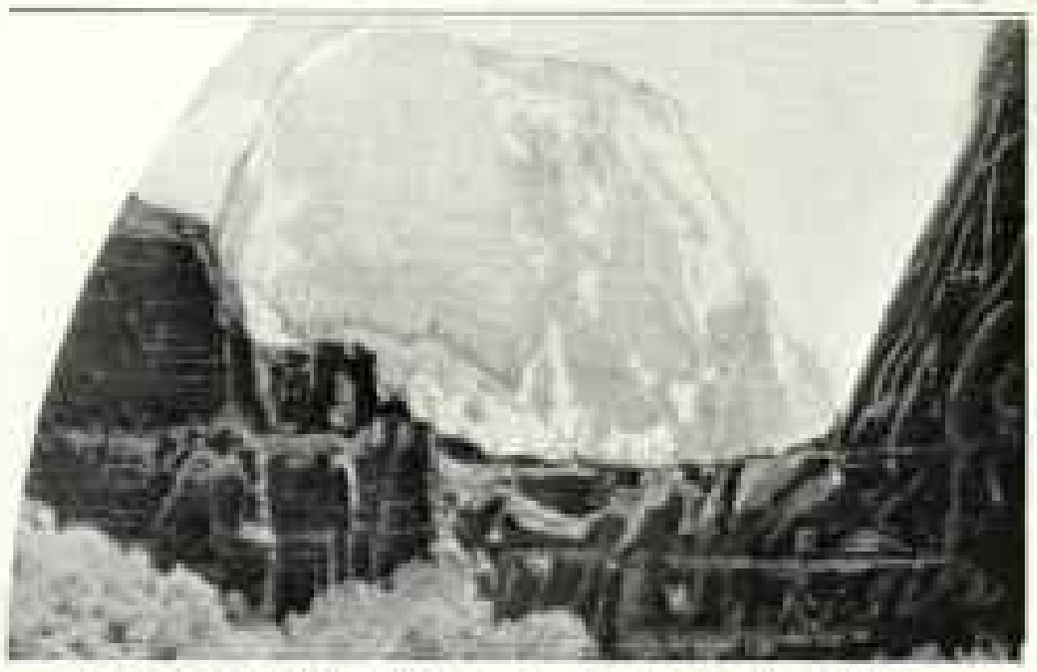
. . .

THE IMPERIAL EIGHT HOLDS TWELVE A.A.A. CONTEST BOARD STOCK CAR SPEED RECORDS IN ITS CLASS FOR ONE TO FIVE MILES

CHRYSLER SIX . . $885 to $895
CHRYSLER "70" . $1245 to $1295
CHRYSLER EIGHT $1495 to $1665
CHRYSLER IMPERIAL EIGHT $2745 to $3145
(Custom Models $3150 to $3575)

All prices f.o.b. factory; special equipment extra.

NEW....DIFFERENT



The Great White Throne, Zion National Park, Utah

Nature's Wonders in *Endless* Variety

GROUPED around Salt Lake City are no less than 62 national parks and monuments, many of which are within a day's ride of this cradle of western historic lore. Zion, Bryce Canyon, Grand Canyon, Yellowstone, Grand Teton National Parks, and Cedar Breaks, to mention but a few, give you unforgettable pictures of Nature's most heroic moods. Come and get new and different recreation of body and mind in this region of endless wonders.

Salt Lake City itself, with its colorful background of dramatic history, and its singular beauty, is acclaimed by world travelers as one of America's most interesting and distinctive cities. Seven canyons lead directly from city *boulevards* into the magnificent heights of mountains which rival the scenic Alps. Golf and all outdoor pastimes provide new invigoration in the clear, bracing air nearly a mile above the sea. Bathing in Great Salt Lake...visits to nearby mining camps...contact with interesting historic scenes, will reward you with rich memories. When you come this summer, stop at least three days.

SALT LAKE CITY

Chamber of Commerce, Dept. C-1
Salt Lake City, Utah.

I am thinking of visiting Salt Lake City this summer and would like the *free* pictorial booklets.

Name .....

Address .....

City .....

State .....

France

Don't stay at home with the envious . . . be envied yourself!

Paris, the incomparable, with her glittering string of week-end resorts . . . Le Touquet, La Baule, Dieppe, Dinard . . . Deauville for the racing season; polo, golf, tennis, yachting . . . days and nights watching that miniature and spectacular drama of Empire building at the Colonial and Overseas Exposition ▼ Biarritz, St. Jean de Luz, Hendaye . . . a trio to shrug slim shoulders at the North and dare it to be as chic ▼ The Riviera, even smarter in its informal sun-tanned summer than in its exotic winter incarnation ▼ The Pyrenees, frosty against the blue . . . Gavarnie of the glaciers, Luchon where we dine in luxury tossed up 4000 feet on a wind-swept ledge, Font Romeu and the highest golf course in Europe ▼ Mont Blanc and the route des Alps, a gorgeous motor road with passes Napoleon crossed, cutting the roof of the world . . . baths and cures at Evian, Aix les Bains and dozens more ▼ If we like the little and quaint . . . picture-book Brittany of the villages and the pardons . . . if we want history . . . Roman France, the Chateau Country, Alsace-Lorraine ▼ Everywhere, railroads and motor buses under the same management to carry us quickly, cheaply, comfortably . . . to stay at big hotels with corresponding prices, or little inns where we can't believe the bills without a microscope.

Information and literature on request

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General Representatives
INTERNATIONAL WAGONS-LITS, 701 FIFTH AVENUE, NEW YORK, *OR ANY TOURIST AGENCY*

The New Way to keep a Travel Diary

Make Home Movies as you go with this $75 Ciné-Kodak

THOSE jolly people in Switzerland. Those charming places in Italy. Will they gradually fade in your memory like receding shores from the stern of your home-bound ship?

Keep them forever—in movies. Movies that you make yourself with a Ciné-Kodak.

Back home you can enjoy at the flick of your finger all the excitement of your trip abroad.

What a marvelous and easy way to preserve your travels forever. If you can take a simple snapshot you can easily operate the Ciné-Kodak Model M.

At tourists' favorite points abroad you will find Eastman experts ready to finish your Ciné-Kodak films without extra charge.

Stop today at your dealer's and see the Ciné-Kodak Model M. Price $75. Kodascope projectors as low as $60. Many dealers offer an easy payment plan.

Ciné-Kodak Model M, the lightest camera made for 100 ft. of 16 mm. film, costs only $75, including carrying case.

Mail coupon for free
HOME MOVIE BOOKLET

Eastman Kodak Company, Rochester, N. Y.
Please send me FREE illustrated booklet telling me how I can easily make my own movies.

Name _____

Street _____

City _____ *State* _____

N. G. 3

Ciné-Kodak *Simplest of Home Movie Cameras*

TUFTED
Pro-phy-lac-tic

IF you are open-minded on the subject of which tooth brush is best for you, these may be the most important 215 words you have ever read. So vital is a healthy mouth in preventing disease.

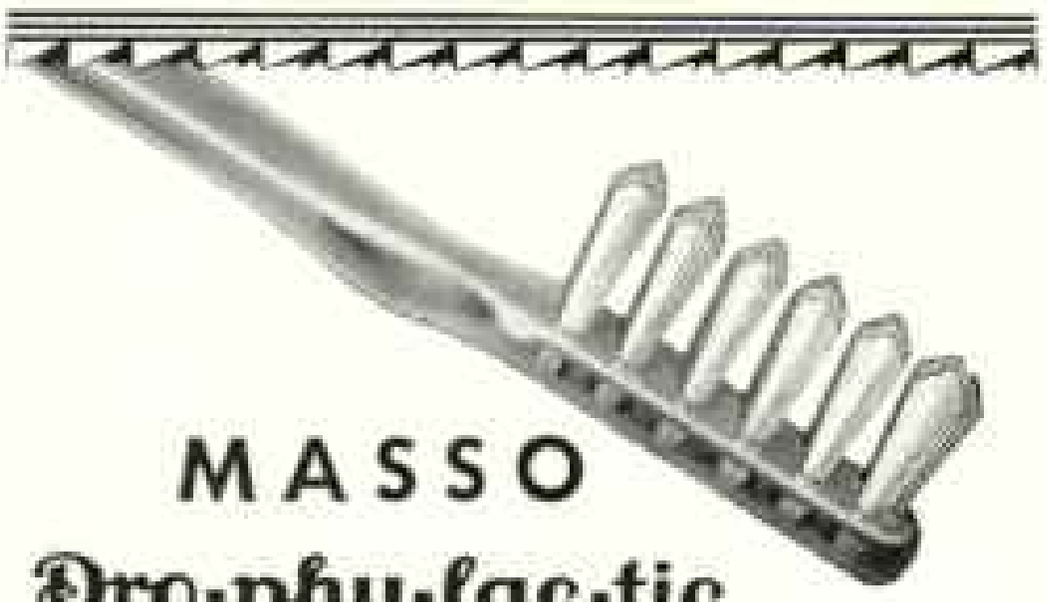
We make two styles of tooth brushes, illustrated. Both were designed by leading dental authorities. The Tufted Pro-phy-lac-tic is medium size. The Masso Pro-phy-lac-tic is the newest small type. We are glad to sell either, although our profit on the Masso is slightly larger because it contains less bristle.

The Masso is a wonderful brush for those who will clean teeth *three minutes* by the clock, as dentists direct. But we cannot conscientiously recommend it, if you brush your teeth in a hurry. Instead, our professional advice is to use a Brush *large enough* to clean, polish, and massage, in the reduced time. Obviously, hasty brushers will get more and better cleaning with a brush that has more bristle.

Buy a Tufted Pro-phy-lac-tic and use it for just one week. See the improvement. Note how much better it does the job. How thoroughly and yet how quickly! Observe, too, how the famous tufted toe reaches and cleans the molars (back teeth).

No matter what brush you are using now, try a Tufted . . . You will thank us for the suggestion.

PRO-PHY-LAC-TIC BRUSH CO., *Florence, Mass.*



MASSO
Pro-phy-lac-tic

New Vigor *from* Food Iron

Here's a delightful solution to the problem of getting enough food iron into your children's diet. You know how they need it. And how the very foods richest in iron are so seldom palatable.

Food Ferrin is a vitalizing, palatable food. So rich that one tablespoonful gives as much food iron as a whole pound of fresh spinach. Naturally it enriches the blood and makes the children grow. Red lips and rosy cheeks are quickly apparent. By building up the blood, the living forces of the body are built up. The whole body flourishes and every function is improved.

Not only children, but adults benefit from Food Ferrin. Mothers especially need this organic iron. It builds up good red 100% blood which sustains all the vital forces.

You can get Food Ferrin, together with the full line of Battle Creek Sanitarium Health Foods, at the authorized Battle Creek Dealer, your Grocer, Druggist or Department Store.

FREE diet advice

At Battle Creek we maintain a staff of dietitians to advise you on any diet problem. Send your child's diet problem on the coupon below and mail to Ida Jean Kain, our chief dietitian. She will send you suggestions for your child's individual diet, without charge. Naturally, no diagnosis of any disease will be attempted. Consult your physician for that. "Healthful Living", a most helpful book written by a leading nutrition expert, will also be sent free. This offer is to assist you in home life and without obligation. The advice may be followed with utmost confidence whether you use the foods in this system or not.

MAIL COUPON TODAY

Ida Jean Kain NG-5-31-283
THE BATTLE CREEK FOOD CO., Battle Creek, Michigan.
I want to avail myself of your Free Diet Service. My child's diet problem is checked below. Also send "Healthful Living."
☐ Constipation ☐ To Gain Weight ☐ Meal Planning
☐ Pre-School Age Menus. (Check problem)

Name _____
Address _____
City _____ State _____

FOOD FERRIN

New Food Iron

Look at this

BARGAIN

FOR A

DOLLAR AND

A QUARTER

● *This Johnson's Wax Floor Duster* **$1.25**
One half pint Johnson's Liquid Wax .50
Total value **$1.75**

BOTH FOR $1.25

● If you want to have radiant floors then you need Johnson's new Dry Floor Duster. It comes as the result of years of experimenting by the highest authorities on floor finishing and maintenance in the world. At last they have produced the perfect floor duster—the mop with the gold stripe.

● You'll like the way it slides under low furniture—never scratching. There are 10½ ounces of superior yarn in its head (that's a lot of yarn). The metal thread at the handle won't get loose. You can reverse the head—Bend it over—Take it off and wash it. It will come up smiling.

● Housekeeping editors say: Don't use oil on floors if you want to keep them clean. Oil collects dust. Wax your floors occasionally, then, when necessary merely dust them off.

● Here is the perfect duster for every kind of floor and here is the famous Johnson's Wax that goes with it.

FEATURED BY HARDWARE, GROCERY, DRUG AND DEPARTMENT STORES EVERYWHERE

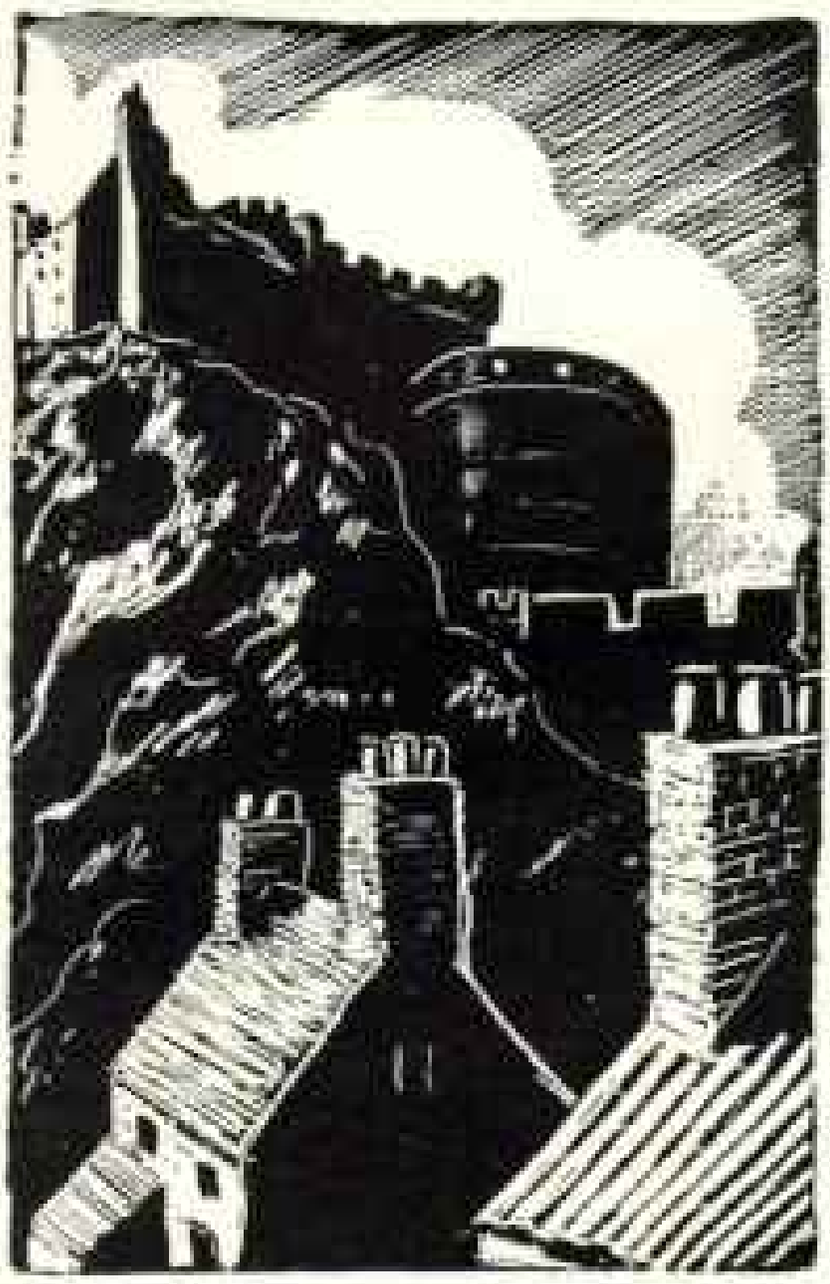
If your dealer can't supply you, send coupon.

S. C. Johnson & Son, *Dept.* NG3, Racine, Wisconsin. ● Please send me the new Floor Duster ($1.25) and ½ pint of Johnson's Wax Polish (40c). Total value, $1.75, at the special introductory price of $1.25 for both. ☐ check ☐ money order ☐ stamps.

Name _____

Address in full _____

SEE BONNIE SCOTLAND



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Take the FLYING SCOTSMAN . . . superb train of modern luxury . . . at 10.0 a.m. any week-day from King's Cross Station (London) and in just 8¼ hours you will be in Edinburgh. Glorious Edinburgh . . . Athens of the North they call it . . . well named too . . . the rugged beauty of the castle high upon the rock is not excelled by the Acropolis. When you have seen and left the beauty of Edinburgh, go north to mighty Stirling . . . then further to Balmoral, highland home of the King and Queen. Scotland makes poets . . . you will know why when you have seen the glorious Trossachs and the Western Highlands . . . Scotland makes golfers too . . . you will understand this also when you have played at St. Andrews. Call or write for new descriptive booklet 68.

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OF ENGLAND AND SCOTLAND

LAKES · MOUNTAINS

and SEASHORE *promise*

a COOL SOJOURN *in*

ITALY

EUROPE this summer? Italy by all means! Only in Italy can you be reasonably sure of summer skies.

Lake Como, Lake Maggiore . . . the Alpine valley-stations . . . and the most renowned beaches of all Europe. Summer is the time to see them!

You bathe at the Lido when fashion gathers there. You paddle through the Grand Canal . . . under velvet night skies. And discover in full tide the charm of Viareggio, Rapallo, Rimini—magic names to those who love the wine-dark sea.

But know the cities, too! In Florence you may nibble frozen ices in the open piazza cafes . . . and then loiter nearby in cool stone galleries amid the treasure of the Renaissance. In Rome, after the pictures in the Borghese, drive at tea-time through the Pincio Gardens . . . and next day swim at Ostia, where the great pines march into the sand.

A 10% reduction in rates has been ordered in all Italian hotels for the summer. Allow us to help you perfect your plans, in co-operation with your tourist agent. Our office is operated by the Royal Italian Government for that purpose and that purpose alone. Itineraries, hotels, routes . . . valuable and impartial data on all phases of travel to make the way easy and economical. Make it a resolve not to miss Italy—and begin now by writing for a most interesting book on Italy.

ITALIAN TOURIST INFORMATION OFFICE

Squibb Building, 745 Fifth Avenue, New York City

How you can make your stucco home

LOOK LIKE NEW

HAS your Portland Cement stucco home become stained and streaked with dirt? It need not remain that way. You can easily and inexpensively make it look as it did the day it was finished. More than that, you can protect it against future disintegration. • Have your stucco home painted with Medusa Portland Cement Paint. This paint will give the stucco its original beauty. *Unlike other paints, it becomes a homogeneous part of the stucco,* forming a hard, permanent, cement-like finish which is impervious to moisture. Furthermore, it resists the chemical action of lime and alkalies, which causes other paints to scale, peel and chip off. • Medusa Portland Cement Paint is inexpensive, easily applied, easily washed and can be had in white, blue, green, cream, stone gray, pearl gray, or red. • Medusa Portland Cement Paint is also widely used for painting exterior and interior concrete and masonry surfaces, such as basement walls, warehouses, industrial buildings, swimming pools, bridges, etc. Send the coupon for complete information on Medusa Portland Cement Paint.

MEDUSA PORTLAND CEMENT COMPANY, 1002 Engineers Building, Cleveland, Ohio

Manufacturer of Medusa Gray Portland Cement (Plain and Waterproofed); Medusa Waterproofing (Powder or Paste); Medusa White Portland Cement (Plain and Waterproofed); Medusa Portland Cement Paint, and Medusa-Mix, the Masonry Cement

MEDUSA PORTLAND CEMENT COMPANY, 1002 Engineers Building, Dept. C, Cleveland, Ohio. Gentlemen: Without obligation or cost, please send me complete information on Medusa Portland Cement Paint for painting Portland cement stucco.

Name .....

Address .....

City ..... State .....

Above: Coldwell "Twin-Thirty" motor lawn mower and roller. Mows and rolls simultaneously 6 to 8 acres a day on one gallon of gasoline. Riding sulky may be had at extra equipment.

Investigate the ..Coldwell

Better Lawns at Less Expense

LIGHT rolling combined with the mowing saves the expense of rolling . . . . A healthy, smooth, velvety turf is the result.

The 1931 Coldwell models are available in a wide range of sizes. Advanced features in design and careful workmanship in assembling the finest materials available insure Dependable, trouble-free performance.

Sales and service stations all over the country.

Full particulars and demonstration on request.

Hand — Horse

COLDWELL

Dependable Lawn Mowers

Gasoline — Electric

COLDWELL LAWN MOWER COMPANY, NEWBURGH, N.Y., U.S.A.
In Canada: Taylor-Forbes Co., Ltd., Guelph

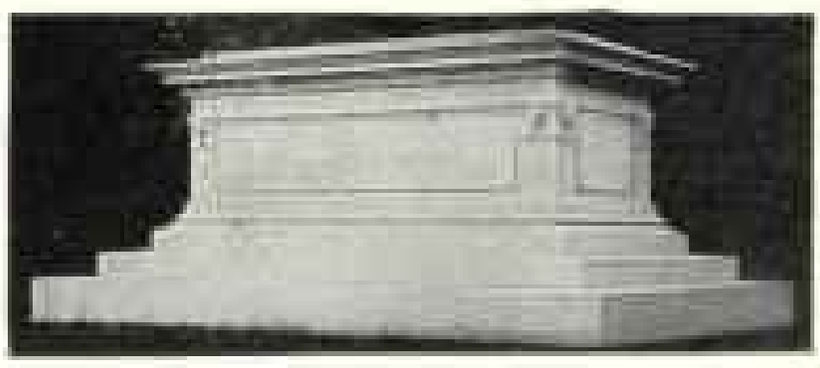
Change Your Breakfast

To this delicious old-fashioned whole wheat cereal

IT'S just the golden wheat kernels, flaked to tissue thinness so that they cook wholesomely done in 3 to 5 minutes. But what a wealth of health and deliciousness this cereal brings! Here's that nut-sweet, whole-wheat flavor . . . that crisp, whole-grain texture. Here, too, is nature's cure for faulty elimination. Try this delicious, old-fashioned whole wheat cereal tomorrow morning.

Pettijohn's

Rolled Wheat with All the Bran



Tribute . . .

Booklet "J" on Request

EXCELLENCE of workmanship and beauty of design have made Memorials by Harrison the acknowledged commemoration.

Harrison Granite Co., Inc.

Established 1865

MONUMENTS MAUSOLEUMS

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Branch Offices:
Chicago, Detroit, Pittsburgh, Minneapolis
Works: Barre, Vermont

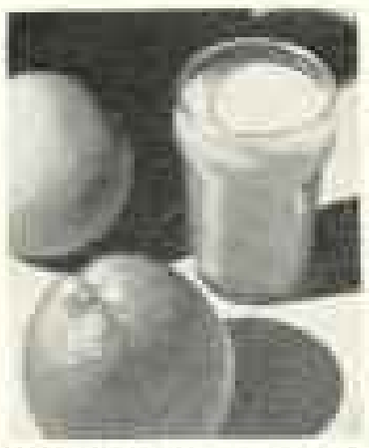
HARRISON MEMORIALS

COUNTRY-WIDE SERVICE

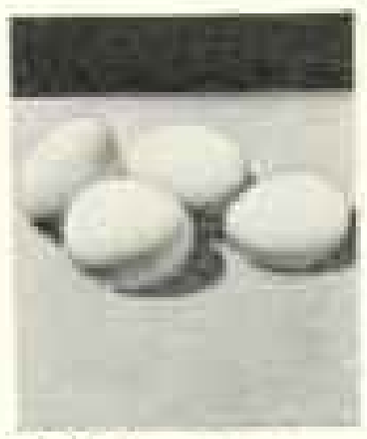
Baby Teeth are *important*... Mother

Neglect them and your child may pay the penalty in later life. Here is some helpful information.

MILK is abundant in the mineral which makes up the major part of the tooth.



ORANGE JUICE, the best known source of vitamin C; aids in keeping gums healthy.



EGGS, the best natural food source of the sunshine vitamin —also rich in iron.

Do these three things . . . to have strong, healthy teeth

1. At the lecture some suggestions of what is good for you. 2. *Use Pepsodent twice a day.* 3. *See your dentist twice a year* (children oftener).

NO mother needs to be told how easily the first (baby) teeth decay. What many do not know is the trouble these teeth, *if neglected*, may cause in later years.

To be safe is so simple. Take your child to your dentist every few months. Between times make sure your child uses Pepsodent tooth paste night and morning—without fail.

Pepsodent—especially for children

Pepsodent tooth paste is especially recommended for children. The cleansing agent in Pepsodent was developed after thousands of experiments and many years of research. It polishes enamel to a brilliant lustre. It is *twice* as soft as the polishing agent commonly used in tooth pastes. *Pepsodent is supremely safe*, as hundreds of laboratory tests on teeth have proved conclusively.

Pepsodent tooth paste is the most effective way of removing the troublesome film from teeth, which is the major cause of decay and other serious troubles.

Film holds germs of decay against the teeth. To remove germs you must remove this dangerous germ-laden film.

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NOW *at your nearest druggist's*

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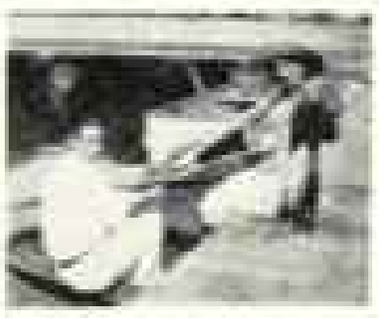

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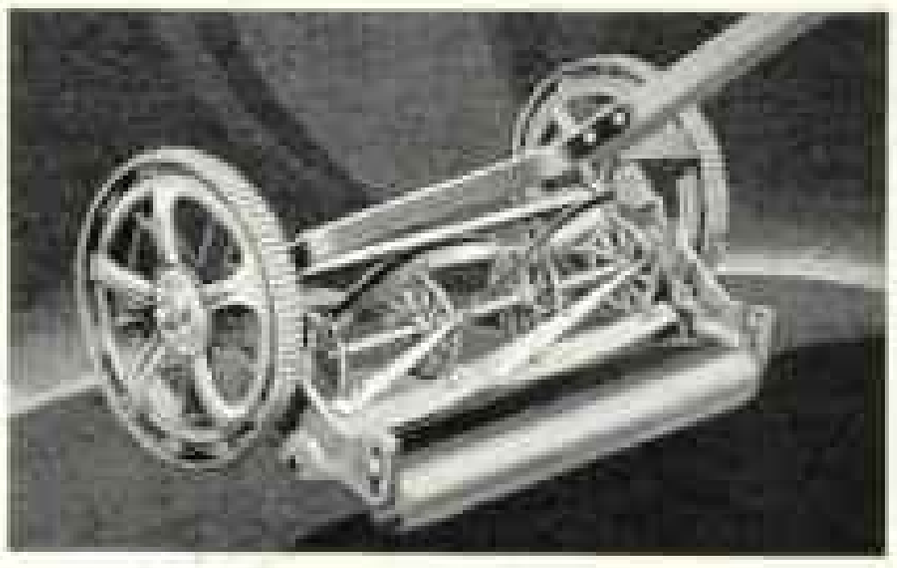

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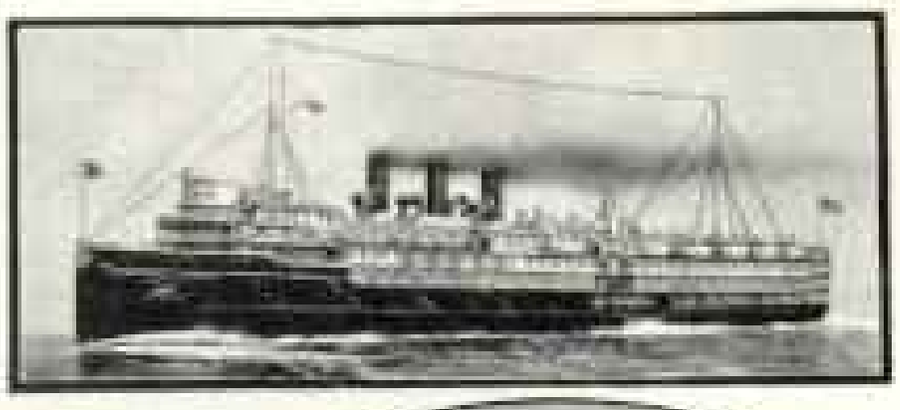

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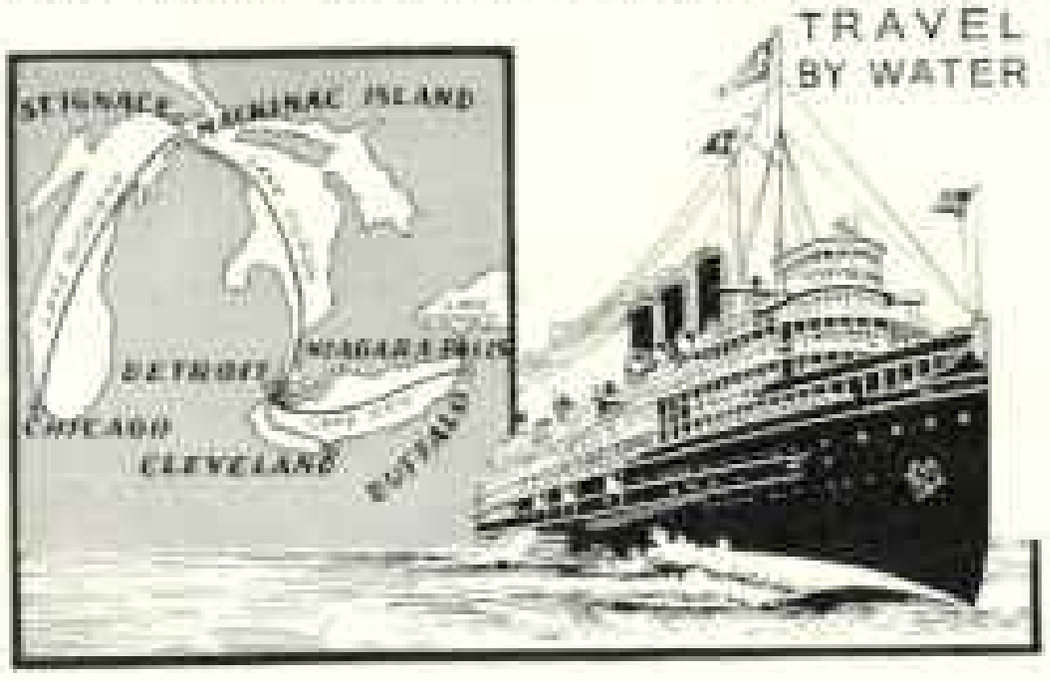

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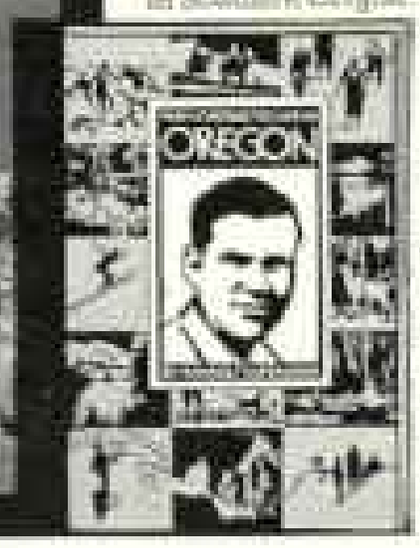

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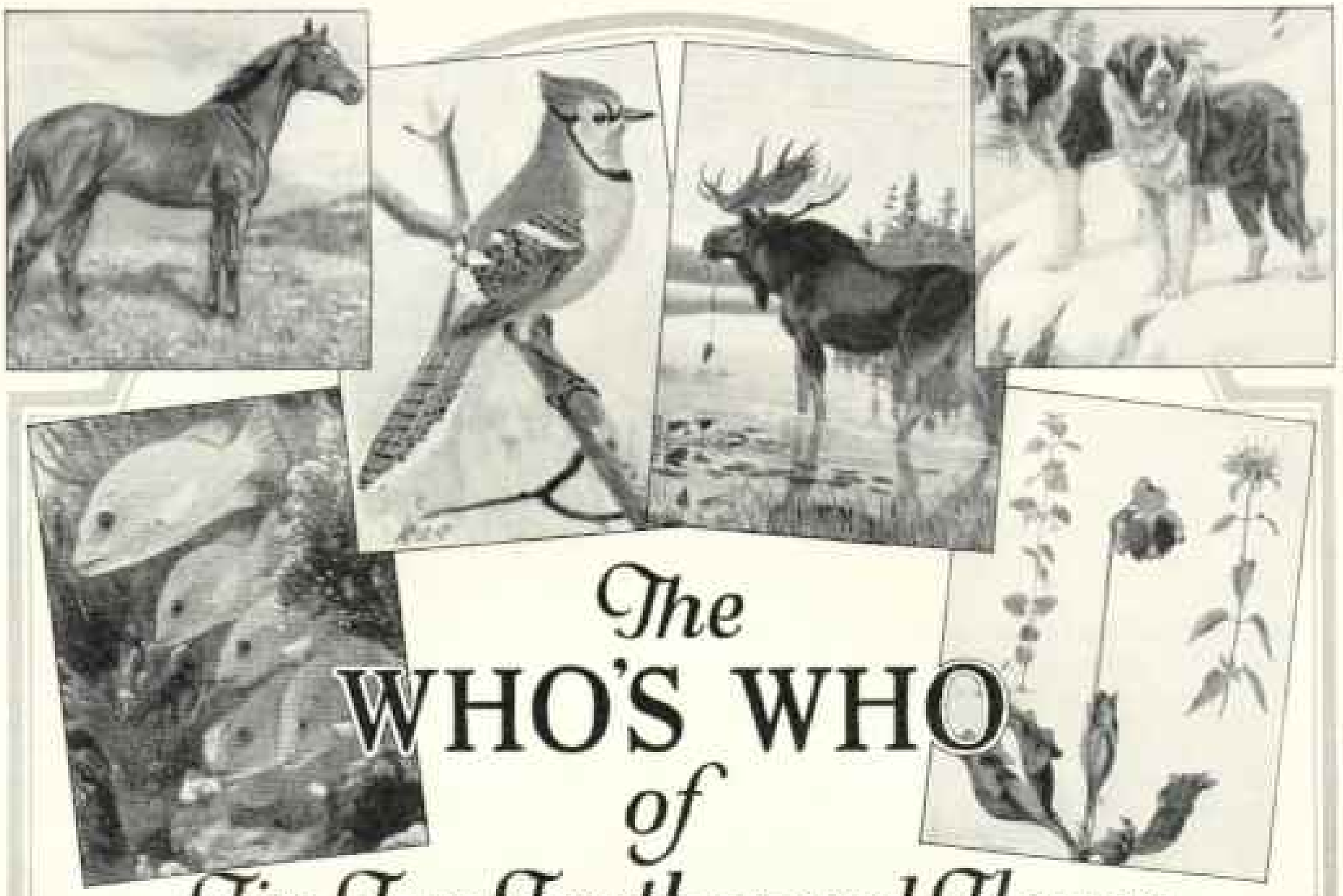

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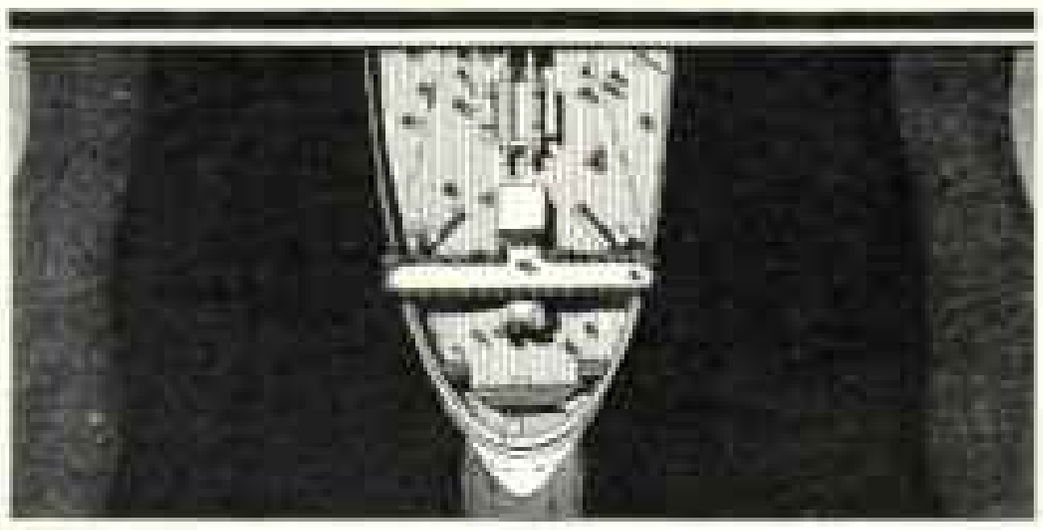

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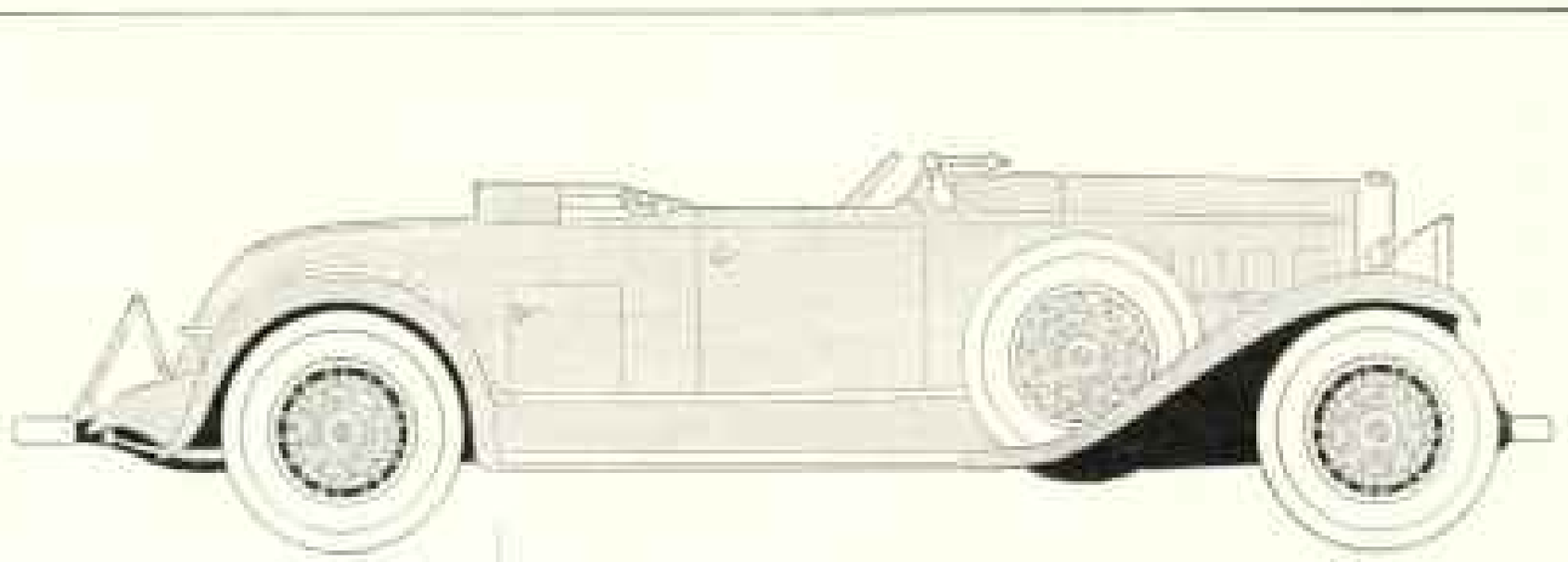
LA SALLE V-8



The new La Salle V-8 applies to eight-cylinder design the significant advancements in engine, chassis and coachwork developed in creating the new V-8, V-12 and the V-16. Shown above is the La Salle 2-Passenger Roadster, coachwork by Fleetwood. Price range, $2195 to $3245, f. o. b. Detroit. The liberal G. M. A. C. payment plan is recommended to all purchasers.

CADILLAC MOTOR CAR COMPANY, DETROIT, MICHIGAN

DIVISION OF GENERAL MOTORS

QUESTIONS THAT YOU SHOULD ASK IN SELECTING AN ELECTRIC CLEANER

"Does this cleaner combine the greatest possible speed of cleaning with the greatest ease?"

If a cleaner cleans slowly, it wastes your time. If it is hard to operate, it exhausts your strength. Any cleaner you select should combine the greatest possible speed of cleaning with the most effortless use.

The Hoover not only removes more *dirt per minute* —cleans more quickly and thoroughly—than any other cleaner, but it also requires less human energy for its operation. These facts have been demonstrated in exhaustive, impartial scientific tests. The Hoover is able to achieve these results because of its amazingly efficient cleaning principle, Positive Agitation, which flutters loose embedded grit with incredible rapidity; and because its perfectly-balanced, smooth-running, leisurely operation needs almost no effort on the part of the user. ¶ A wise precaution in the selection of a cleaner is to compare its action on your rugs with the cleaning performance of a Hoover. Let results alone guide your choice. Every Hoover dealer welcomes the opportunity to make such a comparative test. Simply telephone your Hoover dealer for a home trial of The Hoover. The New Hoover is only $6.25 down, complete with dusting tools; balance monthly. Liberal allowance for your old electric cleaner.

$ ONLY 6.25 DOWN

THE HOOVER COMPANY, NORTH CANTON, OHIO

The oldest and largest maker of electric cleaners. The Hoover is also made in Canada, at Hamilton, Ontario

There is a permanent Hoover representative in your neighborhood. He is bonded and trustworthy. He will call on all Hoover users to give a free inspection of Hoover cleaners. We hope Hoover users will see him when he arrives

The HOOVER

IT BEATS AS IT SWEEPS OR AS IT CLEANS ON A CUSHION OF AIR

PRESS OF JUDD & DETWEILER, INC.
WASHINGTON, D. C.

Sheaffer presents the "Autograph" ...in Lifetime® pens and pencils

Now the Autograph pen...protection against loss in addition to the Lifetime® guarantee! Sheaffer's newest Lifetime® bears your signature, exactly as you write it, engraved on its solid 14-karat gold band. More than ever this Lifetime® companion is moulded to your individuality, now incorporating even the characterful shadings of your signature. Through life your Autograph pen will serve as signature identification—and Balance® will make writing as natural as a gesture of your hand.

SAFETY SKRIP, SUCCESSOR TO INK. SKRIP-FILLED, 50¢ TO $10. Sheaffer's answer to writing fluid problems—a brilliant fluid that cannot clog or thicken—in the non-leakable Safety Skrip package. Saves furniture, rugs, clothes, keeps fluid fresh, makes all pens write better.

AT BETTER STORES EVERYWHERE

The ONLY genuine Lifetime® pen is Sheaffer's; do not be deceived! Other pens may be guaranteed against defects, but Sheaffer's Lifetime® is guaranteed against everything excepting loss for your lifetime. Sheaffer's Lifetime® pens from $7; Sheaffer's Lifetime® 14-karat solid gold-band Autograph pens with duplicate of your actual signature (serving for identification) from $12.75. Autograph pencils from $9. Other Sheaffer pens from $3.

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No. 803, Desk Stand, $3. Lifetime® Balance® pens, from $7; others lower.