

VOLUME LXI

NUMBER FIVE

THE NATIONAL GEOGRAPHIC MAGAZINE

MAY, 1932

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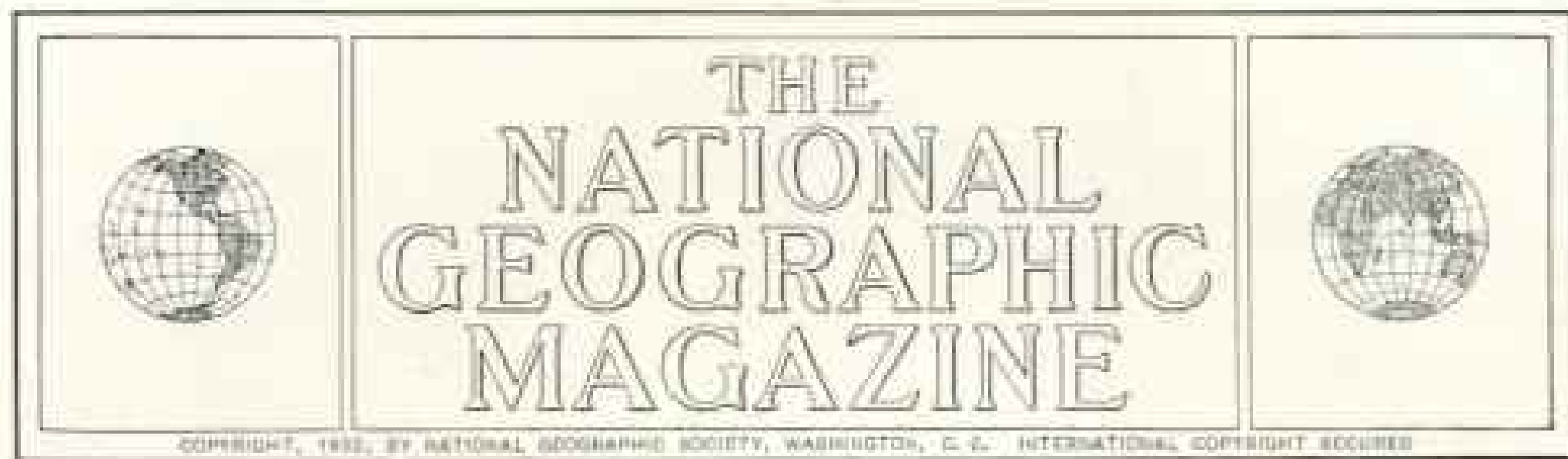
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HASHIME MURAYAMA

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
HUBBARD MEMORIAL HALL
WASHINGTON, D.C.

\$3.50 A YEAR

50c THE COPY



OHIO, THE GATEWAY STATE

By MELVILLE CHATER

ARTICLES OF "UNDER THE SOUTH AFRICAN UNION," "MICHIGAN, MISTRESS OF THE LAKES," "MOTOR-COACHING THROUGH NORTH CAROLINA," ETC., ETC., IN THE NATIONAL GEOGRAPHIC MAGAZINE

SIXSCORE years ago a State's fathers founded its capital in a forest. This was the way of it:

Lyne Starling, Alexander McLaughlin, John Kerr, and James Johnston, earnest-eyed men all, clad in buckskin, rifles under armpits, ranged over the forested bank of the Scioto River to determine which tract they, the owners, would offer as a site for a capital.

These four and their fellow Ohioans were separated from the seaboard by a one month's horseback journey. Westward lay some two thousand miles of prairie, desert, and mountain. The great river looping to southward had never been stirred but by drifting flatboat or by Indian paddle. In the surrounding hardwood forests—oaks, poplars, elms, beeches, nut trees, not to mention that subsequent celebrity, the buckeye—deer and bear roamed to the edge of ax-cleared oases. Machinery, if so it could be called, was confined to some occasional sawmill whose crank had come by pack horse from beyond the Alleghenies.

Their backwoods domain was all their own and they were proud of it. It stretched northward to a great lake and eastward and southward to a great river. It seemed to Starling and his friends that those two water bodies demarked Ohio's terrain as a sort of gateway that future settlers must pass through to spill over into the West.

The general assembly had decided to abandon Chillicothe and Zanesville, former village capitals along the "Trace" Ebenezer Zane had cut through the forest fifteen

years before, and select a centrally situated seat of administration where, as it was augured, pioneers' future highways would cross. The legislators would make for their Gateway State a central key. And, since the far traversal of virgin forests and that of virgin seas have somewhat in common, why not call their new capital Columbus?

THE STATE HAS GIVEN THE NATION EIGHT PRESIDENTS

So said, so done. Encircling its rustic Statehouse, Columbus arose. Its founders' auguries proved true beyond their dreams. Their descendants lived to see its surrounding terrain crossed, not only by western-sweeping waves of immigrants and by some forty intersecting roads—one of which, the National Road, or "Pike," became the nucleus of a vast east-west trade track—but by five trunk railways, of fifteen divisions, radiating in all directions. And their more remote descendants now know Columbus as an airways plexus and a transfer point on transcontinental airlines.

You will find no slums in Columbus. On the other hand, you will find old residential streets of patriarchal dignity that in a more hurly-burly city would long since have yielded to jerry-built apartments or to some blatant "gasoline row." Farther out you will find scenic drives, one of them stretching for 21 miles along the Scioto River, or the outstanding municipal airport, or the gracious setting of Ohio State University, with its 15,000 students. (There are, in fact, five universities or col-



Architects, Graham, Anderson, Probst & White

Photograph courtesy Harold T. Clark

THE TERMINAL TOWER DOMINATES CLEVELAND'S BUSINESS DISTRICT

The Tower, 52 stories high, or 708 feet above the concourse level, is flanked by associated skyscrapers and by the Union Station, just under it, with its coordinated ramps, causeways, and plexus of sunken railway tracks. In the background is the winding Cuyahoga; in the foreground, the Public Square, with its Trafalgarlike column, the Soldiers' and Sailors' Monument, to the left. The wide street running diagonally across the foreground is Superior Avenue, one of the main business thoroughfares (see, also, illustrations, pages 530 and 531).

leges within the metropolitan area.) And everywhere you will be apt to sense that here is a city which has retained something traditional and warming, as of those former days when gentlemen doffed their hats to other gentlemen in passing.

That the town they originally designed as a capital should one day have a pay roll whereof manufacturing and construction work represents 40 per cent would have surprised Starling and his fellow planners. Even more amazed would they have been to know that in time a little town some seventy miles west of them would inaugu-

rate the world's aircraft era; or that eight Presidents would be sent to the White House from their log-hut State; or that its agricultural advent, as typified by the wheat sheaves on its great seal, would be eclipsed by undertakings that to-day place Ohio fourth as to value of her products among manufacturing States in the Union.

The capital's original Statehouse was replaced in 1839 by the present one. Its Doric frontage leads on to a rotunda floor where some 5,000 marble blocks are laid to form an unusual pattern. It is that of a sunburst springing outward from a series

of concentric circles. Each sun ray represents a State, and the circles denote, in successive order, territory unorganized at the Union's birth, the Louisiana Purchase, territory added by the Mexican War, and the Constitution, which incloses the whole.

Perhaps a similar design might be applied to Ohio—that of rays diverging from its centrally placed capital to surrounding towns and cities; and perhaps the story of Ohio is best envisaged by having this started from that central standpoint, where four men once gathered in the wilderness to select a site for a capital; for it symbolizes, that rustic capital, the great State that sprang from log huts in a western forest.

TOUR OF THE STATE BEGINS AT EAST LIVERPOOL.

It was somewhere on the Ohio's banks near East Liverpool, one Saturday morning, that our car overtook a barelegged boy, with fishing rod and worm can, who was whistling a well-known tune to the effect that Old Man River must know something 'cause he don't say nothing; he just keeps rolling along.

What Old Man Ohio has known, as silently he rolled along through the centuries, would make an epic. Far back he caught multiplying footfalls while the red man heaped his mounds. Then he heard those footfalls fade and the palefaces' footfalls augment toward the stretching of bridges, the piling up of cities. And thus it will go on for successive civilizations, each one straining in accomplishment beyond the last, while "he just keeps rolling along."

In 1667, or thereabouts, La Salle learned of a great river, the "Hohio," which if followed for many moons would lead to what the explorer inferred to be the Vermilion Sea whose farther shores washed China.

Later, "La Chine" appeared amid Canadian place names in derision of the great explorer's anticipation of his proximity to China. But more than a century and a half were to elapse before the Celestial Kingdom's name became actively identified, in a manufacturing sense that changed China to "china," with the banks of the Ohio.

At East Liverpool there rose before us the massed alignment of kiln stacks that reveal that chinaware center as a veritable potters' town. We visited one plant among many, for there is no lack of choice at East Liverpool or, for that matter, throughout

the State. Ohio has some 490 ceramic plants and an accompanying output that places her foremost as a ceramics producer in the United States (see page 572).

Later on, at Cincinnati, Zanesville, and other centers, we were to watch the creation of local "ware" that has achieved high art levels in designs as young as yesterday or as old as Crete's peacock-feather vase. In contrast, East Liverpool represents a more exclusively utilitarian mass production that, in a single factory, has sometimes reached 10,000,000 "dozens" a year.

Yet it is far from that type of mass production whereby raw material slides over endless belts, issuing at last in machine-made symmetry. Few casual five- and ten-cent purchasers of, say, an East Liverpool coffee cup realize that by the time it was ready for shipment it had passed through 52 pairs of hands. The potter is still irreplaceable; he is a refreshing survival of family trade skill; and it is not uncommon at East Liverpool to see three generations of a Staffordshire "Five Towns" family working side by side.

HOME OF THE MOUND BUILDERS

Mother Earth plus two fashioning hands, the potter's basic formula is as simple as it is ancient. One cannot date Ohio's earliest molders of clay vases and animal-effigy pipes except by estimating from local tree-growths that the associated mounds have been in use during less than a thousand years.

Many a schoolboy of a past generation upon opening his elementary American History was thrilled to discover on page 1 a mysterious folk called the Mound Builders. That there were two serpentine mounds in Ohio and a somewhat similar one in Argyllshire, Scotland, suggested to him far peregrinations of that folk on their tumulus-rearing mission. Mysterious, did we say? Not, at any rate, to Solomon Spaulding, early Ohio settler, for he announced his belief that the Mound Builders were none other than Israel's lost tribes!

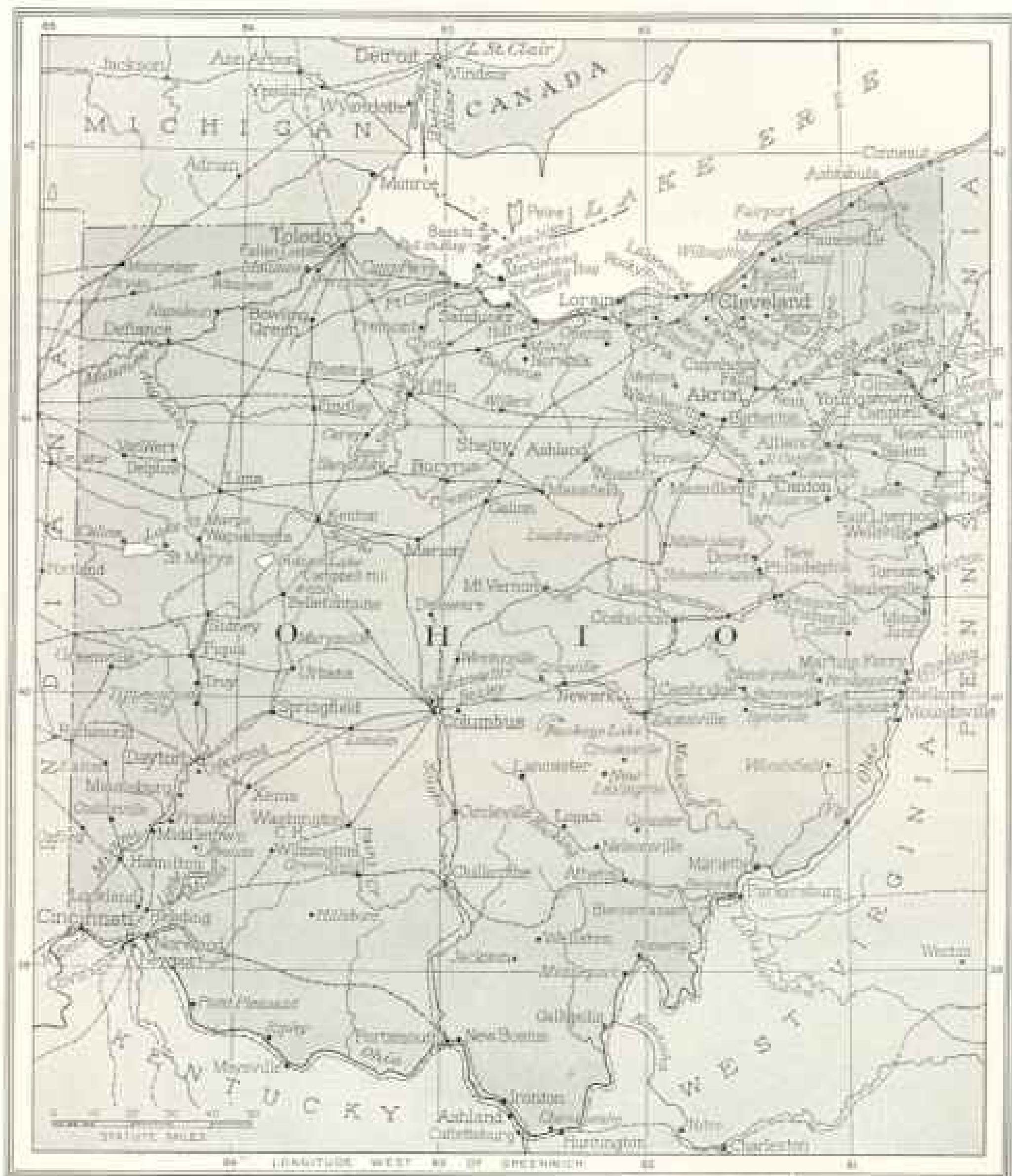
But some forty years ago, in view of the Smithsonian Institution's survey of North American mound areas, the "mysterious-people" theory vanished in the face of the deduction that all mounds and earthworks then investigated were attributable either to the historic American Indian tribes or to their prehistoric ancestors. Fanciful theories concerning the builders'



Photograph by Jacob Gayer.

STEEL BARGES SUPPLANT WOODEN BOATS ON OLD MAN RIVER

In size the modern barges range from simple flatboats 50 feet long to covered ones 200 feet long, or open barges that can carry from eight to ten loaded railroad freight cars. They transport a variety of heavy bulk products—coal, steel, ore, stone, gravel, sand, cement, etc. A stern-wheel tug with coal barges, near East Liverpool.



Drawn by James M. Darley

OHIO RANKS THIRTY-FIFTH IN AREA, FOURTH IN POPULATION, AMONG THE STATES OF THE UNION

While Ohio's mineral wealth is chiefly of the so-called baser sort, its annual production of limestone, coal, and clay products is more than double the value of the United States output of gold and silver, and its oil and gas equal the value of South Africa's annual diamond output.

mathematical accuracy and their teeming population also went into the discard. It has been estimated that Ohio's mounds, and no other State contains a greater number, could have been erected by 4,000 men within a single generation.

We followed "Old Man River" downstream to where southern Ohio lies within

the crook of his vast elbow. There the harbor town of Portsmouth offers a convenient gateway to roads radiating into the State's mound regions: northward to Chillicothe, Circleville, and Newark, and northwest, past Portsmouth's near-by Tremper Mound, through Adams County to Lebanon and Miamisburg (see page 543).



Photograph courtesy Harold T. Clark

THE HEART OF CLEVELAND, SEEN FROM THE AIR

In the foreground is the Municipal Stadium, on the lake front, opened in 1931, and used for outdoor opera and other civic activities. Its seating capacity is 76,000. In the left background is the Terminal Tower (see, also, pages 526 and 531). The long, low building between it and the Stadium is the Cuyahoga County Courthouse, located in the Mall area.



Photograph by Jacob Gayser

DOORWAY OF A LAKE SHORE BOULEVARD RESIDENCE, CLEVELAND

As in many American cities, the older fashionable residential sections of Ohio's largest municipality are giving way to trade, and newer ones have been established in such sections as Shaker Heights, Lakewood, and Bratenahl. Architecture and landscape effects in the Ohio metropolis are of a high order.



531

Photograph courtesy Harold T. Clark

A PANORAMA OF CLEVELAND, FROM WATER FRONT TO HORIZON-LINE TOWNS

In the foreground is part of the city's 14-mile lake front, protected by a breakwater about six miles long. A large ore-carrier (see, also, illustration, page 532) is just entering the mouth of the Cuyahoga River.



Photograph by Ewing Galloway

CLEVELAND IS THE WORLD'S HEAVIEST HANDLER OF ORE

Ore freighters, ore docks, steel mills whose life blood is made from the red ore—these are dominant notes in the city's mighty symphony of smoke, iron ore, and steel. These basic industries of iron and steel, together with a host of others depending on them, fill Cleveland with a throbbing industrial life and make up about one-half the total value of its manufactures. Of Ohio's eight lake ports, Cleveland, Conneaut, and Ashtabula predominate in ore handling, Toledo and Sandusky in coal handling, while the total of ore and coal passing through them is normally 68,000,000 tons a year.

The word "mounds" hardly conveys a picture of what one finds at Newark and, again, near Lebanon. Rather, "military breastworks" comes to mind, as you survey Newark's vast earth-walled inclosures, one of which is so large that it has been utilized as a golf course that offers prehistoric bunkers aplenty.

The same thing may be said of Lebanon's near-by earthworks, whose name, Fort Ancient, conveys one conception of their former use. This configuration stretches in gigantic zigzags $3\frac{1}{2}$ miles long around a steep tongue of land over Little Miami River, its walls rising to a height of from 10 to 25 feet and spreading at base

to a varying thickness of about three times those figures. Fort Ancient has also been described as a temple and as a hunting trap—theories wherein the irrelevancy of a wall sometimes 70 feet thick at base repels one in favor of regarding it simply as the remains of a fortified town.

Circleville's name reveals the shape of the earthwork on which that town was built. Miamisburg, in its gigantic conical mound, offers a suggestion of what, according to Homer, was raised over heroes' ashes on the plains of windy Troy. Of Chillicothe's mound groups, one great rectangular inclosure formed part of a World War camp, while that town's so-called



Photograph courtesy Harold T. Clark

INSCRIPTION ROCK, ON KELLEYS ISLAND, IS AN ABORIGINAL MASTERPIECE
On this limestone boulder is one of the finest remaining petroglyphs in the United States. Kelleys
Island is also remarkable for its glacial groovings.



Photograph by Jacob Gayne

EDGEWATER BEACH PROVIDES HEALTHFUL RECREATION
Cleveland's 14-mile water front offers excellent bathing-beach facilities.



Photograph by Herbert

PICKLES BY THE MILLION

Each vat of this Cleveland plant holds 800 gallons, and the pickles, covered with brine, are kept in them until ready for packing. Few cities show such wide diversification of industries as Cleveland, whose metropolitan area embraces nearly two out of three of all the Nation's industry types and three out of four of all those found in Ohio. Of food and kindred products it makes more than 440 varieties.

Hopewell area has yielded copper art forms, such as the swastika, serpent's head and quatrefoil, of amazingly cultured workmanship.

Of effigy mounds, Newark has its eagle, Granville its opossum or alligator, while Warren and Adams counties have a serpent each. Perhaps the most impressive work Ohio's mound builders left behind them lies amid the latter county's wild remoteness—that great convoluted snake, more than 440 yards long, sunning itself on a high promontory, with an oval formation, supposedly an egg, at its gaping jaws (see illustration, page 543).

A PASTORAL PANORAMA

More and more, as we had followed "Old Man River" southward, our preconception of Ohio as a flat State had been forgotten in the sight of striking boundary bluffs that subsided, mile after mile, into

a charmingly undulated hill country. Indeed, one must near the State's center before occasional vistas of ironed-out appearance reveal that the Allegheny Plateau is giving on to plains.

It was glacial drift, filling up valleys and grinding down contours, that constituted the ironing-out process. From Ohio's prairie-flat northwest to its hill-rumpled southeast, one may trace the effective limits of that drift, as if scanning the pathway of some supernal steam roller.

It is often difficult, while motoring through the State, to realize that you are in average only 850 feet above sea level; and your enduring impression, far from one of flatness, is a picture of gentle contours; of graceful hillsides and of dipping dales, murmurous with streams; of lush tobacco fields giving on to orchard-bosoming slopes where red farmhouses and pied cattle look down, as from a promontory,



THE BIRTHPLACE OF PRESIDENT U. S. GRANT

The cabin in the little village of Point Pleasant, 25 miles from Cincinnati, where General Grant was born in 1822, is only a replica of the glass-enclosed original, which is now preserved in the Ohio State Fair Grounds at Columbus. It contains various relics of the great Civil War general and eighteenth President of the United States.



Photograph by Jacob Gagar

MOTOR TRAFFIC WILL EVENTUALLY ELIMINATE THE OLD "S" BRIDGES

There are many theories as to why the bridge was built with so many curves. On either side is a "manhole," a safety niche where a pedestrian could stand in case a runaway team caught him while on the bridge. The "S" Bridge near Hendrysburg.



Photograph by Jacob Gayer

REGALIA FOR REVELRIES

At Columbus, Ohio, is one of the country's largest establishments of its kind manufacturing military and secret-society goods, uniforms and equipment, lodge and church furniture. The costume shown in this picture is valued at \$550.

upon the sealike sway of standing grain—a pastoral panorama often suggestive of Surrey and its hills.

Certainly whatever Nature withheld from interior Ohio in the way of the spectacular was amply atoned for when Congress set her boundaries. Of these, but one is wholly inland. To southward and eastward she looks out upon the wide windings of her parental river in its 1,000-mile course to the Mississippi; and something like two-thirds of her northern frontier is washed by one of those vast bodies of water which the early Americans, although proverbially dealers in the gigantesque,

modestly named lakes instead of inland seas (see map, page 529).

When Lake Erie's southern shore first assumes historical focus, we find it the scene of the Indian warpaths and French trade trails. Gun-discharge was necessary to clear a passage through the packed herds of buffalo occupying a region so large that, as the chronicler quaintly puts it, "two thousand men could easily live there."

THE FIRST CHURCH AND SCHOOLHOUSE IN OHIO

Some fifty miles from Bridgeport, where the old Cumberland Road, now a Federal highway, crosses the Ohio, we came upon Schoenbrunn, a deceiving replica of the earliest known pioneer settlement in the State. Anyone chancing upon that remote group of mission cabins, with their rough-hewn log walls, their mud-plastered chimneys, their roughly fashioned settles and fireplaces,

could almost imagine himself back in 1772, with Zeisberger and his colony (p. 572).

To this site, 160 years ago, came David Zeisberger, of the Moravian Brethren at Bethlehem, Pennsylvania, having blazed a way through primitive forests, to build what were probably the first church and schoolhouse to be planted west of the Ohio. That those brethren sectaries of Moravia and Bohemia had come to the New World because of war and its evils and were seeking primitive Christianity is evidenced by the articles entered into by Zeisberger and his Indian converts: "We will not go to war and will not buy anything of warriors



YOUNG STOCK-RAISERS AT THE HOLMES COUNTY FAIR, MILLERSBURG

Ohio ranks fourth in number of dairy cows, with raw milk as its chief dairy product. It has more sheep than any other State east of the Mississippi. From 1850 to 1870 it led the Union in sheep production, and sent blooded stock to Australia to aid in the development of the mutton and wool industry of the island continent.



Photographs by Jacob Gayler

FREMONT CHERISHES THE MEMORY OF RUTHERFORD B. HAYES

The home of the nineteenth President stands in the midst of a beautiful tract of forest known as Spiegel Grove, now a State Park. His tomb is in a quiet corner of the estate.

taken in war. We will not admit rum . . . (nor) be idle, nor scold, nor beat one another, nor tell lies." Such is the tone of the first civil code laid down by white men west of the Ohio.

At Schoenbrunn one may see in replica the rough-hewn log hut where Zeisberger taught A-B-C's from his "Essay of a Delaware-Indian and English Spelling Book for the use of Christian Indians"—Ohio's first schoolbook—and the little log church where converts were adjured against such backslidings as "sacrifices, heathenish festivals, (and) tshapiet, or witchcraft, when hunting."

Due to the Revolution and its reverberative turmoil among the tribes, Schoenbrunn was abandoned in 1777. For 146 years its very site remained unknown; then, thanks to excavation and to remarkably complete records among the Moravian Archives, the "lost mission" arose from its ashes as a fitting memorial to these pilgrims.

NEW ENGLAND EX-ARMY OFFICERS ESTABLISHED MARIETTA

The full significance of the Ohio River, its majesty and romance, as suggested by its French and Indian names, did not realize itself for us until of a sudden we came upon its wide, untroubled sweep, translucent in aquamarine hues, where it makes confluence with the Muskingum at Marietta. Standing there at gaze, one knows why the French called it "La Belle Rivière," and why to the Iroquois it was the "Ohio," or "Great River."

There one can recapture visions of the red man's canoes enfiled on those vast waters, or of the 50-ton galley, *Mayflower*, built on its upper reaches by the Ohio Company of Associates, as it floated off through the hushed wilderness, bearing the New England ex-army officers who in 1788 planted Marietta on the mound builders' earthworks.

One could scarcely imagine a more charming pioneer town in the Northwest Territory's pioneer State than old Marietta of to-day. Broad-avenued, with great trees massing their foliage over staid streets of homes, with here the wide prospect of one river, yonder a leaf-screened glimpse of the other, Marietta still reflects something of that demeanor of dignity and repose which we call, in a word, colonial.

In those early tumultuous times, which Marietta still honors by the preservation

of Gen. Rufus Putnam's home and the Ohio Company's land office, a sheriff must needs be a man of muscle and inches. When Col. Ebenezer Sproat was appointed to that office the local braves, feeling somewhat daunted by his altitude of 6 feet 4 inches, exclaimed, "Ugh! Big Buckeye!" And thus in time all Ohioans, tall or small, were made to celebrate the lofty *Aesculus glabra*, of fine back-log qualities, by being called Buckeyes; wherefore theirs became known as the Buckeye State.

The tree's further claim to distinction lies in that it once helped to swing a President into office. That was in 1840, when an opposition newspaper described candidate William H. Harrison, of Ohio, as "fitter to sit in a log cabin" (than the White House) "and drink hard cider." Thereupon he became "the log-cabin candidate." Cabins of buckeye logs appeared in torchlight processions, buckeye canes for voters were seen everywhere, and the tune celebrating Scotland's bluebells was applied to Ohio's buckeyes:

"Oh what, tell me what, is to be your cabin's fate?
We'll wheel it to the Capital and place it there elate,
For a token and a sign from the bonny Buck-eye State."

From Marietta to Gallipolis we followed some seventy miles of road which for the most part paralleled riverside scenes as wild as when the first flatboat floated there. Amidstream lay Blennerhassett Island, now a mere scenic adjunct, scarcely suggestive of the national uproar it created in 1805, when Harman Blennerhassett there received Aaron Burr in furtherance of the latter's somewhat beclouded conspiracy.

Whether that disgruntled politician purposed to split the Union or to overthrow Spanish power in the Southwest, his subsequent trial-verdict of not guilty left the country unconvinced and did not save him from foreign exile and ruin.

WHERE A COLONY OF FRENCH ARISTOCRATS CAME TO GRIEF

It was in Gallipolis's great, shady square, and Ohio's town squares are noteworthy for their spacious, tree-embowered dignity, that we encountered a Frenchman who, while motoring through Ohio, had paused here to find if any descendants of his *émigré* ancestors still remained. He judged, from signs he had seen displayed



Photograph by Jacob Gayne

A SHAFT OF STEEL AND STONE DOMINATES OHIO'S CAPITAL CITY

From whatever direction one approaches Columbus, the American Insurance Union Citadel looms over the Civic Center, which has recently been developed around both ends of the Broad Street Bridge over the Scioto River. The new City Hall (to the left, beyond the bridge) replaces one burned in 1925.



Architects, W. R. West, J. O. Sawyer, and N. B. Kelly.

Photograph by Jacob Gayer

THE CAPITOL BUILDING OF "A CITY THAT WAS BORN A CAPITAL"

Founded in a forest sixscore years ago, Columbus is the administrative seat of a State which has attained fourth rank in population and made distinguished contributions to the Nation in industry and agriculture, in the arts and sciences. Its Doric Statehouse, built of limestone from near-by quarries, stands in one of the two 10-acre squares originally donated by citizens for a capitol and penitentiary. The dome is 136 feet high.



LIKE GIANT MUSHROOMS, FIFTEEN BALLOONS TUG AT THEIR MOORINGS AT AKRON'S SPEEDWAY.

In training pilots and navigators of motorized airships, the free balloon plays an active rôle in the Nation's center for the development, manufacture, and operation of lighter-than-air craft. Akron is here seen as host to the National Elimination Balloon Race, which decides the American teams for the International Balloon Races for the James Gordon Bennett balloon trophy.



Photograph by Jacob Gayer

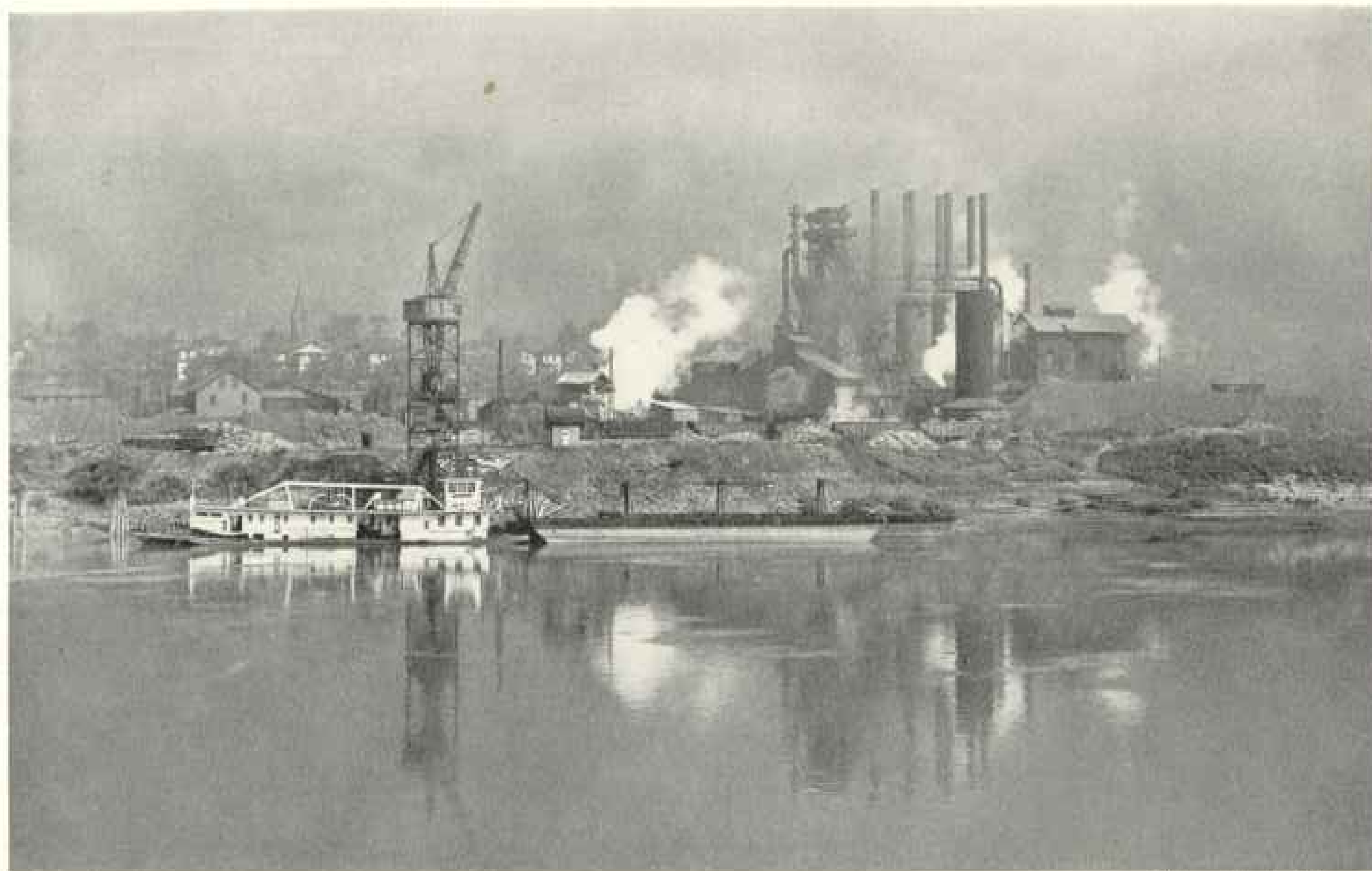
THE LOGAN ELM IS ASSOCIATED WITH AN IMPASSIONED INDIAN OUTBURST

Near or under this veteran tree, tradition says that the famous chief, Logan, in 1774, summed up his injuries received at the hands of the whites in a speech remarkable for its pathos and savage eloquence. "There runs not a drop of my blood in the veins of any living creature. Who is there to mourn for Logan? Not one." The speech was made famous by Thomas Jefferson, who published it in his "Notes on Virginia." It has been a favorite for school-boy declamation ever since. The tree is preserved in Logan Elm State Park, near Circleville.



THE GREAT SERPENT IS THE FINEST OF OHIO'S INDIAN EFFIGY MOUNDS

Although most effigy mounds are found in the upper Mississippi Valley region, this most impressive exhibit lies entirely outside that area, northwest of Portsmouth, Ohio. It measures more than 1,300 feet from head to tail and is believed to have been used, not for burial, but for religious and ceremonial purposes. Note what seems to be an open mouth, with the serpent about to swallow an egg-shaped figure.



Photograph by Jacob Gayer

TO-DAY'S MAGICIANS IN METAL PERFORM MORE WONDERS THAN ALCHEMISTS OF OLD EVER DREAMED OF

Martins Ferry is only one Ohio town where iron ore begins its transmutation in blast furnaces into pig iron and then into steel. Cincinnati excepted, every great city of the State and many small ones owe their importance chiefly to this industry. Activity centers in areas in and around Cleveland and Youngstown and extends, in lesser degree, part way down the Ohio. The State's first six barrels of ore from Lake Superior mines were considered worthless and were sold for their freight; to-day these mines are the chief dependence of its greatest industry.



Photograph by W. Preston Mayfield

AUTOMOBILES CROWD THICK AS BULLETS AT THE TRAPSHOOTERS' GRAND AMERICAN HANDICAP

The shooting home and club grounds of the Amateur Trapshooting Association at Vandalia have few rivals in elaborate layout. Here, in the early autumn, gather the devotees of this sport for a week's steady firing at more than a million flying targets, the program culminating in the main event, the Grand American. Ohio has been interested in trapshooting for more than 100 years.



Photograph by Jacob Gayer.

CINCINNATI'S SUSPENSION BRIDGE WAS REGARDED AS IMPRACTICAL AT FIRST

So dubious were people about it that permission to line it up with certain streets in Cincinnati and Covington was refused; hence there is no direct approach at either end. Designed by John Augustus Roebling, this bridge is one of the oldest of its type in the country and became the forerunner of its Brooklyn successor and many other great suspension spans, including the new George Washington Bridge across the Hudson. The main span measures 1,057 feet. Today five bridges cross the Ohio between the Queen City and the Kentucky shore.

near roadside properties, that there must be quite a lot of the family still about. "The name," he added, "is De Tour."

Some weeks later we reëncountered him at Toledo. By now he had learned all about American road signs, and when we inquired if he were still searching for De Tours, he replied with a wink, "Not at all. In fact, I have now a map which aids me in avoiding that annoying family."

Gallipolis, in Gallia County, and Belpre (Belle Prairie), near Marietta, furnish in their names a souvenir of those unfortunate French aristocrats and other worthy folk who, fleeing from the Revolution in 1789, were fraudulently persuaded to join a nonexistent colony on the banks of La Belle Rivière. That the very last of these ill-adapted colonists did not perish at that Indian-infested spot in the wilderness so felicitously called Gallic City was due to Congress's forthcoming donation of more suitable lands.

At best, the Ohio venture was not for Old World aristocrats, but for folk already inured to life in the Colonies: husky Germans from Pennsylvania, hard-bitten New England Puritans, pioneering Virginians, tenacious Scots from the Carolinas, "hill-billies" of Irish breed from the Blue Ridge Range. And these came, came like an ever-swelling tide, over the mountains and down the river, to mix their stocks toward the making of a State.

THE RIVER BECOMES A STOREKEEPER'S HIGHWAY

In that steamless era the Ohio was a one-way river. At its head the pioneer bought lumber, built an ark, and, having floated his family downstream, broke up the craft into the makings of a cabin. The ark, following the design familiar to nurseryland, measured perhaps 40 feet long by 15 feet wide, sometimes much larger. Poorly adapted for defense, it did not come into general use until Indian hostilities ceased. The flatboat, on the contrary, another popular water vehicle for moving families, was well equipped with loopholes against possible attacks by red "varmints."

Soon, there being no shops, came the salesboat—a red flag indicating groceries, a yellow flag indicating dry goods—at the sound of whose conch-shell horn buckskin-clad planters or their sunbonnetted wives

would hoist the stop-signal to barter tobacco, dried venison, or furs for store goods.

In time the planter, too, turned salesman and floated his hogs or grain to Cincinnati or New Orleans, there selling his flatboat for lumber and returning overland. From 1820 to the Civil War the Ohio was literally a storekeeping highway, alive with flatboats filled with sales counters—yes, and with blacksmiths' or tinsmiths' outfits, and even lottery offices.

INDIAN MENACE ENDS ON BANKS OF THE MAUMEE

All things considered, the post-Revolutionary settling of Ohio was surprisingly rapid. The presence of some 25 forts, built from 1774 onward, attested to the white man's westward invasion and the red man's resistance. When the Ohio tribes beheld the palefaces' "dog-fight-dog" war come to a close, they redoubled their assaults on a foe who had thus eliminated one military front.

Year after year the inmates of some stockaded cluster of log huts would awaken to the dreaded war whoop, would fight till their ammunition was exhausted; then perish amid flame-lit scenes of torture or scalping.

Repeatedly, against such chiefs as Little Turtle, Bluejacket, and Brant, military expeditions met with disaster, and the tide was not turned until General ("Mad Anthony") Wayne marched into northwestern Ohio in 1794. There, on the banks of the Maumee, "the grand emporium of the hostile Indians of the West," he smashed the allied chiefs at Fallen Timbers and, by the subsequent Treaty of Greenville, made Ohio forever safe for settlement.

Within a maximum of six years thereafter northern Ohio had received settlers at Cleveland, Conneaut, Youngstown, and Toledo, with Akron soon to follow, while in southern Ohio there had appeared Portsmouth, Chillicothe, Dayton, Athens, Zanesville, and Lancaster. Indeed, about half of the State's 88 counties can claim some spot that was occupied, either by civilians or soldiers, within two decades after the Revolutionary War.

The history of Youngstown and several of its northern neighbors is really an extension of that of New England, since those towns were established in the so-



Photograph by Jacob Gayer

PORT COLUMBUS IS ONE OF THE AIRWAYS CENTERS OF THE NATION

This plane is part of a system which furnishes two-day service across the continent. Passengers travel by train from New York to Columbus, Ohio, transferring there to planes and continuing the journey by air to a point in Oklahoma. There railway transportation is resumed to New Mexico, where another transfer to planes is made for the final leg of the trip. The journey, consuming two nights and two days, is so arranged that the railway travel is done at night and the flying by day.

called Western Reserve of Connecticut by pioneers from that State. Their Yankee traits of shrewdness and industry were invaluable for the exploitation of lands where, instead of potential gold fields, as one might have supposed from the clash of four States' claims to the Reserve, there were simply some 5,000 square miles of virgin wilderness.

A VAST COMPLEX OF FURNACES AND OVENS

Not gold, but golden wealth in crude form—coal and limestone, a happy combination for iron and steel production—lay regionally where John Young and his companions settled in 1797. Six years later there appeared near Youngstown Ohio's first blast furnace, harbinger of an industry that was to transform the Mahoning Valley into a Ruhrlike area of national importance.

Had Daniel Eaton, who built that first blast furnace, been given to prophetic visions, and had he foretold a future Youngstown with an output value for all its commercial products of \$400,000,000 a year, he would have been laughed at.

If, persisting, Eaton had announced that within little more than a century Youngstown's outgoing shipments would require each year a train of steam-hauled cars 12,000 miles long, or about half the length of the earth's Equator, he would, in all probability, have been incarcerated as a madman.

While wandering amid Youngstown's vast complex of smokestacks, blast furnaces, coke ovens, and steel converters—scene of the production of one-sixth of all pig iron and one-eighth of all steel made in the United States—one can only grasp the scale of its immensity by studying a single unit in relation to the whole.



PISTOL PRACTICE FOR POLICE IN "HOGAN'S ALLEY"

That is the name for this part of the Small Arms Firing School at Camp Perry, near Sandusky. Police from all parts of the country come here for training. An instructor walks behind the policeman who is firing and, unseen by the latter, signals the leverman which silhouette target to swing in place. The National Rifle Matches are also held here.



Photographs by Jacob Gayer

AT MILLERSBURG THE HOLMES COUNTY FAIR IS HELD IN THE STREET

The State Agricultural College at Columbus, the State Experiment Station at Wooster (see, also, page 550), the county agricultural agents, boys' and girls' farm clubs, and the local farm organizations—all help to maintain Ohio's agriculture at a high level.



Photograph by Jacob Gayser

A TEAM-PULLING CONTEST AT THE WAYNE COUNTY FAIR, WOOSTER

The strength of the pull is determined by a dynamometer mounted on the truck which the horses are dragging.

Thus one of Youngstown's steel mills covers an area three miles by three-quarters of a mile. Under normal conditions, its 15,000 workers turn out seven million tons of diversified products and a million and a half tons of by-products annually.

It would be like reciting from a freight-classification schedule to present any idea whatever of the vast list of articles made from iron and steel—from battleships to tacks, from toys to ocean cables—used in modern life.

For the center of what is recognized as one of the largest iron-and-steel producing areas in the country, and in view of a considerable foreign-born population, Youngstown surprises one in presenting a picture singularly lacking in the less attractive features of many a mill town.

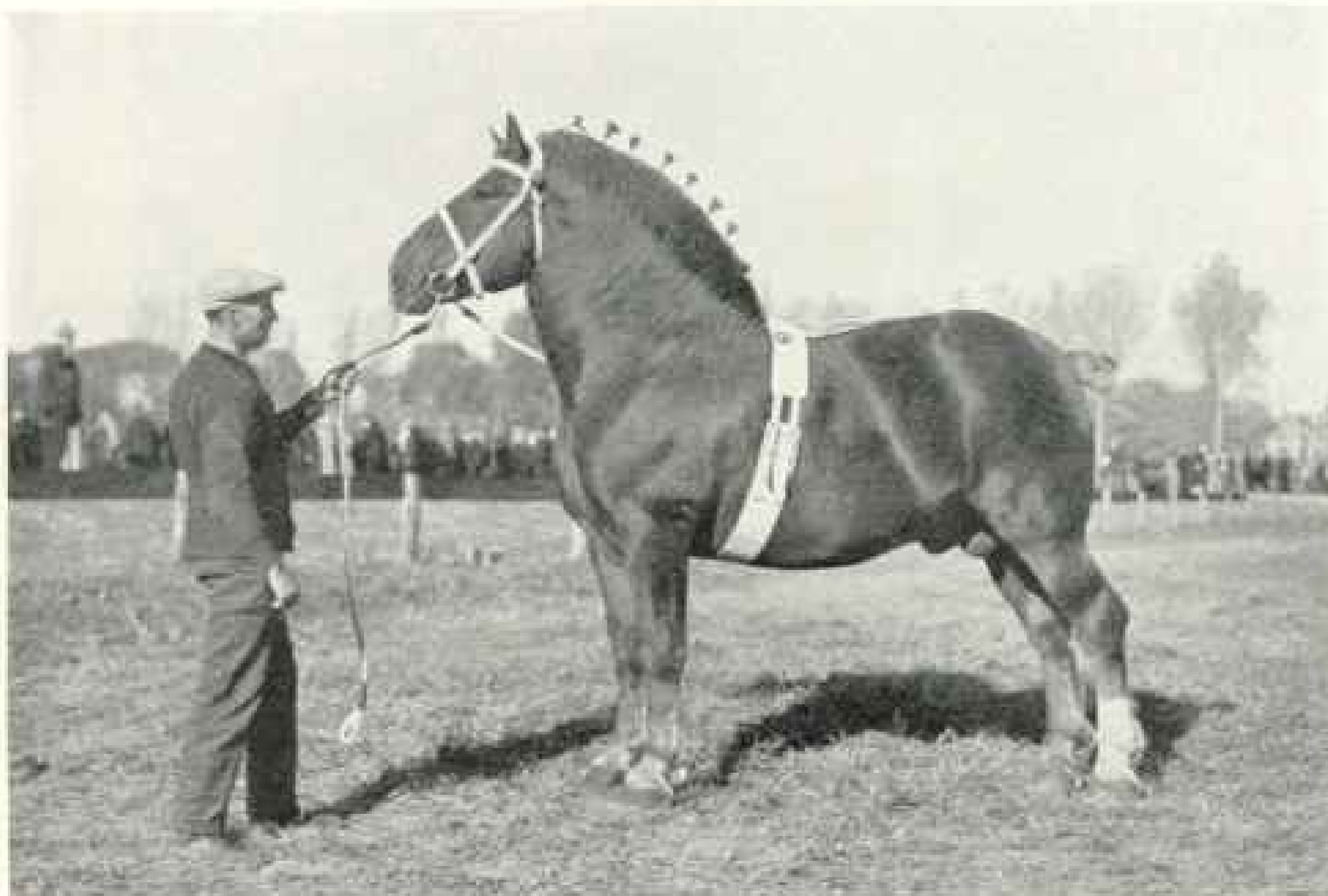
Though by night the garish upleap of furnace flames offers the familiar symbol of armies of steel workers at toil, by day the city reveals itself in clean orderliness as a community of fine homes, of civic amenities, of scenically memorable parks, of residential sections stretching to outly-

ing hills, where one's proximity to an industrial Vulcan and his anvils seems remote indeed.

Perhaps this happy result relates itself to the fact that Youngstown, regarded industrially, is not a city of absent landlords or, for that matter, largely one of tenants. It can boast proudly enough that almost one-half of its homes are occupant-owned, a figure that places it near the top of the roster of American cities in respect to home-ownership.

THE FOUNDING OF CLEVELAND

Just a year before the founding of Youngstown, the trail to the Western Reserve had been blazed by Moses Cleveland and his party of Connecticut Yankees. In 1796 they had entered what might well be described as the Promised Land, since it had been promised to so many. Due to the magnificent phrase "from sea to sea," which had adorned many a colonial charter, Virginia, Massachusetts, New York, and Connecticut all held grants reaching from the Atlantic to the Pacific;



Photograph by Jacob Gayler

LOURDEAU II, AN OHIO-OWNED CHAMPION, AT THE WAYNE COUNTY FAIR, WOOSTER. In 1927 this Indiana-bred stallion won the King Albert Trophy as the outstanding horse of Belgian breed at the International Livestock Show at Chicago.

hence all laid claim to this region as being part of their territory.

But in the end the dispute was settled by ceding these claims to the United States, Connecticut reserving a strip south of the Lake Erie shore. This was the "Connecticut" or "Western Reserve."

Cleaveland and his party of fifty, after a two-months' voyage up the Lakes, had landed on Conneaut Beach on the auspicious date of July 4. We read that they drank toasts to celebrate the future State of New Connecticut and expressed the hope, "May (these) fifty sons and daughters multiply in sixteen years sixteen times fifty."

They then pushed on and ascended the winding Cuyahoga, upon whose banks they inaugurated New Connecticut's future capital, naming it after their leader.

A year before that event General St. Clair, Governor of the Northwest Territory, had written, "There is not a road in the country." There were, however, old buffalo routes that had become Indian trails, which in turn would become corduroy roads, successive stages in an

evolution that produced many a western highway.

EBENEZER ZANE HACKED A WAY THROUGH THE WILDERNESS

But now appeared a doughty ax-swinger and pathfinder, Ebenezer Zane, who hacked a way to southwestern Ohio from Wheeling, West Virginia, to Kentucky. Due to Zane's Trace (*i. e.*, "trail"), sprang up the beginnings of such towns as Zanesville and Chillicothe. By 1810 a quarter of the State's population lay in counties along its route.

Then came the famous Cumberland, or National, Road, begun at Cumberland, Maryland, in 1811, and reaching Columbus, via part of the "Trace," in 1833. This most interesting among the Middle West's historic roads, eventually stretching from Baltimore, across Ohio and Indiana, and into Illinois, can still be followed on U. S. Route 40. Famous folk beyond reckoning have driven over it. Several of our eight Ohioan Presidents must have passed that way when they headed eastward for the White House.



Photographs by Jacob Cayer

OHIO HAS ALWAYS PIONEERED IN EDUCATION

Miami University, at Oxford, dating from 1809, grew up on one of the townships granted to Ohio by Congress for university purposes. The author of "McGuffey's Readers" was a professor here. With its 58 colleges and universities, Ohio ranks among the foremost States in higher institutions of learning.



UNLOADING THE DAY'S CATCH AT PUT IN BAY

After the fish are sorted, pick-up boats will take them to Sandusky, center of one of the country's largest fresh-water fishing industries, to be shipped from there to various markets. Sheepshead, blue pike, yellow perch, whitefish, and sauger pike are important species in the Lake Erie fisheries.



Photograph by Jacob Gayer

THE BEAUTIFUL RIVER NEAR DELPRE, WITH AN ISLAND THAT ONCE CREATED A NATIONAL UPROAR

Now a mere scenic adjunct, Blennerhassett Island, visible through the tree tops, is hardly suggestive of those exciting days in 1805 when Harman Blennerhassett received Aaron Burr in his home here in furtherance of the latter's somewhat beclouded conspiracy (see, also, text, page 538). Not far from the island is the famous "W" bend of the Ohio.



Photograph from J. R. Schmidt

WHEN THE ICE GORGE BREAKS ON THE OHIO, DESTRUCTION FOLLOWS

The ice was moving downstream from Cincinnati at the rate of ten miles an hour when the picture was made, showing the crushing of a steamer as if it were an eggshell.

A picture of early times along Zane's Trace has been left us by one of a party of colonists in their 700-mile trek from Granville, Massachusetts, to Granville, Ohio (as they called it), in 1805. This amateur bard, in verses as rough as their road, thus cheerily prologizes:

"Adieu, my friends! Come on, my dears!
This journey we'll forego,
And settle Licking Creek,
In yonder O-hi-o."

BOOKS BOUGHT WITH COONSKINS

Observing the Sabbath throughout their two-months' journey, and sleeping wherever their ox-drawn wagons halted for the night, the prospective settlers jolted along twelve miles per day, their wheeled habitations crammed with bedding, spinning wheels, sacks of corn meal, axes, flintlocks, tools, garden seed. The passing scene was alive with game—deer, bear, wild hogs—while the glut of wild turkeys was so formidable that they were ultimately re-

garded, not as a godsend, but as a crop-destroying pest.

That was when the settlers' log cabins had risen foursquare in the wilderness, each with rifle and powderhorn over its 6-foot fireplace, with hand loom and cobbler's bench hard by, with a turkey wing to brush the hearth, a broom made of buckeye splinters, and a grandfather's clock whose many weight-supporting cords gained it the name of "Old Longstring."

Their clothing? Deerskin suits with coonskin caps, or the butternut-dyed product of the handloom. Their fare? Bear or deer steaks, wild turkey, toothsome ashcakes, johnnycakes, hoecakes, dodgers, ponies. Their medium of exchange? Peltries, ginseng, beeswax, and, for want of small change, Spanish coins cut in quarters, known as "sharp shins." Their diversions? Part-social, part-utilitarian "bees," whether of the quilting, or corn-shucking, or house-raising variety.



Photograph by Jacob Gayer

NOT SUMMER VACATIONISTS, BUT SHANTY-BOAT FOLK

In the steamboat era such year-round dwellers on the Ohio were the bane of skippers, who were fearful of running down their crude craft of clapboards and tin. Formerly floating families depended for food on adjacent cornfields, berry patches, stray chickens, and fish. Hundreds of them, at winter's approach, drifted out of the Ohio and down the Mississippi, returning as a spring seasonal sign. The shanty-boat was the lineal descendant of the pioneer keelboat or ark (see, also, text, page 558).

Their touch with the outer world? The rare passing of the circuit judge on horseback, equipped to bivouac throughout his 100-mile journey, or that other horseman, the circuit-rider, whose religious duties demanded equally long journeys between his pastoral flocks.

MCGUFFEY'S AND SPENCER'S GIFTS TO EDUCATION

The coonskin provided Ohio's pioneers not only with headgear but with books. To this the Coonskin Library, now a prized museum relic, bears witness. Coevally with the Licking party's trek, Athens County was founding not only its college, the oldest educational establishment in the Northwest Territory, but a library whose volumes, read and reread by the pioneers, were purchased by the sale of coonskins.

From the outset, as if inspired by the liberal pronouncements of the Ordinance of 1787, Ohio oriented herself toward non-slavery, religious toleration, and the propagation of the "three R's." Athens was settled on specifically reserved "college lands," and the establishment of her university was soon followed by another at Oxford. In time the entire State became dotted with those numerous colleges, of various scope and leanings, which so characterize it today, these in addition to such major seats of learning as Ohio State University, the University of Cincinnati, and the Western Reserve University at Cleveland.

Not yet forgotten are the once-prevalent "McGuffey Readers" compiled by an Oxford, Ohio, educator.

And if McGuffey thus furnished Ohio with one of the "three R's," Platt Rogers



Architects, Joseph H. Freedlander and A. Duncan Seymour, Jr.

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THE PERRY VICTORY MEMORIAL IN THE HARBOR OF PUT IN BAY, SOUTH BASS ISLAND, LAKE ERIE

The 352-foot column, erected by the Federal Government and the States of Ohio, Pennsylvania, Michigan, Illinois, Wisconsin, New York, Rhode Island, Kentucky, and Massachusetts, commemorates Commodore Oliver Hazard Perry's victory of 1813, the northwestern campaign of William Henry Harrison during the War of 1812, and a century of peace between English-speaking peoples. At the top is a gallery surmounted by a beacon light.

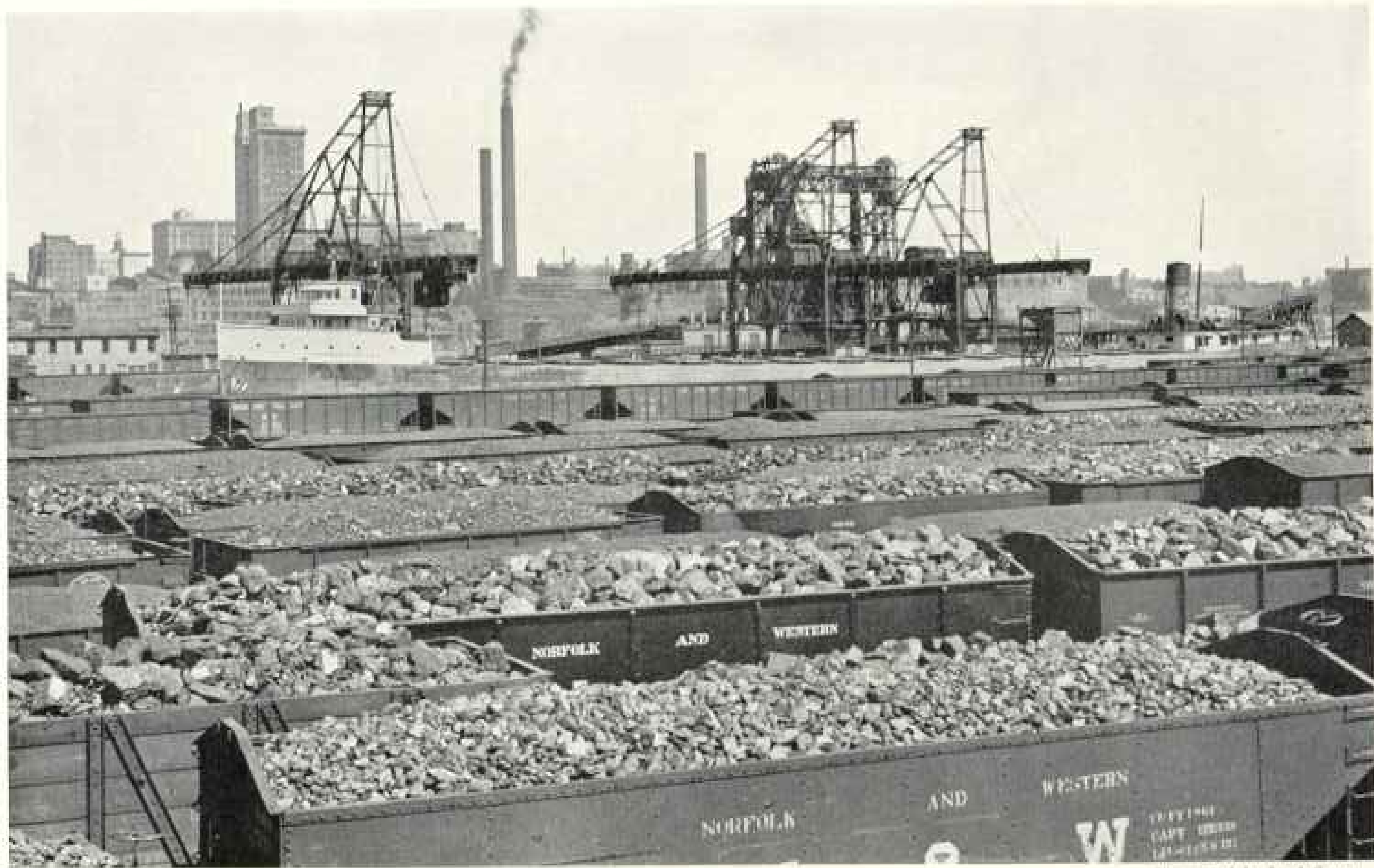
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Photograph by Jacob Gayer

WHAT A GREAT DAY IT WAS WHEN THE "SHOWBOAT" CAME TO TOWN!

These floating theaters, whose romantic day is almost done, were towed from town to town by chartered steamboats. Every spring and summer their shrill calliopes (see top, rear) summoned people for miles inland to performances of simple heart-throb dramas. The showboat *Hollywood*, at Gallipolis, with its escorting stern-wheeler, aptly named *Chaperon*.



Photograph by Jacob Cayer

WHAT CLEVELAND REPRESENTS IN THE LAKES' ORE TRAFFIC, TOLEDO REPRESENTS IN THEIR COAL MOVEMENT

Twenty-four steam and electric lines crisscross Toledo. Favorable location, coal, oil refining, a thousand or more factories, a national and overseas distribution of products—these features explain why it ranks among the foremost of American railroad centers. During times of full activity, solid coal trains move almost hourly over the extraordinary network of rails that makes this city appear from the air like an intensive patch of what an illustrator calls "cross-hatching" (see, also, text, page 578).

Spencer certainly supplied her with another. Perhaps the sight of execrable pot-hooks, produced in his log-hut alma mater, fired young Spencer with the aim of evolving a school of "genteel penmanship."

For some years he wandered through rural Ohio, attracting pupils by public posters executed in his grand style. His first copybook appeared in 1848, with the result that many a graceless small boy, now gray-haired, had Spencerian flourishes imparted to him in the form of such moral maxims as "D—Delays are dangerous—D," and so on down the alphabet.

A SHOWBOAT PERFORMANCE ENLIVENS THE WAY

It was following our visit to Ohio University at Athens, and upon our regaining the river, that we beheld, plodding along like some faithful pilgrim on an otherwise deserted Via Sacra, a veritable old-time stern-wheeler. What is more, it was a showboat, and that evening we witnessed aboard it a thrilling performance of "Over the Hill to the Poorhouse." Heart-throb mother, virtuous younger son, villainous older son, snakelike daughter-in-law, black-face comedian, peanuts, prize packets—all were there. The depths of villainy were sounded. ("Send my old mother to the poorhouse? Yes. But what would the neighbors think?") The heights of heroism were reached. ("I have returned a millionaire, mother, with a mansion at your disposal.") In short, virtue triumphed, as it ever does—at least in showboat performances (see, also, page 556).

Whoso would see an Ohio showboat or travel on some faded "river queen" had best make haste. What with several trunk lines crossing the State from east to west, and its motor cars thick as locust swarms, and major commercial airports at four of its cities, the steamboating glories of Old Man River have passed away like last night's dream.

THE LEGEND AND ROMANCE OF STEAMBOAT DAYS

It was one day in 1811, war with England being imminent, that a strange, fire-breathing monster first descended the Ohio. Some cried out, "The British are coming!" Others mistook it for a floating sawmill, while yet others thought a comet had fallen into the river; and of course

nobody realized that by this epochal appearance of the steamboat *New Orleans*, of Pittsburgh, that the Ohio had ceased to be a one-way thoroughfare.

Twenty-five years later, Ohio River ports were launching 107 steamboats on western waters, 29 of them from Cincinnati's five boatyards. In the next two decades, river traffic increased in volume and variety, and Cincinnati, as augury of her growing importance to the South, was shipping to the cities of that region plows, wagons, sugar mills, and cotton apparatus—"everything from a pitchfork to a sawmill."

Story and ballad have recounted rich memories of those great white river liners: of their passenger cabins, each named for a State; of their captains, hostlike personages of dignity and mark; of their speed triumphs, their occasional catastrophes, their gamblers, their negro roustabouts, their sweet-toned bells.

PROUD SKIPPERS WERE HAMPERED BY RIVER SHANTY-FOLK

Charles Dickens averred that he was urged to reserve berths aft "because steamboats generally blew up forward." Outspeeding one's river rivals was gorgeously achieved by crammng your furnaces with rosin-fat wood, "with a nigger squat on her safety valve." Gargantuan boasts of light draft, and therefore speed, were voiced by proud skippers, to the effect that "The *Champion of the West*, sir, could ha' skimmed right along on a medder after a reasonably heavy fall o' dew."

The bells, many of them the product of Cincinnati's eight bell foundries, sometimes attained to 700 pounds, and one of sonorous yet sweet tone was the pet of captain and crew until, mayhap, it was melted down into Confederate cannon or else retired at the close of steamboating days to act as farm bell on some Southern plantation.

The captains' chief pest was the always-in-the-way "shanty boat," of which a few may still be seen on the Ohio. This legitimate descendant of the "ark" (see text, page 555) was a small river tramp whose clapboard-and-tin superstructure, housing a wandering family, floated on an ever-leaky hull. Living rent-free and food-free, thanks to their fish traps as well



Photograph by Felix J. Koch

WHEN THE CLOVER FIELDS ARE IN BLOOM ABOUT COLLINSVILLE

as to riverside cornfields, berry patches, and stray chickens, Ohio shanty-boat folks thus achieved the hobo's heaven. Upon winter's approach they would float downstream to more balmy climes, returning with springtide, as truly a vernal symptom as the swallows, to plague steamboat captains afresh.

And pirates! Not to use the less time-hallowed term of racketeers, those brethren of the six-shooter and shotgun fairly terrorized river shipping for a while by their raids, conducted from Hurricane Island. The dodge of using a sinking rowboat offshore to decoy sympathetic steamboat skippers found much favor and profit until, about 1830, the latter took to mounting small cannon on their decks.

As for the barefoot, open-shirted roustabout, with his crap games and banjo tunes, he knew the Ohio as the "Cincinnati River," and that town, by reason of its

rag exports, as Ragtown, and hence he so named it in his tuneful philosophy of life:

"People allus happy when dey gits out o' jail,
Galveston fo' oysters, Boston fo' beans and
bail.
Chicago fo' yo' pretty gels, but lookout dem
Ragtown bolles!"

And, showing that objurgation by steamboat mates achieved a high art in those days, we may imagine the above melodic burst as being brutally interrupted by the following authenticated curse: "Get to work, you petrified slungullion, whoopedah sons of lizards; you ring-tailed, lop-eared, splay-footed razzmetazz imps of Hades; you double-jointed gazamaloozums and sons of cemeteries; you——!"

CANALS HELPED TO DEVELOP OHIO

It was just precedent to the steamboat's advent that a band of pioneer trekkers came upon some Indian villages at "akron"



BIRTHPLACE AND BOYHOOD HOME OF BENJAMIN HARRISON, AT NORTH BEND

An imposing structure in its day, it stands about a mile from the tomb of William Henry Harrison, ninth President and grandfather of the twenty-third President of the United States.



Photographs by Jacob Gayser

QUARRYING GRINDSTONES NEAR MARIETTA

The stone is drilled out to the required thickness and a light charge of powder then splits it neatly from the bedrock. From Ohio sandstone are made most of the grindstones used in this country, as well as pulpstones (for grinding wood to pulp), oilstones, and scythe-stones.



Photograph by Jacob Gayer

GLACIAL BOWLDERS INDICATE THE RED MAN'S TRAIL

This one marks the northern terminus of the Indian portage between the Cuyahoga and Tuscarawas rivers. The "carry" was about eight miles long and crossed the watershed between the Great Lakes and Ohio River drainage systems. The old Portage Trail passed through what is now Akron (see, also, text, below).

(i. e., "high place"), which site and its adjacent lakes, the Portage Lakes of to-day, had long teemed with activity; for here lay the carry over which tribal canoes passed between the Cuyahoga and Tuscarawas rivers.

As so often at that period, the white man appropriated the red man's site and its name. Within twenty years Akron's significance as a canoe station had increased to that of a junction where two of Ohio's early canals branched eastward.

Akron's early development as a canal junction might be paralleled by the history of many an Ohio town that early in the 19th century emerged into assured existence by reason of some traffic-bearing "ditch" having been dug through it. In those days digging *was* digging, and not a matter of steam-driven machinery, and by the might of muscle-driven pick, shovel, and wheelbarrow alone was Ohio networked to the extent of some 800 miles of canals.

Wheat, lumber, flour, pork, beeswax, livestock moved along the narrow cut

through many a town whose chief importance lay in that on its main, canal-parallel thoroughfare, there rose warehouses correlated with the waterway. Travelers going to or from the East in those unhurried days reserved their canal-boat berths, sat on canal-boat roofs, and were drawn by canal-boat mules (with whiskey, card-playing, and tobacco-chewing as solaces) through a trip perhaps 500 miles long.

For over thirty years Ohio's canals constituted the chief factor in developing her toward a rank among the Union's foremost States; but in 1839 a potty little steam contraption, running on rails between Sandusky and Bellevue, marked the twilight of canal history. By 1851 the Ohio River and Lake Erie were rail-connected, and ensuing years saw the beginnings of great rail routes which, ultimately developing into transcontinental scope, gave modern Ohio her great east-west trunk lines.

The once-prized canals achieved a slow fade-out. Even during the eighteen nineties there continued to some extent that gypsylike existence of "locking through"

Ohio's rural regions. Then the barges vanished and the canals sank from sight under superimposed main streets, where ubiquitous flivvers pursued their erratic courings. Only the lone fisherman remained on some forgotten canal-side amid an atmosphere of solitude suggesting that of the *Elegy in a Country Churchyard*. And doubtless he would still be at it somewhere on the Miami Canal's last-surviving links but that these were finally dynamited, leaving here and there a stranded lock, which remains like the skeleton of some strange monster that evolution's merciless process has eliminated (see, also, p. 588).

As we drove into Ohio's "farthest north"—that is, the lake-bordering region of the old Northwest Territory—our preconception of that State's shore belt as being exclusively the scene of the world's greatest cross-movement of iron ore and coal became agreeably modified. For Conneaut, Ashtabula, Cleveland, and ports farther west lie sufficiently far apart to yield you but fleeting glimpses of that movement, as you glide along fine, tree-shaded thoroughfares whose environs display the presence of hothouse culture and nursery gardening.

A DISTRICT OF MUSHROOMS AND ROSES

It might surprise midwinter restaurant habitués in Eastern cities to know that the fresh asparagus on the menu may have come from no farther south than the Ohio shore of Lake Erie. And few of those who enjoy fresh mushrooms all the year around realize that masses of them are grown in the same region. Shipping mixed mushrooms thence, say, to Florida, savors of the miraculous until you are initiated into the secret, namely, that a few pounds of molders' sand, when frozen to 20 degrees below zero and placed in a carton of mushrooms, will do for them everything a cake of ice would do, except drip, for a 48-hour period.

Along the frontage of Lake County the massed spectacle of a million roses blooming in late August is not uncommon; but they are "born to blush unseen," as far as the buying public is concerned, for it is when Painesville's last rose of summer and its million companions are withered and gone that their plants are stored, as near freezing point as possible, for ultimate shipment to the garden-makers.

Yet such is the common way of life—to plant for others' enjoyment.

At Kirtland, southwest of Painesville, we paused for a glimpse of the Temple, built in 1836 by Joseph Smith and his followers, as a "stake of Zion." It was at Kirtland that, the gift of tongues having descended upon Brigham Young, he discoursed to Mormon's followers "in pure Adamic language," a language as yet unknown to philologists. The curious may still see at Oberlin College Library the script of Solomon Spaulding's "Manuscript Found," which, it has been claimed, furnished Smith's basis for the "Book of Mormon."

QUAINT ROADSIDE INNS OF VENERABLE AGE

Along our lake-shore route to Cleveland we stopped at a roadside inn which for age and attendant mellowness could only be surpassed in Ohio by one we had already encountered near Zanesville. The latter was built in 1802, the former in 1810.

Hand-hewn walnut beams, great fireplaces with hand-carved lintels, patchwork quilts, silhouettes, prints of President Washington depicted as the Constitution's guardian, yellowed pages from ledgers and faded stagecoach waybills are among the treasures of these two ancient hostelries, where the inquiring guest may spend some profitable hours before going to bed; or, rather, out of respect to the valanced four-posters, we should perhaps have said "retiring for the night."

Regrettably, no ghosts have been inherited by either inn. If the acquisition of one were possible, we would favor for the Zanesville establishment its intriguingly named proprietress of old, Mistress Usual Headley.

Yet a glimpse of the time-mellowed waybills and house ledgers preserved by the other inn, at Painesville, raises in one's mind ghosts aplenty. We wonder if the gentleman who stopped there in 1845 and was debited with "2 meals and lodging, 62 cents," made any outcry of being overcharged, and if the contemporary gentleman who bought "1 quart of brandy, 75 cents," managed to catch the stagecoach next morning. As for the coach arriving in 1832 with "12 gentlemen and 1 lady," we behold the compliments and attentions fairly flying about and feel sure that that girl was shown a good time.

WHERE THE WINNING OF THE WEST BEGAN



Walker and Weeks, Architects

CLEVELAND ORCHESTRAL MUSIC HAS A PERMANENT HOME IN SEVERANCE HALL.

The great concert auditorium, set in a charming park provided by Western Reserve University at University Circle, was given to the city and its symphony artists by the Musical Arts Association president whose name it bears.



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Finlay Photographs by Jacob Gayer

AN OCCASIONAL OLD-TIME FERRY STILL PLIES THE OHIO

Although most of these craft have been superseded by great steel bridges, this one at Fly recalls the days when the West was young. Canalization of the river may bring back the glory of the steamboat by insuring a minimum depth of nine feet even in dry season.



© National Geographic Society

Natural Color Photograph by Jacob Geyer

THERE IS IRON IN OHIO'S GREAT COMMERCIAL ARTERIES

At Ashtabula docks, millions of tons of iron ore are received from Minnesota mines and sent on by rail to Youngstown, Pittsburgh, and other manufacturing centers.



© National Geographic Society.
CLEVELAND PAINT MILLS MAKE COLORS FOR A NATION

As the modern machines grind the pigments for enamels, one may recall that here, once Indian braves pulverized the same sort of materials for warpaint.



Finlay Direct Color Photographs by Jacob Gayer

MOLTEN METAL HAS ITS MOMENT OF AWFUL SPLendor

Dante dreamed no vision more terrifyingly beautiful than may be seen in any Youngstown steel mill when the giant dipper pours its draught into the cooling cylinders.



Henry Hornbuss, Architect

IN A CLASSICAL MEMORIAL AT MARION SLEEPS WARREN GAMALIEL HARDING

The stately edifice, erected in 1926-27 by popular subscription, stands in a 10-acre landscaped park. In its roofless inclosure a lone willow tree shades the twin graves of the former President and his wife.



© National Geographic Society

Natural Color Photographs by Jacob Gayer

PEONIES GARLAND SPRING WITH PRODIGAL LOVELINESS

Because of its ideal climate, Lake County has become one vast nursery where exquisite flowers are grown. This field of bloom is at Mentor, not far from the shore of Lake Erie.

WHERE THE WINNING OF THE WEST BEGAN



AGRICULTURE ALONG LOW OHIO BANKS REMAINS PRECARIOUS

In the 1915 flood, water submerged this farm and rose to the level from which the photograph was taken. The river plays weird tricks. If its rise and fall are gradual, the land is enriched by deposited silt; but if the current is swift, the productive soil is carried away.



© National Geographic Society

Finlay Photographs by Jacob Gayer

TOYMAKERS CAJOLE RUBBER INTO FROLICHSOME MOOD

Automobile tires are far from being the only product of the rubber plants at Akron. One company manufactures 32,000 different kinds of articles, ranging from elastic bands to dirigible balloons.



© National Geographic Society

Finlay Direct Color Photograph by Jacob Gayler

CINCINNATI REARS PROUD TOWERS ABOVE A 37-MILE WATERFRONT

Until recently the Union Central Building (to the right of the group of skyscrapers in the background), rising 495 feet to its pyramidal top, dominated the city skyline, but it is now somewhat overshadowed by other structures built on higher ground. Along the Ohio River is the busy wholesale and shipping district, overlooked by the commercial and hotel zone. The distant hills afford magnificent vantage for delightful residential sections.



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**HEADLEY TAVERN HAS WATCHED THE WESTWARD MARCH
FOR NEARLY A CENTURY**

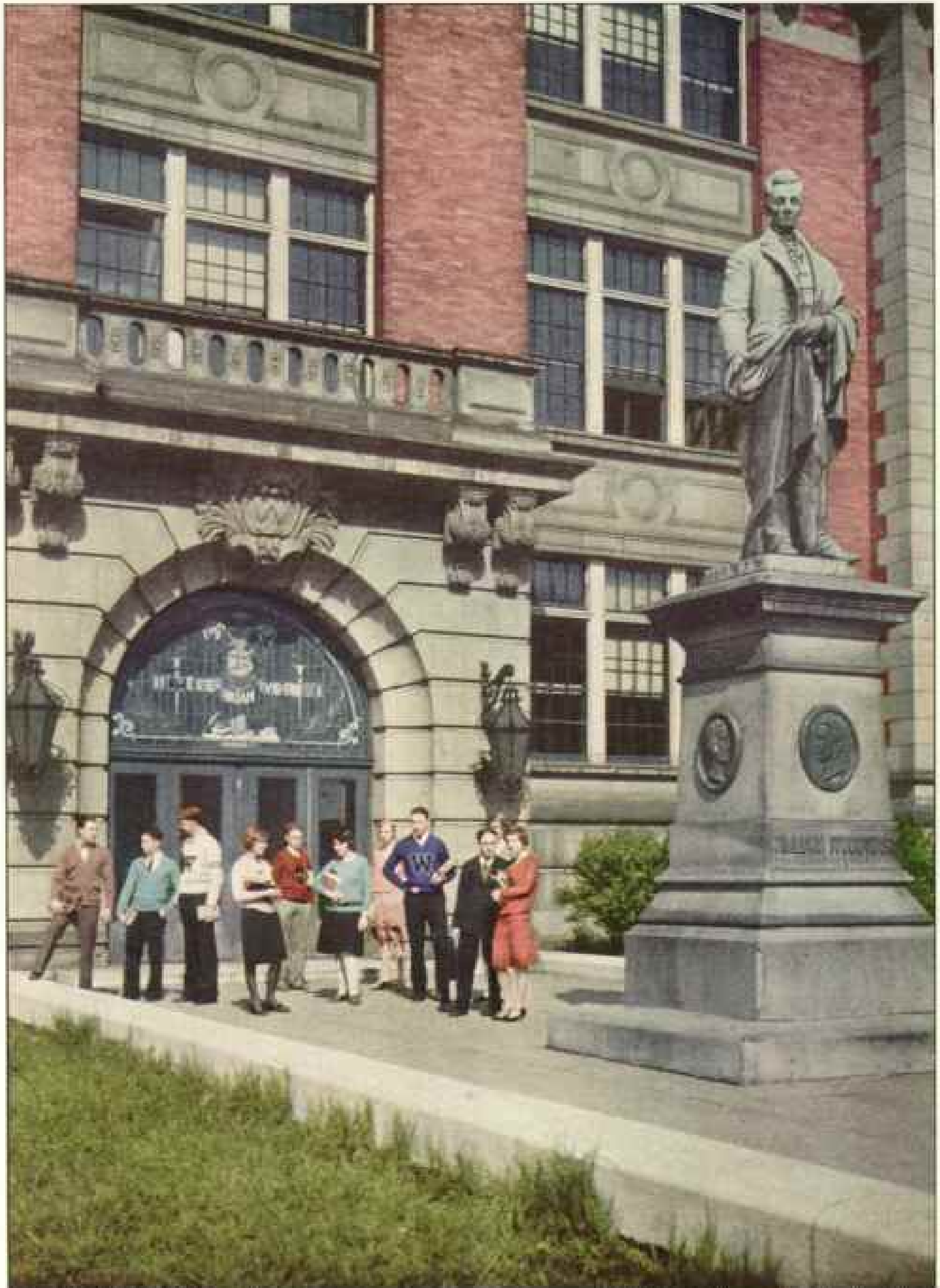
This old inn is on the historic National Pike five miles west of Zanesville. In early days roads were so difficult and traffic so heavy that hotels prospered at one-mile intervals.



Natural Color Photographs by Jacob Gayet

**A SIMPLE STONE OF THE FIELDS COMMEMORATES TECUMSEH
AND TENSKWATAWA**

The monument stands at Greenville where, in 1795, General Anthony Wayne made a treaty with the confederated Indian tribes organized by the dauntless Shawnee chieftain and his brother "the Prophet."



© National Geographic Society

Natural Color Photograph by Jacob Gayer

FORMER PRESIDENT TAFT ATTENDED WOODWARD HIGH SCHOOL.

Founded by a wealthy tanner, whose statue stands before its portals, this substantial old institution has afforded educational advantages to Cincinnati young folks for a hundred years. The donor and his wife are buried under the monument.

Judging from both inns, travel accommodations must have improved vastly during the generation or so by which they postdate the experience encountered in New York State by a letter-writing lady of the late 18th century. By reason of poor cookery, she "hastened to bed supperless," via so narrow a staircase that "I was almost stopped by the bulk of my body." Then, "I laid down my poor carkes" on a bed so hard and scant that, upon being awakened by fellow sufferers' complaints that "their legges lay out by reason of the shortness," she "riss up, setting by the fire until light."

THE LAKE SHORE APPROACH TO GREATER CLEVELAND

Beyond Painesville we swung into the Lake Shore Boulevard and presently came, past outflung vistas of summer colonies and bathing beaches, to Cuyahoga County, which is to say, Greater Cleveland. The city proper, stretching for some fourteen miles along the lake, represents about one-sixth of this metropolitan area and three-quarters of its population.

Cuyahoga County forms a wide amphitheater which rises from the Cuyahoga River's valley through upper levels, representing the lake's prehistoric shores, to a yet higher plane situated toward the east and southeast. In the lowest of these three levels lie lake-and-river activities: ten miles of dockage along the Cuyahoga, towering grain elevators, outstrung ore docks, iron and steel plants, tankage facilities.

Ascending to the amphitheater's top-most level, one finds oneself, remote from commerce and its clamor, amid such residential areas as Shaker Heights, Cleveland Heights, Garfield Heights, Cuyahoga Heights. Some of these, with their attendant shopping centers, represent highly restricted sections, with all, in respect to architecture and landscape effect, that that term implies.

Throughout this region, and dipping lakeward, runs one continuous belt of greenery, comprising golf courses, country clubs, parks, and parkways, ending only at the Lake Shore Boulevard; and there one encounters what can be classed among the finest approaches to any American city, the Bratenahl residential section, whose park-like lawns give on to tree-screened glimpses of Lake Erie.

Along the amphitheater's intermediate level lie Lakewood's fine residential environs, a second belt of parks and golf courses, ending at the municipal airport, and to eastward, Cleveland's main complex of industry, commerce, public buildings, seats of learning, amusement centers, hotel life. Dominating all this, as the tall queen dominates pawns on a chessboard, rises the Terminal Tower, flanked by its associated skyscrapers and by the Union Station, with its coordinated ramps, causeways, plexus of sunken railway tracks, the whole forming a futuristically conceived unit known as Terminal Area (see illustration, page 526).

The whole architectural mass below you forms a civic complex: transport, local and continental; garage arrangements for 1,700 cars, restaurants where 10,000 people lunch, hotel accommodation for other thousands, banking facilities, life-size model displays of offices and houses, radio center, shops in infinite variety—in brief, the multitudinous interests which draw the Terminal Area's daily ingress-egress movement of 250,000 people.

Every American city of commanding industrial importance has its great communities of foreign peoples. Of Cleveland's white population, some 25 per cent are of foreign birth. Its Czechoslovaks, Poles, Italians, Germans, Hungarians, and Slavs have their distinctive localities, contribute their distinctive color to the city's mosaic, and furnish problems for the social worker.

Fortunately, along with those manifold problems Cleveland has always had, in a pronounced degree, the civic will toward coöperation. Not to catalogue the multitude of strands composing her network of social service, she has always ranked high in that field for her achievements and innovations—to instance only her inauguration 22 years ago of the social-service clearing-house idea.

CLEVELAND'S CULTURAL SIDE

That Cleveland's opportunities for diversion are commensurate with the scale of its labors is evidenced by its various amusement parks and beaches, and, in a more serious sense, by its art, natural history and historical museums, orchestral and philharmonic events, concerts, recitals, and variegated field of drama. The museums have their crowded "gallery talks," the Public



AS OHIO'S FIRST TOWN LOOKED BACK IN THE 1770'S

At Schoenbrunn, near New Philadelphia, the Ohio State Archaeological and Historical Society is reconstructing the early Moravian settlement originally located here (see page 536).



Photographs by Jacob Gayler

EAST LIVERPOOL IS THE "STAFFORDSHIRE OF AMERICA"

As a ceramics producer, Ohio takes first rank in the United States, its 490 plants making tableware, art pottery, tile, brick, electrical porcelain, sanitary ware, and other clay products. East Liverpool, where the industry started in 1830 with some clay ground up for test purposes in an old coffeepot, now has upward of 300 kilns (see, also, text, page 527).



Photograph by Jacob Gayer

BIRTHPLACE OF THOMAS A. EDISON, AT MILAN

Ohio's native sons have made distinguished contributions in many fields of activity to the culture and welfare of the Nation and of the world. The list in science and invention includes not only the late Thomas A. Edison, but also such names as Charles F. Brush and Orville Wright.

Library has its juvenile art clubs, attracting 1,000 children monthly.

In the realm of community drama, Cleveland's most striking innovation has been its so-called Theater of the Nations. Utilizing the city's wide diversity of foreign peoples and their respective cultures, the inaugurators of this scheme selected about 1,200 performers from among some 29 nationalities and put on, for spectators totaling 20,000 during the 22 productions, plays, music, and folk dancing from all lands. Every night was home night for some nation or other, ranging from China to Ireland, from the Balkan States to Wales, from Scandinavia to Spain.

ISLANDS AND FISHING GROUNDS ALONG OHIO'S LAKE SHORE

From Cleveland westward we followed a shore road through the ore-and-coal ports of Lorain and Huron, with successive views of Lake Erie's resort life, until Sandusky was reached. There one is on terrain known more than two centuries ago

to the French, who doubtless had a trading post on what they called the Sandosquet River. And if anyone imagines that in those days Indian canoes had a limited range, let him consider the contemporary account, which depicts war canoes as crossing the entire region via the Sandusky and Scioto rivers, and thus into the Ohio, to do battle with tribes "toward Carolina."

Nowadays Sandusky ranks among the country's chief fresh-water fishing ports and is the gateway for a widely scattered resort life, from the slender, lagoon-indented neck of land extending offshore to Cedar Point to the group of islands gained by crossing Sandusky Bay Bridge and proceeding thence overland to Catawba Island.

If the reader demurs at the paradox of arriving overland at an island, he is in no worse case than the author. Having motored across Sandusky Bay's westward-lying peninsula to its ultimate tip, we inquired of a peach-picker in one of those fine orchards with which the region abounds, for Catawba Island.



CINCINNATI WORKS FOR THE GOSPEL OF CLEANLINESS

At Ivorydale, a suburb, is the parent plant of a well-known make of soap (see, also, opposite page). The "Porkopolis" of the 1830's, when Cincinnati loomed as a meat-packing center, has been eclipsed by a growing variety of manufactures, from those of the metal trades down to playing cards. Some are locally produced on a large scale. Soap, metal products, men's clothing, meat packing, and printing and publishing are the city's five leading industries to-day.

"You are on it," he replied.

"Really? But there's been land all the way—a peninsula."

"Yes, Marblehead Peninsula. It sort of worries you, I s'pose? There was that city feller, sort of scientificlike, who came up here for island fishing. It worried *him*, too, till he got used to the idea that Catawba Island is just, as you might say, its *name*."

However that may be, there are islands and fishing grounds aplenty along Ohio's shore, not to mention duck-shooting, sailing, beach life and the countless other

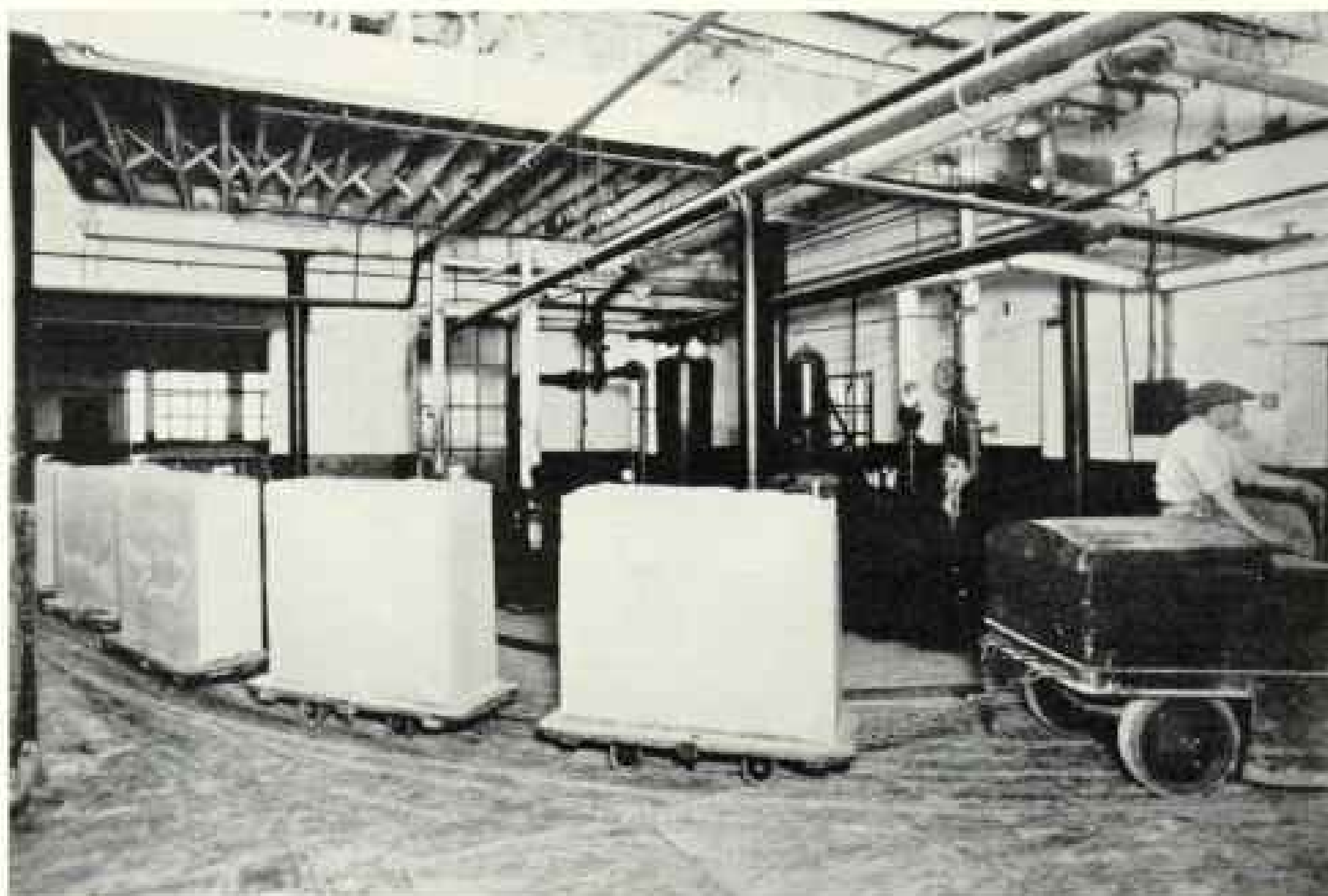
diversions that render Lake Erie's island district an open door for vacationists from States far and near. South Bass Island is the scene of an annual regatta. Middle Bass Island drew multitudes of fishermen before Grover Cleveland and has drawn other multitudes since William H. Taft, both of those visitors there having been instances of the tradition whereby some of our Presidents seek solace in waters less troubled than the political whirlpool.

Dominating whatever island scene you may visit, there looms over Put in Bay the Doric shaft commemorating Commodore



HUGE SLABS OF SOAP, LEFT TO DRY AND SOLIDIFY

After 20 or 30 minutes of violent agitation, the soap mixture is poured into oblong iron "frames," each holding about 1,000 pounds. Here it must be left to solidify and age before it is cut and stamped into bars. When the aging process is complete, the sides and ends of the frame are removed, leaving the slab of soap standing on its truck ready to be cut.



AN ELECTRIC TRACTOR HAULS A TRAIN OF SOAP TO THE SLABBING MACHINES

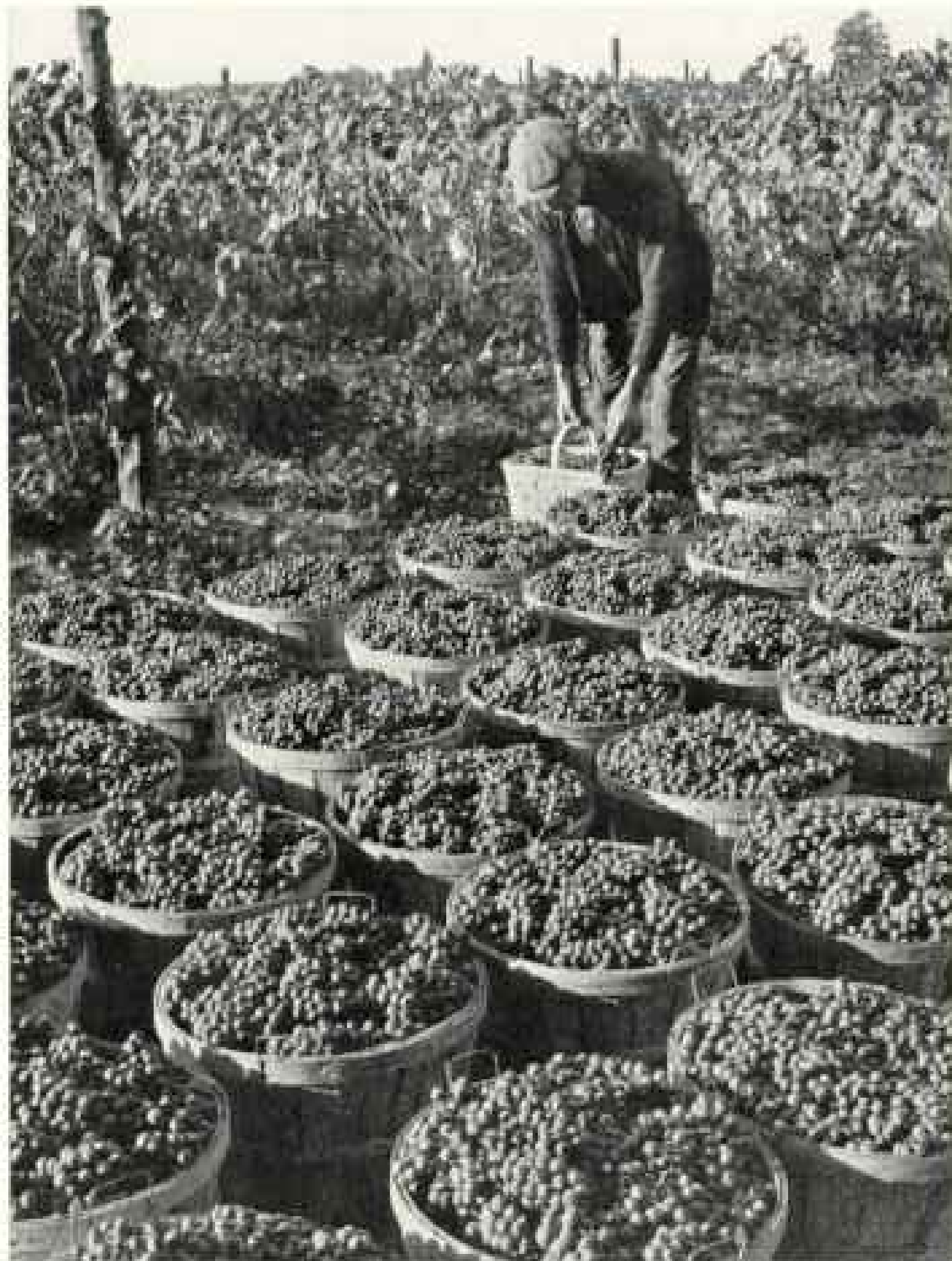
In the first cutting operation, known as "slabbing," the huge blocks are forced through frameworks of equally spaced piano wires. Upward of three billion pounds of soap are made in the United States every year, Ohio being a manufacturing center of great importance.



Photograph by Jacob Gayer

INCLINED-PLANE RAILWAYS LINK BUSINESS AND RESIDENTIAL SECTIONS OF CINCINNATI

The city is built on three levels. On the river "bottoms" are the manufacturing and wholesale districts, while the chief retail houses are on higher levels north of Third Street. Inclosing these terraces on three sides are the seven hills and the higher levels beyond, where most of the finer homes are located. The Mount Adams inclined-plane railway lifts the street car bodily from one level to another and affords fine panoramic views. In the right background towers the Union Central Life Building (see, also, Color Plate VI).



Photograph by Jacob Gayer

SOUTH BASS ISLAND HARVESTS THE FRUIT OF THE VINE

Ohio's grape industry began more than 100 years ago, when Nicholas Longworth developed the Catawba variety. First centering around Cincinnati, it moved later, after the vines were killed, to the southern shore of Lake Erie, where soil and climatic conditions favored it. Peaches also flourish in this lake belt.



Photograph by James A. G. Duvey

THE HOME OF THE "FOUNDER AND FATHER OF OHIO"

The Marietta house of Gen. Rufus Putnam, leader of the group which made the first permanent settlement in Ohio, in 1788, is completely inclosed for preservation within a costly modern building. The oldest existing home in the State, it formed part of one of the blockhouses of the Campus Martius, as the settlers called their stockade.

Perry's victory at the Battle of Lake Erie in 1813. Thus planted between Canada and the United States, it is a reminder of the Treaty of 1817, limiting armament on the Great Lakes, and, reassuring as a lighthouse, memorializes a century of peace between the English-speaking peoples.

Immediately south of Marblehead Peninsula lies an island—better say an islet—which, although one might easily overlook it in a casual map-reading, is visited annually by thousands. To-day our closer knowledge of wartime's propaganda leads to a reconsideration of much that was formerly written concerning Civil War prisons. Johnson Island held from first to last some 15,000 Confederate prisoners, most of them officers.

While one's practical reflections suggest that 200 deaths there during a period of some years was not an extraordinary number, one's sympathies revert to the boys themselves who died thus far from home and kin. For years the Daughters of the Confederacy have cared for the island cemetery where rests this little brotherhood of "the palmetto and the pine."

OHIO'S MAJOR RÔLE IN THE CIVIL WAR

Ohio's historic associations with the Civil War are manifold, often distinguished. Of her sons, native or adoptive, that State gave to the Union cause no less than 53 brigadier generals, 19 major generals, and 3 generals, the last named being, of course, Sheridan, Sherman, and Grant. That "war is hell" should ever become a piece of cheap humor was far from Sherman's thoughts when, addressing Ohio's veterans at Columbus in 1880, he said earnestly: "There is many a boy here to-day who looks on war as all glory; but, boys, it's all hell."

The "farthest north" of the Confederacy's operations was attained in Ohio when, in 1863, Morgan and his raiders made their predatory dash across southern Ohio before surrendering to Union forces. John Brown lived in several Ohio towns, in one of which he engaged in the wool business. Daniel Decatur Emmett, born near Mount Vernon, Ohio, wrote "Dixie" as a walk-around song for a minstrel show in 1859, little dreaming of its future war fame.

Tradition says that the phrase "underground railway" originated at Ripley,

Ohio, when the baffled pursuer of a fugitive slave remarked ironically that the neighborhood must contain what we moderns would describe as a subway. And still in that region one may see the house—or, more properly speaking, the several houses—to which Eliza is supposed to have fled from Kentucky across the ice.

TOLEDO IS OHIO'S COAL CAPITAL

We regained the Lake route and, approaching Toledo, crossed the Maumee River where it widens toward the bay that washes a corner of two States, Ohio and Michigan. What Cleveland represents in the Lakes' ore traffic, Toledo represents in their coal movement. During times of full activity, solid coal trains move almost hourly over the extraordinary plexus of rails that make this, Ohio's third most populous city, appear from the air like an intensive patch of what an illustrator calls cross-hatching (see, also, page 557).

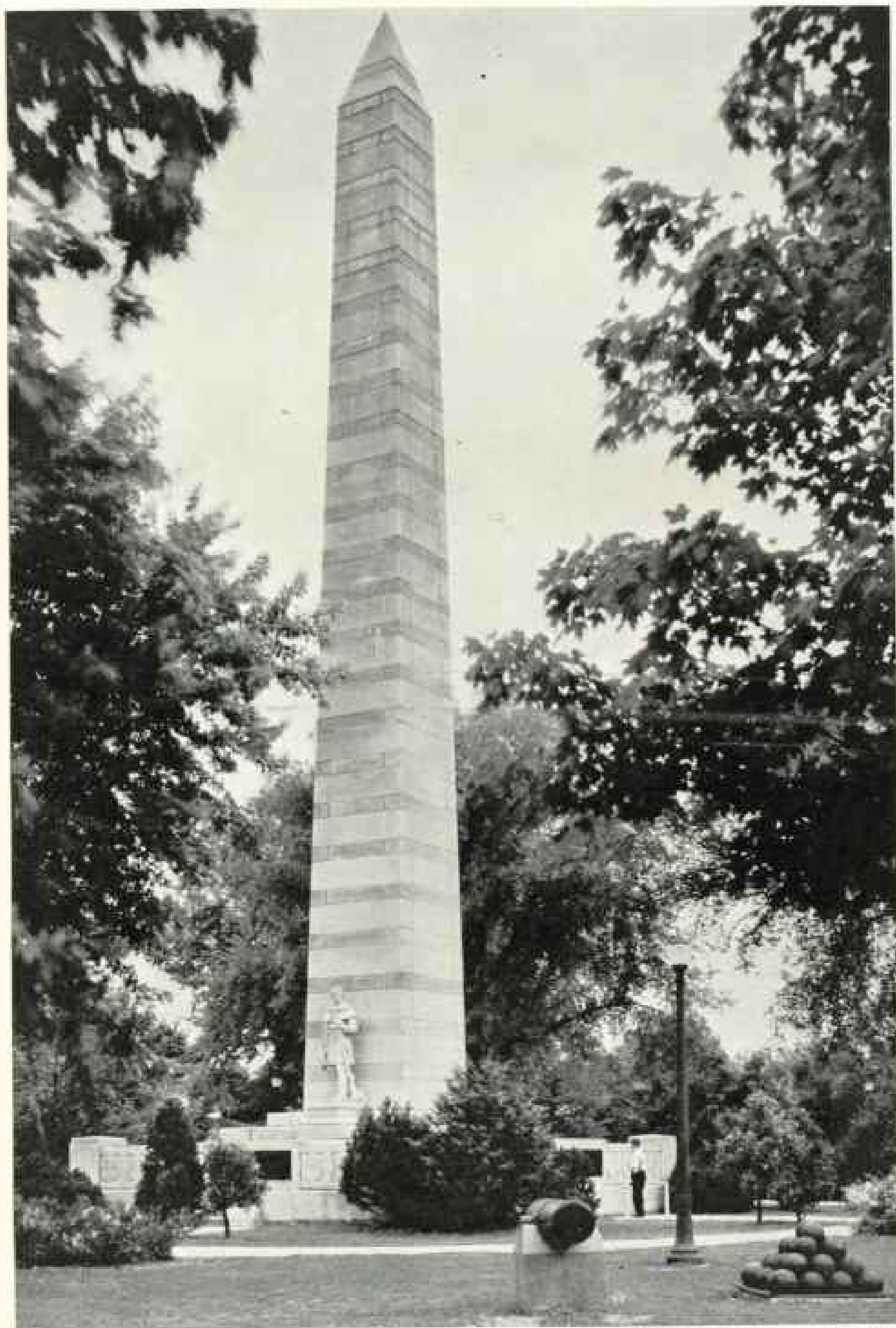
Toledo and her industries along the Maumee represent so peaceful a scene that it is difficult nowadays to envisage it as once having been the center of clouds portending interstate war. Yet such was the case in 1835, as witness the words of some forgotten poet laureate of the incipient fray:

"Come all ye Michiganders and lend a hearing ear,
Remember for Toledo we once took up
sword and spear."

Barring the poet's lurid reference to spears, his verses adumbrate an interstate dispute wherein both Ohio and Michigan laid claim to a boundary line that included the Maumee River's mouth. Fiery proclamations about marching over corpses and wading knee-deep in blood were followed by an advance upon Toledo of 800 Michigan volunteers. But in good time President Jackson intervened, proposing the Toledo strip for Ohio and the Upper Peninsula for Michigan. The compromise was accepted and the "Wolverine War" ended as a bloodless example of what arbitration can achieve.

A REMINDER OF OHIO'S AGRICULTURAL LIFE

From Toledo we took our last view of Lake Erie before turning southward through Ohio's wide agricultural belt that extends along the Indiana State line. It is often difficult while traveling for some



Photograph by James A. E. Duver

AT FORT RECOVERY RED MAN AND WHITE BATTLED FOR THE "INDIAN SHORE"

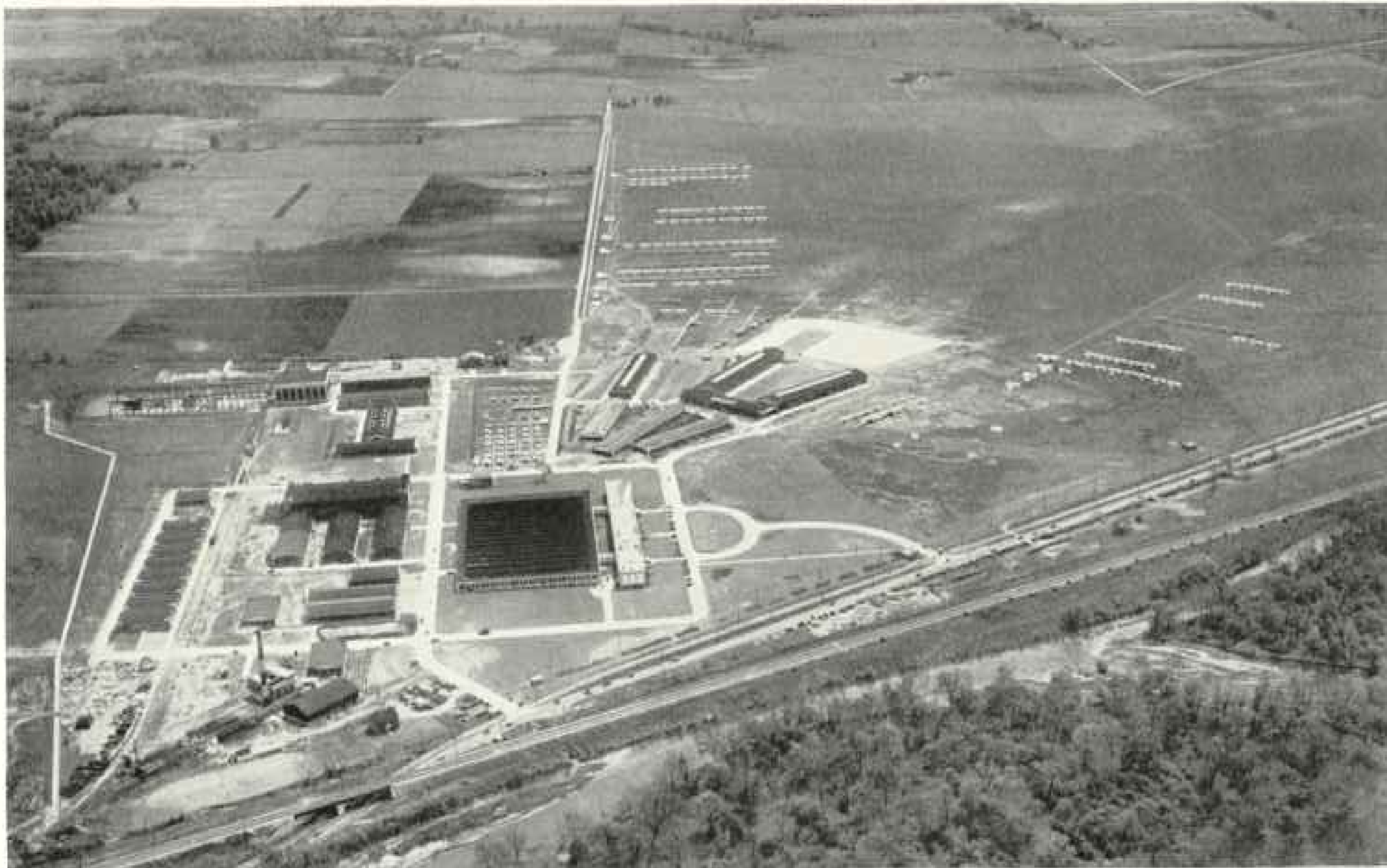
"Smash the Indians or abandon the western settlements"—that was the alternative. In the bloody ensuing struggle, Chief Little Turtle, in 1791, strewed the banks of the Wabash, near the Indiana border, with St. Clair's dead; but Anthony Wayne, "The Eye That Never Sleeps," recovered the spot and built a stockade there; hence its name. The shaft stands in a park near the site of the old fort and commemorates not only St. Clair's men, but those of Wayne who defended the fort in 1794. The figure at the base represents a scout of that time.



© International News

THE "AKRON," THE WORLD'S LARGEST DIRIGIBLE, ON HER MAIDEN VOYAGE

The Nation's queen of the skies on its trial trip of September 23, 1931, flying over Akron, America's center of lighter-than-air craft production (see, also, page 541). The huge dock built for the *Akron* in its home city has 314,000 square feet of interior floor space, enough to accommodate 100,000 people.



Official photograph, U. S. Army Air Corps

WRIGHT FIELD, ON THE OUTSKIRTS OF DAYTON, IS THE CENTER FOR THE DEVELOPMENT AND TESTING OF ALL TYPES OF AIRCRAFT FOR THE U. S. ARMY FLYING FORCE

The area of the flying field where all airplanes considered for military use are tested is 520 acres. The total area of Wright Field is 746.78 acres. There are three hangars of steel and concrete construction and two runways, each one mile long, grass-covered. Twenty-nine buildings house the various laboratories and administration offices, with a total floor space of more than 2,200,000 square feet. The propeller-test rig is the largest in the world. Power plant, radio, wind tunnel, metallurgical, photographic, and other laboratories are most modern in construction and equipment.



Photograph by Jacob Cayer

FOOTBALL ENTHUSIASTS WATCH THE OHIO STATE UNIVERSITY TEAM TRIUMPH IN ITS \$1,800,000 STADIUM

The Ohio Stadium, opened ten years ago, has normal seating capacity for 64,000 fans, but for hard-fought contests, such as this Western Conference game with Iowa State University, an additional 6,000 can be accommodated.



Official Photograph, U. S. Army Air Corps

REHEARSING FOR THE "CATERPILLAR CLUB"—A PARACHUTE JUMP AT MCCOOK FIELD

Ten years ago the parachute had yet to prove its value for general use; to-day more than 400 service men and civilians are members of the "Caterpillar Club" because it has saved their lives in forced jumps. At McCook Field, Dayton, the Engineering Division of the United States Army Air Corps has developed for American pilots a silk parachute of light weight but of tremendous strength.

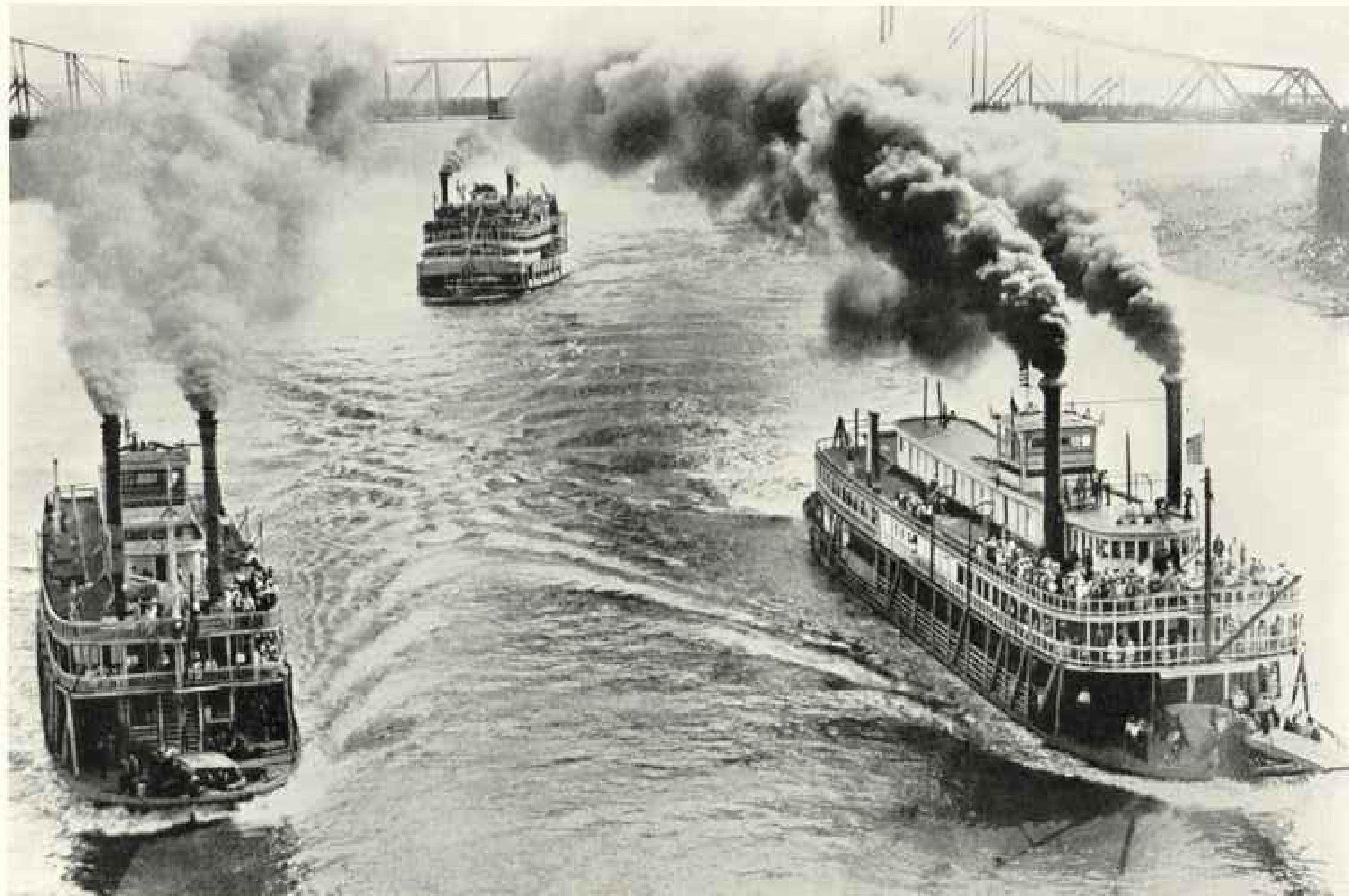


Photograph by Ewing Galloway

NOW, AS ALWAYS, THE OHIO IS CINCINNATI'S ROYAL ROAD TO THE SOUTHLAND

Her stately white packets of the Golden Era have changed into puffing towboats and steel barges; her drummers, gamblers, adventurers, and roistering stevedores have turned into staid folk. But renaissance of a kind is in the air. With a river made navigable the year round and linking her with inland waterways serving the South; with rail, air, and highway arteries, and a central geographical location, the Queen City once more reemphasizes her proud old claim to the title "Gateway to the South." The water front at the foot of Broadway, with the Central and the L. & N. bridges.

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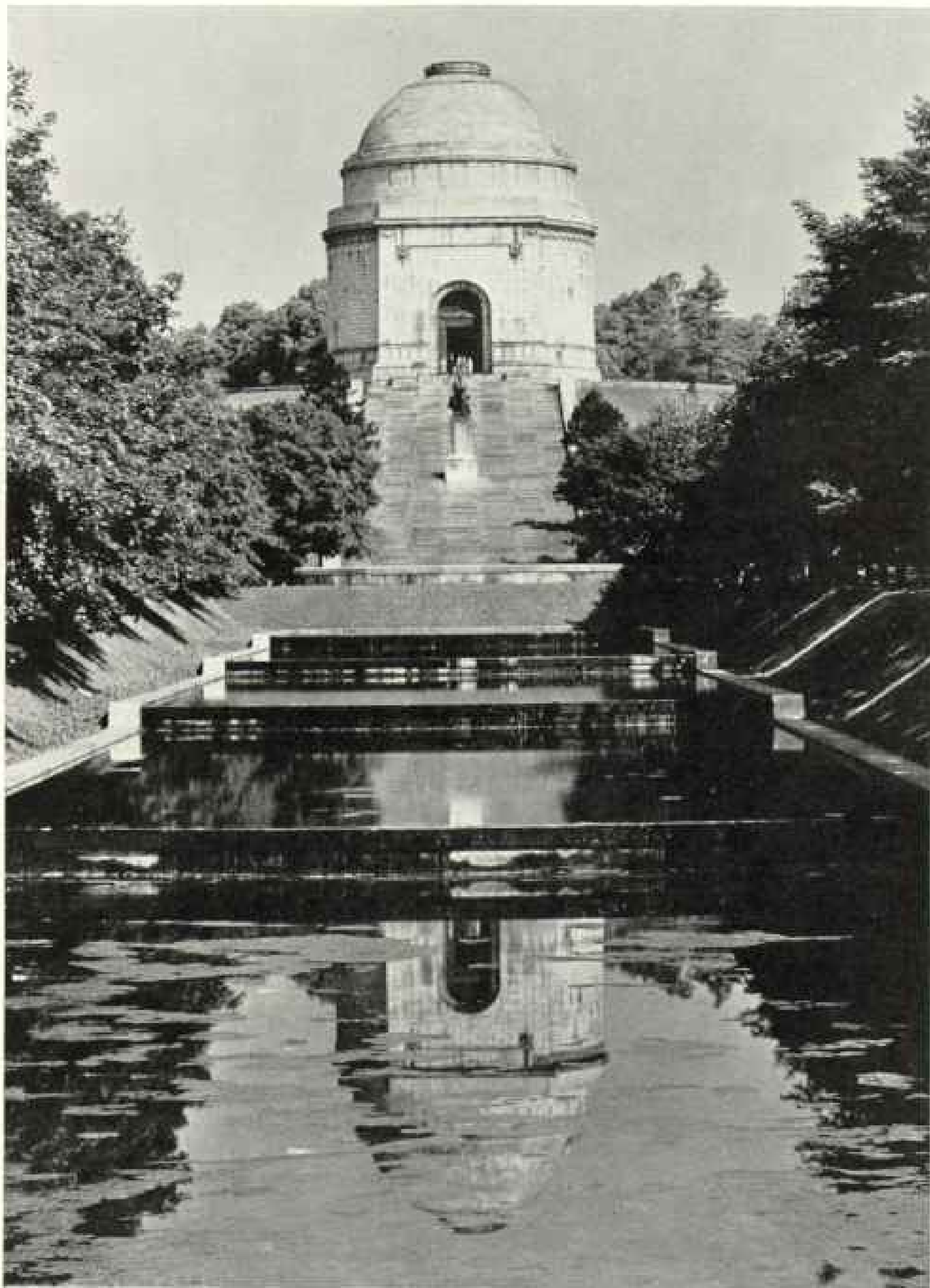


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Photograph by Arme

RACING NECK AND NECK, MODERN RIVER PACKETS RECAPTURE THE THRILLS OF LONG AGO

The glamour and romance of early steambotting days on the Ohio have passed away like last night's dream, to revive only on exciting occasions like this, when, in 1929, the wooden-hulled *Betsy Ann* (left) raced the steel-hulled *Tom Greene* (right) from Cincinnati to New Richmond. The latter won by a scant ten feet. Distance, 20 miles; time, 2 hours, 21 minutes. Cincinnati still maintains passenger packet service with Pittsburgh, Charleston, West Virginia, and Louisville. The Central Bridge of Cincinnati in the background.



Architect, Harold Van Buren Magonigle

Photograph by Jacob Gayer

THE TWENTY-FIFTH PRESIDENT OF THE UNITED STATES RESTS IN THIS TOMB

Canton, President McKinley's home and the scene of his "front porch" campaign, dedicated this granite memorial in Westlawn Cemetery in 1907. Halfway up the stairs is a bronze statue by Charles Niehaus depicting the Martyred President delivering his last speech, at the Pan-American Exposition, Buffalo, New York, just a few hours prior to his assassination. Mrs. McKinley is also buried here in a sarcophagus beside the President's.

200 miles through this farmland area to realize that Ohio is preponderatingly an industrial State. For years, like other industrially evolving States, Ohio has witnessed a cityward drift and a correspondent thinning of her rural population. Of her 6,647,000 people, only 16 per cent are found in agricultural regions, while, in contrast, these represent upward of 83 per cent of Ohio's land surface.

We wonder if any future son of an intensively industrialized Ohio will ever experience quite the same feelings with which many a gray-haired "Buckeye" nowadays reverts to the time when he was a barefoot farm boy; for, while the latter still hears the dear old cowbells in his dreams, one cannot successfully imagine the former reminiscing about the dear old factory whistle. "And I, too, was once in Arcady," seems to have been the inspiring note of the Ohio Society of New York in choosing, instead of a gavel, an Ohio cowbell two centuries old.

In 1735 this finely hand-wrought heirloom was brought from Germany into the Colonies. There it descended through eight generations while adding its remote rustic jangle to a Nation's joy bells ringing out the successive conclusions of its major wars. For a century it had been sounding in Ohio clover patches, when at last it was retired as a symbol of those distant wintry dawns when the erstwhile farm boy, routing out the bell cow, warmed his feet where she had been lying.

CITY OF CASH REGISTERS, ELECTRIC REFRIGERATORS, AND WRIGHT FIELD

We came to Dayton, originally a log-hut contemporary of Zane's Trace (see page 551) and to-day the sixth in population among Ohio's cities. One's first impression of its spacious comeliness might easily deceive a stranger into dissociating Dayton from the idea of large industries; yet in fact certain of its manufactured products are distributed all over the world. Far lands traditionally devoted to the abacus have replaced it by the cash register, and savage tribes have been known to welcome it as a magic piano that calculates while emitting musical notes. Electric refrigeration equipment of Dayton make has solved many a household problem in tropic countries, and a room-cooling cabinet—turn the

knob and change the temperature—also emanates from the same city.

One would hesitate to guess how many matches have been played with Dayton golf clubs or how many millions of tons of ice cream have been consumed from its cones, and only Uncle Sam knows how many carloads of his stamped envelopes are manufactured there each month.

Though communism doubtless will always prove unpalatable fare for the American body politic, it accepts the coöperative principle in multiplying forms, one of which, Dayton's local delivery system, is a case in point. Among other civic innovations, Dayton was a pioneer in the commission-manager form of government, which nowadays is found in several Ohio cities.

Dayton's adoption of it was accelerated by her dire flood experience of March, 1913, when, due to excessive rainfall, the swollen Miami poured into the city, submerging its central business section and the whole of its most populous area to depths of from 8 to 20 feet. But the lesson of this major catastrophe was promptly applied and part of Dayton's war-time activities consisted of constructing, at a cost of \$32,000,000, a system of enormous retarding basins which, with channel regulation, now render her flood-proof.

The city's Veterans' Administration Home is well worth a visit, not only for one's enjoyment of its parklike spaces, as well as that of chatting with veterans of several wars, but because it is the general depot for clothing distributed to the country's nine additional homes.

Although it comprises some remarkably fine buildings and offers plenty of intramural employment, you are not to infer that these war veterans are necessarily of a sedentary disposition. Quite the contrary. What with ten national homes on the list and the veterans' pensions and earnings to depend on, they "hop" regionally to and fro—from Maine to Virginia, from Tennessee to California—as chance offers. There's nothing like fresh scenes, fresh faces—yes, fresh audiences. For the spinning of war-time experiences those ten national homes offer the handsome total of 25,000 potential listeners. When Maine is surfeited with that one about what General Shafter said concerning bad tinned beef, or that other one about the cootie



Photograph by Jacob Gayer

ONCE PRIZED, NOW THE ABANDONED RELIC OF A DEPARTED ERA

A scene along the Ohio and Erie Canal, near Massillon, of which only an isolated lock and a few stretches of water remain (see, also, text, page 561).

contest at Fère-en-Tardenois, why, try it on California!

WHERE WINGS WERE FIRST GIVEN TO MAN

At Dayton, as all the world knows, wings were first given to man. There the Wright brothers, initially as a mere sport, progressed from gliding to wind-tunnel construction, and from that to building the motor-driven plane in which, at Kitty Hawk, North Carolina, in 1903, they made the world's first flights.

It is but historic justice that Dayton, in addition to its municipal airport, should have the headquarters of the Materiel Division of the United States Army Air Corps. Since 1927 this has been situated at Wright Field, which includes the Wright brothers' early experimental ground (see page 581).

An absorbing hour or more may be spent with the guide who shows you through the headquarters' various departments. Here is the branch where propellers up to 45 feet in diameter are whirl-tested, and where models, swung in wind tunnels, predetermine some projected airplane's performance. Here are other branches where you encounter the automatic supercharger,

which supplies an engine with auxiliary air pressure at high altitudes, or witness the workings of oxygen equipment for flyers, or their 5-lensed mapping cameras, or the "gyro-pilot," which automatically stabilizes the plane in flight.

Again, in accordance with set standards, all contributing materials must be tested, sometimes replaced, as one quality of lubricant for another, or as rayon silk for the imported product; and such activities, together with ceaseless experimentation in lesser airplane parts, constitute the work of a fourth branch. And so you progress, through departments devoted to air armaments, pyrotechnics, and lighter-than-air craft, until you arrive at the hangars, where, like clusters of torpid hornets, the planes of latest type stand ready for the test pilot.

Now a plane is rolled to the flying line. Great things are claimed for it by the manufacturer, but the test pilot, that broncho-buster of the air, wants to see not only its best performance but its worst. What with his voluminous leather garments, oxygen mask, parachute harness, and electrically heated gauntlets, he looks rather like a deep-sea diver as he climbs in, adjusts his safety belt, and "revs" up his engine.

He's off! For awhile he fairly rushes over the 2-mile course; then he slackens pace to an alarming point, thus measuring the plane's minimum speed. Presently he is rising, ever rising, in wide circles, toward the plane's "ceiling," where, at perhaps 29,000 feet, with the temperature at 50 degrees below zero, the air-pumping supercharger will be assisting the engine and oxygen will be nourishing the man.

All the while he has been noting tendency to spins, the rate of climb, the speed at given altitudes, and the many other points which will comprise his report.

As he soars up there, as on a tamed roc, doesn't it look easy? Yet when the air broncho does buck, perhaps by a flat spin, it is a matter of seconds between life and death, between relinquishing attempts to emerge from the spin and parachuting over the side.

Progress has ever given the lie to the consideredly impractical. It is not ten years since the individual 'chute, then looked at askance, proved its effectiveness when, at McCook Field, Capt. Albert W. Stevens established a high-altitude parachute record by going over the side at 23,894 feet. Since then the life buoy of the air has saved the lives of many airmen.

CINCINNATI, A MAIN KEY OF THE GATEWAY STATE

We ended our statewide tour at Cincinnati, the "City of Seven Hills." That description, recalling Cincinnatus' home town on the Tiber, became applicable when, in 1789, due to floods on the Ohio, the then low-lying Cincinnati removed to the surrounding heights. Ever since it has been expanding over these, until now it covers some 72 square miles. Like Cleveland, it is a city with townships in its midst, the three independent municipalities of Elmwood, St. Bernard, and Norwood lying completely within Cincinnati's boundaries.

From the outset, due to its commanding position on a river bordering upon a long-established South and leading toward an undeveloped West, it was destined to be one of the main keys of the Gateway State, while by virtue of its proximity to regional raw materials—iron ore from the North, coal from the East, timber from the South—it later developed as a great manufacturing and distributing center.

As a distribution center for northern goods in the South, Cincinnati has always

been particularly proud of her commercial prestige—so much so that she once built a railroad to maintain it. This was after the Civil War, when she found that her southern trade had almost slipped away. In transportation, the Railroad Era was fast displacing the River Era. Iron arms were shifting north and east much of the Ohio Valley traffic formerly handled by the river, while Louisville, having direct rail connection with important cities south, was out to wrest the crown from the Queen City as a southern "gateway."

How meet the challenge of the Kentucky rival?

"Why shouldn't our city build and operate an interstate railroad to the South as a *municipal enterprise*?" finally asked a Cincinnati lawyer. A startling suggestion; but Cincinnati, isolated, with her commerce and industry stagnating, accepted it and set about the tremendous task. Fighting continual difficulties in securing a right of way through two States; defeated, discouraged time and again, she struggled on until, after seven years, victory was hers, in 1880. To-day the Cincinnati Southern, "the only railway owned by a municipality," is here to tell the tale of its 335-mile link between the Ohio metropolis and Chattanooga, Tennessee.

Cincinnati still owns this, one of the country's most important trunk lines, but leases it to another railroad. It produces a goodly revenue, but perhaps of greater importance are "those more or less intangible values that have accrued through many years from the contact thus established."

Standing on one of the city's surrounding hills, you view far below the checker-board complex of a business district overlapping the town's original riverside site. On your one hand, sliced along its outskirts, like some vast swath cut through standing grain, runs horizonward the half-completed Union Terminal rail access. Yonder green flats along the Little Miami constitute the municipality's 1,000-acre airport, while all around you rise Cincinnati's seven hills, clothed with fine residential suburbs and embowered by parks.

One cannot trace the great arc of the old Miami and Erie Canal, for it has long since been banished underground, but one can identify, to northward of where it ran, that section, settled by Cincinnati's German colony, which for long was described as "Over the Rhine."

Coming in two waves after the revolutions of 1832 and 1848, the colonists warmed to a New World "Rhine," whose hillsides, while lacking ruined castles, soon vied with the Rhineland's vineyards. Also, they implanted the Turngemeinde, that system of concerted physical exercise which began in Germany under Frederick the Great. Vintaging was accompanied by brewing as inevitably as pretzels were accompanied by beer. And—since what are these things, lacking song?—harmonies of their homeland's Gesangvereine flowed from them as joyously as, say, Rudesheimer flows from its slender-necked bottle.

A CENTER OF MUSIC CULTURE

In short, they brought with them an entire culture, that of well-beingness, conviviality, music, literature, language—especially language. Heroic was the tussle between English-speaking census-taker and "the lady from over the Rhine"—if you recall the bygone ballad—when, to all of his queries concerning number of children, their ages, and if she had a husband, "she civilly answered, 'Nein,'" or, as he understood it, "Nine."

Although the Turngemeinde idea long ago entered the public schools, and though Cincinnati still has many singing societies, "Over the Rhine" is to-day merely a memory of what, while fusing with civic life, contributed to it an ineffaceable tradition.

Perhaps its chiefest contributions lay in music, although, for that matter, musical culture in Cincinnati, dating back to the Haydn Society and the Harmonical Society, is almost as old as the city itself. It was the Saengerfest of 1842 that inaugurated Cincinnati's May music festivals, followed the biennial Maytime festival, now close upon its sixtieth year, whose conjoined solo, choral, and orchestral presentations have been participated in by musicians of world fame. Cincinnati's Symphony Orchestra, founded by the Orchestra Association, of which Mrs. William Howard Taft was the first president, is nearing its fortieth season. Other musical societies of note form a striking list.

A park to every hill and a playground wherever possible seem to have been the aims of those who some twenty-five years ago planned Cincinnati's beautiful system of plaisances. And yet, from Eden Park, Alms Park, and Mount Echo Park, all overlooking the Ohio, to Ault Park, high-

crested over the Little Miami's valley, "system" is too formal a word to convey a picture of those many hill-and-dale sylvan spots, so artfully contrived as to create a ring of untrammelled Nature around the city.

Within that ring are scattered other green spots, including Zoo Park and its outdoor home of opera. From precarious beginnings, this sylvan theater has established itself upon a basis of wide repertorial range, from the oldest of tuneful favorites to so demanding a work as the "Meistersinger." Rare indeed is the experience of hearing opera presented in high excellence amid woodland surroundings where, gracing the conventional *mise-en-scène*, "tall trees crowd into a shade." Were Cincinnati's opera park situated in Europe, multitudes of American tourists would make it a seasonal pilgrimage spot.

Cincinnati, then, is the reverse of a metropolis immersed in big business at the expense of cultural life. That this is true, not only in the realm of music, is evidenced by so distinguished a foundation as the Cincinnati Institute of Fine Arts. And, as an architectural center of period styles, the charming suburb of Mariemont, with its Tudoresque and Colonial effects, as well as its village church modeled upon the one at Stoke Poges, of "Gray's Elegy" fame, offers a memorable instance.

Mount Auburn, at Cincinnati, is honored as being the birthplace of William Howard Taft, the only man who ever held, as President and as Chief Justice, the two highest offices within the Nation's gift. He was the seventh in historic order among eight Ohioan Presidents who, with a single exception, were born in that State. Ohio ranks next to Virginia as a mother of Chief Executives, and in William Henry Harrison, born in Virginia and elected from Ohio, they share one in common.

OHIO WAS AMERICA'S FIRST "MELTING POT"

Why, apart from immediate political causes, as many as eight Ohioans should have been sent to the White House during a period covering 21 national elections would afford interesting speculation. Yet it is worth remembering that the Gateway State received early from the East native peoples of markedly different stocks, and that it was under novel conditions and on a scale never known in the Colonies that



Photograph by Jacob Gayer

THE CINCINNATI BIRTHPLACE OF ONE OF AMERICA'S BEST-BELOVED CITIZENS

William Howard Taft was the sixth of Ohio's seven native-born sons to attain the Presidency and, as Chief Justice of the United States, the only man in the country to hold the two highest offices within the gift of the Nation. He actively encouraged the National Geographic Society for 25 years and served as a member of its Board of Trustees from 1917 until his death, in 1930.

these fused into something new and highly characteristic.

The Ohio of the Ordinance days was America's first instance of a melting pot of American ingredients. It lay off the track of sectionalism. It is not wholly surprising, then, considering the electoral factor of compromise, that its sons were repeatedly called upon to represent the Nation's mosaic of interests.

But, juvenile aspirations notwithstanding, we cannot all be Presidents. Yet we may become nationally or internationally known as ambassadors, inventors, authors, sculptors, humorists, architects, military "aces," illustrators, historians, stagefolk, movie stars, social reformers, cartoonists, composers, impresarios, dramatists; and in each profession of that incomplete list some Ohioan's achievements have passed into the national or international flow of consciousness, from the arc light and the storage battery to the colossal statue of Washington at the Subtreasury in New York; from the phonograph, stock ticker, and motion picture to "Happy Hooligan"

and "Buster Brown"; from the Woolworth Building to such a world-encircling melody as "Mandalay."

Ohio's story begins with a great river that winds ever through it as a leitmotif emerges recurrently throughout a music drama. Then came the railroad, the airplane, the motor highway, while doubtless Old Man River often stirred in his sleep to wonder where all his children had gone. But nowadays, what with modern dams and locks rendering the Ohio permanently navigable, and with proposals for a State waterway system connecting that river with Lake Erie, it is quite possible that he may yet enjoy a renaissance surpassing even the steamboat era.

But, anyway, Old Man River doesn't care. Like many an eclipsed parent who has fostered his offspring and beheld them emerge through promise into high achievement, his great work is done. Well content in retrospection of the rich pageant that sprang from log huts in a Western forest, "he don't say nothing; he just keeps rolling along."



Photograph by Newell F. Johnson

PLANE-TABLE WORK IN THE RIO NEGRO SWAMPS PRESENTS DIFFICULTIES

To wade for hours waist-deep in water is not intolerable discomfort (see text, opposite page), but it is a bit hard to disregard the multitudinous insects and remain unmindful of the alligators and snakes which infest the dripping jungle.

AN ARMY ENGINEER EXPLORES NICARAGUA

Mapping a Route for a New Canal Through the Largest of Central American Republics

BY LIEUT. COL. DAN I. SULTAN

Corps of Engineers, U. S. Army

SURVEYS for the building of canals and the improvement of waterways are routine jobs for an officer of the Army engineers; but the survey of a new interoceanic canal across Nicaragua was something different. The importance of this proposed new canal and the difficulties that were certain to be encountered in a survey of this magnitude in the tropical wilderness of Nicaragua fired the imagination and challenged the ability as no everyday job in the States could.

With a group of Army officers and a provisional battalion of Engineer troops, it was my privilege to spend two years in this interesting country surveying the canal route and planning its construction features.

The Marines put us ashore in small boats from an Army transport anchored several miles offshore from Corinto, the chief Pacific port, for the entrance channel to the harbor was considered too shallow to be safe for so large a vessel.

In the early morning, our first glimpse of the Nicaraguan shore was impressive. The northern end of the line of Nicaraguan volcanoes—El Viejo, Santa Clara, Telica, and others—stood out in bold relief against the sunrise, and in the hazy distance rose the perfect cone of Momotombo, marking the location of Lake Managua, whose waters almost surround it.

Corinto is one of the few places in Nicaragua the average tourist sees. One gets here the unmistakable smell of the Tropics, and, although it is only a commonplace seaport, it has an atmosphere all its own.

NO HOLIDAY JAUNT IN THE JUNGLES

We found it no holiday jaunt, this business of surveying an interoceanic canal through tropical jungles. There were problems enough to keep us alert, whether they dealt with health, with supplies, or with carrying on our technical work.

Our most difficult terrain was near the Caribbean end of the zone. This is one of the wettest places in the Americas, averag-

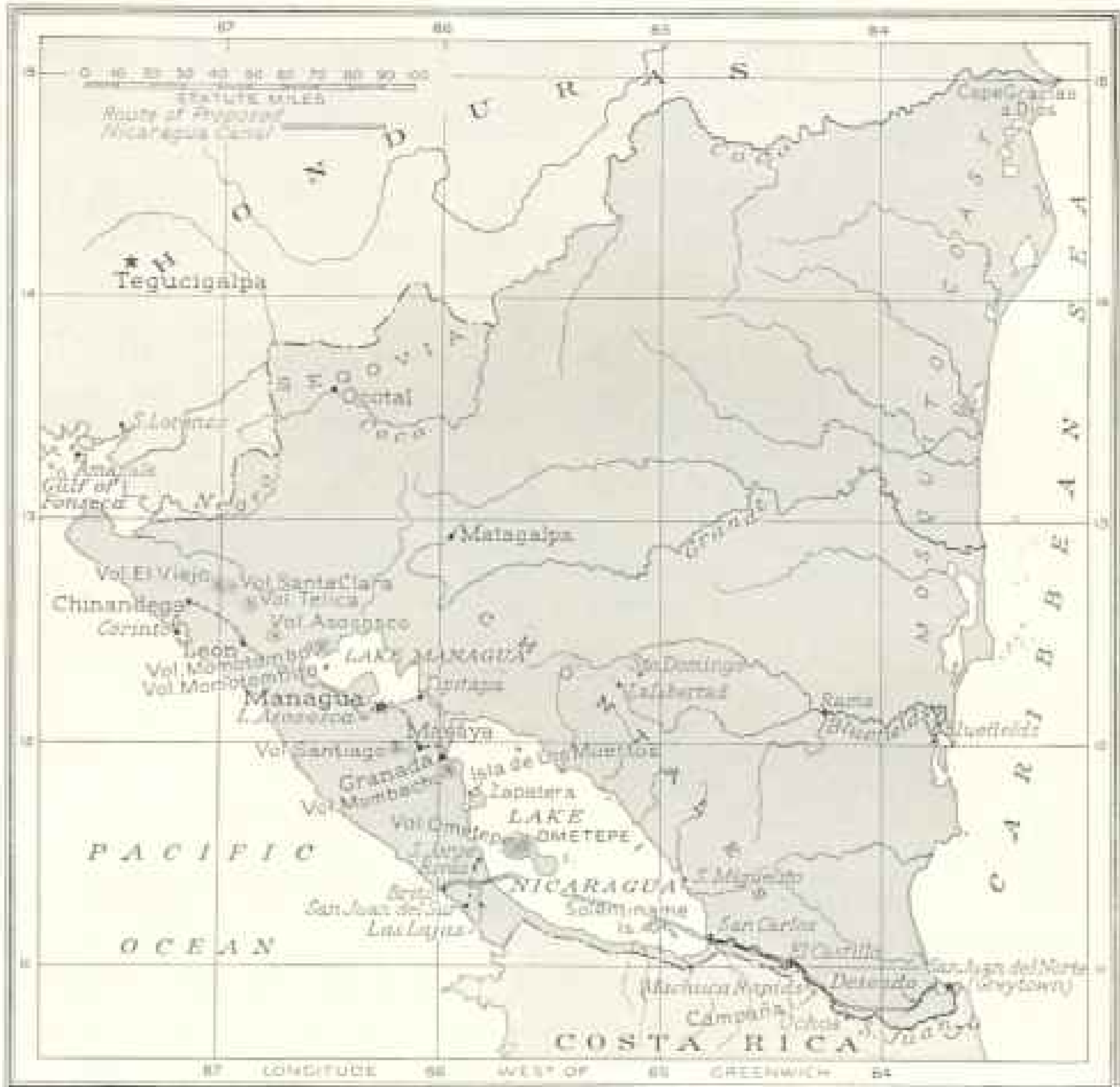
ing some 255 inches of rainfall each year. By way of comparison, Washington, D. C., has 42 inches and San Francisco 22.

You can pick out what may be called the height of the wet season in Nicaragua by the concentration of showers, but it is impossible to find a distinct dry season in the east. Here one may expect rain every day in the year and is rarely disappointed. Tents were first used as shelter, but in the wetter parts of the zone we soon substituted thatched native shacks, as they were cheaper, shed the water better, and required less transportation, as all materials were readily at hand.

The troops were never dry; but fortunately, although being wet constantly is not comfortable, in Nicaragua this condition does not lead to colds and pneumonia, as would be the case in the United States. Working in an almost continuous downpour in a jungle so thick that you can rarely see ten feet in any direction, where the vegetation is so dense overhead that little light penetrates and a permanent gloom pervades, where the footing is always insecure, and where large areas are covered with bottomless swamp, is not a very happy existence for an American soldier.

If you increase this discomfort by adding unnumbered mosquitoes; insects by the million, so varied as to size, shape, bite, and method of locomotion that classification is impossible; and then throw in alligators, snakes, and scorpions, not to mention the fleas and ticks, you will have a picture of the conditions under which the Army personnel worked in Nicaragua. The men showed courage, determination, and the stamina to carry on that won the highest praise.

And there was always the saving sense of humor. Some of the younger officers wanted to play a joke on one of their number who had a particular aversion for snakes; so they captured what to them was a small, harmless snake and placed it under a tin bowl at his place in the mess tent.



Drawn by C. E. Riddiford

THE REPUBLIC OF NICARAGUA, WHERE U. S. ARMY ENGINEERS HAVE SPENT TWO YEARS SURVEYING A CANAL ROUTE

The proposed waterway, whose estimated cost is \$722,000,000, would have its Atlantic entrance near the mouth of the San Juan River, follow the Rio Desgado for a distance of some 15 miles, then cut across to the San Juan and follow the valley of that stream to Lake Nicaragua and across that body of water to the River Las Lajas, and reach the Pacific at Brito.

The joke, however, was not on the nervous friend. When the snake was released and the victim had jumped up with a whoop, the doctor also let out a yell. The latter, who was our reptile expert, had recognized it as a coral snake, a beautiful specimen, but also one of the most dangerous to be found in Nicaragua.

A PLAGUE OF INSECTS

We did not have so much malaria as we expected, for it was impossible to make any attempt at mosquito control or to screen our shacks and tents. The men

slept under nets and took quinine daily as anti-malaria measures. But many of the camps were so far removed from human habitations that the mosquitoes had no chance to become malaria carriers.

There are many kinds of mosquitoes. Even in the case of the malaria type, the male mosquito is nothing more than a pest, and the female has to bite a person who already has malaria in order to become dangerous to her subsequent victims. Camps near native villages or isolated habitations did develop malaria cases, but the total number in our command was never large.



TWO LIEUTENANTS OF THE ENGINEERS BUILT A HOME FOR THEIR FAMILIES

Casa Loma, as the house was christened, was in Costa Rica, across the San Juan River from a survey party camp in Nicaragua. The officers themselves put up the building, but the architecture, particularly the roof, is of the native type.



Photographs by Newell P. Johnston

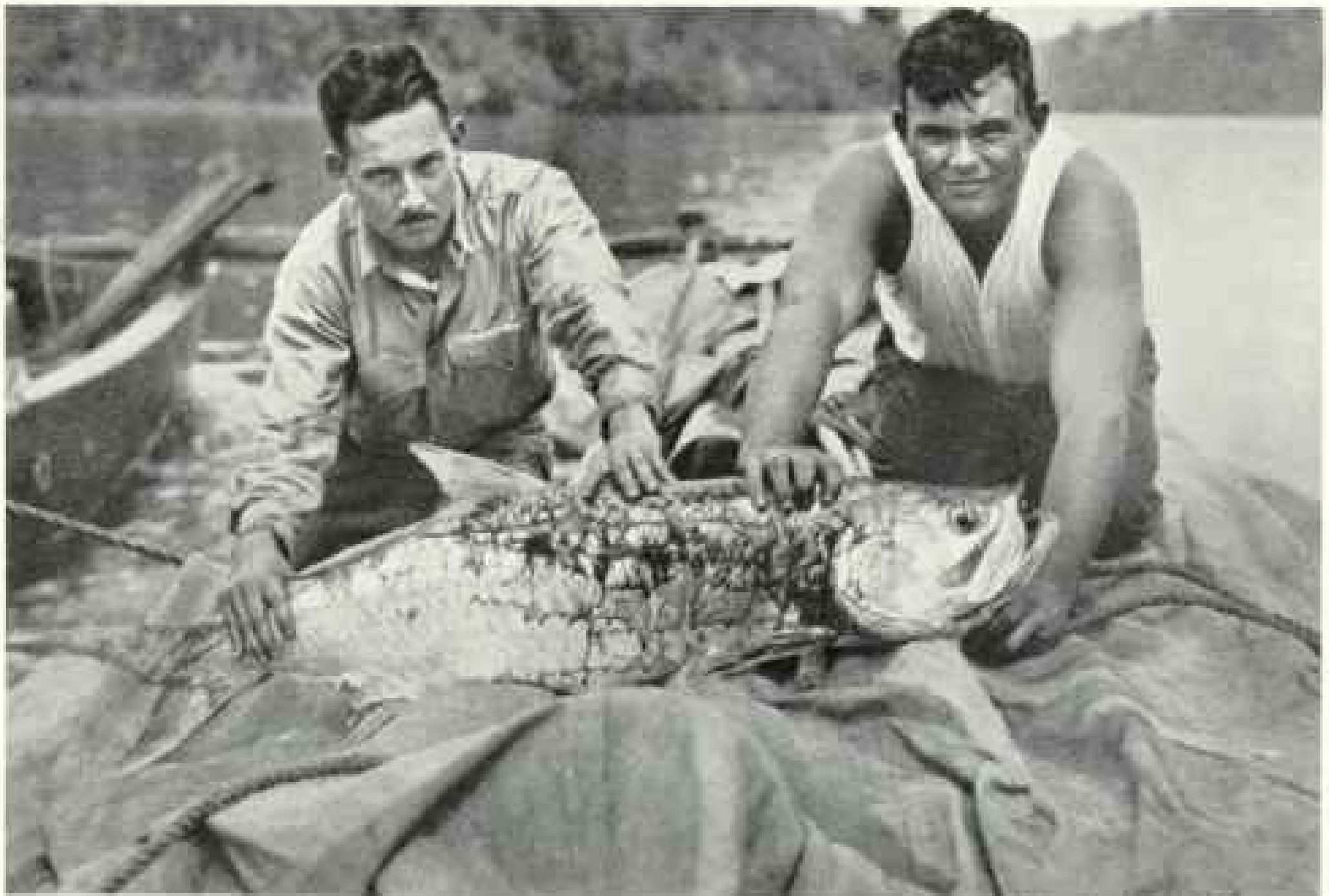
THE MESS SERGEANT WEIGHS HIS OWN PURCHASES IN GRANADA

So fond of barter are the natives that they will refuse to sell their produce outside the market, even at double the prices obtainable in the street stalls. The customer may use the old balance scales to insure full weight. The baskets held by the Army coolies contain alligator pears and the larger papayas.



TARPON CATCHING IN THE SAN JUAN AFFORDS EXCITING SPORT

These salt-water fish are found in inland lakes and rivers of Nicaragua (see text, page 612). The men went out for them in boats lashed together in such a manner as to leave a space of water between the hulls and pushed forward by a motor launch. When the prize got into the moving trap, it would leap into a boat. The scramble to subdue it was always exciting (see below).



Photographs by Newell F. Johnston

IT IS NOT EASY TO HOLD DOWN A 60-POUNDER

After the fish lands in the boat, he begins his fight; for he has not been tired out by being played with line and reel. To be hit by his lashing tail is no fun.



Photograph by J. C. Sawyers

BOAT PASSENGERS BETWEEN SAN CARLOS AND GREYTOWN FURNISH THEIR OWN "STATEROOMS"

One may travel first or second class on the long river voyage, but the difference between the two grades of accommodation is slight. The patron who buys the more expensive ticket is entitled to swing his hammock or spread out his blankets in a favored spot on the deck. Others must be content to make their beds on top of heaps of cargo. All carry their food, consisting in part, in the case of natives, of alligator eggs.

Ringworm, screw worm, infected ears, and infections from insect bites or ordinary cuts and abrasions caused us much trouble. There were plenty of poisonous snakes, but all camps were stocked with anti-snake serums, and we had no serious cases of poisoning, a remarkable fact considering the costume worn by our men. Their only garments in the jungle were a sleeveless shirt, a pair of loose trousers, and shoes full of holes.

Boots or water-tight shoes were useless. Water was sure to get in at the tops, and the more holes in the shoes, the more easily the water ran out.

The thorns with which many vines and other plants are protected were a great nuisance, but the worst plant pest was the picapica, the smart resulting from contact with which lasts for hours and makes one

feel as if he were being bitten in a small area by hundreds of ants.

Sharks are much feared by the natives, and justly so. We lost one member of our party, who was attacked before he could get ashore from a capsized boat off the bar at Greytown.

THE ROUTE OF THE PROPOSED CANAL

An interoceanic ship canal has been the dream of Nicaragua and Nicaraguans for centuries. As the Central American isthmus became better known and accurate information based on instrumental surveys replaced vague guesses based on insufficient data, the choice of routes for a United States-built waterway narrowed between Panama and Nicaragua.

The story goes that when the final decision was to be made by the American



Photograph by Newell F. Johnson

EXPLORING WITH A DRILL, FOR A DAM FOOTING ON CAMPAÑA ISLAND

Samples of the deep rock strata were brought up for study by the engineers (see, also, illustration, opposite page). Moving the machinery into the jungles was one of the chief difficulties of the survey.

Congress, it was the postage stamp of Nicaragua, with its picture of Nicaraguan volcanoes, that helped to turn the tide in favor of Panama. On such small matters sometimes hang momentous decisions.

But Nicaragua still has her dreams, and well she may. As traffic continues to grow at Panama, arguments multiply for increased facilities for interoceanic traffic.

The natural line of the Nicaragua Canal route, beginning at the Caribbean Sea near Greytown, follows the Rio Desceado for a short distance, then cuts across into the val-

ley of the San Juan River and follows that stream to Lake Nicaragua, crosses the lake, then cuts across the narrow neck of land, some 15 miles wide, separating the lake from the Pacific Ocean, to Brito (see map, page 594).

Such a canal would require three locks at each end, as at Panama. It would necessitate the excavation of about six hundred million yards of rock and earth and the placing of about seven million yards of concrete, with the building of all accessories, such as railroads, highways, dams,

power plants, harbors, and towns.

Lake Nicaragua provides an ample supply of water. The canal would be about three and one-half times as long as the Panama Canal, but its deepest cut would lack 150 feet of being as deep as the deepest part of the Gaillard (Culebra) Cut. A Nicaragua canal would cost \$722,000,000, including the cost of its defenses, and would take ten years to construct.

The narrow strip of land between the lake and the Pacific coast is high, rolling, fertile country, with few swamps, and, for Nicaragua, is thickly settled and has some roads usable by ox-carts.

This short section of the canal zone would have been a comfortable area for Army engineers to work in during the dry season of the year but for the ticks. These troublesome little creatures vary in size from those almost too small to see with the naked eye, but murderously active when they burrow into the skin, to the larger and more common varieties.

Army tents were used for shelter on the Pacific side; bull carts carried equipment from the wharf at San Jorge to the camps; and Army rations, supplemented with native fruits, vegetables, and meats, were easily available.

If you ever go to Nicaragua to help build the canal, get a job on the Pacific side.

NICARAGUA IS ABOUT THE SIZE OF NEW YORK STATE

Nicaragua has an area of some 50,000 square miles, about equal to that of New



Photograph by Newell F. Johnston

THE CORE BOX TOLD CAMPAÑA ISLAND'S SECRETS

Engineers, seeking a site for a dam across the San Juan River, studied rock samples brought up from deep strata by the diamond drill (see, also, illustration, opposite page).

York State, and a population of approximately 650,000, close to that of the city of Buffalo. It is the largest of the Central American republics; many consider it the most beautiful. Much of the interior is mountainous; the coasts are generally flat. It faces the Pacific, with its back door to the Atlantic. Most of its people live in the cities in the western part of the Republic, for the rainfall here is moderate as compared with that of the eastern coast; the climate, although tropical, is agreeable, and the land is fertile.

The cities of Chinandega, León, Managua, Masaya, and Granada are located near the west coast and along the one line



Photograph by Newell E. Johnston

A PET MONKEY MAKES A JOLLY COMPANION FOR LONELY HOURS

The cook at the camp on the Desado River caught this little chap in the jungle near by. At the base of the hill are the kitchen and mess hall; at the top of the steps the officers' quarters, the diamond-drill tent, and the radio station.

of railroad, extending from the port of Corinto, on the Pacific, to Granada, the main port on Lake Nicaragua.

Managua, the capital, is the largest, and, although badly set back by the earthquake and fire that almost destroyed the city in the spring of 1931, will in time again become the most important business center of the country.

León and Chinandega, cities of artisans and small proprietors, are located among very fertile farming lands and are the centers of the sugar trade. Masaya is an Indian town and owes its importance to the coffee-growing district on the *sierras*, located between the lakes and the Pacific.

Granada owes her early growth to the fact that she was the chief port for the trade between Central America and Spain, by way of Lake Nicaragua and the San Juan River. Her leading citizens are not only landed proprietors, but merchants who sell goods in person over the counters of their stores.

HIGHWAY ACROSS REPUBLIC NOW UNDER CONSTRUCTION

Matagalpa, the largest town off the railroad, is the center of an important coffee-growing district. Because of its altitude, it has a more agreeable climate than the cities located in the plains; but the ab-



Photograph by Newell F. Johnston

AS A PET, THE COATI PROVES AMUSING BUT TRICKY

To supplement his regular fish diet, this raccoonlike little animal obligingly ate ants and other insect pests. He developed a passion, however, for eggs and sweets, and on one occasion crept into the warehouse at San Carlos and ruined forty dollars' worth of sugar. When angered, he would bite viciously.

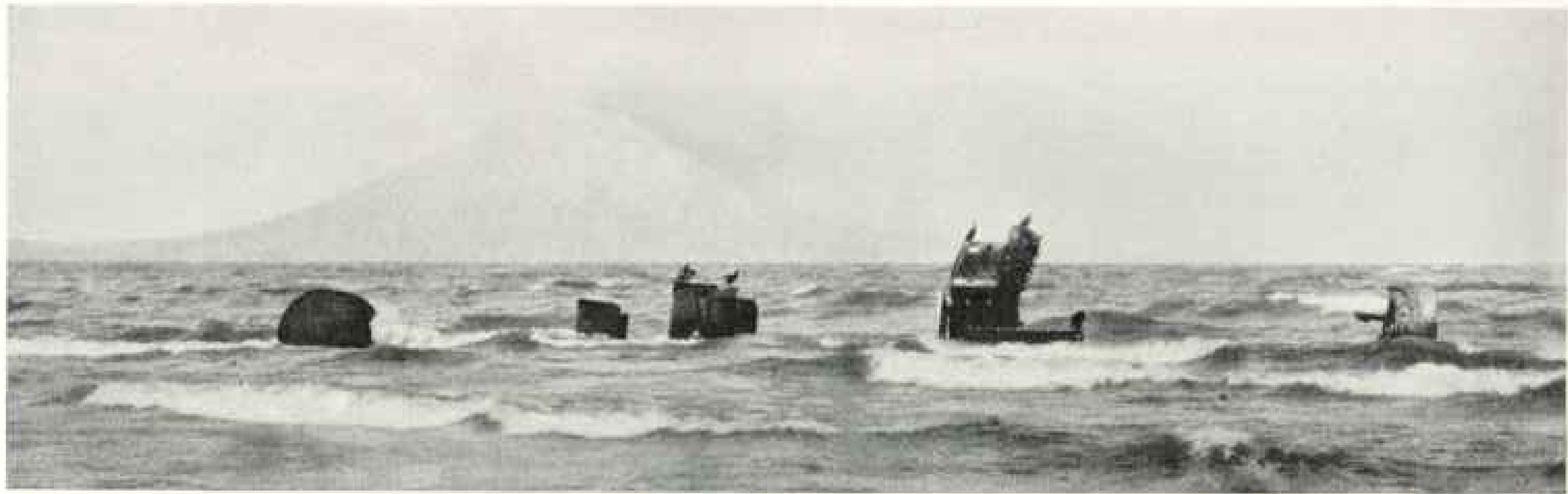
sence of a railroad, or even a good highway connection with the outside world, has thwarted its growth.

Eastern and western Nicaragua are divided by mountains and jungle-covered country, which have effectively prevented intercommunication except to a very minor degree. The physical separation has operated to prevent close political union and a common national outlook; to hamper trade and commerce; and to obstruct a desirable interchange of people and ideas.

In addition, the lack of a practicable route to its east coast has forced virtually all of Nicaragua's foreign commerce to

seek a longer and more roundabout route via the west coast and the Panama Canal. For these reasons it has been the desire of the Government of Nicaragua for many years to open a means of communication between the west and the east, either by the canalization of the San Juan River or by the construction of a highway or a railroad. A highway is now being built from Managua through Tipitapa to Rama, on the Bluefields River, where boat connections can be made with Bluefields, the largest port town on the Caribbean.

The population of the country is overwhelmingly of mixed Spanish and Indian



NEAR SAN JORGE LIE WRECKS OF BOATS SAID TO HAVE BEEN USED BY FILIBUSTER WALKER (SEE TEXT, PAGE 616); OMETEPE RISES IN THE BACKGROUND



Photographs by Alexis Kabanikhin

OXCARTS RENTED FROM THE NATIVES CARRIED THE SURVEY PARTY'S EQUIPMENT FROM ONE CAMP TO ANOTHER

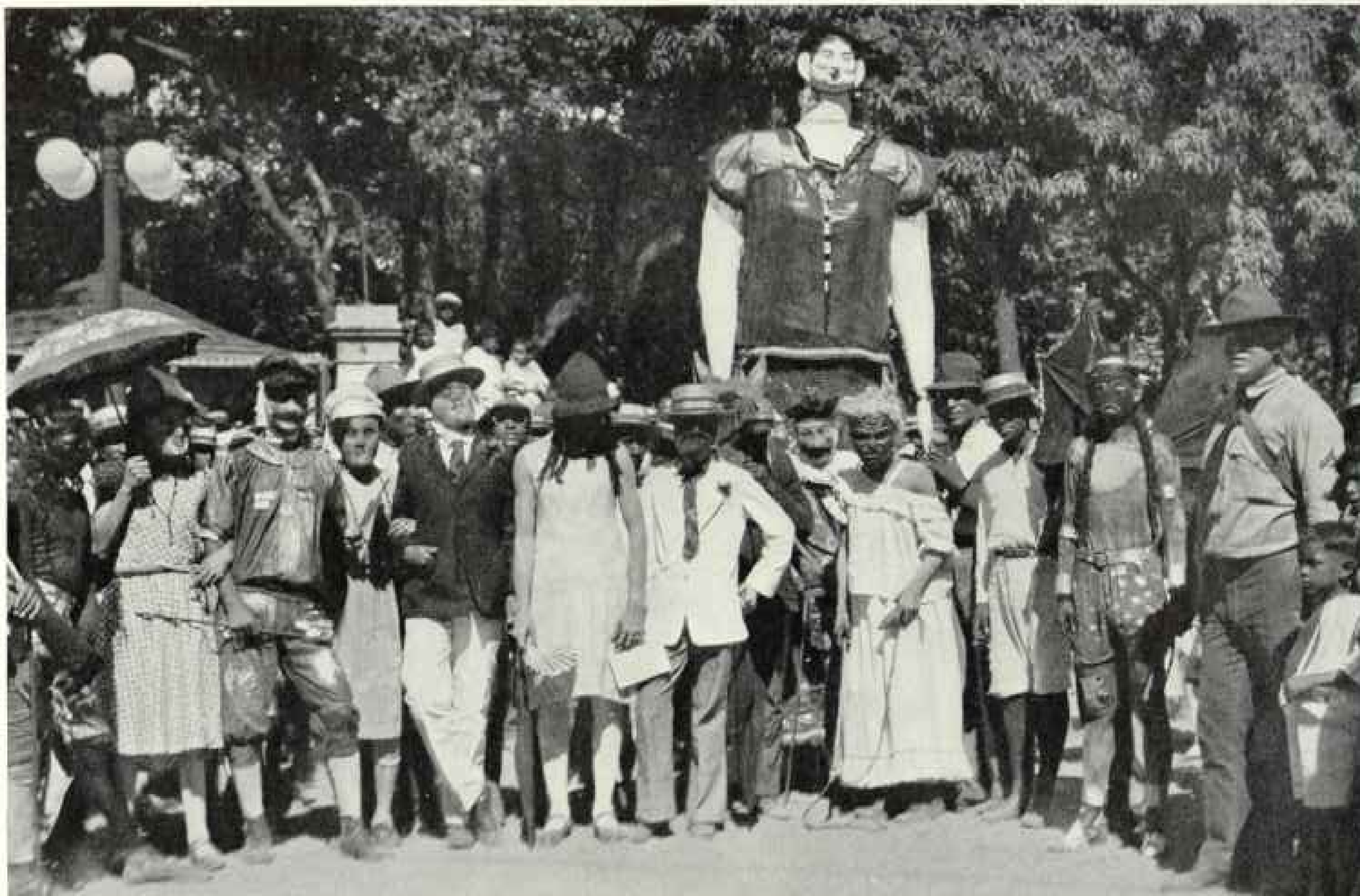
The wheels of these crude vehicles are of solid wood with iron tires, and prove most roadworthy on jungle trails where motor trucks are too heavy (see text, pages 599 and 609).



Photograph by Capt. Albert W. Stevens

MANAGUA, ON THE LAKE OF THE SAME NAME, ENJOYS SOME WATER COMMERCE

Here are brought shiploads of half-wild cattle (see illustration, page 612) and produce of the fields and forest. The Capital City has 40 miles of streets, about one-third paved. On the left bank of Laguna Tisiapa, filling a sunken crater in the foreground, is the President's palace.



Photograph by Newell F. Johnston

GRANADINOS DON FANTASTIC GARB TO EXORCISE EVIL SPIRITS ON CHRISTMAS EVE

Wearing fearsome masks and carrying a huge effigy of a saint, they march to inns and *cantinas*, pretending to seek a place for the birth of the Christ Child; but their search is never successful, though they affect to drive out devils wherever they go.



Photograph by Newell V. Johnstone

PRICELESS LACE ADORNS THE CHAPEL OF MARÍA AUXILIADORA IN GRANADA

The hangings are exquisite examples of native women's needlework. By courtesy of the Nicaraguan Government, the survey expedition was housed in the Monastery of San Francisco, adjoining this old church (see text, page 619; also, illustration, page 606). About the adobe walls many revolutions have swirled, but the interior has ever been a place of peace and quiet.



Photograph by Newell E. Johnson

IN GRANADA THE TROOPS OCCUPIED THE OLD MONASTERY OF SAN FRANCISCO

The low, rambling adobe building and its church are rich in tradition (see text, page 619). Here the American filibuster, William Walker, is believed to have made his headquarters. Soldiers under the author's command unearthed human skeletons in the courtyard. On the walls are many bullet marks.



607

Photograph by Newell F. Johnson

GRANADA BOYS TAKE PART IN THE TREE FESTIVAL ON JUNE 25

The celebration, which is an annual affair, corresponding to Arbor Day in the United States, begins in the morning with a parade by the youngsters, who are gathered here about a fountain in Colón Park. In the afternoon there is a procession of men (see, also, illustration, page 608).



Photograph by Newell F. Johnstone

ONLY THE MEN MARCH IN GRANADA RELIGIOUS PROCESSIONS

A parade by the grown-ups follows the children's tree-festival ceremonies on June 25 (see, also, illustration, page 607). Women and girls are permitted to look on, but take no active part in such celebrations (see, also, text, page 620).

blood, with Spanish the universal language, although one finds in Granada and the other large towns many families of pure Spanish blood. Perhaps 10 per cent of the population is pure Indian, found mostly in the area around Masaya and Matagalpa and in the thinly settled cattle-raising sections of the Province of Chontales, east of Lake Nicaragua.

Strangers in the eastern section of Chontales are rare and are usually bandits or revolutionary groups seeking recruits. Upon the approach of a visitor, the men hide out; only the women and children are in evidence.

THE WORLD'S WORST REAL-ESTATE TITLE

Still farther to the east, along the rivers that drain into the Caribbean north of Greytown, the Sumo Indians have their homes. They are a wild and timid race and have resisted all Spanish influence. Their huts are simple structures, thatched with palm leaves and located on the banks of streams. Their worldly possessions are confined to bows, arrows, blowguns, and one or two pots and pans.

Part of Nicaragua's Caribbean coast has the world's worst real-estate title—"The Mosquito Coast." It gets its name not from the prevalence of mosquitoes, but from the Misquito Indians. Here there is decided evidence of negro blood, partly a heritage from the cargo of a slave ship that was wrecked on the coast years ago. These blacks, or mixed Indians and blacks, called "Sambos" or "Zambos," were augmented by escaped slaves from the plantations that sparsely dotted the coast in later years, and by renegade slaves from Jamaica and other islands of the West Indies.

The Mosquito Coast was also a refuge for buccaneers and pirates and was visited by many trading ships seeking turtle shells. As a result, the blood of the inhabitants became badly mixed, and characteristics of many races can be detected in the present-day population.

San Juan del Norte (Greytown), at the mouth of the San Juan River, has an English-speaking negro population. We had one of our camps here and occupied it throughout the survey. Long ago the port had an excellent harbor and was a thriving



Photograph by Newell F. Johnstone

QUIET NOW, BUT THEIR RECITATIONS CAN BE HEARD FOR BLOCKS

The pupils in the porch classroom of the Government school at Corinto practice counting in English aloud and all together, trying to drown out one another, as they shout, "one-ee, two-ee," etc. Seven and nine are almost invariably omitted.

community, but drifting sands have closed the entrance from the sea, and now only an occasional schooner calls.

In the boom days, when the Maritime Canal Company undertook the construction of a canal, Greytown had visions of being a metropolis; now it is only a dreary community of rusted tin and frame shacks, with a population of 250 people.

In spite of the financial difficulties that are general throughout the world and are particularly trying in Nicaragua, General Moncada, as President, has improved the public schools and has built more roads and railroads than any of his predecessors.

Along the country's roads you will occasionally meet a high-powered car snorting its way over ruts and bumps, carrying some Government official or landed proprietor on business best known to himself. The car has a number of occupants, usually half a dozen in excess of its normal capacity, for the Government official travels with his guards, his friends, and perhaps a large part of his family, while the usual car-owner always has his entire family in the car and baggage and other impedi-

menta strapped on the running board and anywhere else that it can be suspended or attached.

Practically all cars are of American make, and it is a tribute to their sturdiness that they can stand the usage to which they are subjected. New cars are frequently equipped with extra spring leaves, as spare parts are hard to get, and for service on Nicaraguan roads springs have to be strong.

The cars on the roads are few and far between, but they add the touch which shows that you are traveling in a civilized country. The creaky oxcart is the usual means of locomotion. Small but sturdy animals, with yokes or pulling bars lashed just behind the horns, draw these carts creaking and groaning over the trails, but they get through mud that will stop a strong pony.

EVERYONE RIDES HORSEBACK

It is not necessary to ask for road directions; there is never more than one road or trail in the direction you want to go. A question as to distance is futile, for no peon has any conception of time or distance. A



Photograph by Dr. Max Jordan

HERE UNITED STATES MARINES STOOD SIEGE BY SANDINO REBELS

The marks in the walls of this building in Ocotal were made by bullets fired by the bandits in their efforts to dislodge the Americans from their headquarters on July 16, 1927.

league may actually be any length from one to six miles. The usual answer to the question, "How far is it to any place?" is "No hay más," the Nicaraguan equivalent of the answer, "Not fur," which one so frequently gets from the small darky on our Southern roads.

Every one rides horseback or muleback—the gay caballero, the dainty miss traveling under heavy escort, the market woman or the plain, everyday mozo. The market woman is the most interesting. Her heavy burden of fruits, vegetables, firewood, earthenware pots, hammocks, forage, or what not may be on her head; she may be seated on top of a load, and when the poor pony cannot carry it all she may be on foot, leading or driving the animal.

Her walking is with no thought of sparing the pony, but means that the animal simply cannot carry more.

Women never ride astride. Every rider has a spur—one only—a cruel instrument strapped on the usually bare heel, and used frequently. Ponies are cheap and their maintenance costs nothing, for their sole ration is water once a day and what they can forage during the night. Occasionally they may get a few bananas. They would probably die of indigestion if given grain.

COFFEE IS THE COUNTRY'S MAINSTAY

The prosperity of the country depends upon the coffee crop and its price. Crops have been good in recent years, but the price has been very low. For its future



Photograph by Newell F. Johnstone

THE AUTHOR ENTERTAINED PRESIDENT MONCADA IN SAN FRANCISCO MONASTERY. The Chief Executive of Nicaragua is seated between the two ladies at the center. Colonel Sultan, in white, stands at the left of the picture.



Photographs from Lieut. Col. Dan I. Sultan

SANDINO'S FLAG AND SEAL FLAUNT HIS THREATS

United States Marines captured this banner—a piece of cheap white cotton cloth, with the grim design outlined by ordinary black paint. When the bandit issues his handbill proclamations, he signs them with the threatening stamp to insure their being read and heeded.



Photograph by Newell F. Johnston

HORNS PROVE THE WILD STEER'S UNDOING

Cattle are put aboard ship on Lake Nicaragua by rough but effective means (see text, page 614).

Nicaragua looks to the building of the canal. A prosperous Nicaragua will no doubt mean a quiet Nicaragua, for prosperity will mean roads, railroads, and other public improvements. A hungry man in Nicaragua is a prospective recruit for one of the bandit gangs. Banditry probably will cease when any man seeking work can get it and when every man can boast of a few dollars rattling around in his pocket.

Gold in small quantities has been produced in Nicaragua for hundreds of years. The richest mines are in the Province of Chontales. This area is also bandit-infested, and the mines are a favorite field for bandit activities. The situation has prevented the installation of modern machinery or the development of the properties on a large scale.

The Babilonia mine at La Libertad has the distinction of having had a young mining engineer named Herbert Hoover con-

nected at one time with its management. Here only the richest strikes are now worked, the ore being brought to the mill by pack mule. The Javali mine at Santo Domingo is worked on a larger scale and at considerable profit to its owners.

SALT-WATER FISH IN A FRESH-WATER LAKE

Putting a canal across Nicaragua is a matter of utilizing some geographic features and overcoming others. Of outstanding importance physically are the country's mountains and its two great fresh-water lakes in its central basin, "the Great Lakes of Central America."

Once Lakes Nicaragua and Managua were parts of the upper end of a large salt-water bay, a portion of the Pacific Ocean. In the course of time volcanoes ejected huge quantities of lava, which closed the entrance to the bay. The connection with the sea being closed, the water of the newly formed lake rose to a height of some 50 feet above its present level, until it found the lowest gap in the Continental Divide, somewhere in the vicinity of the present town of El Castillo, and flowed out to the Atlantic. The outlet eroded its bottom, the Rio San Juan was formed, and the lake was lowered to its present elevation of about 100 feet above sea level.

It is because of this unusual geological history that Lake Nicaragua contains swordfish, shark, and tarpon, all salt-water fish. They were entrapped in the lake, and as the water freshened gradually they were able to adapt themselves to the changed conditions. For the sportsman who enjoys tarpon fishing, there are few better places in the world than San Carlos, at the foot of Lake Nicaragua, in March, April, and May. The soldiers of the Nicaragua Canal Survey had no difficulty in hooking them, but because of deficiencies in tackle and inexperience, landing them was another matter (see page 596).

A VOYAGE ON LAKE NICARAGUA

Lake Nicaragua is one of the large lakes of the world and one of the most beautiful. There is an old steamer, built in Wilmington, Delaware, some fifty years ago, that makes regular trips to all lake ports (see opposite page).

For sheer discomfort on a bad night of wind and rain, I recommend the trip on the



Photograph by Newell F. Johnston

THE OLD STEAMER "VICTORIA" IS KNOWN AS THE NICARAGUAN NAVY

It has been plying on Lake Nicaragua since 1884, and its hull is pockmarked with bullet holes, mementoes of the numerous revolutions it has weathered. It carries passengers and all manner of freight and livestock.

Victoria. On a bright day, when the lake is smooth, the picture is decidedly different.

Leaving Granada in mid-morning, with all the hustle and confusion, tears, kisses, hand-shaking, back-slapping, and shouting of "adios" that go with a trip in Nicaragua, the *Victoria* pulls herself away from the dock by hauling on the cable attached to an anchor conveniently dropped when she landed there a few days before, and starts puffing and panting on her way. She skirts the 1,000 islands—"diamonds," the Granadinos call them—each island a gem and the domicile of a native family whose thatched hut perches on its top.

When you pass Zapatera, the center of religious activities of the early Indians (see pages 623, 624, and 626), Ometepe bursts into view. This now quiet volcano is a perfect cone, rising more than 5,600 feet directly from the lake surface (see page 623).

After a trip of some five hours, the *Victoria* makes her first landing at San Jorge, the port for the old city of Rivas. Here most of the passengers disembark amid

confusion rivaling that incident to the departure from Granada. Unloading the freight requires the rest of the afternoon.

The Nicaraguan Government is building a short section of railroad from San Jorge via Rivas to San Juan del Sur, on the Pacific, thus providing two Pacific ports with rail connections to the interior—Corinto, the old port, and San Juan del Sur, the new. All railroad material has to be brought to San Jorge by water from Granada, and the unloading of rails and knock-down locomotives and cars from the *Victoria* is attended with much shouting, clanking, and rattling.

EVERY VOYAGER SLEEPS ON DECK

Leaving San Jorge in the late afternoon, the *Victoria* skirts the northern end of Ometepe Island, whose twin peaks are usually swathed in clouds and have the appearance of huge mushrooms. Soon after sunset the lone deck hand, who is deaf and dumb, begins to pass around native cots, and there is a wild scramble to choose one that is not a menace to safety by reason of



Photograph by Newell F. Johnson

NATIVES WITH PICK AND SHOVEL DUG THE SAN JORGE—SAN JUAN DEL SUR CUT.

With labor plentiful at 40 cents a day, the laying of this 17-mile stretch of railroad is being accomplished at comparatively small expense.

having been slept on by a too-heavy passenger on a previous voyage, and to place it in some sheltered nook on the deck.

Everyone sleeps on deck, wrapped in a sheet or blanket, and in the morning makes his or her toilet at the one and only basin at one side of the boat. There has, however, been little sleep, for during the night the boat has anchored off the north shore of Ometepe to land passengers and freight in small boats and has made a landing at San Miguelito, on the Chontales shore.

San Carlos is reached in the early morning. This town has a strategic location, as it is the transfer point of freight and passengers to and from launches and small boats that ply the Rio San Juan between the Caribbean and Lake Nicaragua. In these days, except when our survey launches carry supplies to camps along the canal route, there is little traffic; for the river

boats are slow, run at irregular and infrequent intervals, and are sadly lacking in accommodations for the traveler (see illustration, page 597).

Having reached the end of her run at San Carlos, the *Victoria* starts back to Granada, stopping at the same ports on her return trip. Her outgoing cargo was made up largely of manufactured goods in boxes, cans, and sacks; but on her return she picks up fruit, vegetables, chickens, parrots, huge cakes of native cheese, bananas, melons, hides, cacao, cattle, and horses.

It is an interesting sight to see cattle and horses loaded at San Miguelito. They are made to swim out to the ship; then a noose is dropped over the horns of the unsuspecting steer and he suddenly finds himself being hoisted out of the water and dumped on deck, where he falls in a heap (see page 612). A few twists of his tail by the wait-



Photograph by Capt. Albert W. Stevens

MOMOTOMBO STILL SPEWS FORTH ITS FIRES

The active volcano rises from the shore of Lake Managua near León. Behind it, to the left, is its little brother peak, Momotombito (see, also, text, page 593).

ing deck hand bring him to life and he struggles to his feet. The transfer of a horse from water to deck is more dignified, for a sling is passed under his belly and he comes down on the deck on all four feet.

It takes two days for the trip from Granada to San Carlos and return, and the *Victoria* makes one such round trip weekly.

THE ROMANTIC HISTORY OF NICARAGUA

The history of Nicaragua since the arrival of the white man on the North American Continent is fascinating to the romance-loving traveler. Columbus sailed along her Caribbean coast in 1502, and, taking shelter during a storm behind her northern cape, named it *Gracias a Dios* (Thanks to God) in gratitude to Divine Providence.

Gil González de Ávila, the first Spaniard to penetrate into Nicaragua, came in 1522

from Panama and landed at the Gulf of Nicoya, Costa Rica, on the Pacific coast. His four horses and the beards of his hundred followers caused terror to freeze the hearts of the Indians, who treated him with respect and awe. Noting the effect of his bearded men upon the Indians, González caused all his men to acquire beards immediately; those who could not grow them were supplied with artificial ones.

An early chronicler states that the Cacique Nicoya "courteously entertained him and gave him 14,000 pieces of eight in gold thirteen carats fine and six idols of the same metal, each a span long," in return for which González "gave him some Spanish toys and baptized him and all his subjects, being 6,000 in number."

Here we have in a few words a statement of the two ideas that were to dominate the subsequent acts of the early Span-



Photograph by Paul Brooks

HOWEVER THICK THE JUNGLE, THE LINE GOES THROUGH
Topographic work in the leafy wilderness of Nicaragua is pursued
despite snakes and swamp fevers (see text, page 593).

yards—to secure gold and to Christianize the Indians. The Spanish Governor of Panama was so interested in gold that he sent Francisco Hernández de Córdoba to Nicaragua with a larger band. On Lake Managua they founded León, later moved to its present site, and Granada, on Lake Nicaragua.

As these cities grew in importance and wealth, they were periodically ravaged and pillaged by pirates. Their struggle for existence was turbulent. Granada became the seat of the Conservatives, and León the

center of the Liberals; and bloody were the civil wars waged between these factions in the middle years of the nineteenth century. It was while their strife was under way that the American adventurer and filibuster, William Walker, with his intrepid band of 56 men, landed in Nicaragua, at the request of the Liberal government of León, to help fight the Granadinos. Theirs was a wild adventure, the prime motive of which, so many Nicaraguans believe, was the extension of the slave territory of the United States.

War followed war in the years after Walker's arrival, in 1855. His "phalanx" of Americans grew to a maximum of several thousand, and no less than two thousand died on Nicaraguan soil. Walker fought his way to the Presidency of Nicaragua, and but for Cornelius Vanderbilt might have retained what he had won with his sword.

When the gold rush began, in 1849, Vanderbilt had established a line of steamers from

New York and New Orleans to San Juan del Norte, a line of river boats on the Río San Juan and across Lake Nicaragua, and a line of stagecoaches across the narrow strip of land between the lake and the Pacific to San Juan del Sur, where steamer connection could be made for San Francisco.

It became a favorite route for the gold-seekers and the tide of emigrants who later moved to California and the Northwest. Walker interfered with the transit company and made its operation difficult and



Photograph by Newell P. Johnstone

AT A DISTANCE IT TAKES A GOOD EYE TO SIGHT THE RODMAN

Ferns, vines, and tropical flowers form a veritable tangle in the jungles near Machuca. In this sort of country the men's clothing was never dry (see text, page 593).

expensive. Vanderbilt financed Walker's enemies and turned the tide against him. He finally faced a firing squad in 1860.

PEARY OF POLAR FAME BEGAN HIS CAREER IN NICARAGUA

Names later carved on the tablets of history are associated with Nicaraguan soil. Lord Nelson, of Trafalgar, once captured the fort at El Castillo and garrisoned it with 200 British sailors, of whom only six survived the "tropical fevers" that beset them. Admiral Peary, discoverer of the North Pole, was a member of one of the earlier canal survey expeditions and mapped many of the jungle rivers in the valley of the lower San Juan.*

The American Marines were in Nicaragua from 1912, when they were landed at the request of President Diaz, until withdrawn in 1925. This was a peaceful period in Nicaraguan history and the country prospered.

Fresh revolutions having broken out following the withdrawal of the Marines,

* See "Across Nicaragua with Transit and Machete," by Robert E. Peary, in the NATIONAL GEOGRAPHIC MAGAZINE, Volume I, pages 315-335.

their return was considered necessary in 1927. Col. Henry L. Stimson went to Nicaragua, as the personal representative of President Coolidge, to find a way of bringing quiet to the country. It was agreed by both factions which were fighting for control of the Government that an election, supervised by American officers, should be held in 1928, and that the Marines should train the Guardia Nacional and make it an efficient police force for the country.

Gen. José M. Montcada, the leader of the Liberal army at the time of the so-called Stimson armistice, was elected President by an overwhelming majority. Sandino, an old lieutenant of Montcada, refused to abide by the terms of the armistice, and began operating with small bands of bandits in the wild northern areas of Nicaragua.

Sandino poses as the George Washington of Nicaragua, but he is only a cut-throat and a bandit, preying upon foreigners and the law-abiding citizens of his country. His bands terrorize the country, carry on a desultory warfare against the Marines and the Guardia, and exact tribute



Photograph by Henry Durham

A MANAGUA BOY COMBINES PLAY WITH BUSINESS

Having fashioned a goat cart after the model of his elders' wagons (see page 602), he collects garbage to feed the family pigs. Similar vehicles are used by youngsters vending ice cream.



Photograph by Newell P. Johnstone

DESPITE THE PIG'S STRUGGLE, THE WOMAN KEEPS HER HEAD LOAD BALANCED. She is on her way to the market in León, where she will pass a happy day of bartering. The natives are remarkably skillful at this sort of transport.



Photograph by Newell E. Johnstone

OXEN AND RADIO TOOK OFFICERS AND THEIR WIVES TO THE ARMY-YALE
FOOTBALL GAME

The play-by-play account of the contest was received at the wireless station at engineer headquarters in Granada.

from all, friends or foes, who have anything they want.

The gangs concentrate and attract recruits when funds, weapons, and ammunition are available, and disperse when pressed by the Government forces. The Segovias and the section along the Coco River where the handits operate are wild, mountainous regions, lacking all means of travel and communication.

The American Government has announced that all Marines will be withdrawn from the country after the next presidential election, in the fall of 1932.

THE SURVEY HAD HEADQUARTERS IN A
MONASTERY

Whether Marines should or should not be used to maintain peace and quiet in Nicaragua is a matter for agreement by diplomats and statesmen; but, regardless of the whys and wherefores of the Marines being there, they have done the job assigned to them with their usual efficiency. Their task has been a difficult, disagreeable, and dangerous one, but they have done it well.

The Guardia has steadily improved under their training and is now an efficient police force.

Our survey headquarters were in the old Monastery of San Francisco in Granada, a charming place, with adobe walls a yard thick, wide corridors, numerous patios, cool and comfortable. It is so quiet and serene in its present-day setting, one has difficulty in picturing its turbulent history. Revolution after revolution has swept over it, scarring its walls and battering down its doors. It has been used as a fort and stronghold in almost every one of Nicaragua's many fratricidal wars (page 606).

Granada is a city of landowners and merchants, and its old families have engaged in trade for centuries. Proud of their lineage and feeling secure in their wealth, these people are surrounded by an atmosphere of quiet, with little thought of the changes that are taking place in the outside world.

Although many of Granada's sons go annually to schools in Europe and the United States, hers is a self-satisfied popu-



Photograph by Newell F. Johnson

EVEN A DEAD BOA LOOKS FORMIDABLE

But the species is nonvenomous. This one, killed near Mombacho, is not full grown (see, also, text, page 593).

lation; and changes in manners, customs, and ways of living are slow to take root. One wanders through her still streets bathed in a gorgeous tropical moonlight, or looks out over her tile-covered roofs, and, but for the dim electric street lights and the sound of an occasional phonograph, can see Granada much as it was three hundred years ago.

Life is leisurely; no one wants to hurry. The streets are unpaved and the sidewalks are narrow and uneven. A slow-moving bullock cart, with the driver in front leading his beasts, which are trained to follow him, blocks the narrow street. Traffic laws do not have to prescribe speed limits.

It is the custom to have frequent religious festivals, in which the people take part with great ardor. Certain saints' days are more popular than others, though hardly a week passes without a procession,

usually featured by the carrying of sacred objects, banners, and lighted candles, and by martial music and the explosion of firecrackers. On a really big holy day there is a continuous din of clanging bells and an uproar and banging of bombs and torpedoes. The less clamorous, intermittent, daily noises of firecrackers and church bells signify weddings, funerals, parties, or mere good spirits.

The fiesta of La Santisima in early July appears to have a peculiarly significant place among the year's festivals. The procession begins in the afternoon, starting from the old Church of Maria Auxiliadora. The route of the march is determined beforehand, and the streets are decorated with screens of artificial flowers, mostly red and white paper roses, artistically draped. The procession is of men only, its central object being an image of Saint Peter in magnificent vestments, protected by an elaborate canopy.

The narrow sidewalks are crowded with bevy's of señoritas, all dressed in their very best. For this day only, it appears, the young ladies are privileged to come forth from their customary semiseclusion, and to look, unembarrassed and critical, upon the young men strolling in the procession. It is certain that these do not hesitate to return the glances of the señoritas, with looks probably less critical and more ardent.

HOW THE AUTHOR LIVED IN GRANADA

My family lived on the edge of town, in a house with two large patios, a sala the size of a grand ballroom, and numerous bedrooms, storerooms, servants' quarters, and a kitchen so large that the cook spent most of her time and energy moving from stove to cupboard and back again. Preparing a meal required almost as much movement as a marathon. Around the house and in the patios there was a profusion of flowers, with hibiscus, bougainvillea, mimosa, lilies, and roses of many varieties predominating.

One patio was given over entirely to pets. It had been our misfortune to live in a city apartment for a number of years, so the children were promised all the pets they wanted. The patio was a small-sized zoo. A deer, a monkey, a dog, a honey bear, a pisote (coati), a parrot, a gorgeous red, blue, and yellow macaw, two peacocks,

a toucan, two parrakeets, and numerous small patio birds made up the collection.

We had a half dozen full-blooded Indian maidens for our servants. In all Nicaraguan homes of the better class the families are large and include many generations. Houses are beehives. Children are numerous; so are the servants, the latter frequently exceeding in number the members of the large family served.

We found our servants faithful and affectionate and in many ways loyal, but of course unfamiliar with American ways and customs and sometimes obstinate and stubborn in their refusal to learn them. Ours were foolish ways in their eyes; they could see no reason why water should be boiled before drinking or food protected from flies; why sheets should be tucked in at the foot of the bed, or what possible use there could be for two forks at one meal, when it was so simple to lay the first one aside and have it ready for subsequent use.

Their loyalty to us had some queer twists. Why should they tell us that their poor compatriot, who had packed a sack of charcoal many miles from her hut in the country that morning, was asking at our door three times the ordinary price of charcoal demanded of any of our Nicaraguan neighbors? Charcoal was worth what one could sell it for, any way.

EVERY BEDROOM HAS ITS HAMMOCK

The fundamental idea of all trade, whether with a street vender or in the largest store, is that anything is worth what the seller can get for it. In the eyes of an American, articles such as fruits and vegetables raised locally or goods made in Nicaragua are cheap; but, because of the high duty and the enormous profit that the merchant must make, articles of American manufacture cost about three times the price one would pay in the United States. There are no five- and ten-cent stores in Nicaragua.

There is not much that is typical of the country that one cares to buy. If you stay long enough in Nicaragua to acquire the hammock habit, by all means secure one of the fine hammocks made by the Indian women living near Masaya. They are so large that one can sleep comfortably on one lying crosswise. No Nicaraguan bedroom is complete without one.



Photograph by Alexis Kokoushkin

ONE CAMP HAD A SUSPENSION BRIDGE

Engineers of Company A improvised this 40-foot span across the Rio Grande. The footing consists of roughly hewn planks called "chests" by the builders.



Photograph by Capt. Albert W. Stevens, courtesy Pan American Airways

DRINKING WATER USED IN MANAGUA COMES FROM ASOSOSCA LAKE

This natural reservoir, the cup of a sunken volcano in a heavily forested area about five miles from the city, holds a deep, clear lake, to which engineers have constructed pipe lines. Beyond the long mountainous ridge in the background lies Lake Managua.



Photograph by Capt. Albert W. Stevens

ON ZAPATERA ISLAND PRE-COLUMBIAN INHABITANTS WORSHIPED THEIR STRANGE GODS

It is a wild and awesome place of dense forest, with Ometepe Volcano standing clear against the horizon across a stormy stretch of Lake Nicaragua, and Mombacho, Santiago, Momotombo, and Momotombito rising in purple mist to the northwest. The temples, which were of wood with thatched roofs, have long since disappeared, but the plateau at the top is covered with monuments, altars, and stone idols (see text, page 627). Burial urns, primitive pottery, and human bones may be found by digging anywhere on the slope toward the lake.



Photograph by Newell F. Johnston

THE AUTHOR AND HIS STAFF EXAMINE TWO IDOLS FOUND ON ZAPATERA

In addition to images of human and animal form, the party found mounds of stone supposed to have been altars for human sacrifice. Some of the statues have been removed to the patio of the college at Granada, but many remain on the island. These two, by consent of the Nicaraguan Government, will eventually adorn the entrance to the barracks building at Fort Humphreys, Virginia.

The American woman shudders when she sees her linen being washed by the native *lavandera*. It is more convenient to have her work on the place and one feels safer when the washed garments are put on if the source from which the water came is known; but if you leave it to the *lavandera* she will take the clothes to her favorite spot on some stream or along the lake shore, where washing becomes a contest between the strength of the fabric and the strength of the sticks and stones used to beat the clothes in the washing process. Even if the fabric wins, the buttons are sure to lose.

Standing in water up to her hips, the *lavandera* thoroughly soaps each garment; then beats it with a stick and slaps it against the pile of stones conveniently placed for the purpose. After working on the clothes for a while, to break the monotony she may grab one of her small, naked children paddling around in the water near by, and give it a thorough scrubbing.

NICARAGUA IS A MAN'S WORLD

If the dogs or pigs get in the way, a small urchin shooes them off. The clothes and the children having had their scrubbing, the *lavandera* takes a bath herself

and modestly dons a dry garment while still standing in the water.

The marriage ceremony, to be considered binding by both church and state, must be performed by both. As a state wedding costs about \$20 to comply with all requirements, it is often dispensed with.

Man is supreme in Nicaragua; any money the mozo laborer earns goes first toward buying a little *aguardiente* (locally called *guaro*) for himself, and then, perhaps, the cloth for a new shirt or whatever he considers necessary to his comfort and well-being. If anything is left, it goes toward the support of his family.

The woman of the mozo family must provide the food for her man as well as for herself and the children. In taking care of the unfortunate sufferers of the earthquake that destroyed Managua in the spring of 1931, we thought that the best way to provide relief was to furnish labor with adequate pay for all able-bodied men. But this did not settle all our problems, for there were many women with large flocks of children who had no man for the time being, and even if he was temporarily the king of some brood, he recognized no responsibility for all the children.

Work had to be found for the women, and many of them were organized into street-sweeping gangs that gave the final cleaning to the streets from which the laborers had removed the heavy debris. No one, however, went hungry, for the American Red Cross had generously provided sufficient funds to carry on the



Photograph by Newell F. Johnstone

WEIRD CARVINGS ADORN THE TOP OF ISLA DE LOS MUERTOS

These symbols of a prehistoric worship cover a slab of basalt an acre or more in area, at the summit of the conical Island of the Dead, near Zapatera (see illustration, page 623, and text, page 627). Natives fear the place and never go near it. They say no birds sing in its forested slopes. Legend has it that here was the holy of holies of an ancient race, tabu to all save the high priests.

program of labor and, at the same time, food for free distribution to those who could not work. Milk was given each morning to every woman with a child in her arms.

In Managua, the woman who owns a sewing machine—and that seems to be the ambition of every one—makes clothes or does simple sewing. Almost every house is a *tienda* (store) and has something to sell—a little fruit, cigarettes (sold singly), a few cakes, buns, or sweets, and something to drink. The women do the selling, and the profits, if any, are theirs.



Photograph by Newell P. Johnston

RELICS OF A PREHISTORIC CULT ABOUND ON ZAPATERA ISLAND

Hacking their way with machetes through dense jungle, members of the expedition came to a small plateau which formed a natural amphitheater for the temples of an ancient worship (see text, opposite page). Here were stone images resembling both human beings and animals (see, also, illustration, page 624).

But man is king and lord of the household. He wants his food when he wants it. There seem to be no regular hours for meals; one eats when one is hungry. The man has affection for his children and shows it. He is reasonably loyal to the mistress of his household and she to him, but a change in allegiance is neither complicated nor unusual.

PLANTAINS AND BANANAS ARE THE STAFF OF LIFE

Life is not complicated in Nicaragua; the needs are few and Nature is kind. In the country or in small villages, all one needs in the way of food can be raised with small effort. Little cash is needed. Meat is a luxury and seldom finds a place in the meal of a humble family. Rice, beans, and plantains are the staple diet, and no table in a Nicaraguan home of even the better class is complete without them.

A boiled plantain in itself provides a reasonably good meal, and plantains are plentiful and cheap. In the country they can be had for nothing. There are many grades and kinds of plantains and bananas, from the coarse, fibrous, wild article to the

luscious banana so familiar to all of us in the States.

Early in our stay in Nicaragua one of our field parties sent in a bill for horse bananas in large quantities, which caused some comment from me; but I soon learned that chickens, horses, cattle, pigs, dogs, pet parrots, and the pot-bellied children all thrive equally well on such a diet. There can be no real famine in Nicaragua unless some blight or insect should destroy the plantains and bananas.

The American soldier cannot adapt himself to native foods as a steady diet, but the good old Army ration was supplemented in our jungle camps with wild hog, native wild turkey, venison, tapir, sea turtle, manatee, or sea cow, and fish, which abounded in all the streams. Of the many fruits, only the oranges, limes, alligator pears, melons, papayas, and grapefruit found favor.

Our surveyors went armed at all times and all camps were prepared for defense; for Sandino had boasted that he would not let us survey the canal route. He claims all Americans as his enemies and makes no distinction between Marines on duty with the Guardia and Army engineers engaged

in the peaceful mission of surveying a canal whose construction would mean more to his country than anything else that could happen to it. But because of our isolation and the distance of the canal zone from his favorite haunts, or perhaps because he knew we were prepared, no attempt was made to molest us.

We had little fear of a surprise after we had been in the country for a few months, for our doctors had made us many friends, who would have warned us of any threatened attack. Natives made long trips, taking two or three days by canoe, to our jungle camps to see the *médicos*. To their minds, our doctors could perform miracles.

To see a child so weak from amoebic dysentery that it could not walk, but had to be carried by its parent from the canoe to the camp, cured in a few days, so that it could run around naturally, or to see badly infected wounds and sores improve rapidly under proper treatment, or to see a minor operation performed which cured some trouble that had existed for years, was truly a miracle to these sufferers.

Several victims of snake bite were brought in to our camps near Greytown. The patient was always wrapped in sheets from head to foot, for it is a local superstition that if he looks upon a woman who is soon to become a mother he will die, and if she looks at him her child will be born dead.

Grown men deaf or blind since childhood, permanent cripples, or old people in the last stages of leprosy or cancer had to be turned away, but the number of those who could be helped far outnumbered those with incurable ills.

NICARAGUA'S EARLY CIVILIZATION RELATED TO AZTEC CULTURE

The early Indian civilization found in Nicaragua by the Conquistadores was closely related to the Aztec civilization of Mexico. In their writings the early Span-

ish invaders make frequent reference to the reverence with which the Indians spoke of Montezuma. There was a similarity of religion, language, and customs that indicated close contact with the more advanced civilizations of the north.

We visited Zapatera Island to see the idols and ruined places of worship of these early races (see illustrations, pages 623, 624, and 626).

Zapatera is the cone of an extinct volcano long since overrun with a dense growth of tropical vegetation which has converted a gigantic heap of ashes and molten lava into a garden of fertile soil. Except for a few coffee groves high up on the slopes of the extinct volcano, there are no signs of civilization, as only a few native fishermen live along the shore. Most of the idols are concentrated on a plateau several hundred feet above the lake and overlooking Mombacho.

Of equal interest is a small island near Zapatera, which we visited on our return trip to Granada. It is called Isla de los Muertos (Island of the Dead) by the natives and is uninhabited. The more daring natives will land on the island in the daytime, but staying overnight is another matter.

We made numerous friends in Nicaragua and left the country with many regrets. We hope to return with steam shovels and dredges to dig a new interoceanic canal, but we are happy to have known Nicaragua and the Nicaraguans with all their charm of to-day, untouched by the bustling outside world.

Few tourists have as yet found the way to Nicaragua. Yet its wonderful scenery—with broad plains, magnificent mountains, turbulent rivers, and tropical grandeur—and, above all, its soft-voiced people, provide sources of never-failing charm and interest. From the very railroad stations you can step into streets and into houses that have remained practically unchanged for centuries.

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THIS UNUSUAL PICTURE SHOWS THE AMERICAN TOAD (*BUFO AMERICANUS*) TRILLING HIS EVENING SONG.

The male toad sits in a puddle and with throat puffed out serenades his lady. Every trill gives a thrill, no doubt. During the call the mouth and nostrils are closed while the air is driven back and forth between lungs and mouth. Some of the air escapes into the balloonlike resonating organ, which immediately fills up and often extends in front of the head (see page 629).

OUR FRIEND THE FROG

BY DORIS M. COCHRAN

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SPRINGTIME is here again, heralded by delicious odors of early blossoms, green mists of soft young leaves throughout the woodland, the warm touch of the sun, the echoing voices of birds. Of birds, did you say? That high-pitched, thrilling chorus coming from yonder ravine, and seeming to express the vibrant joy of all living things at the return of the glorious season of growth, is not included in any known category of bird notes.

If you would look upon the creatures from which these joyously ear-splitting calls emanate, come with me for a few paces and you may see them for yourself.

Approaching the ravine, we find at the bottom of it a marshy place centered about a little pool, the banks of which are still covered with the brown fallen leaves of last year. We can hear the chorus going at full blast and becoming louder with every step we take, but as yet we discern nothing. Surely these must be very large creatures to make such a din!

Now we are within a few yards of the pool. Suddenly the chorus ceases, and almost at our feet some small brown fragments of the forest floor detach themselves and make flying leaps into the shallow waters of the pool, and we see that they are tiny cricket-frogs! (See Color Plate III.)

Our curiosity is now thoroughly aroused and we make our way cautiously to a tussock of grass overlooking the water, being careful not to tread on any of the little lumps that we suspect may turn into minute froglets without warning. But we might have spared our pains, for all the frogs on our side of the pond have followed their leader into the water.

There they are, just a few inches from the shore, staring up with their widely opened, protruding eyes, and not even taking the trouble to hide under the leaves of water plants dotting the surface here and there.

A FROG'S MEMORY IS SHORT

We remain quiet for a moment, and so do the frogs. But a frog's memory is short, and by standing perfectly motion-

less we are soon forgotten. One bold little fellow swims to the bank and hauls himself out onto a flat stone, and his companions are not slow to follow.

As we watch, we see the nearest frog puffing out his yellow throat, and while we anxiously wonder if he is choking to death, he utters a staccato note, which he repeats at intervals of a second or two, while his throat expands for each effort. Now two or three more join in, and presently the whole chorus is in full tilt, with a hundred or more participants on the bank, each with his little throat bubbling madly up and down with his vocalistic enthusiasm (see pages 628, 649).

The chorus appears to have at times a kind of rhythm, destroyed often by a small group that seems to have got out of time with the music, and restored once more by the efforts of the majority, only to be lost again by some small nonconformist. Heard close by, the note of an individual frog loses some of its musical quality and sounds more like the spasmodic winding of a watch or the irregular shaking of castanets.

THE FEMALE FROG NEVER SINGS

Now that we have grown accustomed to the song, we pay more attention to the appearance of the singers. We note their color, which ranges from a dull brown on some individuals through all shades of olive-gray to bronzy green, with usually some irregular darker bars across the hind legs and a conspicuous green X-mark between the shoulders.

The skin of the back is slightly roughened, this condition being caused by the numerous glands found, more or less, in the skin of all amphibians, which serve to secrete the acrid slime that makes some species so distasteful to their enemies.

Some of the frogs do not take part in the song, but sit placidly on the floating leaves moored to the shore. These are the females, which never sing. They average slightly larger than the males, achieving the dimensions of one and one-quarter inches in length. Their throats are white and smooth. The males have yellow throats



Photograph by Lynwood M. Chase

THE WINNING SMILE AND OGLING EYE

This amphibian swain seems to know just how to win his lady fair, judging from his knowing facial expression. Note reflection of kneeling cameraman in pupil of right eye, while in the other a miniature landscape may be seen.

clouded with gray markings, and when the call is not being given, the loose gular skin lies in folds.

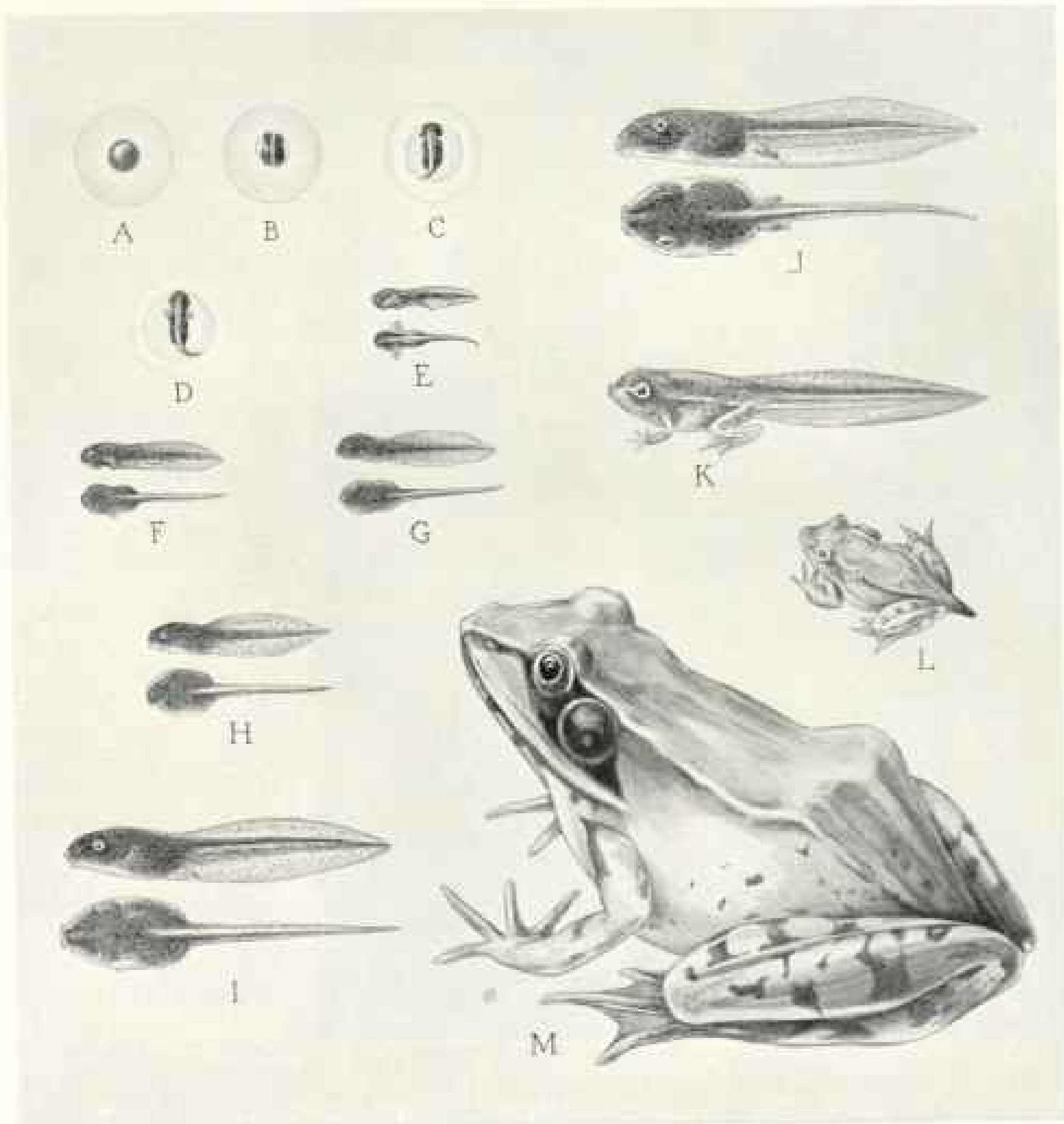
The females do not occupy themselves continuously in listening to the chorus in which they cannot participate. A low-flying aquatic insect is hovering over the surface of the pool, and finally comes near to one of our beady-eyed, attentive frogs. There is a well-directed leap, a little splash as the frog lands in the shallow water, and the insect has disappeared. No, not quite, for there is still the tip of a shiny wing protruding from the corner of the frog's mouth. As we watch, the frog bats its eyes, gulps hard, and even this vestige is gone!

THE FROG CAN SEE INSECTS ONLY IN MOTION

When engaged in seeking food, the frog is interested only in prey which is moving. If an insect remains motionless, it becomes

invisible to the frog, who stays with his eyes attentively staring straight at it, but makes no effort to take the luscious tidbit which may be at the very end of his nose. But if the insect begins to move, froggie becomes instantly animated, and usually one well-directed leap rings down the curtain for the insect.

Food is never so interesting to a frog as when there is a chance of its going down the other fellow's throat. To watch two frogs intent upon stalking one insect is to observe one of Nature's little comedies of manners. Even after the food has been snapped up by one frog, the other often makes several vain efforts to seize it by a fast-vanishing wing or leg, the successful captor often having to aid his prize to its destination by using his hands to shove the more difficult portions into his wide mouth. The process of swallowing, once the insect has been successfully stored inside, involves the closing of the eyes and the low-



Drawing by Hashime Murayama

THE LIFE HISTORY OF THE FROG

The development of the wood-frog, *Rana sylvatica* (Plate III), is outlined here in various stages, from the egg to the fully adult form: (A) first day, (B) second day, (C) fourth day, (D) fifth day, (E) eighth day, (F) tenth day, (G) twelfth day, (H) fourteenth day, (I) third week, (J) seventh week, (K) beginning of ninth week, (L) eleventh week, (M) third year. One and one-half times natural size. In the preparation of this drawing and the paintings from life (pages 635-642) the National Geographic Society is indebted to Dr. William M. Mann, Director of the National Zoological Park, for helpful cooperation.

ering of the eyeballs, which serves to start the food down the broad gullet.

The tongue is attached to the front of the lower jaw, and when the mouth is closed it lies flat and points backward down the throat.

In seizing a fly, the tongue unfolds and projects out of the mouth, its attachment at the front allowing the use of its full length. Like a trap covered with glue, it

is coated with a viscous, sticky substance which helps to snare the insect.

OUR FRIEND IS AFRAID OF DEEP WATER

Should our frog friend happen to land in deep water after his fly-catching leap, which is not by any means always successful, he will swim frenziedly toward shore. He has an innate fear of deep waters, in which live all manner of frog-eaters—



Photograph by Lynwood M. Chase

"TREE-TOAD UP A TREE": NATURAL SIZE

When clinging to the trunk of a tree the tree-toad (*Hyla versicolor*), whose song in spring is so familiar, blends so well with the bark that he is hardly visible, but accidentally touch his soft, yielding body and you will know he is there. Each toe is provided with an adhesive disk (see text below).

voracious fish, turtles with their sharp, cruel, tearing jaws, crayfish, and other enemies. The cricket-frog can swim well, however, and his hind feet have short webs stretched between the five toes for this purpose. The front feet, having four fingers only, are not webbed and are not used in swimming.

We notice that small round disks are to be seen at the tip of finger and toe, and this tells us that our frog is more terrestrial than aquatic, and that he belongs to the family Hylidæ, called tree-toads or tree-frogs, of which all the members are

characterized, among other things, by the possession of disked toes, and consequently they all have some ability in climbing (see Color Plates I, II, and III).

The shallow water of the little pond, only a few inches in depth, has been slightly warmed by the rays of the April sun, and this warmth of air and water, together with the abundant rains, has induced the early mating of the cricket-frogs.

Attached to the submerged stems of sedges near the shore, we see some globular, translucent objects, each with a round black center, while on the sand and leaves in the shallows there are more like them scattered at random. These are the eggs of the cricket-frogs, laid the night before by one of the newly mated females, and already well along in their developmental stages.

A female may lay as many as 240 eggs, which are fertilized externally by the male, who grasps the female

in an axillary embrace.

The eggs are deposited, usually singly, but sometimes in small masses, on water plants or on sticks or leaves lying in shallow water. An egg consists of the yolk—the round black center—and the vitelline envelope—the surrounding transparent membrane—which begins to absorb water as soon as the egg is laid, and thus immediately swells to be several times its original size and forms a moist cushion of protection to the egg.

But already danger besets the germ of life growing there. A gray fungus or mold,



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A LITTLE GAME OF LEAPFROG

The big toad is one of the least belligerent of creatures and does not resent being used as a footstool by the young tree-toad who sits on his head. A repetition of this tableau may well take place in the vivarium, where the frogs tend to "stack up" on top of each other.

Saprolegnia, may penetrate the vitelline envelope, sprout upon the yolk, and thus cut off the life of the little frog before it has well begun. But if Fate is kind and conditions are favorable, the central yolk, at first a single cell, begins at once to grow, dividing into two cells, these into four, these into eight, and so on in the typical way (see, also, page 631).

TADPOLES HATCH ON THE FOURTH DAY

Under favorable conditions, the tadpole hatches on the fourth day. At first it is a minute, flattened, yellowish object, with conspicuous branching filaments, its gills, at one end and a coarse, rudderlike appendage, the tail, at the other.

The little creature at this stage can barely wriggle away from its cast-off envelope, to squirm upward to the surface of the water, where it instinctively seeks the shelter of foliage and of the shallow water, for at this age it easily becomes the prey of small fish and other ever-hungry enemies.

Its powers of locomotion are very limited, and it is unable to dart and dodge in the game of life and death, as it will have

to do when it is a little older. It grows rapidly, at first living upon the nutriment from the original yolk-sac now stored in its own abdomen.

In a few days, when its mouth parts have begun to develop, it nibbles the "scum" of green algae which forms a dense mat over every submerged stone or pebble in the stagnant pond.

The mouth of the tadpole is not at all like that of the adult frog. A sharply hooked beak, suggesting that of a parrot, but almost microscopic in size, adorns the front of the tadpole's head and is useful as a means of scraping and tearing at the minute water plants and animals which it takes for food.

At this stage tadpoles are scavengers, and fortunate are they to find the crumbs that fall from the rich man's table in the form of fragments of fish or other food left by larger and more careless banqueters in Nature's storehouse. This rich fare fattens the tadpole's body to ridiculous rotundity. His tiny, lidless eyes stare solemnly upward at the water surface, to which he must now rush every few moments for a

lungful of air, as his gills are beginning to be absorbed and he has had since to depend largely on his two nostrils, equipped with valves to keep them closed and water-tight during his submarine excursions, augmented by a spiraculum, or breathing pore, on the left side of his body.

His tail has developed to a thing of surprising strength and pliability, for on its power alone his safety depends in the increasingly bitter struggle to escape his countless enemies. Almost every carnivorous water-dweller is his enemy now. The crayfish would catch and rend him in an unwatchful moment, the water-beetle lies in wait to spring on him with tigerlike ferocity if he comes too near, the cruising turtle would find him a luscious mouthful, and the bright-eyed heron would spear him and hundreds of his brothers if they lay too long in the soft mud. Life is hard and strenuous for tadpoles, and not more than one in a hundred survives to reach maturity.

THE TADPOLE CAN GROW A NEW LEG

Before the tadpole is many weeks old a pair of budlike growths sprouts near the base of the tail, and shortly these elongate into a pair of hind legs equipped with five toes, which closely resemble those of the adult. At this stage a marvelous power of regeneration may take place, for if a toe or even a leg is nipped off, another one will grow in its place, an exact duplicate of the one lost. After metamorphosis is complete, this regenerative power ceases to function and a limb once lost is not regrown.

Some days after the legs appear, the right arm comes out. Now the little tadpole stays near the top of the water nearly all the time and seems very uncomfortable, and no wonder. His left arm is developing just where the breathing pore is located. As soon as it bursts through, his troubles are lessened, for now he can hop out on the bank in true frog fashion and breathe the air freely; for, as we have seen, his nostrils have been functioning for some time as air-breathing organs.

With the formation of his legs his head structure has likewise changed. The scraping black beak gave place to the wide mouth characteristic of the adult frog, the staring eyes acquired lids and nictitating membrane, a tympanum appeared, a definite color pattern showed on the skin, and

some glandular cells arranged themselves in characteristic toughened areas all over the back.

Only the tail remains to tell of his former aquatic habits. Day by day it, too, is absorbed into the body, just as were the gills in the very early stages, until at last our little frog is completely metamorphosed and can go freely on shore with his brothers to catch flies among the plants bordering his ancestral pool.

It is now the end of July, and for the next two or three months his only occupation is eating and preventing himself from being eaten—enough to keep him busy and on the alert every instant.

FROGS LIVE ALL WINTER UNDER MUD

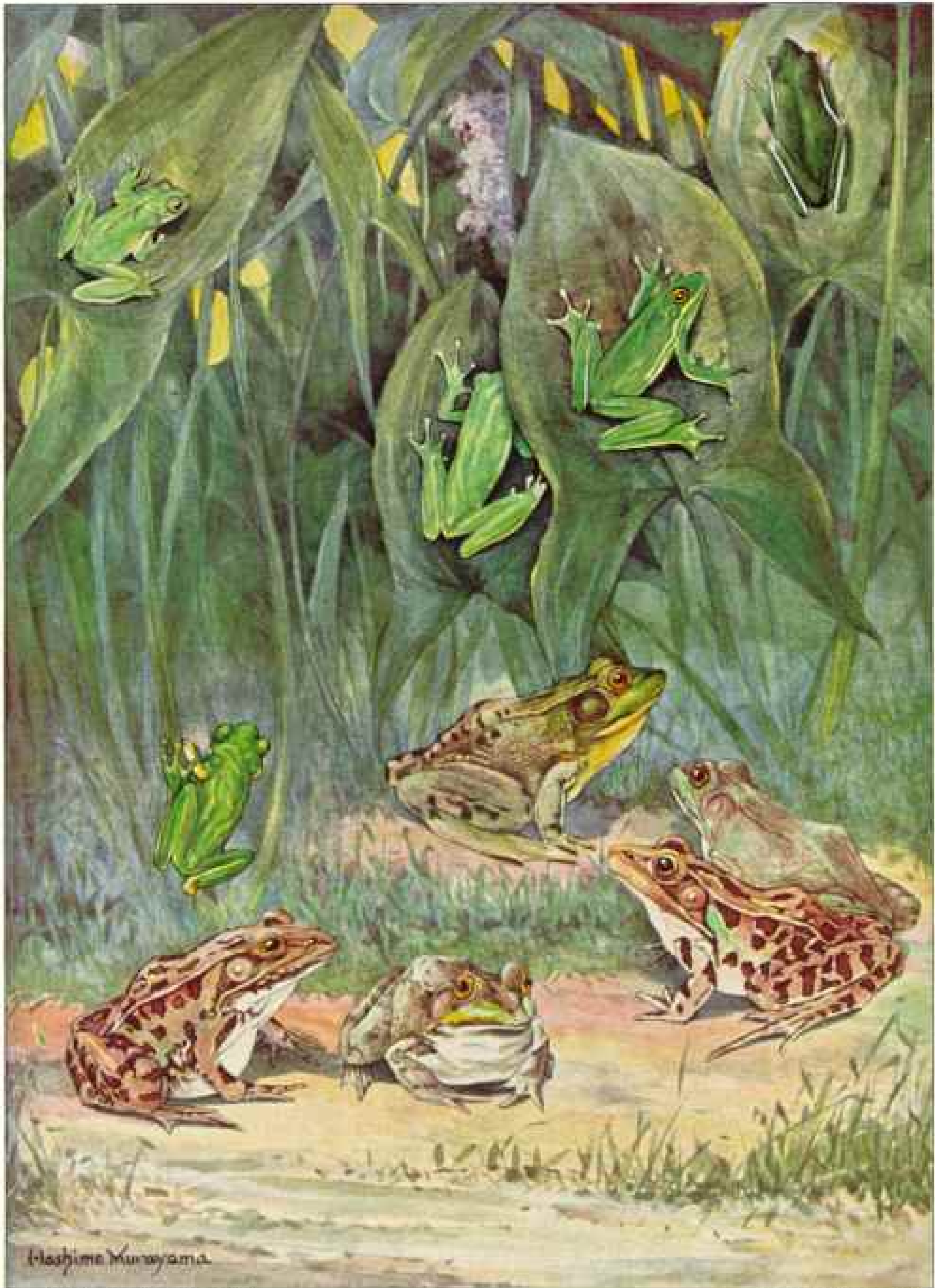
At the approach of the sharp autumn weather he is about half an inch in length and half-grown. While he has no voice as yet, the mating call of his elders may occasionally be heard in the pool as late as September, for cricket-frogs are active over a long period of the year and the breeding season may be said to last from April to September, reaching a peak at several different times, as warm weather and heavy rainfall favor it.

At the onset of winter everything is silent, but with sleep, not death. Near the borders of the pond, buried under logs and stones in the mud, the little frogs have begun hibernation for the winter. A wise provision of Nature slows down their life processes to suit them to this complete inactivity and apparent inanition.

In their summer activity, more than a few moments' enforced submergence in water would have drowned them. Now, in hibernation, they can pass a whole winter beneath the mud because they are not breathing. Sometimes, indeed, a warm spell of weather in midwinter is sufficient to wake them from their lethargy, and their clicking calls may be heard in nearly every month of the year in some of our Southern States, where the winters are not severe. But the energizing warmth of the returning spring calls them to another cycle of singing and mating, and so life goes on in the little pool in the woodland.

The life history of our cricket-frog is more or less typical of that of all members of the Salientia, or tailless amphibians, which constitute one of the three existing orders of the Amphibia. The other two

THE IRIDESCENT BEAUTY OF FROGS AND TOADS



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One-half Natural Size

MEALTIME COMPETITION IS ASSURED IF A FLY HAPPENS ALONG

The green tree-toad, *Hyla cinerea*, [left center and four upper] is usually to be found perched upon the stalks and leaves of plants growing near the water's edge. Below, the spotted leopard-frog, *Rana pipiens*, and the green frog, *Rana clamitans*, are shown on their unceasing watch for low-flying insects which may be seized in a single well-directed leap and swallowed in one gulp.



DISKED TOES GIVE A SURE FOOTHOLD EVERYWHERE

The common tree-toad or rain-toad, *Hyla versicolor*, [upper left] is shown here away from his natural environment in order to contrast him with his large tropical cousins, *Hyla septentrionalis*, hailing from Cuba. Metachrosis, or color change, takes place in these as in most other tree-toads. A single individual will turn from dark brown to pale yellow in a few minutes, the change depending largely on atmospheric conditions, especially humidity.



© National Geographic Society

One-half Natural Size

THESE ARE GIANTS IN THE TOAD FAMILY

Bufo marinus, the marine toad from tropical America, is not sea-going, as its name suggests. It is distributed over an exceedingly wide territory, however, and seems to thrive when introduced into regions where it was not previously found. In this way several of the islands of the West Indies have been populated by it, where it was brought to aid in eradicating insects harmful to agriculture.

THE IRIDESCENT BEAUTY OF FROGS AND TOADS



A POND SIDE SCENE IN NORTHERN UNITED STATES

The wood-frog, *Rana sylvatica*, [lower left] is one of our earliest harbingers of spring. The beautiful pickerel-frog, *Rana palustris*, [lower right] looks much like the leopard-frog (see Plate I) but may be distinguished by its square spots. The habits of the cricket-frog, *Acris gryllus*, [center and left] have been described in the text. The spring-peeper, *Hyla crucifer*, [upper right and left] is likewise one of the voices of early spring.



© National Geographic Society

One-half Natural Size

ALWAYS ON THE QUI VIVE FOR WHAT MAY COME

True's toad, *Ascaphus truei*, [lower center and right] is not a true toad in spite of its name. It belongs to a primitive and ancient family now found only in Europe, Asia and New Zealand, with this lone exile in Washington State. The cold mountain brook makes an ideal home for the shy red-legged frog, *Rana aurora*, [lower left and upper right], while the Pacific tree-toad, *Hyla regilla*, [upper left] is found in all Pacific Coast States.



AN EDIBLE SPECIES IN SOME DANGER OF EXTERMINATION

The "mountain chicken," *Leptodactylus fallax*, from the island of Dominica in the West Indies, is a large and handsome species, whose delicately toned skin suggests the texture of colored wax. The natives of the island value it as an article of food. In size it very nearly rivals our own bullfrog (see Color Plate V).



© National Geographic Society

One-half Natural Size

A PERPETUAL COLD BATH IS WHAT THEY ASK OF LIFE

The southern bullfrog, *Rana grylio*, is quite restricted in its range, being found from southern Mississippi to peninsular Florida. Its voice sounds like the grunting of a pig, and from this resemblance it is also known as the pig-frog.

THE IRIDESCENT BEAUTY OF FROGS AND TOADS



TOADS ARE "NICE PEOPLE"

This conviction is deepened upon meeting *Bufo alvarius*. The group is as bland and philosophical as old gentlemen about to take up golf. Although they live in Arizona and in southern California, reputedly one of our most arid regions, these toads are by choice semi-aquatic. They stay near water-holes in canyons, and irrigation ditches are a boon to them.



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One-half Natural Size

A SPECIES THAT SELDOM GOES FAR FROM WATER

The bullfrog, *Rana catesbeiana*, is the most familiar species in the United States, occurring throughout the entire country east of the Rockies. Since it is our largest frog, it is the most valuable commercially as food. It takes to deep water at the approach of a suspected danger.



ONE TOAD MAY EAT THOUSANDS OF INJURIOUS INSECTS IN A SEASON

Fowler's toad, *Bufo fowleri*, [two at left] is one of the commonest in the United States. It may be seen hopping about in the dusk, on the lookout for worms, beetles and such "fodder." *Bufo valliceps* [center and extreme right] ranges from Louisiana through Texas into Costa Rica. The spadefoot, *Scaphiopus holbrookii*, [lower right] is retiring in habits, and is almost never seen except for two or three days in the breeding season, when it resorts to ponds to lay its eggs, after which it disappears for the rest of the year.



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One-half Natural Size

TOADS ARE FOUND ON ALL THE CONTINENTS AND ON MANY ISLANDS AS WELL

The Cuban toad, *Bufo peltoccephalus*, is a beautifully marked creature, with a skin like the pattern in an old and priceless tapestry. Shakespeare himself said of a toad that he "wears yet a precious jewel in his head." Whatever a toad may lack of grace and elegance in form is atoned for in the brilliance of his eyes, which shine with glints of pure gold, amber, rose, sienna and jade.

THE IRIDESCENT BEAUTY OF FROGS AND TOADS



THESE SPECIES MAKE ATTRACTIVE AND INTERESTING PETS.

In Europe we find the fire-toad or bell-toad, *Bombina bombina*, [lower] an aquatic species of primitive structure related to the True's toad of Plate III. The edible frog, *Rana esculenta*, [left] is highly prized as food in Europe. A most curious example of paternal solicitude occurs in the midwife toad, *Alytes obstetricans*, [right] in which the male takes the long strings of eggs as soon as the female lays them and wraps them around his body, hopping to the water's edge to moisten the eggs daily as they require it.



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One-half Natural Size

SUCH CLAWS OCCUR RARELY AMONG AMPHIBIANS

The Aglossa, or tongueless frogs, are here represented by the clawed *Neuopus mülleri* from East Africa. They are entirely aquatic, and hunt for their food in the mud, stirring it up with their long fingers and seeming to find it rather by touch than by sight. They must go occasionally to the surface of the water for a lungful of air, which lasts them for several minutes.



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One-half Natural Size

AGGRESSIVE AND CANNIBALISTIC HORNED TOADS

The true horned toads belong to the genus *Ceratophrys* from South America. This species, *Ceratophrys dorsata*, is a native of Brazil. It lives in dense forests, where its coarse pattern of brown and green makes it nearly invisible on the carpet of green leaves and brown roots. The horned lizard, *Phrynosoma*, from the western United States is often erroneously referred to as the horned "toad."

orders are the Caudata, or salamanders, and the Apoda, or caecilians.

TWO THOUSAND SPECIES OF "FROGS" AND "TOADS"

While there are about two thousand species of tailless amphibians, we lack a corresponding number of common names for them. We must perforce call everything by the name of "frog" or "toad," although the several families grouped together as "toads," for instance, may be as different structurally and in habits from the true toad, genus *Bufo*, as the lion is different from the camel, although both are mammals.

While most tailless amphibians deposit their eggs in water, with the tailed aquatic tadpole stage intervening between egg and adult, there is one tropical American genus, *Eleutherodactylus*, in which the young frog completes his metamorphosis entirely inside the egg-capsule, and when it is finally time for him to sally forth he comes out and hops away among the tree tops with no tail to impede him.

Other tropical frogs lay their eggs in the rain-filled axils of giant palm leaves perhaps a hundred feet high in the air. Here it is truly a case of rock-a-bye, baby, on the tree top to the little frog baby.

In his wind-rocked cradle of rainwater he may have strange bedfellows. Such a bromeliad reservoir from Jamaica yielded a young *Eleutherodactylus* and tadpoles belonging to two species of frogs, some small crabs, grasshoppers, arboreal cockroaches, a tarantula, and some earthworms, which live high in the air in the quart or two of soil and water which collects in the junctions of leaves with stem.

SHOWERS OF FROGS

"Showers" of frogs and toads have been mentioned in the literature of very early times, and, while some of the tales are exaggerated, we know that showers of organic matter actually do occur when the entire contents of a pond are sucked up by a whirlwind and dropped perhaps miles away from their point of origin. One of the early accounts is by Athenæus and dates from about A. D. 200. In a chapter entitled "De pluvius piscium," he says:

"I know also that it has very often rained fishes. At all events Phœnias, in the second book of his Etesian Magistrates, says

that in the Chersonesus it once rained fish uninterruptedly for three days; and Phylarchus, in his fourth book, says that people had often seen it raining fish, and often also raining wheat, and that the same thing had happened with respect to frogs.

"At all events, Heraclides Lembus, in the 21st book of his history, says: 'In Pæonia and Dardania, it has, they say, before now rained frogs; and so great has been the number of these frogs that the houses and the roads have been full with them; and at first for some days the inhabitants, endeavoring to kill them and shutting up their houses, endured the pest; but when they did no good, but found that all their vessels were filled with them, and the frogs were found to be boiled up and roasted with everything they ate, and when besides all this they could not make use of any water, nor put their feet on the ground for the heaps of frogs that were everywhere, and were annoyed also by the smell of those that died, they fled the country.'"

Several authentic accounts of more recent rains of frogs have been published in scientific journals, mostly in Europe. One account states that during the storm that raged with considerable fury in Birmingham, England, on Wednesday morning, June 30, 1892, a shower of frogs fell in the suburb of Moseley. They were found scattered about several gardens. Almost white in color, they had evidently been absorbed in a small waterspout that was driven over Birmingham by a tempest.

Peculiar superstitions exist about toads and frogs in many countries. Since most races of men observe closely only those creatures which are either directly useful to them or potentially injurious, the majority of the amphibians escaped anything resembling close and protracted study until relatively recent years. It was not until about two centuries ago that the facts of hibernation were definitely made known to science. Before that time it was believed that frogs were procreated from the mud—an idea proposed by no less an observer than the illustrious Aristotle himself.

In Europe, in the Middle Ages, the toad was supposed to be an intimate of the alchemist and the sorcerer, itself endowed with supernatural powers. Credulous sick people were dosed with ghastly concoctions and strange brews of various inedible substances often including a toad or frog, and



Photograph by Lynwood M. Chace

A LEOPARD-FROG WITH EGGS

A single egg mass may contain between five and six thousand eggs. So many dangers beset them and the subsequent tadpoles that perhaps only one out of this mass may live to metamorphose.

over which the wizard healer had said weird incantations supposed to make the evil spirit depart from the body of the sick.

The toadstone was long sought by even those best informed and least credulous. The beautiful, gleaming eye of the toad was supposed to be an outward sign of the inward luster of the jewel concealed in his head. The toadstone was considered to be endowed with therapeutic qualities and to be an effective antidote for poisons. It was carried as a charm, set in a ring or worn as an amulet, or deposited on the shrine of a saint as an offering of great piety.

THE TOAD IS UNJUSTLY CHARGED WITH CAUSING WARTS

Almost as naïve is the belief, common in most parts of the United States, that the handling of toads will cause warts. While toads appear to have warts themselves, due to the swollen glands in the skin, they cannot cause warts, nor can they harm the skin in any way. I myself present proof of this statement. I have kept pet toads for several years and have handled them almost daily, and my hands are absolutely without warts. The only wart I ever had

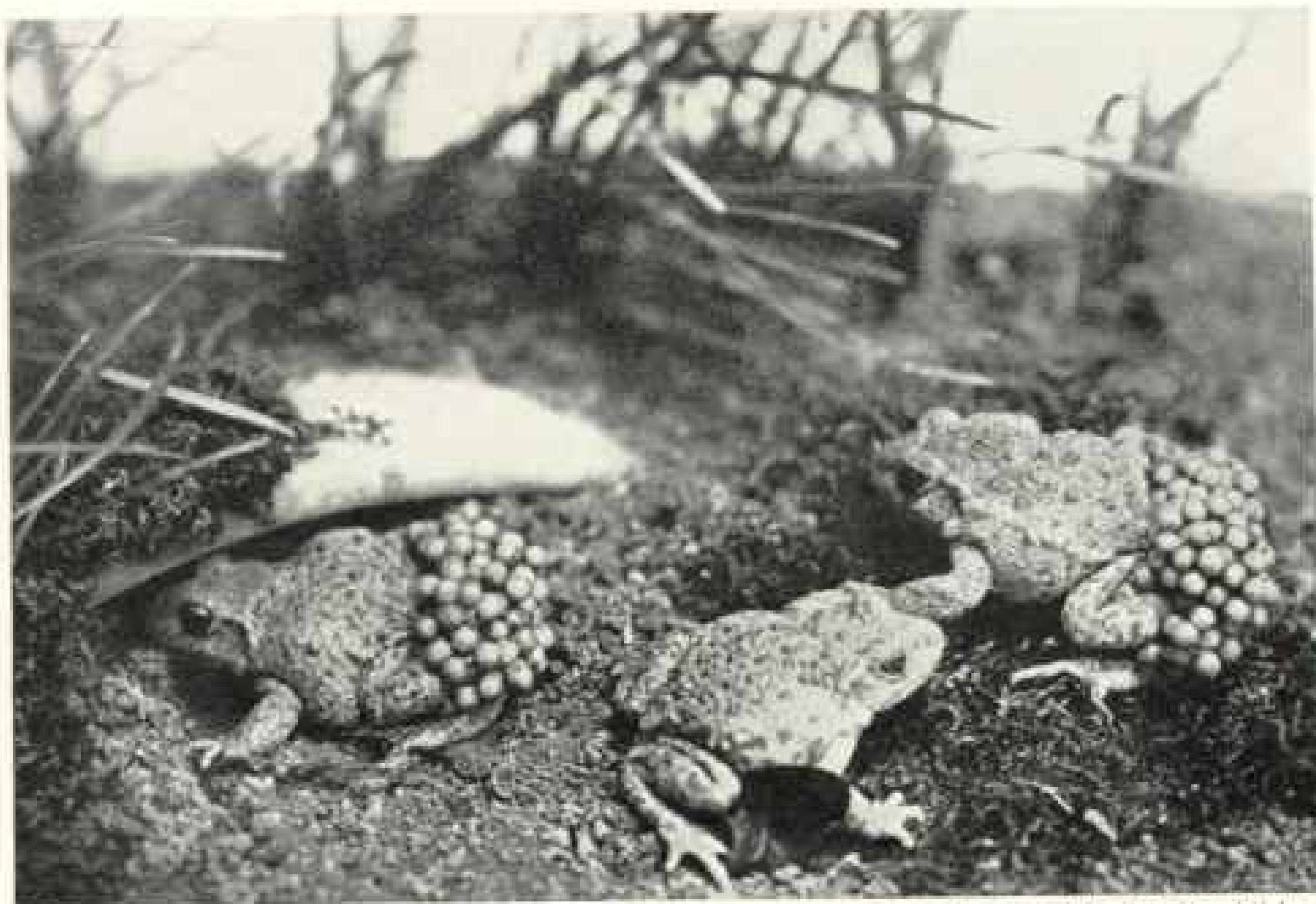
on my hands was during the comparatively toadless period of my high-school days, and even that one went away soon after I began playing with toads.

After handling toads, however, care should be taken not to get any of the mucous secretion from the skin glands into one's eyes or mouth, as serious trouble might ensue.

The use of toadskins as medicine in China may be more reasonable than it appears. Recent studies of the secretion of the parotoid glands of the toad reveal chemical changes taking place within the matured secretion producing adrenalin.

Primitive tribes have long been familiar with the uses of poisons obtained from various kinds of tailless amphibians. In Colombia the Indians poison their arrows with a secretion from the small, brilliantly colored *Dendrobates tinctorius*, which is less than two inches in length when fully grown. By exposing it to heat near a fire, sufficient poison may be scraped from the back of one individual to poison fifty arrows.

The principal use of this same toad, however, is in "dyeing" parrots. The green and



Photograph by Paul Henri Fabre

THE FEMALE OF THIS SPECIES IS FULLY EMANCIPATED

In the case of the midwife toad, *Alytes obstetricans* (see Plate VII), the female (center) has no further responsibilities after she has laid her eggs. The male toad (right and left) takes the greatest care of the eggs until hatching time, and appears to like his parental duties, as several batches of eggs may be thus "incubated" by him in one summer (see, also, text, page 650).

blue feathers on the head and neck of the Amazon parrot are plucked out in some fanciful pattern, and the bare skin in these areas is touched with the skin of a living *Dendrobates*, and again after the young feathers have begun to appear. When the feathers finally grow in, they are yellow instead of green. There is considerable demand for these artificially colored birds in the South American countries.

Another quite dissimilar utilization of toadskins by the orientals is in the fabrication of small articles such as purses. For this purpose the leather is admirable, being soft and thin, yet very strong, with a pleasing texture when prepared by experts.

THE MUSCULAR POWER OF FROGS

The leaping powers of the average frog are such that the best records of our Olympic athletes are distinctly put in the shade by them. A man can make a running jump of not much more than four times his length, while any two-inch frog worth his salt thinks nothing of a jump of twenty times his length.

The gliding habit is much more unusual among frogs. In Brazil some experiments were conducted with one of the tree-toads, *Hyla venulosa*, which proved that it would leap voluntarily into the air from a height of 40 feet, spreading its legs to break its fall and landing unhurt after its gliding descent. One specimen was released from the top of a water-tower 140 feet in height when a slight breeze was blowing; it landed uninjured on the ground 90 feet from the base of the tower. If thrown high up into the air, it managed to right itself every time, so that it came down on its feet. The frog is no more able to fly in the true sense of the word, however, than is a falling leaf.

The insect-eating habits of the tailless amphibians are of great economic value to man. Toads especially take enough food to fill the stomach completely four times in 24 hours, and they have been truly valuable in fighting an outbreak of sugar-beet web-worms.

Man utilizes frogs' legs as food in many parts of the world. They are collected for market on a commercial scale in some



Photographs courtesy Ozio Fisheries

CAPTURING A FOUR-POUND BULLFROG IN LOUISIANA

The specially designed frog gig which is operated with a trigger on the handle catches the frog but does not kill it.



HE PLACES HIS LIVE CATCH IN A SACK

Note the flashlight on the cap, like a miner's lamp, which the trapper uses in stalking his prey at night.



Photographs by Clifton Adams

PURCHASING FROG LEGS IN A WASHINGTON, D. C., MARKET

While practically all frogs are edible when skinned and cooked, only the largest species are of any practical importance in commerce. In the United States the bullfrog supplies the market. (see text, page 654).



TO BE SERVED TO EPICURES

The chef of one of the most famous restaurants of the Nation's Capital skinning a shipment of six dozen "medium" frogs just received from a "Cajun" dealer west of New Orleans, Louisiana.



Photograph by Hugh B. Cott

A PAST MASTER IN THE ART OF CAMOUFLAGE

The toad in the center of the photograph (*Bufo typhonius*) so closely resembles a leaf that it escapes the notice of its enemies on Marajó Island, Brazil.

fifteen States of the Union, but "frog farms" have not proved successful because of the difficulty in providing the adults with live food. After he has emerged from the larval or tadpole state Sir Frog becomes fastidious about his fare, refusing all nourishment except that which is living or moving (see text, page 630).

While the nutritive value of frogs' legs compares favorably with that of chicken and fish, it is the delicacy and palatability of the flesh which place them in the front rank of epicurean luxuries (see, also, sketch of the Edible Frog, page 654).

MAKING A HOME FOR FROGS

While amphibians are not yet quite as popular for pets as tropical fish,* they are no less interesting. Once their special requirements are understood, they become charming inmates of one's vivarium case. A word as to the installation of such a "live box" may not be amiss.

Any wooden packing box a yard long, a foot wide, and two feet high will make a

* See "Tropical Toy Fishes," by Ida Mellen, in the NATIONAL GEOGRAPHIC MAGAZINE for March, 1931.

satisfactory case if one side is either glassed or screened for observational purposes and a screen or cover of some sort is made to fit very tightly over the top of the receptacle. Now add a six-inch layer of moist earth and in one corner sink an earthenware saucer to hold water.

The moist soil may be covered with moss from the woods, planted with ferns, and decorated with flat stones and pieces of bark, under which the small inmates will be glad to retreat at times.

Now to stock our vivarium! If we go forth with a flashlight on a warm spring night to almost any small body of fresh water, the light will attract some kind of amphibian which may be in the vicinity. He may be picked up and put in a container half-filled with moist leaves to supply the proper humidity, for all amphibians require considerable moisture and will very soon die if deprived of it.

Tree-toads, cricket-frogs, the common or garden toad—all these will soon become tame in captivity and will eat readily the flies, angleworms, and other living food that may be supplied to them. While a



Photograph by Dr. A. H. Wright

THE OAK TOAD'S LITTLE THROAT, LIKE THAT OF THE CRICKET-FROG, BUBBLES MADLY UP AND DOWN IN HIS MUSICAL ENTHUSIASM TO ATTRACT HIS MATE

The inflated vocal pouch of the calling male extends in front of the head. The smallest of his kind, *Bufo quercicus*. He is to be found in oak and pine woods from North Carolina south to Georgia and Florida.

number of different species may be kept in the same vivarium, the inmates should be approximately equal in size, as big frogs become cannibalistic toward their small brothers whom they see hopping about and whom they fail to distinguish from a moving beetle or other legitimate food.

The necessity of a tightly fitting cover arises from the fact that the tree-toads especially are adept at squeezing themselves through unbelievably small crevices and thus taking French leave.

After such an escape in one's home, they seem invariably to hop under the most awkward pieces of furniture, from which their owners can extricate them only with considerable effort. Any lady who keeps a pet frog seldom needs to go on a reducing diet, as she will get exercise enough in recapturing her pet when he escapes back of a piano or under a sofa.

Frogs in captivity frequently delight and surprise their owners by their vocalistic prowess. They appreciate the radio program, and there is something in the sound

of the xylophone which invariably sets the little cricket-frogs to piping. A political speech likewise elicits considerable comment, no matter what the platform may be! One's pet bullfrog may decide to sing at 3 o'clock in the morning, however, and then the humor of the situation is not so apparent to some people.

I have not spoken of the real beauty of some species of frogs. Their slender, graceful proportions; their waxlike, nearly translucent skin, glowing with the soft, rich tones of old pottery; their brilliant, expectant eyes, with irises of gold and iridescent colors—these are sufficient to make an esthetic appeal to anyone who is sensitive to beauty in all of its forms.

MÜLLER'S CLAWED FROG: *Xenopus mülleri*

(See Color Plate VII)

Complete adaptation to an aquatic existence is shown by these tongueless frogs. Their fingers are elongate and highly tactile to help them to locate insects burrowing in the mud, while their powerful webbed hind feet carry them

easily through the water to seize fish, swimming insects, and even their own tadpoles. Their nostrils close with valves, and they need go up for air only two or three times in an hour.

In captivity they often stay at the surface with only their nostrils and their lidless eyes projecting above the water, and if a piece of raw beef or an insect is held an inch or two above the water, they will leap up and take their food from one's fingers. They are extremely hardy in an aquarium if given the simple care that they require.

AMERICAN BELL-TOAD OR TRUE'S TOAD: *Ascaphus truei*

(See Color Plate III)

These remarkable amphibians live in mountain brooks in which the water is less than 40° Fahrenheit, where they conceal themselves by hiding under stones at the bottom of the stream. In captivity they must be kept in water with melting ice or in the refrigerator; otherwise they will die from too much warmth.

This species is the only one which possesses an extension of the cloaca in the male. Fertilization is internal. The tadpole clings with the mouth to a stone in swift or still water to keep itself from being swept downstream, and occasionally even fastens itself to a rock in the falls.

EUROPEAN BELL-TOAD OR FIRE-TOAD: *Bombina bombina*

(See Color Plate VII)

This toad, like many other species, produces a slimy, poisonous secretion from the glands on its back when it is annoyed. If it cannot escape, it bends itself backward, showing the brilliant flaming color of its underparts, and likewise displays the bright undersurfaces of its hands and feet as a warning to its pursuers that it is not edible.

In captivity the bell-toad makes a charming pet, living among the water plants in a screened aquarium and soon learning to take food from the hands of its owner. Its voice is very faint, but musical and bell-like. It rests near the surface of the water, with its limbs spread, showing nothing above the surface except its nostrils and its round, projecting eyes. It is found in the lowland ponds from Russia to Germany.

THE MIDWIFE TOAD: *Alytes obstetricans*

(See Color Plate VII)

A lengthy literature exists on the unusual breeding habits of this European species, in which the male frog assumes the care of the eggs for the three weeks during the entire period of their development, going about at night to obtain his food and to immerse the eggs in the water for a short time during very dry nights, and retiring by day to a shallow burrow or to a crevice between stones (see page 645).

When the male finally enters the water to release his burden, some glands on the nose of the tadpoles digest the egg envelope, freeing the embryos, which swim away.

The female is able to spawn three or four times a year, so that the male is kept busy with

family cares during the whole summer. Larva hatched in the spring may complete their metamorphosis before hibernation, but the latest brood retains the tadpole form, living in the deepest water, under the ice, until the following spring, when the transformation can be continued.

THE HERMIT SPADEFOOT: *Scaphiopus holbrookii*

(See Color Plate VI)

Except for a few days at the breeding season, when it resorts to ponds to lay eggs, this species is virtually never seen in the open. It is the most secretive of any of our native frogs, and burrows deeply into the ground with the sharp horny ridges on the soles of its hind feet. Here it stays for weeks and months at a time in a hibernating position, its head lowered over its front feet, its eyes shut, and its sides puffed out, so that it looks like a round ball. It emerges to look for food only after heavy rainfall and at night. Its breeding period lasts only a night or two, at which time its discordant croaking can be heard for a long distance. It ranges over the eastern and southern United States.

THE COLORADO RIVER TOAD: *Bufo alvarius*

(See Color Plate V)

While not the largest known species, *Bufo alvarius* nevertheless attains the distinction of being the largest toad found within the borders of the United States, its head-and-body length being more than five inches. Its smooth greenish skin causes it to resemble a frog more than a toad, while its semiaquatic habits heighten the similarity.

The heavy glands, appearing not only on the parotid region, but likewise on the upper surfaces of the arms and legs, afford it an unusual degree of protection, for their secretion is highly poisonous, and has been known to cause immediate death to a dog which rashly molested one. Only great stress of fear or pain causes the poison to be sweated from these glands, however, for captive specimens gently handled never display the slightest trace of it, even when they are forcibly fed.

FOWLER'S TOAD: *Bufo fowleri*

(See Color Plate VI)

Hopping about in the pine woods at dusk, picking up slugs and beetles, this toad may be found from New England to Georgia and central Texas and north to Michigan. Its eggs are laid in long strings in the water, as many as 5,000 eggs being deposited by a single female at one time. Infant mortality is tremendous among the small black tadpoles which later swarm in the pool, as well as among the countless minute toadlets which have completely metamorphosed.

THE MARINE TOAD: *Bufo marinus*

(See Color Plate II)

Hailing from tropical America, this creature has the distinction of being the giant of all toads. A well-grown individual will measure eight inches in length as he sits, and his waist-



Photograph by Lynwood M. Chace

WITH BRUTAL COMPLACENCE THE AMERICAN TOAD FEASTS UPON A SPICE-BUSIL
SWALLOW-TAIL BUTTERFLY

After he swallows the body of his prey, *Bufo americanus* may use his short, chubby hands to cram the stiffly spreading wings into his mouth.

line achieves the magnificent figure of thirteen inches.

The true toads, those belonging to the genus *Bufo*, may be recognized by the presence of an enlarged parotoid gland, which secretes an acrid slime, the toad's only means of defense against his enemies. This is highly irritating and sometimes fatally poisonous when applied to the mucous membrane of the mouth of dogs, wolves, and other enemies of the toad, so that a wary dog cannot be persuaded to bite a toad after he has had one experience with this glandular secretion.

While the other tailless amphibians have glands in the skin which are more or less active, only the toads have the enlargement at the parotoid region (above the ear), and in this species the parotoid gland reaches a maximum development.

SAPO OR CUBAN TOAD: *Bufo peltocephalus*

(See Color Plate VI)

This species was thought to be rare in Cuba until its habit of congregating beneath stones on hillsides and under the roots of trees was thoroughly understood, when it was found to be very widely distributed on the island.

Like most tropical amphibians, this toad is nocturnal. There is no necessity for hibernation; hence it is able to feed during the entire year. The thick and warty skin is much better adapted

to stand dryness than is the frog's skin, so that the toad is able to travel overland away from wet areas, although it has to retreat into a damp spot frequently to avoid too much desiccation.

THE NEBULOUS TOAD: *Bufo valliceps*

(See Color Plate VI)

The sharp, high cranial crests, emphasizing the abrupt contours of the head, distinguish this toad readily from all others found in the United States. Its coloring is variable, but often ruddy or brown, this characteristic extending even to the eye, which is a combination of copper and sienna outlined with gold.

In captivity the nebulous toad makes a contented and amusing pet, readily accepting insects shaken in front of its face on the end of a straw, or doing battle valorously with a huge angleworm and finally using both hands to cram it willy-nilly into its mouth. It is fond of snails also.

**THE COMMON TREE-TOAD OR
RAIN-TOAD: *Hyla versicolor***

(See Color Plate II)

Widely distributed through the United States from the Atlantic coast to the Mississippi and from the Gulf of Mexico into southern Canada, the rain-toad is known to most of us fortunate enough to dwell in the country. His musical, bell-like voice haunts the orchard, and the fact



THE SURINAM TOAD HAS NO FREE-SWIMMING TADPOLE STAGE

Although limited to the northeastern part of South America, where it leads an entirely aquatic existence in the pools and inundated areas, this tongueless (Aglossid) amphibian (*Pipa pipa*) has long been kept in aquaria in zoological gardens because of its remarkable breeding habits. At the time the eggs are laid the male distributes them evenly over the back of the female, and each egg comes to lie in a deep pouch in the skin, closed by a peculiar lid, which is probably the remnant of a membrane originally surrounding the egg. Within this cavity the egg develops through the tadpole stage, and the young one, fully metamorphosed, leaves his prison and swims away from his mother to live his own independent life.

that he prefers to sing in the rain has earned him one of his names. On the lichen-covered bark of trees, it is next to impossible to see him, for his gray-and-olive spotted coloring makes him a perfect match to the branch to which he clings. He is most active in the evening and at night, sleeping by day on a tree trunk or some other vertical surface to which his sticky toes adhere without any effort on his part.

THE GREEN TREE-TOAD: *Hyla cinerea*

(See Color Plate I)

Perhaps the most beautiful of our native tree-toads, this species is likewise one of the most satisfactory in the vivarium. A never-failing appetite for flies is one of this frog's very desirable qualities. It becomes exceedingly tame in a short time and soon learns to appear in readiness at the regular hour for feeding. Its long limbs give it a graceful slenderness which some other species lack. Its color is always some tone of green, to which the lustrous white or yellow lateral stripe adds a pleasing contrast. It occurs in the southern United States and as far north as Virginia.

THE SPRING-PEEPER: *Hyla crucifer*

(See Color Plate III)

The birdlike piping melody of the spring-peeper may be heard as early as February or March, for it is one of the earliest of the amphibians to appear in the spring. In chorus close by, the sound effect is too ear-splitting to be listened to for very long; but as these frogs are extremely shy, the song ceases at the approach of a human being. The loudness of the song seems all out of proportion to the size of the singers. The species is found in southern Canada, south to the Carolinas and Louisiana.

THE PACIFIC TREE-TOAD: *Hyla regilla*

(See Color Plate III)

While this species has well-developed disks for climbing on its toes and fingers, it seems to prefer to remain on the ground, among the undergrowth, near shallow ponds. From these concealed spots its call may be heard sometimes in winter. Dark, rainy days and early evenings bring a full chorus, especially in February, at which time the egg-laying begins. Metamorphosis may be completed in April. The young

frogs are then only half an inch in length, but attain their full size, an inch and three-quarters, by the next breeding season.

THE CUBAN TREE-TOAD: *Hyla septentrionalis*

(See Color Plate II)

This species is larger than any of the tree-toads found in the United States, attaining a head-and-body length of at least four inches. It does not have to hibernate, since there is no freezing weather in its tropical home. It takes prodigious leaps through the tree tops at night in its search for moths and other night-flying insects, as well as for small frogs and anything else of suitable size. Its head is peculiar because the skin is involved in the cranial ossification. It is said that when these "bone-headed" species, of which there are several, retire into a hole in a tree to sleep, the top of the head is used as an effective plug to the hole, so that enemies are kept out.

THE CRICKET-FROG: *Acris gryllus*

(See Color Plate III)

The salient points regarding this frog have been outlined in the text (see pages 629 to 634). The cricket-frog might be confused with the swamp tree-frog *Pseudacris*, which has no pronounced webs between the toes and which has a much smoother skin. It might also be confused with the newly metamorphosed frogs of the genus *Rana*, but a glance at the profiles of the heads should settle their identity, for in *Acris* the part of the head anterior to the eyes is unusually prolonged, while in *Rana* it is shorter, as a rule.

In spite of its diminished toe-disks and consequent inability to do much climbing, it is properly grouped with the tree-toads in the large family Hylidae.

THE MOUNTAIN CHICKEN: *Leptodactylus fallax*

(See Color Plate IV)

This frog, apart from its culinary uses, is of interest because of its voice. Early explorers of the island of Dominica, where it occurs, noted its loud croak coming all night from the woods, not from the water. In addition to this habitual call, which is made with the mouth closed, frogs of this genus can emit a loud scream with widely opened mouths, if they are pursued too closely or captured. This sound is startling in its unexpected pitch, and might surprise the enemy into stopping for a few seconds to see whence it came, or dropping its prey, thus allowing the frog a brief respite in his race with death.

THE HORNED TOAD: *Ceratophrys dorsata*

(See Color Plate VIII)

This toad is peculiar in possessing elongate, pointed teeth, even in the youthful stages. It can inflict a serious bite and will actually attack



Photograph by Karl P. Schmidt

HIGHLY ADAPTED FOR ARBOREAL LIFE

The remarkable clasping power of the fingers and toes of tree-toads can be noted in *Hyla infrenata*, from Manokwari, Dutch New Guinea. Tree-toads of the family Hylidae are nearly cosmopolitan, being found in all countries except some parts of Africa and Indo-Malayan regions.

with opened mouth if disturbed. Even the tadpoles have large mouths and many tooth rows, for they are carnivorous, feeding on the eggs of other frogs.

The adult is cannibalistic and catches other frogs, as well as mice, small birds, and snails. While a very close relative, *Ceratophrys americana*, secretes a virulent poison from its skin, *Ceratophrys dorsata* is innocuous, though much more brightly colored.

THE OREGON RED-LEGGED FROG: *Rana aurora*

(See Color Plate III)

This delicately proportioned and beautifully colored species is exceedingly shy and wary, and its timidity makes it one of the less conspicuous species in the vivarium, where it prefers to bury itself in the moss in the wettest corner of its cage or to hide under the ferns. When picked up, the males repeatedly give a guttural protesting croak, while the young frogs and females voice their indignation in a high-pitched squeak. Occurring from California north to Vancouver Island, these frogs live in the deep, permanent pools of streams, leading an essentially aquatic existence and seldom going very far from shore into the surrounding forests.

THE COMMON BULLFROG: *Rana catesbeiana**(See Color Plate V)*

The largest of our North American frogs, this species ranges over the region east of the Rocky Mountains, and its sonorous bellowing call may be heard in practically every brook or pond throughout its range. It comes rather late from hibernation, breeding from the last of May into July. Its tadpoles become exceedingly large, measuring six or seven inches from mouth to tailtip before metamorphosis, which does not take place until their second summer. For this reason they make excellent inmates for the aquarium, where they act as scavengers by devouring debris and undesirable algae, while they do no harm to the fish.

THE GREEN FROG: *Rana clamitans**(See Color Plate I)*

This medium-sized species, like the bullfrog, is widely distributed throughout eastern North America. Its voice is much less in volume than that of the bullfrog, but several singing at once can produce a good chorus, nevertheless. The male green frog can be told from the female by his much larger tympanum, or external eardrum, which makes an enormous disk, considerably wider than the greatest diameter of the eye. The adults of both sexes usually have a conspicuous, brilliant green snout, although the remainder of the body may be more or less obscured by a mottling of brown. Unlike that of the bullfrog, the tadpole completes its metamorphosis in a single season and is not over two inches in length.

THE EDIBLE FROG: *Rana esculenta**(See Color Plate VII)*

For centuries this frog has been of culinary interest in the Eastern Hemisphere, where it occurs in one or another of its several subspecific forms over the whole of Europe, in eastern Asia, and in the northern part of Africa. The male frog has two vocal pouches, one on either side of the throat, which are inflated like little balloons when he is uttering the hoarse call and which lie in loose folds at other times.

While *Rana esculenta* goes through life with a "price on its head," so to speak, because of its common name, "edible frog," it is only one of numerous species whose tender and tasty legs may delight the epicure. In the United States the varieties of amphibians which can be utilized for the dinner table include the common bullfrog (*Rana catesbeiana*), the green frog (*Rana clamitans*), the southern bullfrog or pigfrog (*Rana grylio*), the leopard-frog (*Rana pipiens*), the pickerel-frog (*Rana palustris*), and the Oregon red-legged frog (*Rana aurora*). Only the first-named is marketed in appreciable quantities. The others are too small or too scarce to be of general commercial importance.

THE PICKEREL-FROG: *Rana palustris**(See Color Plate III)*

Similar in size and habits to the leopard-frog (see Color Plate I), this species may be distinguished by the presence of a definite yellow

color on the hind legs where they join the body, as well as by the more or less rectangular spots on the back. This frog, together with the other terrestrial species, molts its skin several times a year. Slits appear in the middle of the back and cross the breast, and after a process of humping and jerking the frog manages to pull himself out of his old garment, which he promptly proceeds to swallow! In aquatic frogs the shed skin floats away in large patches without being eaten. The new coat underneath is bright and shining. The pickerel-frog occurs from Hudson Bay to Louisiana and over the eastern United States.

THE WOOD-FROG: *Rana sylvatica**(See Color Plate III)*

The wood-frog merits his name, for he is at home in the forested regions of Canada and northern and eastern United States, while the tadpoles may be found in the deep rain-filled ruts of deserted wagon roads or in the hollows left at the uprooting of big trees blown over by storms. The exquisite orange, salmon-pink, and golden tones of his skin, with the distinctive brown ear-patch covering the sides of his head, make him one of the handsomest of all frogs, as well as serving to conceal him as he hops away among the fallen leaves of his native woodland.

THE SOUTHERN BULLFROG OR PIG-FROG: *Rana grylio**(See Color Plate IV)*

The grunting voice of this species, so unlike that of the common bullfrog, *Rana catesbeiana* (Color Plate V), first directed attention to the presence of this remarkable creature in the swamp lands of the South; but it was so difficult to capture that years elapsed before the scientific collectors could secure specimens to be studied. Pig-frogs live in marshes, lakes, and cypress swamps, in water two or three feet deep, under branches of floating dead trees or other debris; so that it is very difficult to get close enough to capture them by day, although they may be dazzled by the glare of a flashlight at night and thus picked up more easily. In May the eggs are laid in large masses, usually attached to weeds, a single egg mass sometimes measuring over twelve inches across. About three days elapse before the tadpoles hatch out.

THE LEOPARD-FROG: *Rana pipiens**(See Color Plate I)*

Most frogs leap hurriedly into the nearest body of water when alarmed, but the leopard-frog prefers concealment among the long grass. In fact, he is often to be found hopping about in the meadow at quite a distance from any stream. His skin glistens with a metallic iridescence, and he is one of the most beautiful of our native frogs. Especially prominent in this species are the lateral glandular folds, one on each side of the back, from which the secretion of slime to lubricate the skin originates. Since cutaneous respiration assists the lungs, and in some species entirely replaces them, it is necessary that the surface of the body be kept moist at all times. This species is found east of the Rocky Mountains over North America into Mexico.

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HAMILTON

SAILS THE VIKING TRAIL

with DAVID BINNEY PUTNAM

RETRACING the Viking trail pioneered by Leif Ericsson in the year 1000, the midget Nova Scotia schooner *Jahala* sailed last summer with daring, 18-year-old David Binney Putnam second in command.

Vicious gales blew them many miles off their course. Yet daily, hourly, minutely, they were able to check their bearings through the un-



DAVID—the young explorer and writer—takes a "shot" with a sextant

failing accuracy of their Hamilton chronometer.

This famous watch also went with Admiral Byrd to the North and South Poles; and with Explorer Roy Chapman Andrews into the wastes of the Gobi. In America, Hamilton times our fastest flyers—on the rails and in the air. It has earned for itself the title of "The Watch of Railroad Accuracy."

We should like to send you Christopher Morley's scintillating story, "When We Speak of a Tenth," which he wrote after a day spent in the Hamilton factory. In it, he tells with all his charm and wisdom, just how perfect we try to make every Hamilton Watch. Pictures of the latest beautiful Hamilton Models will be sent with it. Address Hamilton Watch Company, 882 Columbia Ave., Lancaster, Pennsylvania.

★

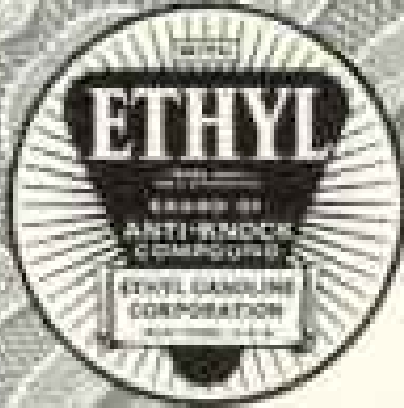
Watches pictured. From left to right: (Hamilton Watch prices have been reduced to meet 1932 requirements.) *Mr. Vexoux*, 17 jewels, 14k filled gold, natural yellow or white, \$50. *Excelsior*, 17 jewels, 14k filled gold, natural yellow or white, \$52.50. *Vauxsua*, 17 jewels, 14k gold, natural yellow or white with black silk cord, \$70. Other Hamiltons for men and women from \$45 to \$200.

★

HAMILTON
the Watch of Railroad Accuracy

★





Announcing

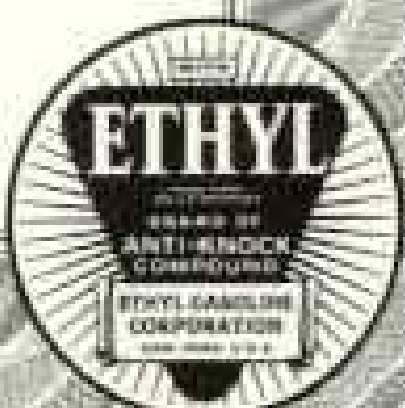
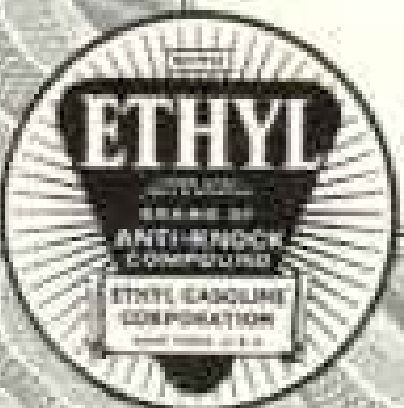
a new and higher standard

for **ETHYL**
GASOLINE

THE anti-knock standard and all-round quality of Ethyl have been raised still higher. For two reasons: (1) to give you more for your money, (2) to meet the requirements of automobiles the motor industry has brought out to take full advantage of Ethyl's universal distribution. **Q** The new cars with high compression engines require fuel of Ethyl's anti-knock standard, and in turn give more power from every gallon. Older cars find Ethyl a real economy because it prevents harmful knock, overheating and power-loss. **Q** The new standard widens still further Ethyl's margin of superiority over ordinary gasoline. Though it costs oil companies more to produce this higher quality, the price of Ethyl today is less, on the average, than you paid for regular gasoline only a few years ago.

© Ethyl Gasoline Corporation, 1932.

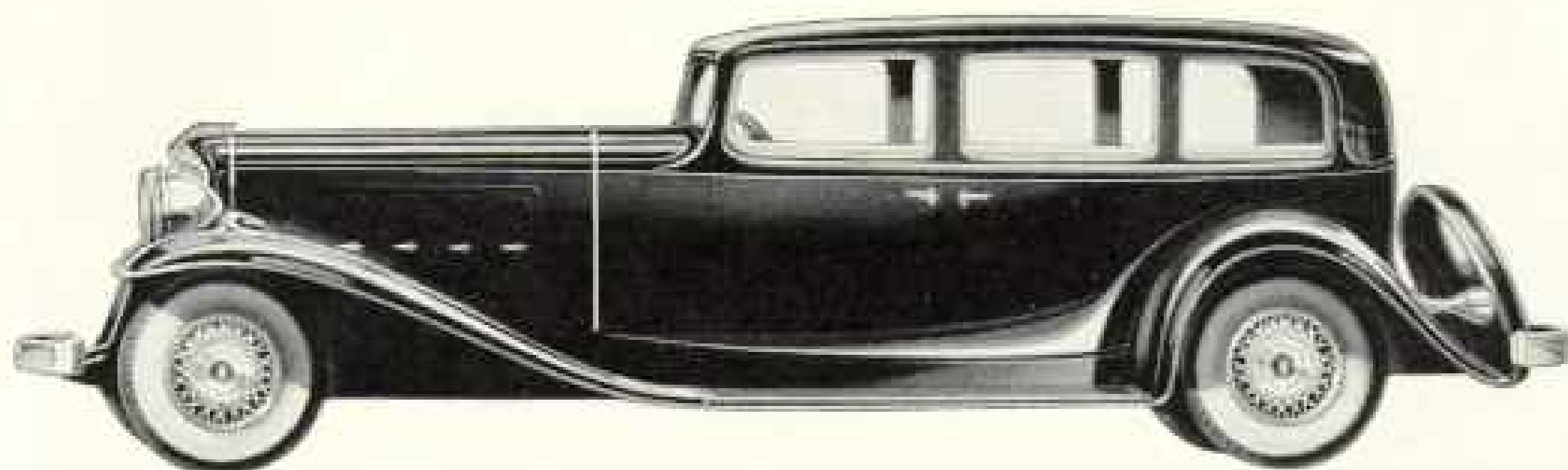
Ethyl fuel contains lead.



NASH

STEPS OUT AHEAD

WITH 5 NEW SERIES



This Year's Most Interesting New Car

THE 5 new series of Nash models introduce important basic advancements in both body design and chassis.

Both new style and a practical purpose are achieved by the Slip-Stream body, V-radiator, sloping windshield, and Beavertail back, for frontal air resistance is reduced and the usual vacuum "hold-back" is minimized, resulting in higher top speed.

The three upper series introduce a Silent, Underslung Worm Drive which enables Nash to secure much lower over-all height without decreasing head room or road clearance.

All models have the new super-rigid X-Dual frame; dash adjusted, full range Ride Control; greater horsepower; longer wheelbases; wider bodies and seats; Synchro-Shift transmission with silent second; Selective free wheeling; two glove compartments, chromium trimmed, in instrument panel; and adjustable driving seat for all Coupes and regular Sedans; as well as many more outstanding features.

You are invited to view these new cars at your Nash Dealer's and to drive them, for it is our sincere conviction you will prefer their performance to any you have ever known.

BIG SIX
116-inch Wheelbase
\$777 to \$935

STANDARD EIGHT
121-inch Wheelbase
\$965 to \$1095

SPECIAL EIGHT
128-inch Wheelbase
\$1270 to \$1395

ADVANCED EIGHT
133-inch Wheelbase
\$1595 to \$1785

AMBASSADOR EIGHT
142-inch Wheelbase
\$1855 to \$2055

ALL PRICES F. O. B. FACTORY



Some models are terribly dumb

"**W**ERE talking about his beard when he stepped into the room. I'm afraid he overheard us. Anyway an awkward silence followed." This, briefly, was the story told us by a young woman a few days ago. The yarn intrigued us, so we decided to re-enact the scene before the camera and present it to our audience. But it was a really harrowing experience. Just try and get a good photograph of an embarrassed silence! So we decided to show you the picture in the making—and here it is.

THE GILLETTE BLUE SUPER-BLADE

The \$2 Kroman De Luxe blade has been withdrawn from production and replaced with the sensational Blue Super-Blade—far superior to the Kroman. You pay only a few cents more for the Blue Blade than for the regular blade and get unmatched shaving comfort. **The Blue Blade is of extraordinary quality—positively the finest blade ever produced.** Colored blue for easy identification—it is contained in a blue package, cellophane wrapped, and is made by a distinctly different process. Distribution is not yet complete—so if your dealer hasn't the Blue Blade, ask him to get it for you, which he can, quickly.

Forgive us if this way of presenting our product seems informal. Life *is* largely serious and if we can get fun out of a difficult task, we feel sure you'll overlook it.

The fact is, we're *amazingly* serious about the present Gillette blades. **Emphatically, and without reservation, these are the sharpest, smoothest-shaving blades ever produced.** They make easy and comfortable the important duty of keeping clean shaven at all times. Use one or two blades. Then if you haven't changed your entire conception of shaving ease, return the package to your dealer and get your money back.

GILLETTE SAFETY RAZOR CO.
BOSTON, MASS.

Gillette

RAZORS  BLADES

Faces that laugh at weather *are shaved* with *Barbasol*



Take a tip from veteran sportsmen—
SHAVE WITHOUT LATHER!

Barbasol prevents dry, harsh, weather-etched skin — insures a soft, smooth, pliant face and weather-proof complexion

WHERE fish are game and winds are keen, long hours in the open toughen and weather-mark unprotected skin.

Here's a tip from veteran sportsmen to every out-of-doors man—**SHAVE WITHOUT LATHER!** Use Barbasol, which increasing millions have made the world's largest-selling shaving cream.

Once you have tried it you'll wonder at the punishment you took from old-fashioned shaving methods. You'll throw away that shaving brush and banish tender face for good.

Because it *is a cream*, and free from biting, soapy alkalis, it provides marvelous protection and balm-like healing power against the marks that weather scores on out-of-doors faces.

Barbasol softens the whiskers instantly, yet holds the hairs straight up for a clean, close shave. And your razor

clips them off, crisp and easy, without pull or scrape.

Just use it right. Follow these directions and you'll follow the crowd:

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

That's all there is to the finest shave in the world. It's simple, easy, quick. Try it today. Generous tubes at all druggists, 35¢ and 65¢, or large jar, 75¢, will quickly make you a Barbasol Believer, too.

Barbasol recommends TEFRA TOOTHPASTE

In every 30¢ tube there is a free Tefra toothbrush refill, to fit a lifetime Tefra refillable toothbrush handle. For full information tune in Barbasol radio programs listed below.

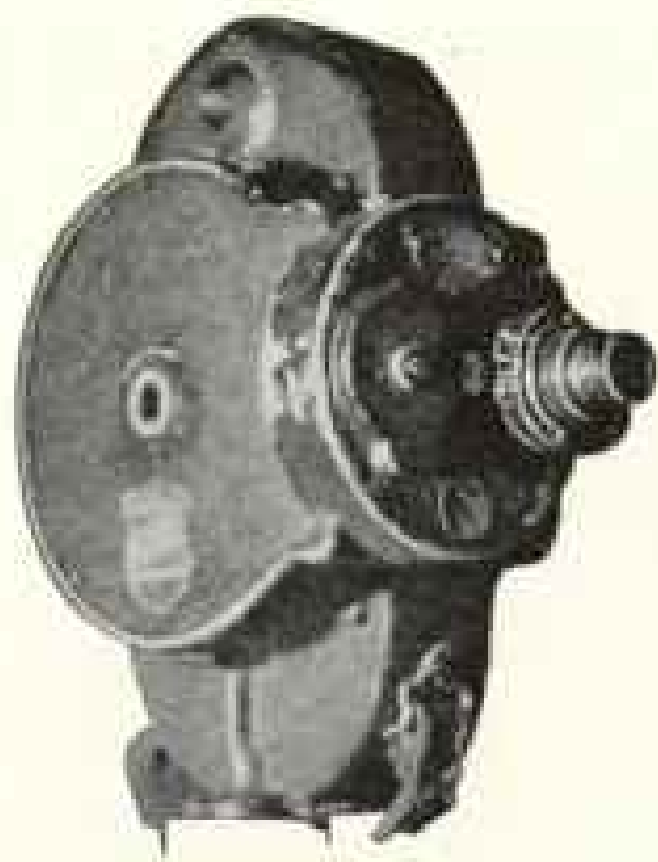
BARBASOL RADIO BROADCASTS

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

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

Consult radio page of your local newspaper for stations.





This much traveled FILMO

— has taken 10,000,000
pictures . . . and it still "runs perfectly" . . .

HERE'S one of the first Filmo Personal Movie Cameras ever built. Over eight years old. Filmed "Tom Jones" at Yale in 1927. Traveled around the world. Spent two years in the Philippines — with *no gentle* treatment. 10,000,000 frames of movie film have passed its lens. "And," says its owner, S. Winston Childs, Jr., Norfolk, Conn., and New York City, "it still runs perfectly. May I heartily second the motto: No Filmo Has Ever Worn Out."



A Bell & Howell professional sound camera "shoots" a wheat threshing scene for the Fox Film Co. Location, near Ferrara, Italy. Cameraman, George Schneiderman. Bell & Howell's 25 years of experience in making the professional cameras preferred by leading producers has made Filmo a personal movie camera that assures you

**PROFESSIONAL RESULTS
WITH AMATEUR EASE**

No better traveling companion can be found than Filmo, the personal movie camera that gives professional results with amateur ease. Take it anywhere. It lends distinction at the smartest resorts. In the wildest of wilds, it asks no special consideration.

No better stay-at-home comrade exists, either. So simple is it that a child can operate it; so fine, that only the Bell & Howell professional cameras

Ave., Chicago; New York, Hollywood, London (B & H Co., Ltd.) Est. 1907

BELL & HOWELL FILMO

MADE BY THE WORLD'S LEADING MANUFACTURERS OF FINE PROFESSIONAL AND PERSONAL MOTION PICTURE EQUIPMENT

The Filmo 70-D, here pictured, is the master of all personal movie cameras. Three lens turret head. Seven speeds. Variable viewfinder. In beautiful Seisamo-locked Mayfair case, priced at \$245 and up. Other Filmos as low as \$92. Filmo Projectors, \$150 and up.

equal it. You and your children will both find Filmo movie making a fascinating, healthful, character-building hobby.

Traveling or at home, Filmo gives a deathless record of the things you most want to remember and re-live . . . the most interesting experiences of outings and trips, the growth and development of your children, recreated at will on the screen in your home.

Ask your Filmo dealer about this finest personal movie camera. Or write for the book: "What you see, you get."

Filmo Cameras use Eastman Safety Film (16mm.) in the yellow box, obtainable everywhere. Filmo Cameras and Projectors may be equipped (under license of Eastman Kodak Company) for Kodacolor movies in full color. Bell & Howell Co., 1804 Larchmont

What You See You Get—With Filmo



We'll give **\$25,000**

to settle this argument!

Write a "blurb"! 464 prizes this month

Here are the prizes for each month—464 in all!

For best Colgate "blurb"		For best Palmolive "blurb"	
1st	\$800	1st	\$500
2nd	125	2nd	125
3rd	60	3rd	50
9 next	25	9 next	25
20 next	10	20 next	10
200 next	5	200 next	5



HERE, PHIL— I WANT TO GIVE YOU A LESSON IN SHAVING. TRY THIS PALMOLIVE ON YOUR WHISKERS.

THANKS, MAC— I'VE GRADUATED. LEARNED ALL THERE WAS TO KNOW ABOUT SHAVING CREAM WHEN I DISCOVERED COLGATE'S.



YEAH? WELL, WAIT TILL YOU SEE THE QUICK, LASTING LATHER I GET. AND ANOTHER THING, PHIL, MY FACE IS GOING TO FEEL LIKE A MILLION DOLLARS.

MEBBE SO, MAC, BUT GIVE ME COLGATE'S FOR A CLEAN, CLOSE, LASTING SHAVE. MY FACE WILL BE AS CLEAN TONIGHT AS IT IS RIGHT NOW! THINK THAT OVER, OLD TOPPER!

THOSE are "blurbs," men—those words coming out of Phil's and Mac's mouths. Read 'em over. Who do *you* side with—Phil or Mac? What's your choice—Palmolive or Colgate's?

Write a "blurb" of your own—in your own words. Help Phil out—or help Mac out. Send in your boost for Colgate's OR Palmolive. We're putting up big money for the best "blurbs" sent to us. Get yours in!

All over the country you'll find men like Phil and Mac. Millions boosting for Palmolive. Millions pulling for Colgate's. More men use these famous shaving creams than any other. They lead a field of 176 competing brands.

Which side are you on? In one of the empty "blurb" spaces at the right (or on a separate sheet of paper) write *your* "blurb" in favor of Colgate's OR in favor of Palmolive—not both.

Come on you shavers—get in on this **\$25,000 argument**

Mac wants you Palmolive users to say your say. Phil says "Stick with me, you Colgate users." If you don't use either, start now and take a shot at this real money.

Palmolive Users

Colgate Users



CONTEST RULES

Mail your "blurb" with name and address to Contest Editors, Dept. J-5, P.O. Box 1133, Chicago, Ill. Residents of Canada, address: 64 Natalie Street, Toronto, 8.

The prize money (totaling \$25,000) is divided into 6 sets of monthly prizes (each set totaling \$4200). At the end of each month prizes are awarded (see list above) for the best "blurbs" received during that month, as follows:

Feb. 29 . \$4200 Mar. 31 . \$4200
 April 30 . \$4200 May 31 . \$4200
 June 30 . \$4200 July 31 . \$4200

(Contest closes July 31, 1937)

Contest is only open to residents of the United States and Canada. Employees of the manufacturers and their families are not eligible to compete.

In event of a tie, each tying contestant will be awarded full amount of the prize tied for. Decision of the judges shall be final.

Some hints to help you win

At the right are some facts about the world's two largest selling shaving creams—Colgate's and Palmolive. Here are some of the reasons why men prefer these famous shaving creams.

PALMOLIVE

1. Multiplies itself in lather 250 times.
2. Softens the beard in one minute.
3. Maintains its creamy fullness for 10 minutes.
4. Fine after-effects due to olive oil content.

COLGATE'S

1. Breaks up oil film that covers each hair.
2. Small bubbles soften each hair at the base of the beard.
3. Gives close, skin-line shave.
4. Gives lasting, 24-hour shave.

WHY WORRY?...we'll settle that...and How!



OR

● This was a problem...but not any more! We've settled it. No one ever did like to get all wet, splashing around the sink taking ice cubes out of metal freezing trays.

So we made *flexible rubber freezing trays*. And you just *lift* out the cubes when they're frozen... one at a time or all of them. The tray is dry. Your clothes are dry. The ice is dry.

No melting, splashing, tugging, pulling, pounding. The cubes are never shattered or broken. And because they're dry—larger—colder and cube-shaped—they last longer. They're clean and as pure as the water you use.

More than a million forward-looking refrigerator owners are now using this sensible, modern rubber freezing tray. It is standard equipment in all leading makes of automatic refrigerators. Be sure there are flexible rubber trays in the refrigerator you buy. Or if you already have a refrigerator, you can have flexible rubber trays to fit it... priced as low as \$1.50 each.

See the local dealer of your make of refrigerator or write us, giving the name of your refrigerator and the number of cubes your ice tray holds.
THE INLAND MANUFACTURING COMPANY
 Dept. C-5, Dayton, Ohio.

2-10

Flexo Tray
 Reg. U. S. Pat. Off. Pat. & Pat. Pend.
ICE CUBES—THE MODERN WAY

Ever eat
 a tomato right off
 the vine? . . . that's

HEINZ TOMATO JUICE

ONE OF THE
57



IF YOU have ever eaten a big, luscious, ripe tomato right off the vine, you have tasted the rich, garden-fresh flavor that makes Heinz Tomato Juice deliciously different.

Perfect red-ripe tomatoes selected from the world's finest crop—pressed and packed the day they are picked, give Heinz Tomato Juice that matchless, natural, fresh flavor. You get all the food value of the ruddy, fully ripened Heinz tomato at the height of its scarlet goodness—all of its essential health-giving vitamins—even its delicate aroma.

Your grocer sells Heinz Tomato Juice in both tin and glass containers.

H. J. HEINZ COMPANY
 PITTSBURGH, U. S. A. TORONTO, CANADA
 LONDON, ENGLAND



HEINZ Tomato Juice

"Mention the Geographic—It identifies you."



**"The big chain
is back"**

10439

Who is reviving this style?

Just notice how many prosperous, progressive, well-dressed men are carrying pocket watches these days. Notice, too, how many men are wearing sturdy, substantial watch chains, for all the world like those their grandfathers wore, back in the days when a railroad journey was an adventure.

But they're not wearing "the big chain" out of sentiment for the past. Oh, no! It's simply that these up-and-coming individuals have decided that "dainty", "delicate" chains don't fit in with their scheme of things. They're wearing "the big chain" because it's practical, sensible—looks right for a man of action and affairs.

You, too will agree that "the big chain" is a handsome and thoroughly masculine piece of jewelry which shows up well against a waistcoat... creates the right impression!

The Simmons Company has developed many smart models in "the big chain"—and, as you know, Simmons Watch Chains are carried by the better jewelers everywhere. String one of these good looking big-calibre chains across your vest and see the difference it makes in your appearance!

R. F. Simmons Co., Attleboro, Mass.
Jewelers for over 60 years

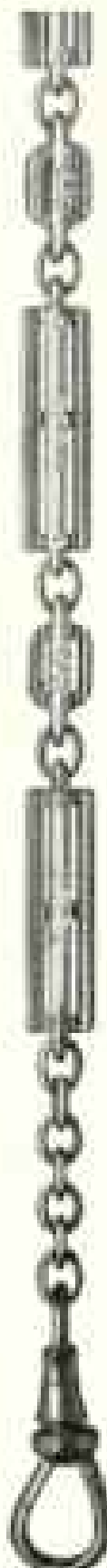
10439—Double
Curb Yellow
Gold Filled
Waldemar \$6.50



30001 Yellow
Gold Filled
Waldemar \$9.50

"The world says
It's a Simmons"

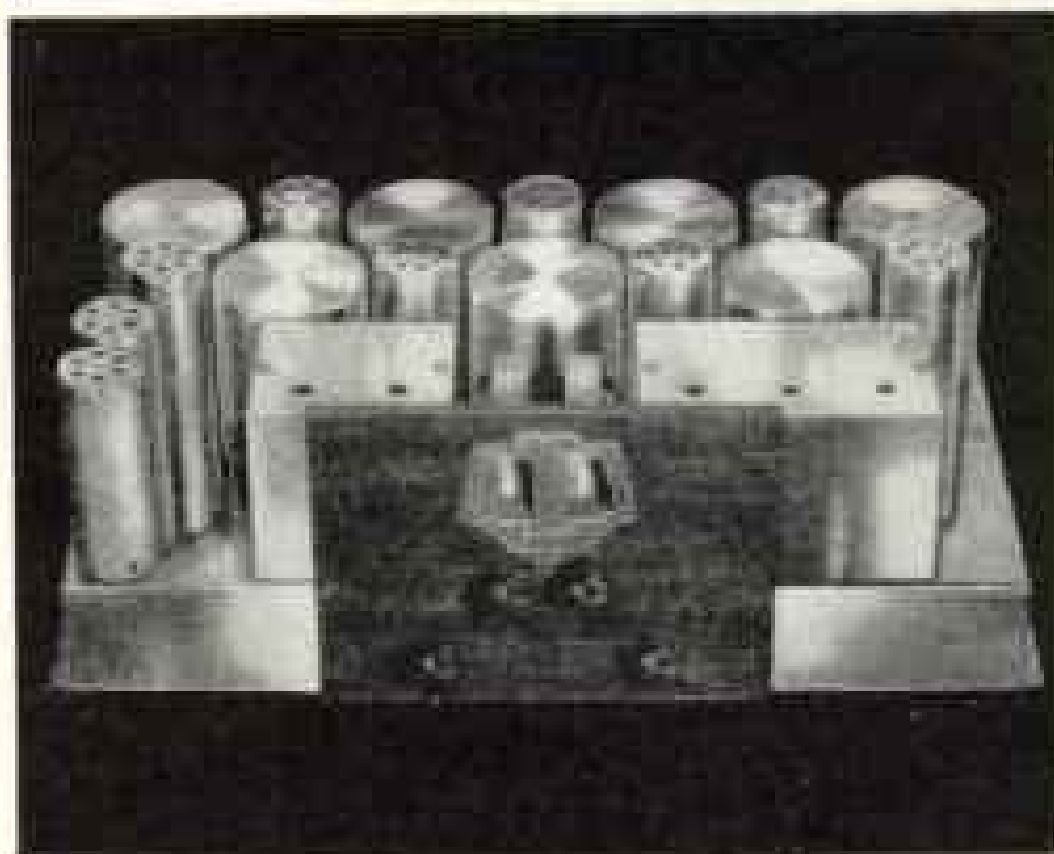
SIMMONS
watch chains



30002

Span the Oceans!

HERE'S A RADIO THAT ACTUALLY BRINGS
the WHOLE WORLD to your DRAWING ROOM



NOW—at the flick of a dial—you can turn from your local station to an intensely interesting broadcast direct from London. Also, you can tune in Holland, Germany, Russia, France, Italy, Spain, Morocco, South America, Java or Australia with equal ease and satisfaction. The Scott All-Wave actually brings these foreign stations to U. S. listeners regularly, day after day, in all seasons. And with perfect clarity and full auditorium volume!

A Jewel of Precision in a Cloak of Refinement

The reason for the unrivalled capability of the Scott All-Wave is the fact that each receiver is custom built by hand in the laboratory. No "production" methods are used. No unscientific hand so much as tightens a screw. Each part is made and every operation is done in strict accord with the highest standards of electrical and mechanical precision. Then—to assure the purchaser of dependable 'round the world range—his receiver is tested on reception from London and from Rome, before shipping.

Send Coupon Complete PROOF that the Scott All-Wave will bring YOU the broadcasts of the world will be sent you by return mail. With this PROOF will come the whole story of this remarkable engineering triumph—and details of the custom built console in which it is available. You will be agreeably surprised at the modest price of the Scott All-Wave. Send the coupon today.

The **SCOTT**
ALL-WAVE custom built
SUPERHETERODYNE

The E. H. SCOTT RADIO LABORATORIES, Inc.
4450 Ravenswood Ave., Dept. NG52, Chicago, Ill.

The E. H. SCOTT RADIO LABORATORIES, Inc.
4450 Ravenswood Ave., Dept. NG52, Chicago, Ill.

Send me full particulars of the Scott All-Wave 15-250 meter superheterodyne.

Name _____

Address _____



Empress of Britain WORLD CRUISE



Float your apartment "Round-the-World"

Next winter, live on Seven Seas Street. Rent an apartment on the Empress of Britain. Establish yourself, among a charming new circle of acquaintances, in the comfort of your own home abroad. Entertain as in a smart town club. Enjoy tennis, squash, swimming in two pools, deck-games, as in a good country club. Listen to charming tea and dinner music. Attend masquerades. Live, aboard, a gay life than most people enjoy ashore.

There are views, too, on Seven Seas Street. Burros with flower-panniers. The little town of Bethlehem on Christmas Eve. The elephants' bathing place in Ceylon. The Taj Mahal, rose-flushed with dawn. Javanese dancing girls. Japan in plum blossom festival.

Pay your rent (and a moderate one) to the Empress next winter. Fares as low as \$2,250. See deck

plans, study the itinerary. Your own agent, or any Canadian Pacific office: New York, Chicago, Boston, Philadelphia, Montreal, and 30 other cities in U. S. and Canada.

Empress of Britain World Cruise sails from New York December 3, 1932.

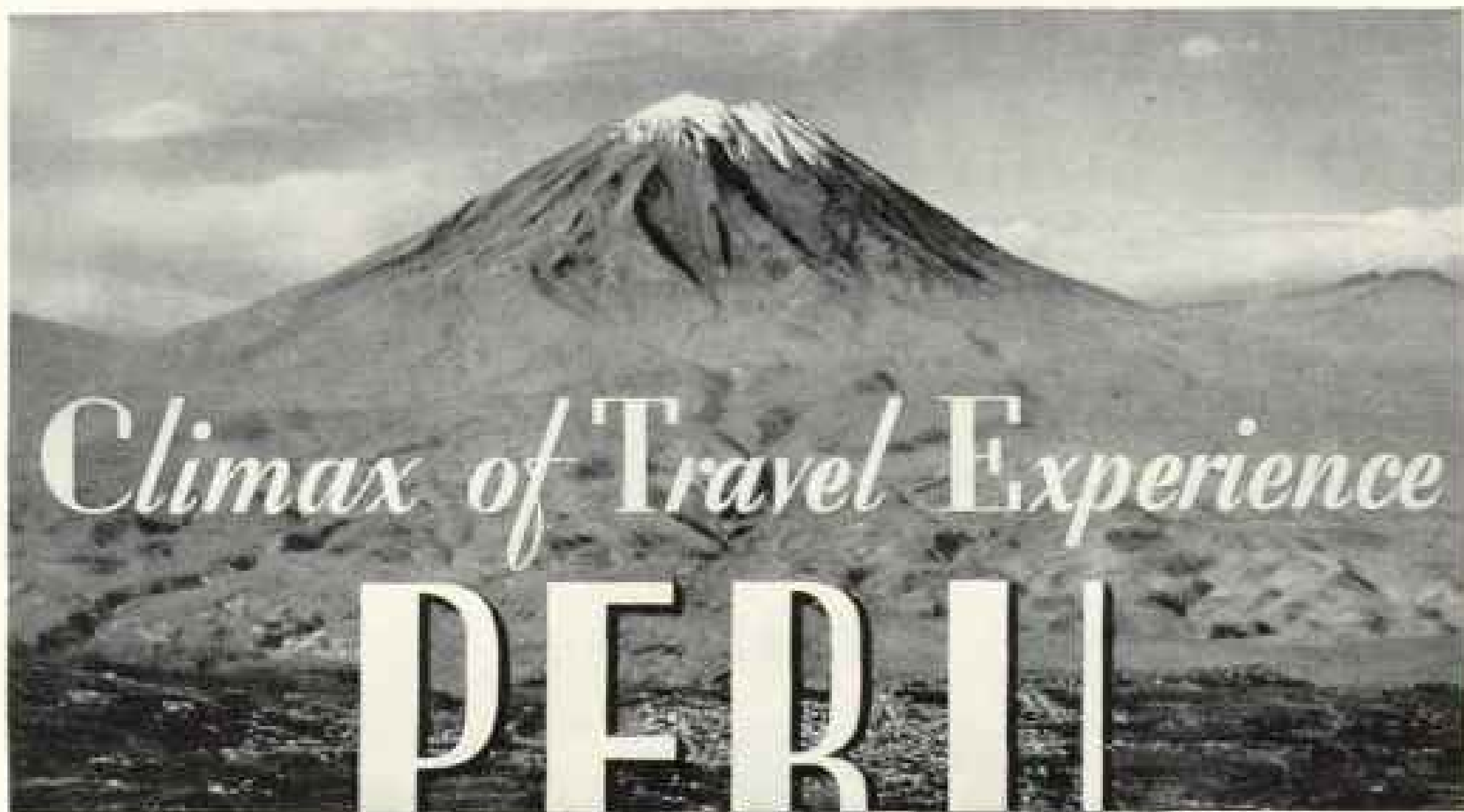
This season's Empress of Britain Trans-Atlantic sailings from Quebec to Cherbourg, Southampton: May 29, June 16, July 2, 20, Aug. 6, 20, Sept. 3, 17, Oct. 1, 15.

WORLD'S GREATEST TRAVEL SYSTEM

Canadian Pacific



- DEC. 3-4
Goodbye to
NEW YORK
- MADIRA
GIBRAITAR
ALGIERS
- MONTE-CARLO
NAPLES
- ATHENS
JERUSALEM
Christmas Eve in
BETHLEHEM
- New Year's
Eve in CAIRO
- INDIA
CEYLON
- BATAVIA
SINGAPORE
BANGKOK
- MANILA
CHINA
JAPAN
- HAWAII
PANAMA
CUBA
- Only Class
AA, 5-day
to-Europe liner
to make a
World Cruise
- Back to
NEW YORK
- 129 DAYS
23 COUNTRIES
87 PORTS
AND PLACES
- 10TH ANNUAL
WORLD CRUISE



Climax of Travel Experience

PERU

Photo by Lieut. Geo. B. Johnson

**23-Day Cruise
to PERU and return
\$295 First Class**



It's easy and inexpensive to visit amazing, paradoxical Peru . . . where the greatest antiquity meets the most modern cosmopolitan gaiety . . . where there is every scene and climate, from the towering peaks of the snow-capped Andes to the warm yellow sands on the shores of the placid blue Pacific.

You will be fascinated by the astounding ruins of the ancient Incan Empire. You will delight in the glamorous charm of Lima, glittering City of the Kings, one of the most beautiful and richly cultured cities of the world . . . composite of Paris and old Madrid . . . with magnificent palaces, hotels, boulevards, smart cafes, opera, race tracks, and nearby bathing resorts.

Go in luxury . . . economically!

You go in the utmost luxury and comfort, for your splendid ship is one of Grace Line's famous "Santa" Fleet—newest, largest and fastest liners to South America's West Coast. All staterooms are outside; every imaginable service, comfort and amusement is provided.

You pass through the Panama Canal. As you sail southward, shore visits alternate with days at sea . . . nights of music, dancing. North-bound, too, there are calls at places of high spot interest . . . with a liberal visit in gay Havana.

\$295 covers First Class accommodations and all necessary shipboard expenses; shore expenses additional. Saturday sailings from New York. No passports. Other Grace Cruises to Chile or 'Round South America. Consult your travel agent or Grace Line.



GRACE LINE

New York: 10 Hanover Square; Boston: Little Building;
Chicago: 230 N. Michigan Avenue; New Orleans: Queen
and Crescent Building; San Francisco: 2 Pine Street; Los
Angeles: 548 South Spring Street; Seattle: Hope Building.



Musie making

Vacation opportunity of a lifetime



Beside the cool Pacific you can forget care

All-Year Club of Southern California, Ltd., Inc., 44-5,
1111 So. Broadway, Los Angeles, Calif.

Send me booklets I have checked below:

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

Free detailed Olympic Games schedules & ticket application blanks.

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

Also free booklets about counties checked below:

Los Angeles
 Orange

San Diego
 Santa Barbara
 Riverside

San Bernardino
 Ventura

Name _____

Street _____

City _____

State _____

(Please Print Your Name and Address)

THIS SUMMER you need a *real* vacation . . . and here it is. All the thrills Southern California always offers, *and* the Olympic Games! Never again in your lifetime this vacation opportunity.

The blue Pacific for swimming, sailing, fishing . . . exotic pleasure-islands . . . mile-high mountains, shaded lakes . . . every sport in new and thrilling settings . . . the foreign atmosphere of ancient Missions, palms, orange groves and Old Mexico close-by.

Gay Hollywood nights . . . big, hospitable Los Angeles . . . Pasadena, Santa Monica, Long Beach, Glendale, Beverly Hills, Pomona . . . fascinating cities and resorts in a sportland of *rainless* summer days and cool nights . . . the *big* vaca-

tion you need this year.

Southern California in festive array, entertaining champions and celebrities from all the world! Come for the Olympic finals, July 30 to August 14, if you can. Or come any time this summer . . . for festival will reign all season.

Make this supreme vacation *yours* this summer. Advise anyone not to come here seeking employment lest he be disappointed, but for the tourist the attractions are unlimited.

Costs lower than ever

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

FREE NEW 64-PAGE VACATION BOOK OLYMPIC GAMES INFORMATION

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

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



the Olympic Games in
S O U T H E R N
C A L I F O R N I A



Only three weeks of travel . . .

but a lifetime of happy memories

NEVER has Paris been so bright and sparkling . . . so varied in offerings, so charming in vivaciousness, so rich and wholesome in humanities! Nowhere is civilized living so cheap in dollars!

Open your ears to the siren-call of French Line ships, as they slip down the bay and out into the sea-lanes that lead to France.


These luxurious vessels have a distinction of their own that attracts distinguished travelers, whether the cost be high or low. No matter what French Line ship you sail on, you will never suffer the feeling of a first-class mind in a lower-class environment.

There is expertness in French seamanship of long tradition . . . perfect skill in the service you receive . . . delicious French

food *par excellence* . . . congenial companionship! Everything is beautifully ordered for your happiness from the moment you leave your taxi at Pier 57, in New York, until you step ashore at Le Havre.

And if your journey's end is England, remember French Line ships bring you direct to Plymouth.

Ask any authorized travel agent about First or Tourist Class on French Line express steamers. Or, inquire of us direct: The French Line, offices in the larger cities of the United States and Canada, or at 19 State Street, New York City.

French Line 

LE ILE DE FRANCE, JUNE 3, JUNE 22 • • LAFAYETTE, MAY 21, JUNE 21 • • DE GRASSE, MAY 19
ROCHAMBEAU, JULY 12 • • PARIS, MAY 14, JUNE 11, JUNE 29 • • FRANCE, MAY 27, JUNE 16 LE



AMERICANS OF TASTE AND INTELLIGENCE don't come to Europe to collect data of bathrooms. They come to gather the flowers of European culture. The Lake District is a garland of English culture! Over these hills and dales Coleridge and Wordsworth used to walk and argue the rules of prosody. By the side of these lakes Ruskin walked to find relief from the heat of his own indignation. Southey wandered here wondering what he could do to save his brother-in-law, the "damaged Archangel" as Charles Lamb called him.

Come and live for a few days where great English poets lived. Some of the best trains in the world go from Euston Station to the Lake District.

LMS

LONDON MIDLAND AND
SCOTTISH RAILWAY OF
GREAT BRITAIN

*Illustrated pamphlets from T. R. Dester,
Vice-President — Passenger Traffic,
(Dept. A-30) L M S Corporation, 200
Fifth Avenue, New York City, or from
any L M S Ticket Agent*



RHODES . . . TRIPOLI

MEDITERRANEAN COLONIES OF

ITALY

FUGHT for by a thousand nameless, forgotten captains—sold up by the Saracens—betrayed by adventurers and Kings . . . Rhodes remains unviolated despite her scars, a monument to days when the bearing of arms was a holy and consuming flame.

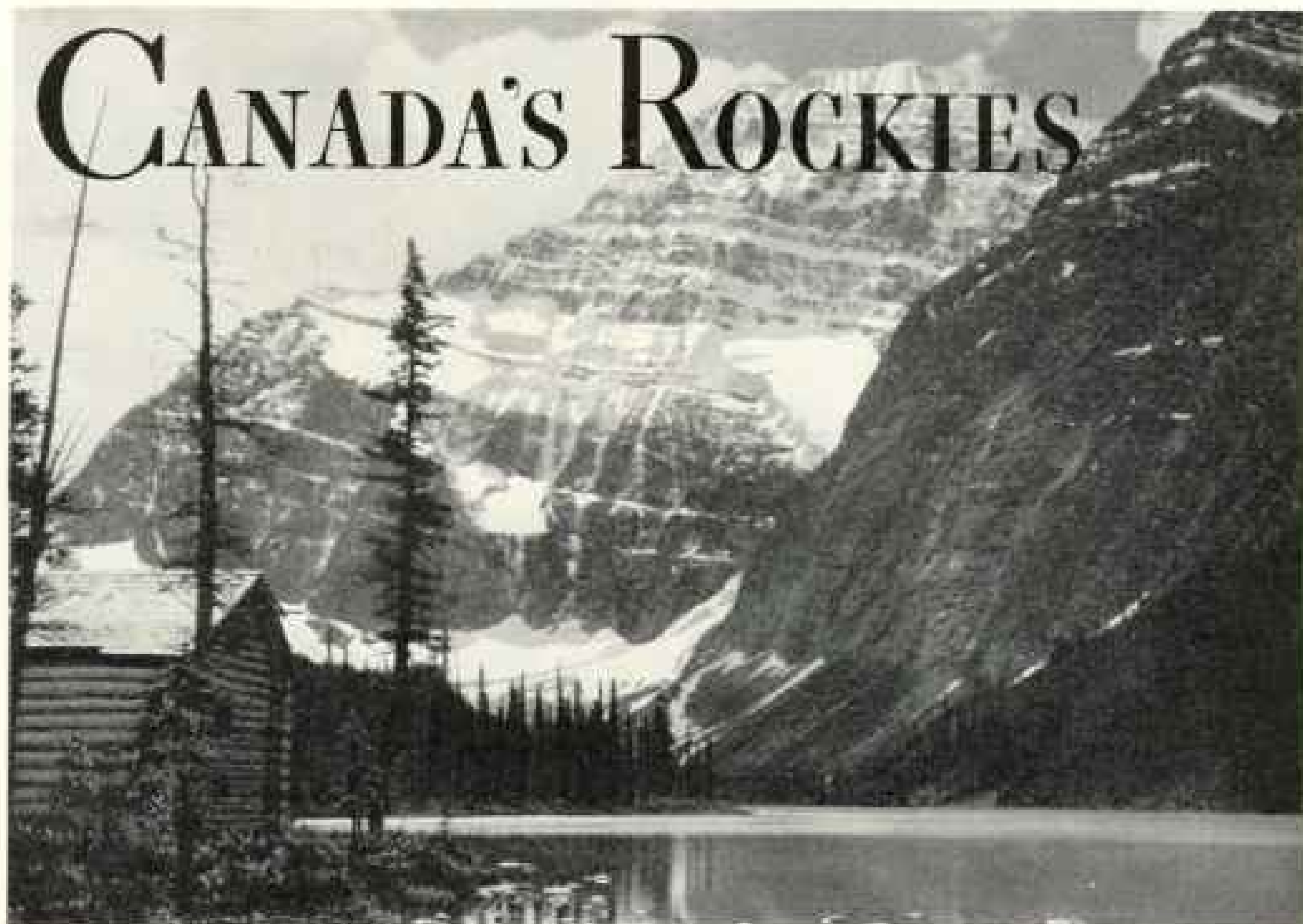
Come this year! And see Tripoli, too, which the same stern Knights ruled for a time. Once a nest of pirates . . . it is now a flowering oasis-town of minarets and flat roofs. Come for the Samples Fair of Tripoli—open until May 12th—and mingle with connoisseurs of the world at an event of prime cultural and commercial interest. Reduced transportation rates are in effect for the duration of the Fair.

Let us help you plan such a trip on your visit abroad in cooperation with your tourist agent. This office is operated for that purpose by the Royal Italian Government on a non-commercial basis—offering advice and information on travel itineraries, hotels and local attractions throughout Italy and her colonies. All services are gratis. Write today for large illustrated books on Italy, Tripoli and Rhodes.



ITALIAN TOURIST INFORMATION OFFICE
Equib Bldg., 749 Fifth Avenue, New York City

CANADA'S ROCKIES



Jasper AND THE *Triangle Tour*



Up over the top of the continent it winds—a railroad that carries you through Canada's highest Rockies, Mt. Robson with its mighty glacier, White-robed Edith Cavell, Pyramid Mountain in its startling and gigantic symmetry . . .

Here is a trip from coast to coast you will remember always and a chance to stop off at Jasper Park Lodge for trail-riding,

fishing and golf in a Canadian Rockies setting! From Jasper the famous Triangle Tour takes just five days. Write for descriptive booklets . . . Rates at Jasper Lodge from \$8.00 per day for room and meals, 10% discount for two weeks or more. (Round trip fare to Jasper \$107.08 from Boston; \$100.00 from New York; \$67.50 from Chicago; \$73.50 from San Francisco.)

CANADIAN NATIONAL

The Largest Railway System in America

BOSTON
148 Tremont St.
BUFFALO
420 Main St.
CHICAGO
4 So. Michigan Ave.
CINCINNATI
69 E. Fourth St.
DETROIT
1222 Washington Blvd.

DULUTH
430 W. Superior St.
KANSAS CITY
705 Walnut St.
LOS ANGELES
697 So. Grand Ave.
MINNEAPOLIS
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OFFICES
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1422 Chestnut St.
PITTSBURGH
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Grand Trunk Ry. Sta.
PORTLAND, ORE.
222 Yamhill St.
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SEATTLE
1229 Fourth Ave.
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901 - 10th St. N.W.
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1 Rue Scribe

Famous Pikes Peak is One of the Fifty 14,000-Ft. Peaks in Colorado. It is Climbed by Rail or Motor



Below: A Glorious High Drive a Few Miles from Estes Park. This Road is Above 11,000 Feet for Eleven Miles



COLORADO

FOR YOU

You Can Motor on the Roof of these United States

The two highest automobile pleasure roads in the world are in Colorado—safe, smooth, broad highways to the very summits of Pikes Peak and Mt. Evans, each well over 14,000 feet high. Equally good roads climb gently to vast heights all over the state. You cannot imagine the glorious variety, the thrilling beauty of such drives until you have taken them. Yet such outings are only incidents of Colorado's extremely inexpensive vacations. Send the coupon for other surprising facts and let your next outing be a Colorado outing! While you are here, study the business opportunities and the innumerable reasons why you could live here so happily.

Taste "Sunshine and Vitamins" in your home: Colorado fruits, vegetables, meats



THE KEY STATE OF THE NEW WEST



Riding on Admirably Trained Horses Is a Favorite Colorado Amusement

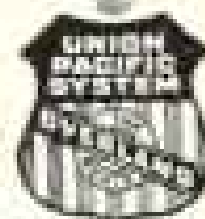
THE COLORADO ASSOCIATION

838 Kit Carson Building, Denver, Colo.

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

Name _____

Address _____



BIGGER VACATIONS FOR LESS MONEY

Union Pacific offers unusual travel bargains this year. Rail fares are down. All-expense tours are also amazingly low in cost. 15 National Parks to choose from and more of the West than is served by any other railroad, including:

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

Visit the Olympic Games in Los Angeles. Go Union Pacific and see the West. Write today for information and vacation ideas.

UNION PACIFIC

J. P. Cummins, General Pass'r Agent
Room 279, Union Pacific System
Omaha, Nebr.

Please send me information and booklet about

Name _____

Address _____

Grade in School (if student) _____

THE OVERLAND ROUTE

Be a REAL Driver



© 1932 H. L. L. CO.

The inexperienced and unskilful driver risks his life and endangers pedestrians and other motorists every time he ventures on the road.

Things happen so quickly in a car. At thirty miles an hour you travel forty-four feet in one second; four feet—often the margin between collision and safety—in one-eleventh of a second. Learn to figure distances and allow yourself ample road-room.

Could you forgive yourself if a moment's inattention resulted in a crash which you might have avoided?

Last year 33,000 people were killed and 1,000,000 injured in automobile accidents.

Relatively few of these accidents were the result of mechanical defects in the machines. The majority were caused by poor drivers or by good drivers who momentarily failed to control their cars.

A real driver does more than start, stop and guide his car. He controls its every action. He is at all times alert and anticipates possible blunders of pedestrians and drivers he meets or passes.

With 16,000,000 registered motor vehicles in the United States, all too many of which are driven by unfit or unskilful drivers, the need for real drivers is greater than ever before.

Learn the fine points of skilful driving. Not only are experts rarely injured, but they seldom suffer from nervous fatigue after a long, hard drive. Most of them enjoy their mastery over a powerful machine, perfectly obedient to intelligent direction.

PREPARE FOR SUMMER DRIVING

Check yourself on the following ten points of good motoring, enjoy your driving this summer and make it free from accidents to your family and others.

	Perfect Score	Your Score
1. Do you keep your mind on your driving?	10	—
2. Do you keep in line of traffic?	10	—
3. Do you watch the movements of other cars and try to anticipate what they will do? ...	10	—
4. Do you watch for pedestrians, particularly children?	10	—
5. Do you slow down at schools, crossings and dangerous intersections?	10	—
6. Do you signal to the car behind when you intend to change your course?	10	—
7. Do you know the feeling of having your car under control?	10	—
8. Do you keep in line when nearing top of hill or a sharp turn?	10	—
9. Do you comply with traffic regulations, signals and signs?	10	—
10. Do you have your car, brakes especially, inspected regularly?	10	—
	100	



Send for free booklet which tells what a real driver does. In addition to valuable information, the booklet contains pages on which to record mileage, gasoline and oil consumption. Address Booklet Dept. 532-N.

METROPOLITAN LIFE INSURANCE COMPANY
 FREDERICK H. ECKER, PRESIDENT ONE MADISON AVE., NEW YORK, N. Y.



The true spirit of Mother's Day



Sampler

17 oz., \$1.50, 2 lb., 3 lb., and
5 lb., at \$1.50 a pound.
All are decorated.

Listen to
Whitman's Sampler Hour
NBC Red Network
Fridays 10:00 P.M. (E.S.T.)

Every mother will enjoy the same gift you would choose for a young girl. If you give her candy, we suggest that box of sentiment and charm—*The Sampler*. Or a box of rare beauty—*Loveliness*.

Everyone knows the varied candy-contents of *The Sampler*. *Loveliness* is full of pleasant surprise centers, all chocolate covered. Both packages are appropriately decorated by a medallion of "The Spirit of American Motherhood," reproduced above.



Loveliness

Loveliness is in metal boxes of exquisite finish. Two sizes \$1.50 and \$3.00.

Advance orders

Twenty-two thousand Whitman agents are taking advance orders now. Last minute orders can be delivered by telegraph.

Whitman's

CHOCOLATES & CONFECTIONS

© S. F. W. & Son, Inc.

Mother's Day, May 8th



How

eagerly the appetite welcomes this invigorating soup-luncheon!

Even when the lunchtime appetite is "choosy" and so difficult to please, it responds instantly to the bracing goodness and delightful flavor of Campbell's Vegetable Soup. Nothing could be a more ideal choice for many a noon-day meal. This famous hearty soup brings you ample nourishment without being heavy. It is enough, but not too much. Delicious, sustaining, yet easily digested. Let your grocer supply you.

LOOK FOR THE RED-AND-WHITE LABEL

21 kinds to choose from . . .

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



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

Enjoy SPORT in



MINNESOTA

"Sportland
of 10,000 Lakes"

Put yourself into this happy vacation picture... then come and make it real.

For here is a land of sunshine and cool breezes... of pine-laden tonic air and vigorous outdoor sports... of 10,000 sparkling lakes where you can store up health and energy for a whole year's activities.

Live in cozy cabins or modern resort hotels ranging from \$15 to \$70 a week. While here investigate the opportunities for business, agriculture and dairying. Start planning now by sending coupon for free booklets.

Ten Thousand Lakes-
Greater Minnesota
Association

St. Paul - Minneapolis - Duluth

10,000 Lakes of Minnesota Assn. Dept. 106, St. Paul, Minn.
Please send me your FREE literature, and information on items I have checked.

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| <input type="checkbox"/> Fishing | <input type="checkbox"/> Farming |
| <input type="checkbox"/> Golf | <input type="checkbox"/> Business |

Name _____

Address _____



"I'm glad we're not far from camp. This ankle is beginning to swell up and get painful."

"Don't worry—we have some Sloan's in camp. That will fix it up in short order."

bruises, sprains

Quiet the Pain!

Never neglect a twisted ankle, a bruised or strained ligament. As soon as possible, pat on Sloan's Liniment to keep the swelling down and stop the pain. No rubbing is necessary—for Sloan's rushes fresh blood to the injured spot the moment you pat it on—and this fresh blood carries away congestion, soothes and rebuilds the injured tissue... Get a fresh bottle of Sloan's today. Only 35¢.

SLOAN'S LINIMENT

The peace that pennies buy

EACH DAY, after breakfast, you bid good-bye to your husband and he is gone. Miles of distance and hours of traveling may separate him from you, yet you do not fear. You have no feeling of his being far away—no sense of loneliness or isolation. For there, within reach of your hand, is your contact with all the world—the guardian of your home... your telephone.

All you see is the telephone instrument itself and a few feet of wire. Through the familiarity of use, you are likely to take it for granted in much the same manner as air and water and sunshine.

Rarely do you think of the complicated exchanges, the almost endless stretches of wire and the hundreds of thousands of trained employees that are needed to interconnect, through the Bell System, nearly twenty million telephones in this country and twelve million in foreign lands. No

matter where you are you can command the full use of the telephone. It knows no class or creed. There is no distinction of position. All may share it equally.

Every time you lift the receiver you employ some part of the nation-wide Bell System. Yet the charge for residential use is but a few cents a day. For this small sum you receive a service that is almost limitless in convenience and achievement—so indispensable in emergencies that its value cannot be measured in terms of money.

Thinking of the peace and security it brings each home—of hurried calls to doctors and hospitals—of priceless, necessary talks with relatives and friends—of the many ways it saves you steps and time and trouble throughout the month, you will know why so many millions of people look on the telephone as a member of the family.



AMERICAN TELEPHONE AND
TELEGRAPH COMPANY



WORRY
& CO.

Resign from
WORRY
& CO.



take a **NORTHWEST
WONDERLAND**
Vacation



Step into your chance for a big thrill. High times at low costs.

Go independently, fares *lowest ever*, or join an all-expense tour. Yellowstone Park (Gallatin Gateway), Black Hills, Spokane, Seattle, Tacoma, Mt. Rainier, Mt. Baker, Portland, Victoria, on to Alaska. Return via Canadian Rockies or California—Grand Canyon, Colorado.

All-Expense Tours
\$141.00 to \$593.00

9 days to 5 weeks. Jolly companions. Best accommodations. Just like a big house party. Prices above from Chicago. Proportionate prices from your home town.

Route of the roller-bearing *Olympian*—*electrified*, scenically supreme. Meals by Rector.

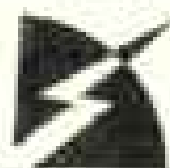
Milwaukee Road trips can't be beat.

Write for full information, address

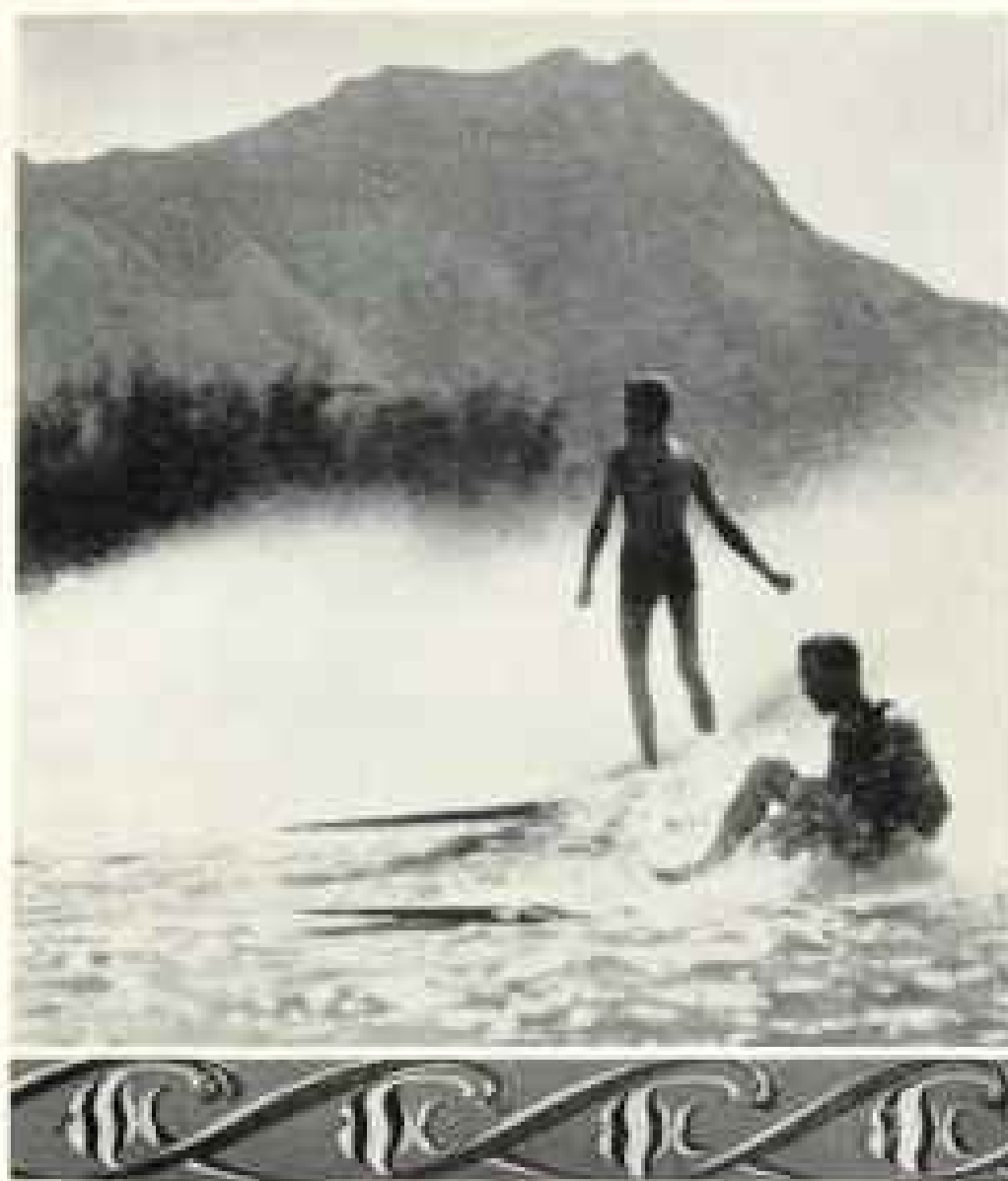
GEO. B. HAYNES, Passenger Traffic Manager
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1311-24

The **MILWAUKEE**
ELECTRIFIED OVER THE
ROCKIES TO THE SEA
ROAD



"Mention the Geographic—It identifies you."



On Top of a Charging Wave!

I PADDLED OUT ON my surf-board to where the waves were breaking. Trailing my foot in the silky water for a rudder. The wave I wait for coming . . . paddle ahead of it, get caught in it. Steady! Spray in my face, quick balance. Up to my knees, my feet! Rushing hundreds of yards to shore on top of a flying wave! Wind in my fingers, water glistening on my shoulders . . . speed . . . the biggest thrill there is!

And there are twenty courses for golf, spattered with flowering trees, and every other sport made new in this tropic setting.

Loading, the greatest sport of all. Rest, where sea and sky warm you, lull your senses, completely relax you. Where rainbows at midnight and blossom-haunted winds mingle with the strum of ukulele to tell of tropic dreams—Hawaiian nights gone by—and other nights to come.

Hawaii beckons all year round without a word for seasons. Summer temperature is seldom above 85° and the Pacific's gentle trade-winds make that cool.

LESS THAN \$300—All expenses, including comfortable accommodations ashore and afloat for a 3-weeks roundtrip from the Pacific Coast need be no more than \$290. A letter will bring interesting proof.

The Hawaii Tourist Bureau will, upon request, mail you free, authoritative information about the Islands. For special booklet, with picture maps, send 10c to defray handling charges.

HAWAII

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Gangway for a couple of Kids you know!



Simply aim, press the lever . . . and you're actually making a movie.

Keep a movie record of the years
that can never be lived again —

BEFORE you know it, that old wagon will be up in the attic . . . and they'll be away from home . . .

But your Ciné-Kodak captures forever the glorious moments of those few short years of growing up.

Ciné-Kodak M, price \$75, makes clear, sharp movies the first time you

\$75 with case—CINÉ-KODAK Model M

Into this compact little camera, Eastman has concentrated all the essentials of movie making. No focusing. Loads with full 100 feet of 16 mm. film,



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REDUCED FARES *that widen your horizon to the bewitching*

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Time cut by faster, finer ships! Cost to Hawaii cut by greatly reduced fares! Now, with the strictest economy of these thrifty days, you can answer the call of adventure in these wonderlands of the Pacific.



HAWAII

ONE WAY AS LOW AS
FIRST CLASS \$90 CABIN CLASS \$75

Your ticket to Hawaii—so surprisingly low in cost—is your passport to the perfect vacation! You pick up the joy of it the moment you board your Matson or Lassco liner—you thrill to it every hour of that voyage of rest and play.

Buy this vacation trip and you've caught the travel market at the very bottom! The super-liners "Mariposa," "Monterey" and "Malolo" reach Hawaii in less than five days. To prolong your enjoyment, sail on the "Maui," "Matsonia," "Calawahi" or "City of Los Angeles"—all famous ships. Departures every few days from San Francisco or Los Angeles.

NEW SERVICE to NEW ZEALAND and AUSTRALIA—at equally attractive rates. The new, ultra-modern liners "Monterey" sailing June 3, and the "Mariposa" sailing July 1, speed you to New Zealand in 15 days—to Australia in 18 days, via Hawaii, Samoa and Fiji. . . Complete details from your travel agent! or our offices. 5-3

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See the Whole
Pacific Coast...
at no added fare!

Go West one Southern Pacific route, return another and see more of the West and more of the United States than on any other railroad. On May 15, from **MOST EASTERN AND MID-WEST** points, the extra charge for including the Pacific Northwest in your round-trip to California will be removed. Thus, when you go and return Southern Pacific you add the whole Pacific Coast *at no added fare.*

Only Southern Pacific's rails serve many of the West's greatest attractions. To make sure that your ticket includes the West you want to see, insist that your routing include two of Southern Pacific's 4 Great Routes that meet and run along the whole Pacific Coast. For example: Go West by a Northern United States or Canadian Line, Then by *Shasta Route* to California, San Francisco and Oakland, Then South to Los Angeles and the Olympiad. You can return by either *Sunset Route* via San Antonio, Houston and New Orleans; or *Golden State Route* via El Paso, Kansas City and Chicago; or *Overland Route* (Lake Tahoe Line). Or you can reverse the order, going West by southern or central routes and returning by northern lines. At no extra cost you can enjoy a Southern Pacific Steamship voyage between New Orleans and New York.

*From most Eastern and Mid-west points.

Southern Pacific

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Write for detailed itinerary to O. P. BARTLETT, Dept. C, 510 So. Michigan Blvd., Chicago, or H. H. GRAY, Dept. C, 531 Fifth Ave., New York City. Name your Pacific Coast destination and the sidetrips you want to include in your roundtrip ticket. (See Map.)

Ask for details on West Coast of Mexico.

IF IT FLIES



IT'S IN THE BOOK OF BIRDS

Whether it be a Pelican, as above, or one of 37 different Warblers—a Humming Bird or one of 37 different species of ducks, or other game bird.

This book slips easily into the door pocket of your car, thus being readily available on trips or outings. And its binding is so sturdy it will withstand this hard usage or that at summer camps, yet is so handsome in appearance as to be an addition to the living-room table. 331 full-color portraits; 12 bird migration maps; 252 pages (10x7 in.), Molloy-made binding, \$4 postpaid in United States and Canada.

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Never again, until about the year 2,000, will the people of this land be able to combine the robust enjoyments of a New England vacation with one of the most terrific spectacles of Nature—the complete blotting-out of the mid-day sun in total eclipse! Seashore or mountains—lakes or rivers—cabin, cottage or smart hotel—*this summer* plan to stay and play *somewhere* in New England through August 31st. From all over the world people are coming for that day of sudden and majestic darkness.



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THREE MILLION VACATIONS IN NEW ENGLAND

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Send me FREE official 1932 VACATIONS book, G-2.
Also special map-folder on the Total Solar Eclipse.

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HORSES OF THE WORLD

By Major General William Harding Carter, U.S.A.

24 full-page illustrations in color by Edward Herbert Miner. 72 engravings; 118 pages.

A VERITABLE Horse Show in itself, this richly illustrated book is a fitting tribute to Man's Working Companion through the ages. General Carter, a recognized authority, tells of the history and development of the horse. We visit the Iceland, Welsh, Shetland and Felo ponies; and learn, in picture and text, to distinguish Arab, Thoroughbred, Standard Bred, Morgan, Clydesdale, Shire, and other aristocrats of horse-flesh. 110 pages (10x7 in.), Molloy-made binding, \$3 postpaid in United States and Canada.

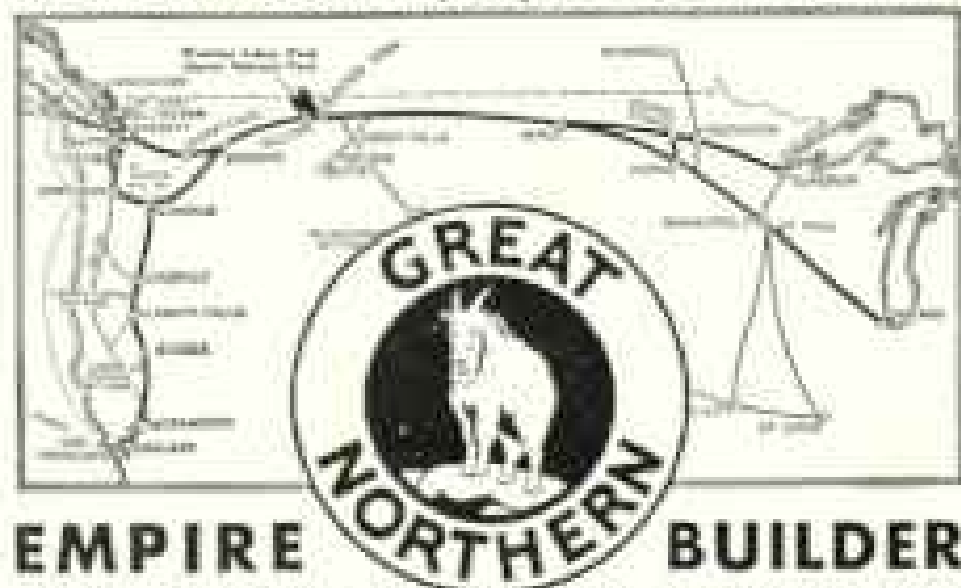
NATIONAL GEOGRAPHIC SOCIETY
Dept. C, Washington, D. C.



Mary Glacier Region, Glacier Park

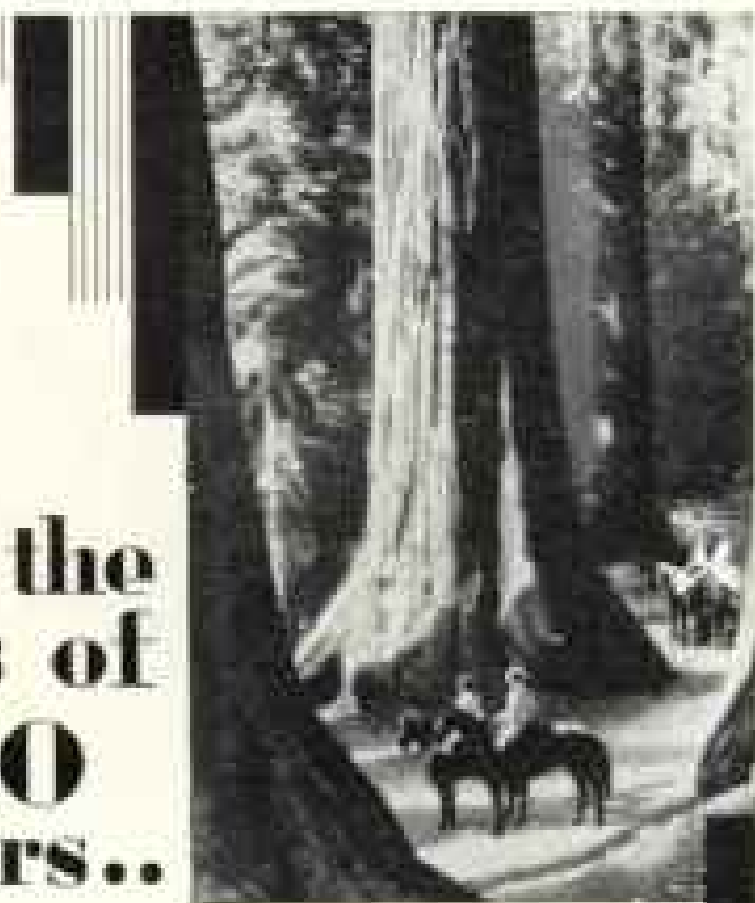
The Old West for a new vacation—Glacier Park!

The glamour of frontier days still clings to this land of shining mountains—rough-and-ready sports, adventure, old-time hospitality. Ride up a mile and back a hundred years—yet find yourself each night in a comfortable mountain hotel or chalet. Come out where vacations seem different—and you do too! Summer fares from the East are lowest ever. Write Great Northern Vacations, Dept. J-5, St. Paul, Minn.



EMPIRE BUILDER
to Glacier Park, the Northwest and California

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 179, Yosemite National Park, Calif.

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Be King for a Summer

For a day ... or a lifetime ... we offer you New Hampshire as your kingdom. We will make you King of miles of wooded hills, King of brooks that whisper a care-free philosophy, King of wide-flung sunsets and vivid hues. We will grant you freedom to wander as you will, to forget your cares in the glorious sweep of mountains and jeweled lakes. But we warn you, we are hospitable folk; and you may find your kingdom too beautiful to leave. Let us introduce you to it; just fill in the coupon below and we will gladly send a free booklet.

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GO BY SEA TO
CALIFORNIA**

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Words can't describe its grandeur. You must SEE it! You'll THRILL at its magnitude—and you'll go ashore for more thrills at Balboa and Panama City, a modern city and an ancient one, at the crossroads of the world.



THE most wonderful ocean voyage in the world! 5,500 miles, and every one brimful of pleasure and interest. Nearly the entire route is in mild or tropic waters, almost invariably smooth.

The day at Havana is a fascinating interlude. And the Panama Canal? You will never forget it! But there are many things on this voyage you'll never forget—deck tennis with delightful companions, luxurious loafing with a good book, happy hours in the outdoor swimming pools, the masquerade ball, and delicious Panama Pacific Line food.

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Special rail and water round trip tours to following West Coast attractions

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From New York, S. S. California, July 9

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to
Coast**
the
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Coast to Coast

You will be amazed—how far you can go and how much you can see—even in two weeks.

All-inclusive cost Escorted Tours on certain days this Summer.

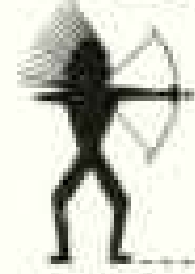
OLYMPIC GAMES

Los Angeles, Calif.

July 30 to August 14, 1932

Santa Fe—The "CHIEF" Railway

Clip and mail coupon



W. J. BLACK, Pass. Traf. Mgr., Santa Fe System
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Please send booklet concerning Santa Fe Summer Xcursions and Western Vacation regions.
 Indicate by X if Grade or High School Student.
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• Combining the simplicity and operating economy of the Roll-film type with the accuracy of a Reflex, Rolleiflex represents the greatest advance in camera construction. A high-speed, focusing finder lens projects a brilliant image—full film size and right side up—on a ground glass screen, indicating, even thru-out exposure, the sharpness you will obtain on your negative and affording you visual evidence of your subject's pictorial qualities. . . . Truly, Rolleiflex is the Camera that Thinks for you.



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NOW YOU CAN AFFORD TO
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