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THE NATIONAL GEOGRAPHIC MAGAZINE

2,000 Miles Through Europe's Oldest Kingdom

BY ISOBEL WYLIE HUTCHISON

Illustrations by National Geographic Photographer Maynard Owen Williams

AN APRIL GALE was tossing the waves into spindrift as our ship thrashed out from the Firth of Forth on her 700-mile voyage to Copenhagen (København). The bitterness of ice was in the air; there was little to suggest that we were headed for a month of sunshine, a Danish Maytime as warm and fragrant as our fuelless British winter had been hard and ice-bound.

Forty-eight hours after leaving Scotland we sighted Skagen's lighthouse on the long hooked forefinger of Jutland. Thereafter we followed a mine-swept channel to the narrow Sound (Öresund) which divides Denmark from Sweden.

In Helsingør the copper towers of Hamlet's Kronborg Castle flashed in a watery sun as we approached the Danish shore. In its dark casemates sleeps Holger Danske, Denmark's King Arthur. So long has he slept, says legend, that his beard has grown into the stone; but if danger threatens Denmark, Holger will waken so quickly that the stone will be shattered as he wrenches his beard free.

Perhaps he stirred when the Germans slipped past Kronborg in the early morning of April 9, 1940, concealed in the holds of cargo ships. At all events, he gave his name to a famous Danish sabotage group defying the invaders of their common homeland.

As we neared Langelinie, Copenhagen's sea-boulevard, I looked apprehensively to see what changes war might have made in one of Europe's loveliest capitals, but, save for the absence of the Royal Yacht Club Pavilion (blown up by Germans), I noticed none.

There sat the "Little Mermaid" on her stone (page 156); there, across the harbor, rose the picturesque warehouses of the old Greenland Dock, from which tall-masted ships set out for Denmark's great island-colony; there, still unharmed, soared the lovely spire of the Bourse with its twisted dragon tails. These at least were unchanged.*

End of an Era

Yet an era was ending. Across the water came the sound of tolling church bells. In the Royal Chapel of Christiansborg King Christian X lay dead under his ermine pall, his coffin surmounted by the crown of Denmark. Before his bier, hour after hour, trooped tens of thousands of every age and class, to whom in Denmark's dark hour this beloved King had been a beacon.

Little children drooped asleep over parents' shoulders or sucked ice cream (the panacea of the Dane) with their elders, all patiently waiting to pay brief homage to the man who had been father rather than King to his democratic family of four million. It was more than three hours before I could enter the chapel, and many were still arriving who could scarcely hope to gain admission before the gates closed.

One thinks of the Danes as a family more than a nation, for of all European nations they seem to me the most domestic. In post-war Europe they are also an uncommonly happy and well-fed family.

The most tragic place in Copenhagen today is the little copse at Mindeparken, Ryvangen,

*See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Royal Copenhagen, Capital of a Farming Kingdom," by J. R. Hildebrand, February, 1932; and "On Danish By-Lanes," by Willis Lindquist, January, 1940.

In Rationed England, Danish Eggs and Butter Help Relieve the Austerity of Postwar Living

Through a model packing station in Skive pass millions of eggs a month. Each egg weighs and sorts itself in this automatic grading machine. Each cold-storage vault holds enough to provide a breakfast egg for every Scot in Aberdeen. Exports have not reached the prewar level when Danish hens laid enough in a year to provide one egg for every person on earth.

on the city's outskirts, where over 100 members of the Danish resistance movement perished. They were tied to trees, shot, and buried where they fell. The ground has now been cleared and made into a tidy cemetery.

When I saw the long rows of graves on a bright May morning they were purple with pansies. This peaceful graveyard on the fringes of the tramline is Denmark's Lidice. Here perished some of her bravest sons.

I had promised to deliver six lectures for the Danish-British Society, a flourishing body which has branches in several parts of Denmark. These lectures took me first to Viborg and Skive, and to Nykøbing on the island of Mors (map, page 144).

It was impressive to find in these Jutland towns audiences which understood English and showed such keen interest in other lands. Many of those I met were members of the National Geographic Society.

Europe's oldest kingdom is one of the Continent's best instructed countries. Compulsory education, introduced in 1814, was reinforced 30 years later by Grundtvig's famous Folk High Schools. These aim to train adult students in the art of living (page 150).

It is rare to find a Dane who does not understand some English. Though fellow travelers were tolerant of my efforts to pronounce their difficult language, they preferred to try out their English. Talk was usually of food and prices. In spite of spoliation during war years, Denmark is Europe's biggest food exporter.

Resistance to German Occupation

On the train to Viborg I traveled with the mother of the engine driver. Her talk was not of farming, but of hard times during the German occupation. Her son, a member of the resistance movement, had been in

Jonals Co.

No Bicycle Built for Two Is Needed When Junior Goes for a Ride

In Copenhagen, where the land is flat, there are ten bicycles to one motorcar. At the noon hour or day's end, a motorist feels the ratio is higher. Skillful but daring cyclists weave in and out, many of them balancing a small child. Some youngsters taste the joys of cycling before they learn to walk.

constant danger of his life from both sides, because of Danish sabotage on railways used by Germans. At last the Germans threw him into a concentration camp.

"Fortunately it was in Nord Slesvig," she said, "which was at least better than Germany! You cannot imagine our joy when the war ended. No one would believe it. All along the street people were opening windows, putting out their heads, and asking if it were true. Then—out came the flags!"

My hosts at Viborg were a lawyer and his wife who had escaped to Sweden one jump ahead of the Gestapo. By night they slipped across the Öresund in a sailboat with their family. Fortunately their timbered house escaped damage, as did Viborg's old cathedral with its arresting modern frescoes.

From Viborg I went on to the pleasant town of Skive. Its streets climb a hill from which the twisting Skive River can be seen wending its leisurely way. Not far away lived the farmer-poet Jeppe Aakjær, translator of Robert Burns.

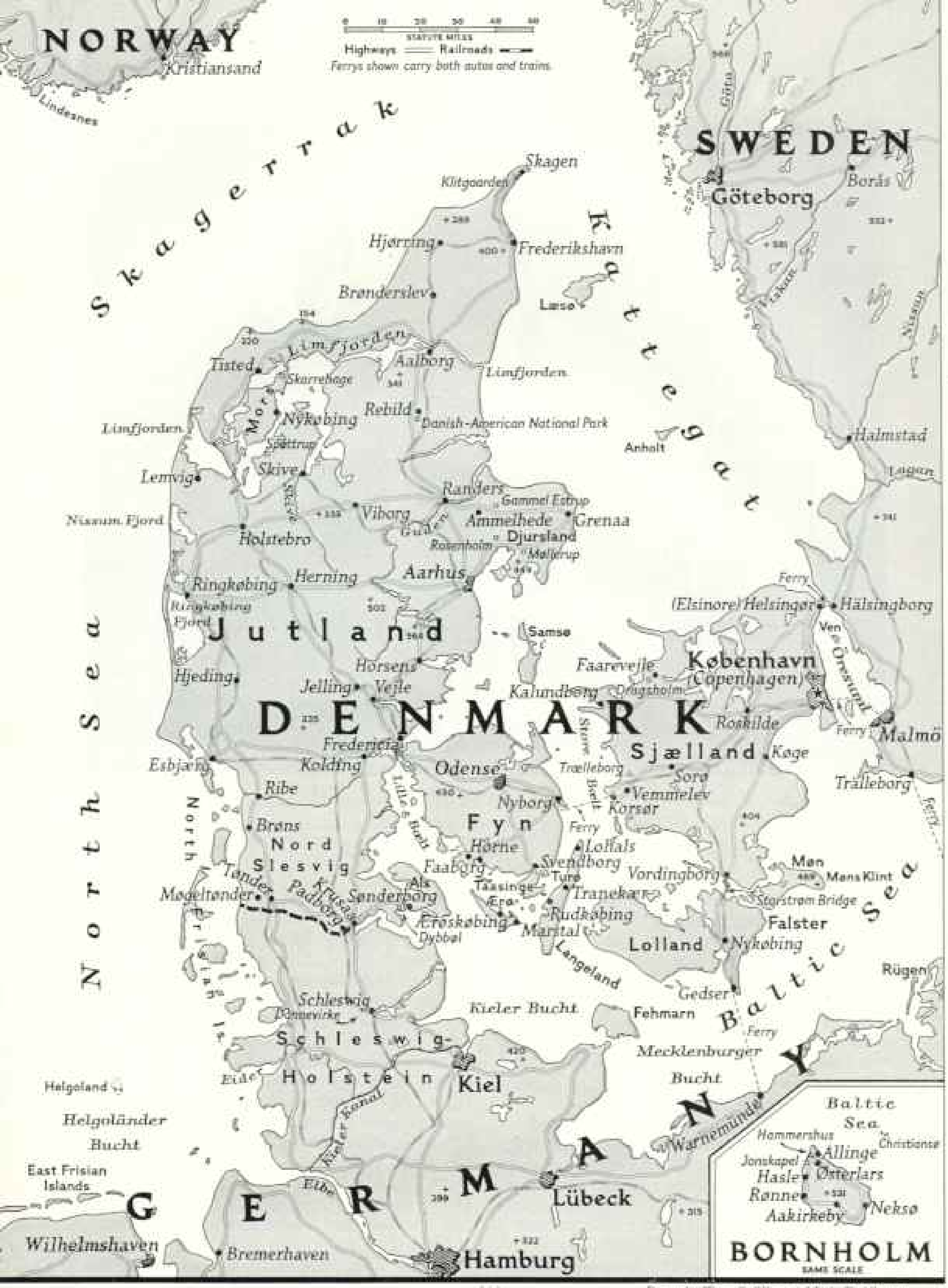
Skive is also the home of northern Europe's most modern egg-packing station, which to an egg-starved Briton seems a veritable Aladdin's Palace (pages 142 and 147).

At the door eggs in their thousands were being unloaded from lorries.

After being graded and candled, they are placed in boxes in cold storage chambers. Each full chamber holds 540 cases, and each case contains 30 dozen eggs—enough to supply a postwar Briton with his weekly egg for 3,738 years!

At Skive's large "bacon factory" it was (fortunately for my feelings) an off-day. For this the manager apologized.

"It would have been more interesting for you," he said, "had it been a day when we slaughter. Our trade is not what it was before the war, when we killed thrice weekly. Now we can do so only once."



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Drawn by Harry R. Oliver and Irvin E. Alleman

Like a Hooded Ghost, Jutland Hovers Over Denmark's Island Kingdom

Viking sea-lords, forebears of the Danes, controlled these three straits between Baltic and North Seas and roamed the seas to France, England, and even Greenland. In an area twice that of Massachusetts live 4,000,000 Danes.

In an adjoining hall I saw prime sides of bacon steeping in brine. "All our best goes to England," I was told. "Britain is our largest customer. We Danes can get only the second-best, and not much of that just now. We need more fodder for our pigs; then we could have more sausages and *leverpostei*" (a delicious liver paste).

Selecting a couple of sausages from a "rope" hanging from the ceiling, the manager flung them into a vat of boiling water. When they were ready, we ate them in our fingers and found them excellent. We went away still eating, for it is almost impossible to avoid doing so anywhere in Denmark.

Near Skive, in a 16th-century manor house, is the well known Krabbesholm Folk High School. In early May it was full of gay young women improving their general education and learning to spin and weave. The school had a memorable atmosphere of quiet happiness on the bright spring morning of my visit. The woods which surround it were starred with anemones, and fruit blossoms hung in snowy cascades above the garden walks.

When the bell rang for dinner we all sat down together, from gardener to headmaster, to enjoy the simple but ample fare. With such "Schools of Life," it would seem that the little country on the forefinger of Europe has much to contribute to both the spirit and the appetite of a distressed continent.

Insulation Millions of Years Old

"This," said the manager of the Skarrehage Moler Works, "is the earliest impression we have of life in Denmark. It is about 60,000,000 years old."

"This" was a bit of Moler, a substance of marine origin found only in Denmark, on which was imprinted the pattern of a fishlike backbone. I saw it on the island of Mors in the Limfjorden, famous to geologists for the unusual volcanic formation of its cliffs, and, incidentally, to gourmets for its oysters.

At the north end of the island lies Skarrehage. Here Moler is made into insulating bricks, exported to all parts of the world.

When I returned to Copenhagen I found a letter from a Danish friend inviting me to the most remote of Denmark's Baltic islands, Bornholm.* After an all-night boat trip from Copenhagen I transferred to a motorcycle sidecar for an island tour.

We visited the granite cliffs and flowery dell at Jonskapel, heard a nightingale singing in the wood below the medieval fortress of Hammershus, and tasted Bornholm's specialty—golden-skinned smoked herring—when we lunched in the fishing port of Allinge. At Osterlars we visited one of the island's four remarkable round churches, of which there are seven in Denmark.

At Nekso, in the southeast corner, I came face to face, for the first time in Denmark, with the devastation of modern war.

Under the guise of docility the sturdy islanders played an important part in the Danish resistance movement, as they had done in 1658. At that time they had refused to obey the Copenhagen authorities, who had ceded the island to Sweden, and had risen as a man against the invaders. From 1660 until the Germans arrived in 1940 Bornholm belonged to Denmark.

American Airmen Smuggled to Sweden

Sweden played a very different part in World War II. Weapons from her ports were smuggled to Copenhagen through the Bornholm backdoor, by which Danish saboteurs and Jewish refugees escaped in the reverse direction. Not a few American airmen, forced down on the island, were cared for and convoyed to safety in Sweden by the islanders, regardless of the risk they ran.

On May 7, 1945, one day before victory in Europe, the tragedy began. The Germans on Bornholm insisted they would surrender only to British troops, refusing to give up their arms to the Russians. They fired on two Soviet planes flying in over Neksø.

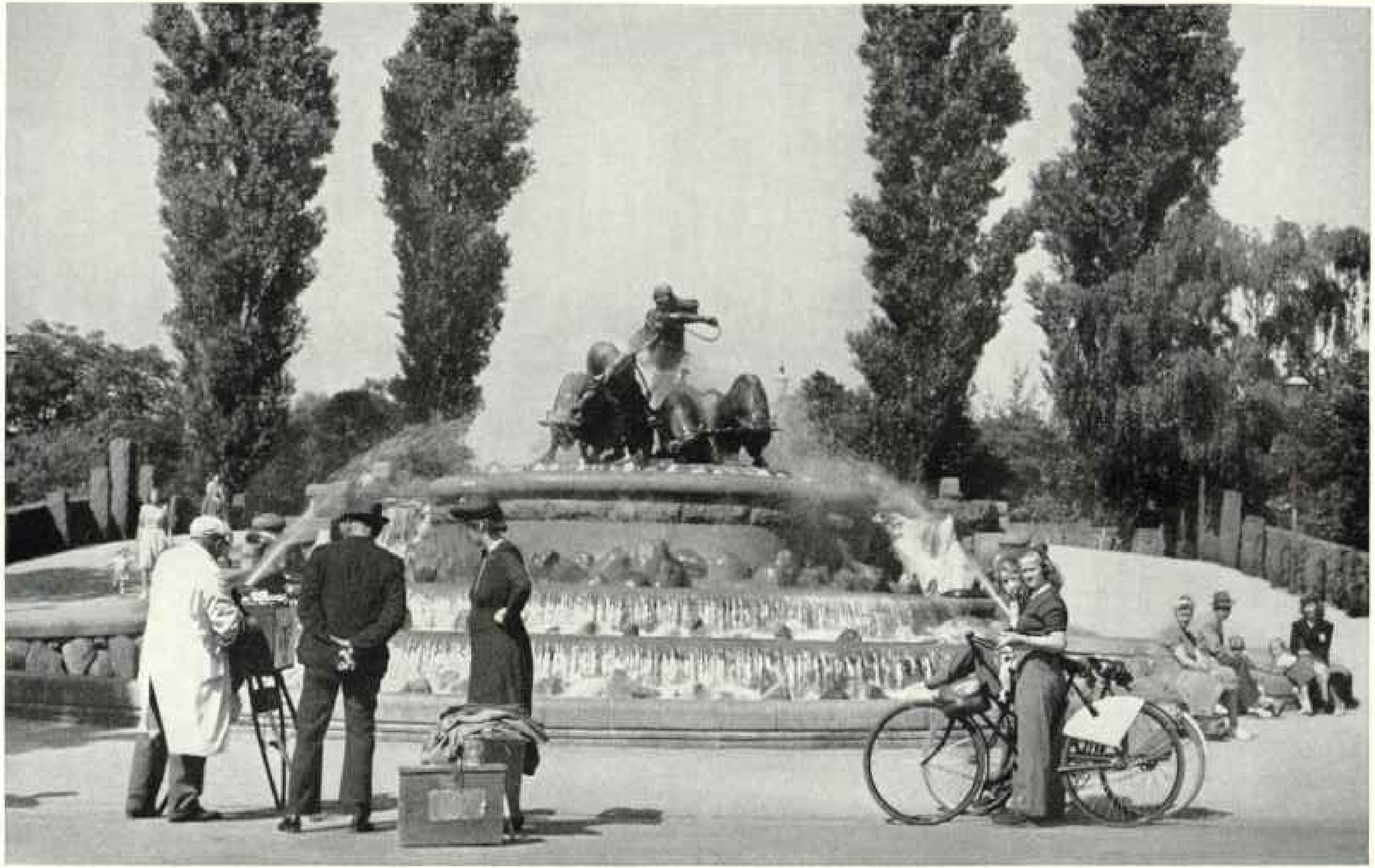
This was the signal for a two days' air bombardment by the Russians which laid most of Neksø and a good part of Rønne in ruins. Small wonder if, when the rest of Denmark rejoiced, there was silence in Bornholm.

In Copenhagen again, I was joined by Dr. Maynard Owen Williams, of the staff of the NATIONAL GEOGRAPHIC MAGAZINE, who was to explore Denmark with me.

On the first morning we took a short preliminary trip. To satisfy the morbid fancy of his two Scottish passengers—my sister and me—Dr. Williams drove us past flowering orchards and whitewashed farms to visit a mummy.

Our goal was the little church of Faarevejle on the northwest side of the island of Sjælland, where James Hepburn, Earl of Bothwell and third husband of Mary Queen of Scots, sleeps uneasily under the constant inspection of the curious—a singular fate for a man who spent his last five years in solitary confinement in the dungeon of the near-by castle of Dragsholm. There madness and death relieved his sufferings in 1578.

* See "Bornholm—Denmark in a Nutshell," by Mason Sutherland, NATIONAL GEOGRAPHIC MAGAZINE, February, 1945.



Denmark's Mythological Mother, Driving Her Sons as Draught Bulls, Plows a Sea Furrow Between Sweden and Zealand

Before the Goddess Gefion returned to Valhalla, she asked her royal lover for land for her four sons. He granted her as much as she could plow around in a day. Transforming her sons to bulls, she plowed across the neck of a peninsula, making Zealand (Sjælland) an island. Anders J. Bundgaard's fountain and statue at Copenhagen commemorate this legend. Waves represent furrows; fountain jets, the dust clouds of her plowing.

To Appreciate Such Oval Wealth, Just Picture Each Egg "Sunny Side Up"—About a Thousand Dozen

In 1947, when one strictly rationed egg was a blessing in England, Denmark sent more than $100,000,000 worth of eggs, butter, bacon and other products to Great Britain. This was an average export of $25 for each Dane. Small Denmark is postwar Europe's largest food exporter.

Bothwell had escaped from Shetland only to fall into the hands of Frederick II of Denmark, who was a lover of dogs if not of men, for on his tomb in Roskilde Cathedral his favorite hound is commemorated by an inscription.

The congregation was just dispersing when we climbed the hill on which the church stands, for it was Whitmonday. A Lutheran pastor in cassock and ruff as stiff as Queen Bess's own stood in the doorway, apparently unabashed at having just added another to four centuries of sermons, for the list of pastors at Faarevejle goes back to 1536.

Bothwell's Mummy Leers at Fate

The church officer rolled back the matting in the center aisle and lifted a trap door. We descended a short ladder to the vault where the coffin, accidentally unearthed in 1858, has been placed, and peered through the glass lid.

The skeleton remains partly mummified. One blind eye and a wound in the skull are held by some experts to be sufficient proof—though others doubt it—of its identity. The mouth is a little open and drawn back, as if in a last defiant snarl at fate.

We left Copenhagen next morning, Nykøbing on the island of Falster our destination for the night. Falster was linked to Sjælland in 1937 by the great Storstrøm Bridge, some two miles long (page 169).

South of Copenhagen we stopped at Køge to visit the oldest dated frame house in Denmark, the delightful little Borghus built in 1527 and still standing on its original site (page 179).

We passed into the high, dark church of St. Nicholas close by. Christian IV's richly carved pew, the pulpit, and the organ loft, decorated by Henrik Reinecke of Køge with unusual panels depicting the five senses and nine muses, all stand as they did three centuries ago.

Køge, we gathered, was a conservative town, for even its latest building fostered an old tradition. From a staff on its unfinished roof hung a triple wreath of evergreens. We asked a passer-by what it meant.

"An old custom," was the answer.

Birthdays and gold and silver wedding anniversaries, as well as house warmings, call for flags and garlands in this friendly land which understands so well the art of living.

In the market square, opposite the oldest Town Hall still in use in Denmark, stood a Victorian carriage and pair with a coronet on its panel and a liveried coachman on the box (page 161). This equipage of nobility was a rather unusual sight in this democratic land, where even the King walks unattended. ("Who looks after the King?" a German trooper had asked a Copenhagen messenger boy. "We all do," was the lad's classic answer.)

From Falster we crossed by ferry to the island of Møn. Its remarkable chalk cliffs, in places 400 feet high, are a famed beauty spot (page 173). They are wooded to the edge and intersected by glades full of unusual wild flowers. From these tumbled masses of chalk the sun drew delicate lights of gray-green and rose, reminding me of Greenland's icebergs.

We wandered by narrow paths along the cliff tops with their background of glittering blue sea. Far off a little fishing craft spread its sail toward the island of Rügen.

Regretfully we turned back to Sjælland and came to Valdemar Atterdag's old goose tower at Vordingborg. The goose with flapping wings which surmounts it was Valdemar's medieval way of thumbing his nose at enemies across the sound!

We spent the night in Sorø to visit this old-world town's famous Academy, Denmark's largest state boarding school, standing on the site of Bishop Absalon's 12th-century monastery. In 1586 Frederick II turned the building into a school "which by the royal munificence was to house the children of nobles and commoners in equal numbers."

The school has had its ups and downs, but it now possesses rich endowments. Parents of modest means whose boys are clever enough to pass the stiff entrance examinations can have their sons educated under the best conditions for very low fees.

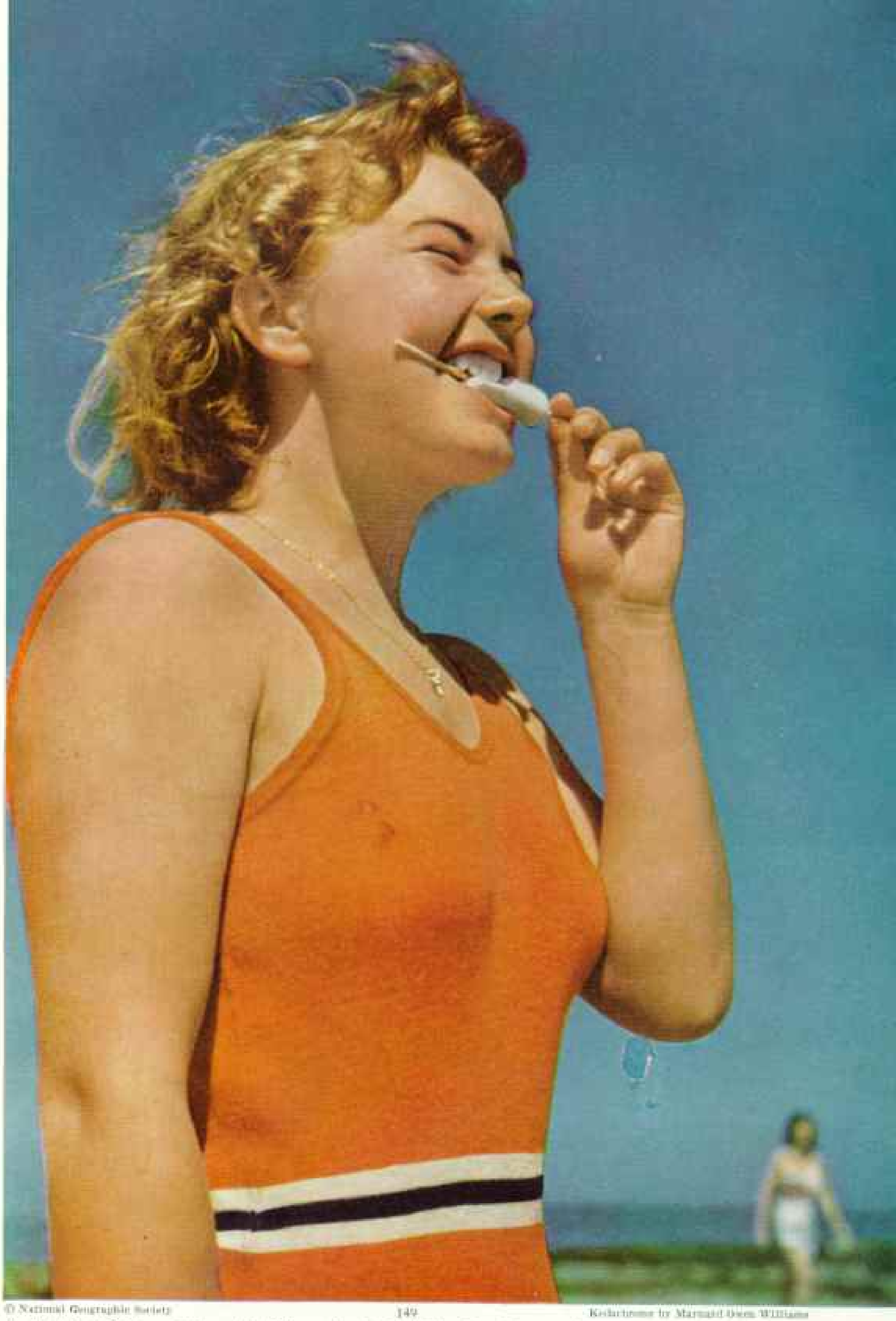
Viking Settlement at Trælleborg

But even these venerable buildings seemed young compared with the Viking settlement at Trælleborg. Sheep were grazing in the green enclosure where the Vikings built their wooden-walled fortress on a broad headland between two small streams (page 180).

A thousand years ago these meadows were navigable waterways to the Great Belt (Store Bælt), and the site was convenient for the sea rovers, who would be surprised to know that every summer thousands of visitors come to Trælleborg to see the traces of their village.

The sun was near setting when we came at last by shining ways to Odense. Though it is an important industrial city and Denmark's third largest town, an atmosphere of fairyland clings to it. The street in which Hans Christian Andersen's birthplace stands is like a fairy tale itself, with its low elfin cottages.

From my window that evening I had a view of copper spires, red-tiled roofs, and chestnut trees brilliant against the setting sun.



Kodachrome by Maynard Owen Williams

A Bathing Girl on Marstal's Warm Sands Nibbles Ice Cream from Denmark's Dairyland

Kodachrome by Maynard Owen Williams

Outside the Baronial Hall Now Housing Their Folk School, Young Farm Wives and Career Women Do Gymnastics

In winter, when farm work is slack, the same buildings, near Skive, are used for men's classes in the literature, history, and geography of Denmark.

Childhood's Fancy Dwells with Storybook Characters in Hans Christian Andersen's Museum Home in Odense

Little Mermaid swims alone (page 156). *Shepherdess and Chimney Sweep* have each other. All three are cardboard cutouts by Lotte Bogelund.

Kodachromes by Maynard Owen Williams

Kodachrome by Maynard Owen Williams

In a Splendid Park, Established for Fourth of July Ceremonies, 45,000 Danes Celebrate American Independence

Each year crowds come to Rebild, over whose national park wave the Dannebrog (Danish flag), the Stars and Stripes, and U. S. State flags.

Denmark's Beautiful Queen, Flanneled King, Military Aide, and an American Legionnaire Celebrate the Fourth

The United States tugs at Danes' heartstrings because so many have relatives there; some preserve family ties by transatlantic telephone. Since 1912 Danes have celebrated Independence Day in Danish-American National Park (opposite page). Here democratic Frederik IX wears mourning for his father, popular Christian X. Ingrid, his Queen, is a granddaughter of Sweden's King. The Legionnaire is one of several hundred American visitors, including 40 choir members.

Kodachromes by Maynard Owen Williams

Kodachrome by Maynard Owen Williams

Summer Is Brief; Danes Enjoy It to the Hilt; Swimmers Swarm the Beaches, but This Sedate Crowd Prefers Tea on a Terrace

On a Sunday Copenhagen's kitchen-weary wives steer husbands to near-by Klampenborg to gaze into the Öresund, which they can see any day.

In the Danish Cities a Scarlet Jacket Screams "Mail!"

Rural postmen wear blue uniforms. Scarlet and blue, together, deliver the mail to home and farm once a day.

Denmark, like the United States, has postal savings, postal money orders, C.O.D. forms and collections.

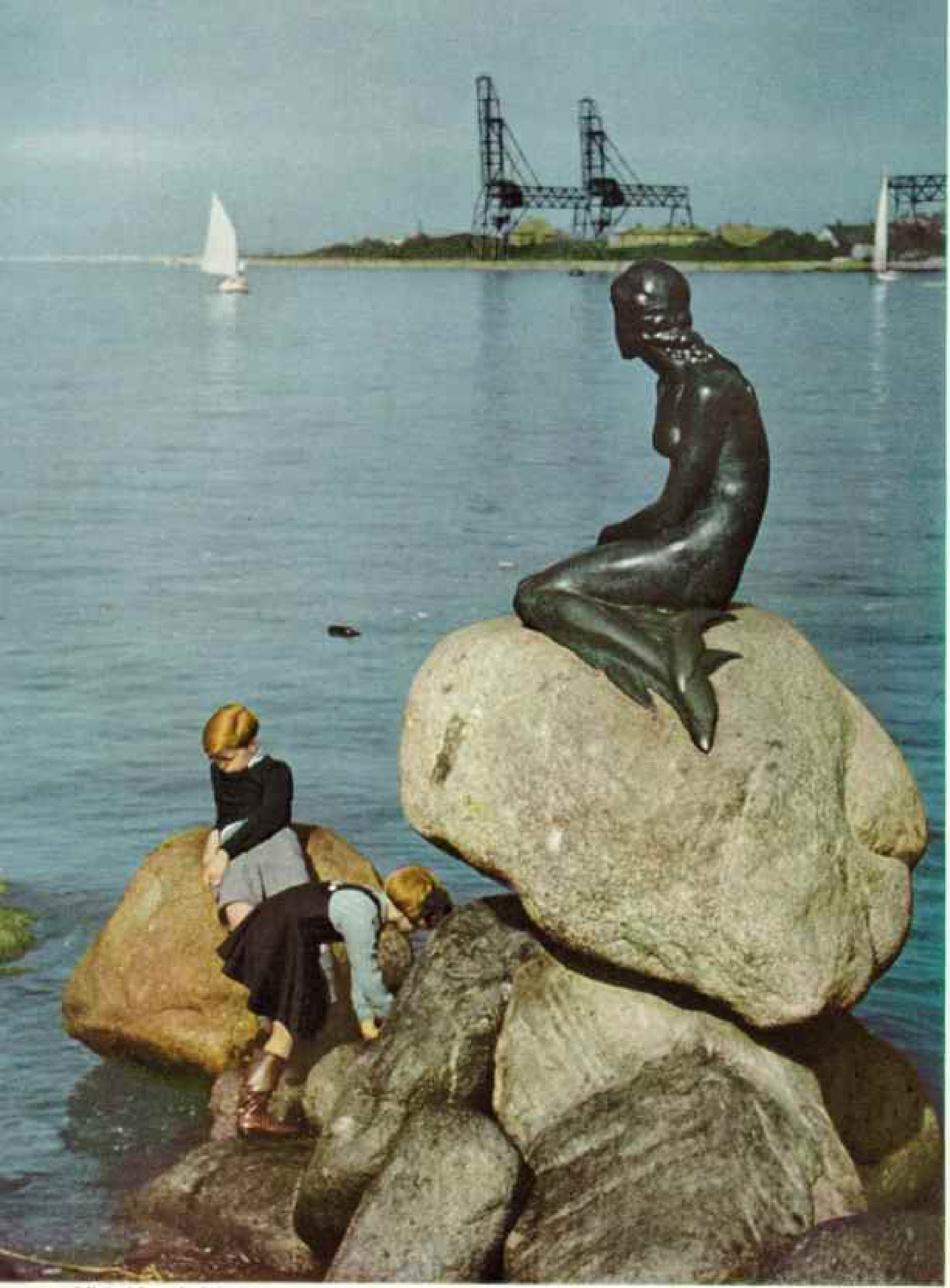
The Crowned Pretzel Says a King Once Shopped Here

An Odense housewife emerges from an antique bake-shop opposite the home of Hans Christian Andersen. Her bread probably will go into open-faced sandwiches, of which Danes are so fond.

Danish pastry, celebrated for its richness, is not what it used to be or will be again; the American variety seems better these days. Imported chocolate and sugar are scarce; butter is bountiful but has to be exported for a living. Thick cream cannot be had; housewives whip up thin cream to look thick. Some Danes may grumble, but they eat better than most of their neighbors.

"Eating Danish food, I gained 20 pounds in a month," said one American, coming from rationed France.

Kodachromes by Maynard Owen Williams



Kobarbrunn by Maynard Owen Williams

Little Mermaid Grips Rock with Fin Foot and Drinks In the Sea with Pensive Eyes

"You will be allowed to sit on the rocks and look at the big ships sailing by," wrote Andersen, her literary creator. This beloved statue overlooking Copenhagen harbor does just that, and children play about her rough rock base.

^ Fire Shrinks but Brightens the Colors of This Faun and His Parrot

^ An Eskimo Family Is Grouped Among Three Phases of Underglaze

For two days and nights, thousands of art objects are baked in the kiln at the Royal Copenhagen Pottery. Since direct flame would ruin them, they are placed in fire-clay boxes. Many pieces nevertheless explode or warp, but the best survive, hard and shiny. They go into export all over the world.

On the right, a vase has been hand-painted—not stenciled—by an artist. A wet coat of glaze (center) obscures his work. It emerges from the kiln (left) fire-shrunken, the picture protected by a transparent wear-proof enamel. Eskimos, baked like the fauns above, reflect Danes' interest in Greenland, their only colony.

Kodachrome by Maynard Owen Williams

Across Fyn's Flat Landscape a Herder Pedals Home, Leading His Lowing Army on One of Denmark's Good Roads

Milk, butter, cheese, bacon, and eggs, products of the "farming kingdom's" specialized agriculture, help feed Europe.

Fyn Gives a Portion of Its Precious Soil to Beauty. This Gigantic Tulip Bed Is Cultivated by Motor

Tulips started coming back after the war. The author drove past several fields as extensive as this, only half of which is shown. So fertile is Fyn, Denmark's second largest island, that it is called "the garden." No spot in the country is more than 564 feet high; the longest river is 80 miles.

Kodachrome by Maynard Owen Williams

In Helsingør (Elsinore), Shakespeare's Setting for *Hamlet*, Danes Watch The Society's Staff Car and the Launching of a Ship

Few Danes live far from the smell of brine. Like their Viking ancestors, they roam the seaways, carrying away dairy products, bringing back coal, grain, and fertilizer.

In Køge, Noted for Its Antiquities, a Stately Carriage Appeared as if Out of a Victorian Novel or a Hollywood Set

In Market Square near the centuries-old Town Hall, this liveried coachman drove up and deposited two elderly women at the bank. Before the war, Denmark had more bank accounts than it did families, with an average deposit of 1,000 kroner ($270).

Kodachrome by Maynard Owen Williams

Old Town's Millstream, Swans, and Half-timbered Houses Illustrate Idyllic Bygone Days of Industrial Aarhus in Jutland

A Walking Tour of Old Town Is a Magic Journey into the Long Ago

Each year some 50,000 people visit Aarhus's open-air museum. Spread before them in a park are 45 old houses saved from ruthless demolition in various towns and here rebuilt as a group (pages 162 and 164). Williamsburg, Virginia, restored in colonial fashion, carries out a similar idea.

Old Town's buildings include the brewer's, glazier's, shoemaker's, and (left) the dyer's and (center) the bookbinder's. Tool displays show how artisans performed their day's work before the advent of power machinery.

Dating from 1597, the burgomaster's tiled and timbered house (right) has antique-filled rooms illustrating the changing fashions from 1600 to 1850.

As the burgomaster was often the town's leading merchant, his house has a bar which served those awaiting his pleasure.

An inscription, applicable to all museums, says, "Touch with your eyes but don't see with your fingers."

Kodachrome by Maynard Owen Williams

A Pipe Outside the Tobacconist's Breathes Masculine Comfort and Smoky Content

Antique crafts from pinmaker's to candlemaker's survive in Old Town. Tools lie as the artisans might have dropped them. This street sign calls to mind advertising's pictographs, which preceded the written word.

In their branches a thrush was singing late. Or could it be Hans Andersen's nightingale?

In the museum which has been added to the poet's cottage the story of his life, which he himself rightly regarded as another fairy tale, is unfolded (pages 151 and 174).

Here are the many souvenirs which he loved to collect, including a dollar bill sent to him by a young girl, Abigail Tompkins, when American children showed their love for the poet by starting a collection in his aid. (Against this, however, he protested, for he was not in need of money). A letter sent to Andersen by Abigail 49 years later shows how long her admiration lasted.

Though Andersen never visited the United States, his interest in it is shown by two finely illustrated volumes in his library, published in 1872 and entitled *Picturesque America*.

Where American Soldiers Relaxed

Thousands of American soldiers from Germany have relaxed on the sands of Kristiansminde, close to picturesque Svendborg on the southern coast of the island of Fyn.

Fyn is the land of *herregaarder*, red brick 16th-century manor houses mirroring copper spires in moats and ponds—Rygaard, built in 1537, with long knights' gallery and immensely thick walls; Glorup, where Hans Andersen was Master of Ceremonies at the victory celebrations for Danish troops in 1848-50; lovely Hesselager with its watchman's gallery from which, through slots in the wall, boiling lead could be poured on the heads of assailants in days of old.

"But you must see Egeskov, too," said Hesselager's gracious chatelaine, the Baroness Karen Blixen-Finecke, "for it is one of the loveliest castles in Denmark."

Egeskov's red walls were colored yet redder by a fiery sunset when we saw them. It seemed as truly a fairy palace as far-famed Brahetrolleborg, home of Count Reventlow, the reflected towers of which shimmer in the lake of a beautiful park amid the shadows of crimson, white, and golden water lilies. It is not surprising that Fyn gave birth to Hans Andersen, who was a welcome guest at many of these manor houses.

From Svendborg we crossed to the orchard-islands of Turø and Taasinge, a few minutes distant. Admiral Niels Juel, who won his famous sea victory over the Swedes at Køge in 1677, purchased Taasinge with his prize money, and it is still, like Svendborg, a center for sailors and yachtsmen.

It was Sunday; family parties were setting out for a day on the water. Everybody went, from grandma to the baby. Dr. Williams stopped to take a photograph, and Grandma herself came forward, broke lilac sprays from the fragrant bush overhanging her garden wall, and smilingly presented them to us. She spoke no English; it was her graceful way of "saying it with flowers."

From Taasinge we crossed by ferry to the old market town of Rudkøbing on the long thin island of Langeland. We found its mediæval fortress of Tranekær shuttered and deserted. But Lohals, the little port at the north end of the island, was a scene of liveliness, with a merry children's party in full swing at the inn.

Off southern Fyn lies the tiny island of Ærø with its delightful "skipper" towns of Ærøskøbing and Marstal. We enjoyed Ærøskøbing from the twin pumps in its ancient square, which still supply water for the town, to its friendly inhabitants.

In Marstal we stopped to photograph a cottage. Its owner invited us to view her remarkable little home, which she and her husband had turned into a private museum with no thought of personal gain (page 174).

Here were carved chests in which brides two centuries ago kept their linen, painted wooden "flat-irons" for smoothing clothes, ships' figureheads—even a couple of china dogs brought by some mariner from Scotland, for the sea, so vital in Denmark's history, breathes through the life of Ærø.

In most Danish churches hangs a ship model presented by some sailor as a thank offering for his preservation in shipwreck, perhaps, or merely as a thank offering for ships. In the beautiful old church at Marstal there are five.

A sum of money has been left by a captain of the town to provide care for the numerous seamen's graves in its churchyard. We clambered to the top of the church tower, from which there is a clear view toward Kiel.

"During the war," said a Dane who had accompanied us, "we saw thousands of Allied bombers passing over. We could hear the bombs and see the flames in Germany. How this old tower used to shake!"

A Town of Romance and Fairy Tales

We spent our last night on Fyn in the charming town of Faaborg, where in August, 1830, Hans Christian Andersen met his brown-eyed first love, Riborg Voigt.

The summerhouse still stands where he vainly courted her, for she was secretly betrothed to another. But until her death Riborg kept a little bunch of flowers which the poet had given her, and when Andersen died a letter from Riborg was found in a wallet on his breast.

Ron Rosenblatt

In a Former Fishing Village, a Fishwife Cleans Fish Beside the Statue of Her Clan

Copenhagen's "fiskerkone" (fishwives) ply trade and tongue on the cobbled quay beside the former castle, now Parliament. Kjobmannshavn (Merchant's Harbor) was built to protect the herring fisheries of Havn. Close to C. H. Svejstrup's dour statue with its back to the fishing fleet, women "man" the morning market, sometimes adding virile language to the task.

It was late when we reached Faaborg, but after supper we were whisked off to visit Fyn's only round church, at Horne, and the rolling hills—"Fyn's Alps"—which lie behind the town.

Faaborg is called the "town of painters" and has a fine art gallery, for delight in painting is a marked characteristic of the Danes. Local museums, too, are frequent in Denmark.

The oldest and largest of the bells in the town's clock tower held its 300-year jubilee in 1946. Fortunately, in the late war it escaped the fate of many south Slesvig bells melted into cannon fodder by the Germans.

From Faaborg we drove north and crossed to the mainland by the Little Belt (Lille Bælt) Bridge erected in 1935.

Our first pilgrimage was to Jelling to see the great boulder carved with runes which Harald Bluetooth set up there about 980 (page 180). It commemorates his parents, King Gorm and Queen Thyra, and also himself—"The Harald who conquered the whole of Denmark and Norway and made the Danes Christians."

On the front of this important monument is a relief of the Crucifixion, and on the side a carving of a dragon wrestling with a serpent. Jelling's little church is almost hidden between two great burial mounds which Harald raised to his parents. Its 12th-century frescoes are among the oldest in Denmark.

The great explorer, Vitus Jonassen Bering—over sixty when he discovered the Aleutian chain and part of the Alaskan coast—was born at Horsens in Jutland. In Amsterdam he attracted the attention of Peter the Great, under whom he took service.

He never returned to his native land and is buried on Bering Island in the North Pacific, but we saw his parents' grave in the vestibule of Vor Frelsers Kirke in Horsens.

From Horsens we sailed in Capt. Aage Larsen's beautiful ketch, *Nirvana II*, far down the fiord. A cool breeze filled *Nirvana's* sails when we returned by moonlight. Surely Vitus Bering himself had a ghostly hand in this delightful expedition!

Returning next morning from a visit to an

experimental farm, we paused in a wood to see the touching memorial to "Aage and Hardy," thirteen-year-old schoolboys who lost their lives in 1945 when they blew up a German ammunition dump there. A third boy escaped in time. Denmark's resistance movement began among the schoolboys of Aalborg, who took Churchill's name for their group.

Near by we visited a Danish camp for displaced German civilians. Though well fed and housed in army huts, they had a dispirited air. Despite vigorous protests, German refugees were poured into Denmark in thousands in the spring of 1945. We were told that Denmark was supporting about 200,000, costing the small country more than even *its* hospitality could afford. By the end of 1948 they were all repatriated.

We joined some 60 representatives of the foreign press invited to spend two days in east Jutland to study Danish farming. On a brilliant morning we set out in three omnibuses to visit dairies and farms south of the city of Aarhus.

After lunch we learned of the "almost explosive" development of dairy farming in Denmark, which started with its first dairy at Hjeding in west Jutland in 1882 and today includes nearly 1,500 cooperative dairies, as well as 150 private ones. A century ago there were only 600,000 milk cows in the country; today there are 1,500,000.

The geographer is tempted to wonder if the success of Denmark's cooperative system may not be due literally to the "lie of the land." Denmark is a flat country with no dividing mountains or valleys such as constrain the Norwegian or the Scot to individualism.

Later we visited a typical Danish small holding. Its owners, with the help of their son, worked their twelve-acre farm themselves, growing a variety of crops. They also attended to eight cows, three sows with litters, 100 hens, and several beehives. The farmer's day in Denmark has no eight-hour limit!

Aarhus Specialty: Meat for Dessert

Visitors to Aarhus, Denmark's second city, recapture something of the leisure of the past as they wander the reconstructed streets of Old Town, the renowned Folk Museum founded by Dr. Peter Holm in 1909 (pages 162-164).

This open air "museum" contains 45 old buildings rescued from destruction, the most recent being a saddle maker's delightful little house and a tannery moved from Randers.

In the startlingly modern Town Hall, with its 197-foot-high clock tower and interior decorations even more modern, the Burgomaster entertained his 60 guests at a luncheon which lasted for two hours and wound up with a third meat course instead of a sweet. This, we were told, was an Aarhus specialty!

The Town Hall is not the only modern building in Aarhus. Its University started work in 1928 and already has 1,000 students. Used as a headquarters by the Gestapo, the University was bombed by the British in 1944.

At the historic mansion of Møllerup, on the Djursland peninsula, the journalists were entertained by its owner, a lady who manages one of Jutland's largest farms and possesses a fine racing stable. Ordered out of her house by the Gestapo, she refused to leave her home entirely in German hands and moved from her mansion to a room above the stable.

Our tour of Djursland ended in a Danish opera singer's home, one of the show farms of Jutland with its long barns of sleek milk cows, stables of powerful Jutland horses, and well-planned fields.

Resistance Fighter of 600 Years Ago

It was raining at last when we left Aarhus to cross the high rolling district of north central Jutland. Our destination was Aalborg on the Limfjorden, which cuts the peninsula in two. As we drove north the sky partly cleared, and sun, wind, and cloud made the day a pictorial one. Bare fields stretched on either hand; here and there Millet-like men and women were hoeing against wide horizons.

We crossed the Niels Ebbesen Bridge over the Guden—one of the largest rivers in this land of small streams—and came to the red-roofed town of Randers. The door of the old church of St. Morten was open, and we went in to see its rich 17th-century carvings.

Outside in the square a statue of Niels Ebbesen, Denmark's Robert Bruce, recalls the national hero who in 1340, at the head of a small band of followers, killed the German usurper, Count Gerhard. In recent times Ebbesen's name was an inspiration to Danish resisters. Several of these perished near Randers, and their honored names are commemorated on a great boulder.

Randers' Tourist Bureau is housed in one of the town's oldest buildings, the Helligaands Hus, which belonged in the Middle Ages to the friars of that order. The half-timbered building has a stork's nest on the chimney.

Near Randers stand the castles of Gammel Estrup and Rosenholm. For six centuries Gammel Estrup passed down in only two families. The last private owner, Count Christen Scheel, died in 1926, and since 1930 the castle has been a museum.

Lovely Rosenholm, with its moat and bridge guarded by two sad-faced lions, its pictures

Against a Cathedral Background, Young Folks of Aalborg Have Fun

A charity carnival at Aalborg gives Danes on a high swinging merry-go-round a chance to kick up their heels, enjoy life, and do good at the same time.

and Gobelin tapestries, is still occupied by the family of Rosencrantz—a reminder that we are in Hamlet's country.

In Ammelhede we paused to inspect the inscribed stone which marks the grave of "the true King Hamlet." (He is buried in several places in Denmark!) Randers, we found, had that 16th-century atmosphere which Aarhus, except for its Old Town, has lost. It was, in fact, still a storks' town, and you can always trust storks.

Danes Celebrate the Fourth of July

The International Exhibition held at Aarhus in 1909 gave birth to twin projects important to Denmark and America—the Folk Museum of Aarhus, and the Danish-American National Park at Rebild in north Jutland, with its Lincoln Log Cabin Museum. The park, on the initiative of the late Dr. Max Henius, was presented to Denmark by Danish-born Americans as a spot where they might meet annually to celebrate July Fourth (page 152).

No lovelier setting could have been found than these high tops amid the broom, the blueberries, and the birch, giving far views to the distant horizon. Since 1912, with the exception of the war years, America's Independence Day has been celebrated at Rebild each year with increasing splendor. In 1947 King Frederik and Queen Ingrid attended, as they had done on previous occasions when Crown Prince

Beside a Two-mile Bridge, Danish Children Gobble Their Icy Reward for Posing

The Storstrøm Bridge, linking Falster to Sjælland, was opened in 1937. Resting on 51 piers, it carries sightseers to Nykøbing and Møns Klint.

and Princess, and a gathering of 45,000 people assembled from all parts of Denmark and overseas (page 153). Speeches were broadcast, and American Danes, some aged and toilworn, came to the microphone to bring greetings to the old country from overseas.

On our way from Randers to Aalborg we visited this beautiful park in the dewy calm of a May evening. Clambering up to its hilltop boulder, which records that the Cimbri emigrated from this region in the dawn of the Christian Era, we looked down upon the Lincoln cabin in the glade below. Built of logs presented by each state of the Union, it houses trophies from America's pioneering days, including a covered wagon from Utah.

Not far from Rebild a smokeless chimney beside a slag heap marks abandoned Tingbaek Mine. A golden-haired maiden unlocked a low door and led us into the bowels of the earth. We followed her, more and more mystified, for the galleries were lit by electricity, though the mine had evidently been long disused. Presently we distinguished carvings cut in its chalky walls and came to a large statue of an elderly woman embracing a maiden.

"Naomi and Ruth?"

"No. Denmark and Nord Slesvig in 1920!"

The mine is filled with the works of sculptor Anders J. Bundgaard, who died in 1937 and who worked here where it is warmer in winter than above ground (page 146).

Jensik Co.

Copenhagen's "Bad-weather Lady" Looks Down at Town Hall Square

At right is the 348-foot tower of the Raadhus, the capital's chief architectural pride. A smaller tower is on the Palace Hotel. Here streetcar lines converge, and cyclists, with right of way, mass before traffic lights. Under the square, no longer disfigured by air-raid shelters, rest rooms and valet shops line a subway for pedestrians.

At Jutland's northern tip we stood amid the sand dunes. Through a bare, flat country we had traveled that morning from Aalborg. Pasture had given way to heath; pine woods bound the sands. Near the village of Skagen we had found amid the pines the drowned tower of St. Laurentius' church, overwhelmed by a great sandstorm which swept this coast in 1775.

Half-hidden in the blue sea grass beside us crouched the low memorial to Denmark's lyric poet, Holger Drachmann. Artists were the first to discover the windswept charm of Skagen, now a popular summer resort. The King of Denmark has his summer villa, "Klitgaarden," near by.

Denmark can give points to most countries in her care for the aged. The Ministry for Social Affairs built more than 4,000 small modern apartments for their accommodation in Copenhagen, and almost every town of any size has its Old Folks' Home.

Returning to Aalborg, we visited one which is unique. It is housed in an old monastery of 1430, which has been completely reconditioned, though it still retains on the walls of the chapter house remarkable 15th-century murals. The old people occupy pleasant single-room homes in the upper story.

"The old folk usually become so attached to their homes," the warden told us, "that they don't want to leave them. When one old man in a Randers home inherited a large fortune, he gave all the money back to his 'asyl' for a new extension so he wouldn't have to leave his single room!"

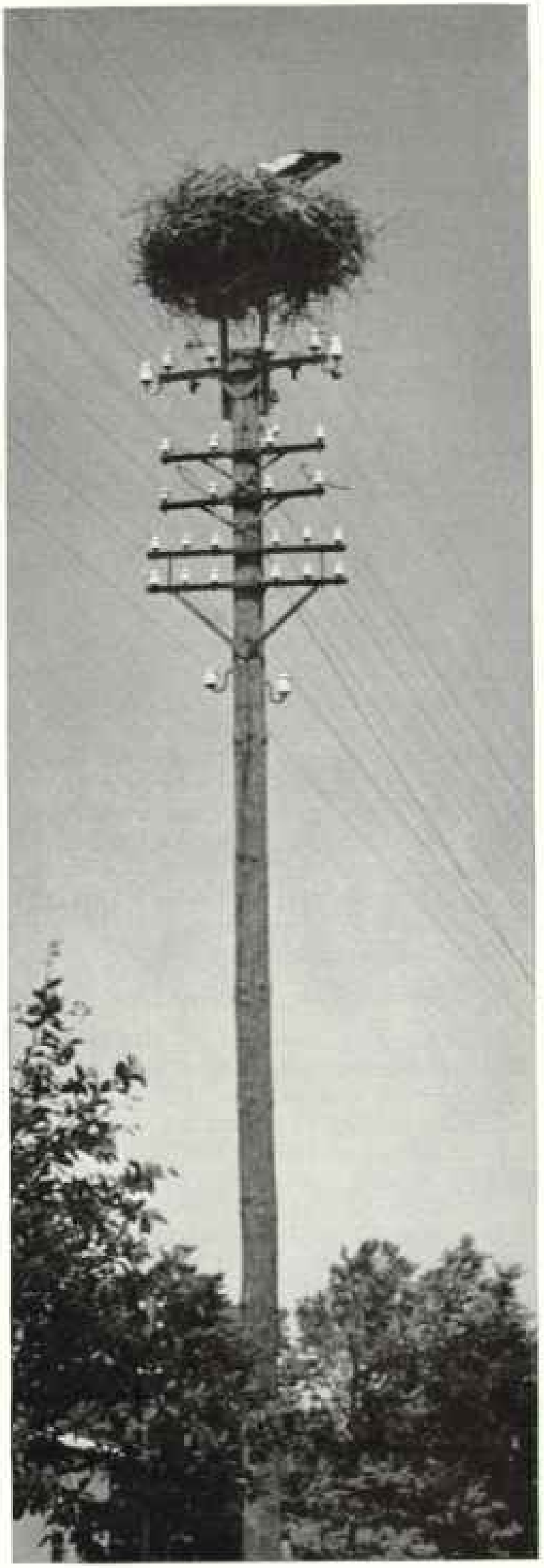
Castle Walls Hid Smuggled Weapons

Motorists in a hurry can travel the length of the Jutland peninsula in a long day. We went more slowly, passing once more through Viborg and Skive. Near there, accompanied by a historically-minded waiter (who would accept no reward save the satisfaction of showing his country to strangers), we visited the famous castle of Spøttrup.

Denmark's finest example of medieval military architecture, Spøttrup stands amid marshes which were once sea. Castle walls, eight feet thick, hid weapons smuggled over from England during the war.

"Spøttrup," explained the caretaker, "shows Denmark's history in a nutshell. It has passed from bishops to nobles, from nobles to large farmers. Now the State has bought it and split it into small holdings for many farmers. That is good; that is Danish democracy—all very happy."

All except the storks, who are not, perhaps, democrats. Though the rusty wheel where



Her Nest Egg Is Based on Tel. and Tel.

With the draining of swamps, Denmark's stork population is decreasing. This high-placed nest at Brøns in Jutland is known throughout Denmark.

they built their nests still stands on the chimney stack, the storks left Spøttrup with the last private owner.

We found them at home, however, when we arrived next evening in the old south Jutland town of Ribe. It was a long drive from Skive to Ribe, for we chose less frequented roads in a world of sand beside the North Sea.

Soon after passing through the bustling town of Esbjærg—Denmark's only ice-free commercial port and the busy terminus for traffic with England—we saw rising over the marshes, as Ely rises over the English fens, the square tower of Ribe cathedral.

Here in 862 Bishop Ansgar built his wooden church, replaced, 300 years later, by the present building. In the Middle Ages ships from Ribe sailed to all parts of Europe.

"Have you seen our storks?" the cathedral custodian asked when we came down from the tower. Yes, we had counted five or six nests above the red tiles of this delightful town. The custodian said we should have counted 15, for Ribe is the sort of place where they number their storks.

From Ribe we travelled in the print of ancient wars along the fringe of Nord Slesvig.

This Danish borderland is historic ground. At almost every crossroad memorial stones remind the visitor of Denmark's writhings to free herself from the talons of the German eagle—her short-lived success in 1848, and the long alienation of Nord Slesvig under German rule from 1864 to 1920.

Stork Nests on Party Line

At Brøns we were halted by a stork whose fame had reached Copenhagen before we left there. Small wonder, for this adventurous bird had built its huge nest on the top of a wayside telephone pole, where it was unconcernedly rearing its chicks (page 171).

We drove to the old garrison town of Tønder through wilder country, where until the end of the 18th century wolves still were hunted. This historic border town once employed 12,000 lace makers, but their delicate art is now almost extinct.

The skill of the thatcher, however, is still in demand in the near-by village of Møgeltønder, where we found one of these artists hard at work on an old roof.

At Tønder we were close to the present German frontier, which most Danes, not least the south Slesvig minority, would like to see withdrawn to its old geographical limits north of the Eider. There the great earthwork of Dannevirke was begun by the Danes in the 9th century to repel the barbarian hordes from the south.

Near the frontier village of Padborg a barrier of barbed wire and a sentry-post stopped our further advance. Peeping over the wire, we saw a woman and child hand in hand walking up the street.

This fence dividing Slesvig into two zones seems a very artificial barrier to those it stops. As we continued on our way to Krusaa, we wondered how it feels to live in an area where a few yards either way make such a difference in calories!

Krusaa is a busy place with much military traffic. Officials permitted me to walk to the German side, where the Union Jack flew above dispirited German soldiers, who looked at me glumly. In a near-by sentry box an imperturbable British soldier smoked a pipe over his hometown newspaper.

Crossroad Memorials Teach History

A little beyond Krusaa a company of school children were gathered around a crossroad memorial. "At this spot," recorded the boulder, "Christian X met the Danes of south Slesvig on 12th June 1920. They shall not be forgotten."

The sun had set on Dybbøl Mill, and Denmark's historic battleground lay in shadow as we came over a rise and saw below the fertile island of Als and its capital, Sønderborg. Prussian guns destroyed much of old Sønderborg in 1864, but the town still retains an old-world charm.

The fertile soil of Als is literally filled with the dust of the past, for over 3,000 prehistoric graves have been counted on the island.

The green redoubts of Dybbøl, so bitterly contested when Denmark lost Slesvig to Germany in the 1860's, are now a national park and to the Danes a sacred spot.

The Mill itself, twice shot to pieces and restored, still fulfills its function. On its flag post the Danish flag flew throughout the recent occupation. As for the ornate obelisk which Germany raised on the top of the hill to commemorate her victory in 1864, it is today a heap of rubble, destroyed by Danish saboteurs.

Als was a happy epilogue to our tour of 2,000 miles through Europe's oldest kingdom. Next morning we took the ferry which landed us again in lovely Faaborg. Recrossing the Great Belt that afternoon, we reached Copenhagen the same evening.

We celebrated our return by a visit to the Isted Lion, a memorial to Danish soldiers killed in the War of 1848. Restored to his native land in 1945 by Allied might after long exile in Germany, he looked upon us, we thought, with a friendly eye.

Kodachrome by Maynard Owen Williams

Like a Shining Prow, Møns Klint Looks Eastward to a Many-tinted Sea

Hidden behind fantastic 400-foot cliffs, a quiet hotel attracts visitors to a chalk-and-coral shore beside the blue Baltic. Paths lead to the beach or under beech trees rustling in the sea breeze.

← A Visit to Grandpa's Is Like a Call on the Seven Dwarfs

In Marstal, island of Ærø, dozens of retired ship captains doze out their years.

One of them, delighting in drolleries, has decorated his home with the objects of his fancy. Antiques and curios cram his rooms. His love of children and the things that please them is borne out by the statue gallery at his door. It is not difficult to picture the old gentleman saying, "Now, children, once upon a time . . ."

A window (left) fails to reflect the curvature common to many panes in Marstal. In them passers-by get distorted views like those in side-show mirrors.

Children in Fairyland: → the Odense Home of Hans Andersen

His fairy tales are loved by the pure in heart of every age and land. His works reflect the kindly, modest spirit of his native country.

Here, by tradition, he was born April 2, 1805. His home has been a museum since 1908. One of the displays is a dollar bill sent in 1873 by a little American girl who thought the author in want. Sight-seers flock from such far and unlikely places as China.

Kodachromes by Maynard Owen Williams

As Clean as Heaven's Golden Avenue Is a Faaborg Alley

Conducted on an official tour, the photographer puffed his way to a belfry. The sight which caught his eye was not the formal panorama of the harbor, but this Peeping Tom's view of Faaborg's domestic felicity.

Not a soul was in sight to lend "human interest," yet the scene was redolent with life. Windows, flanked with bird boxes, stood ajar to catch flower-scented breezes. Bedding aired on sun porches.

Not a garbage can, smoking incinerator, decaying trash box, or broken milk bottle scarred the cobbled alley. Tidiness seemed enforced by the community's unspoken discipline.

Kodachrome by Maynard Owen Williams

Domed Cloud Scuds Across the Sky; Windmill Sails Swirl Like Propeller Blades

This old mill, one of dozens, grinds grain near Randers. Smaller blades in the rear turn the four large sails into the wind. Skilled farmers, Danes produce three times as much grain to the acre as the United States.

▲ Helsingør Cyclists Span the Öresund with Their Eyes; Ahead Lies Sweden

Busiest of Baltic's outlets to the North Sea is the Öresund. Copenhagen owes its growth to its position convenient to Norse and Swedish trade. Admiral Nelson won one of his famous sea battles here.

▼ If Mamma Hears No Yell from Junior, She Knows He's Safe in His Trailer

Danish bike brigades charge down city streets, weaving to the motorist's right and slipping in ahead, but dutifully stop for lights. Unlike this Marstal youngster, many babies ride handle-bar cribs.

An Angry Sky Lights God's White Temple in Vemmelev

What the Gothic spire is to France and the tapering steeple is to New England, the white-washed step-gabled tower is to the Danish countryside. This tiled building, as bright as if plasterer and painter had just dropped their tools, is typical of Denmark's Lutheran churches.

The established church is Lutheran, and it is supported by the State.

Until 1849 Danish subjects had to belong to the Lutheran faith; baptism was compulsory.

Now complete religious liberty prevails. Catholics, Reformists, Jews, Methodists, Baptists, and others form their own congregations. Civil marriage and burial are permissible.

Kodachrome by Maynard Owen Williams

← Author and Sister Rest Beside a Road Marker

Near Korsør, 100 kilometers from Copenhagen, they stopped to enjoy the sun. Miss Hutchison (right), who has lived in Greenland and lectured in Denmark, reads a Danish newspaper.

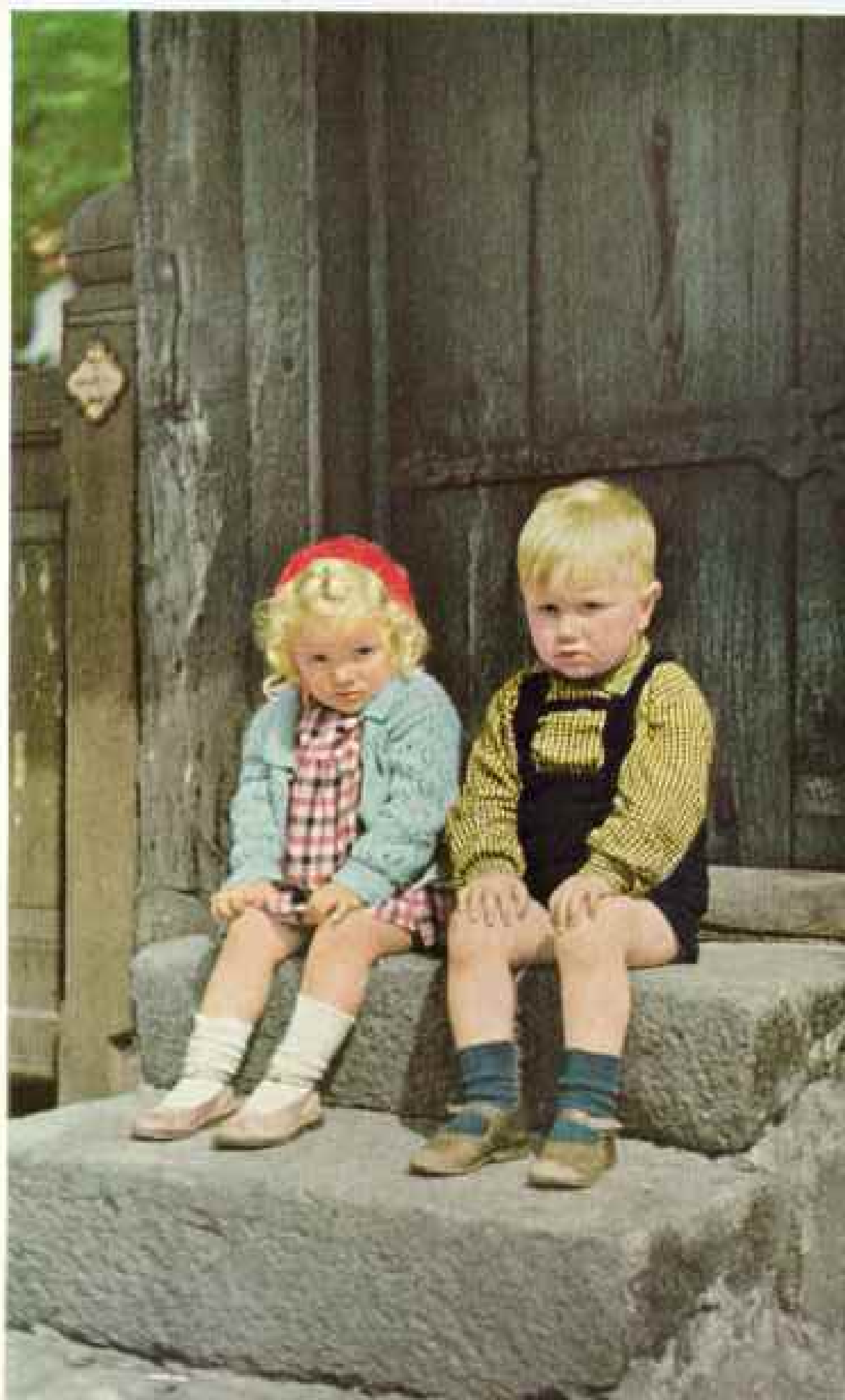
"She's a good traveling companion," says the photographer. "Any time I wanted to stop for a picture, she'd get out of the car, buy an ice-cream cone, and eat it until I completed my task."

This road marker, with its three royal lions, is more elaborate than most kilometer stones in Denmark.

Young Denmark Sits → at Køge's Oldest Dated House

In a town noted for old homes, this weathered frame-and-thatch house is dated 1527. On this day it was locked tight, as if deserted.

Despite Nazi occupation and huge postwar exports of butter and eggs, Danish children are healthy and well-fed. Compulsory education of all children from 7 to 14 dates back to 1814.



^ Sheep at Trælleborg Browse on History in the Ruins of a Viking Camp

An earthen rampart surrounds the fortress. The gate is one of four; keys survive. A thousand years ago the barrack's curved ring of stones was crowned with wooden walls. Its shiplike shape is ascribed to seafarer-architects. Stones in center mark the fireplace.

↑ Harald, Grandsire of England's King Canute, Set Up Jelling's Rune Stones in 900's

On the larger, Harald boasts of having Christianized the Danes; on the smaller, King Gorm memorializes Thyra, his queen. Buried near, they occupy Denmark's oldest royal tombs. Danes are as peaceable as their ancestors, who conquered England, were fierce.

History Repeats in Old Natchez

By William H. Nicholas

With Illustrations by National Geographic Photographer Willard R. Culver

CHAMPAGNE and turkey days are coming back to the durable ante-bellum mansions of Natchez, Mississippi.

Industrial plants and oil, pumped from four fields in Adams County, are spreading wealth in Natchez for the first time since the War Between the States and later the boll weevil ended the reign of its fabulous cotton barons.

Cotton supplied the gold which built the "more stately mansions" on those high bluffs overlooking the Mississippi River (page 190). In pre-Civil War days wealthy planters vied with each other over the size of their spacious houses. They went to Europe to find carved marble mantels, huge gold-leaf mirrors, rosewood furniture, heavy brocade drapes, fine statuary, and other costly furnishings with which to adorn them.

Golden Age of Natchez

Plantation owners cantered into Natchez on spirited horses. Their dazzling ladies were drawn in fine carriages, with liveried outriders and appointments of gold and silver (page 183). Glittering balls testified to the general affluence.

Then came reverses. The straitened owners withdrew into their big houses, and Natchez withdrew into itself. A grim struggle for survival began, to last for the better part of a century.

Paint peeled from the walls of the once-resplendent dwellings and from the once-shining pillars and columns. Costly drapes molded, hand-blocked French wallpaper cracked.

Today, with new wealth, mansions have perked up again. New paint and new plaster have worked wonders.

In the last few years half a dozen homes, long ago abandoned in disrepair, have been restored. Once more they stand proudly alongside those which more successfully withstood the lean days.

Restoration of one of the oldest plantation houses recently was marked by a huge barbecue. Two thousand people attended. Pine-torch flares held by Negro boys lighted the lane to the mansion. Bands played.

Formal receptions signalized the reopening of two other big houses. Long-darkened chandeliers in the huge drawing rooms were lighted. Turkey and champagne appeared in abundance.

"Like old times," sighed more than one Natchezan.

Almost the first thing I saw as I entered the outskirts of the old town one sunny Sunday afternoon was a storage yard jammed with pipe and other oil field equipment.

Industry Brings New Wealth

Later I walked across the expansive floor of the huge $7,000,000 insulating board plant being rushed to completion by Johns-Manville Corporation. I visited the Armstrong Tire and Rubber Company where 700 men were hard at work. I passed a clothing factory where machines clacked busily. Here were sources of the new wealth.*

I strolled to the plaza at the edge of the river bluff, rising 200 feet above the Mississippi, and looked across the broad expanse of water to the Louisiana lowlands. For untold years before the white men came this area was the home of the Natchez Indians.

In 1716 Jean Baptiste le Moyne, Sieur de Bienville, the French colonizer, clambered up the bluff to establish a stockade, which he named Fort Rosalie. But 13 years later the Indians massacred the settlement's entire population.

At the close of the French and Indian War British redcoats took over Fort Rosalie. Within 10 years some 15 English families occupied large grants of land about the settlement.

During the Revolution a third flag flew over Natchez—the flag of Spain. While England was occupied along the Atlantic seaboard, the Spaniards moved in the back door and took the town. Not until 19 years later was the young United States able to gain possession.

Near where I stood at the edge of the river bluff was the southwest terminus of the historic Natchez Trace, wilderness trail which in pioneer days linked Natchez and Nashville, Tennessee, 450 miles away.

Buffaloes Built Natchez Trace

Original builders of the Natchez Trace were buffaloes. On their way to salt licks or feeding grounds, year after year, their hoofs beat out trails through the wilderness. Several of these trails, when joined together by the Indians, led southwesterly from Nashville to the Mississippi. This rude road system provided

* See "Machines Come to Mississippi," by J. R. Hildebrand, National Geographic Magazine, September, 1937.

For 150 Years Bucket Ropes Grooved This Cistern's Rim

The tank is one of several on the grounds of Gloucester Plantation, bordering the Natchez Trace (pages 194 and 197). They were kept filled by piping rain water from the old plantation mansion's spacious roof.

communication among the Natchez, Choctaw, and Chickasaw tribes.

Over the Trace Andrew Jackson and his soldiers marched to and from the Battle of New Orleans. The Marquis de Lafayette, John James Audubon, Henry Clay, Jefferson Davis, Aaron Burr—all rode over the Trace. Meriwether Lewis, of Lewis and Clark fame, died on it three years after returning from his western explorations.

Flatboatmen, who floated down the Ohio and Mississippi to New Orleans with their produce, sold both produce and boats there and walked home over the Natchez Trace. They couldn't push their boats upstream against that Mississippi current.

Soon the lonely trail became infested with bandits and outlaws who preyed upon the flatboatmen and other travelers with well-filled purses, robbing and killing them without mercy.

With the coming of the steamboat, the Trace fell into disuse. Now the Federal Government has begun to build a new Natchez Trace Parkway over the route of the old.

One afternoon I drove along vestiges of the old trail outside Natchez. In the loess soil of the bluff region between Vicksburg and Baton Rouge, a century of use had cut into the Trace so deeply that it had become a sunken road, in some places 30 feet lower than the tree-lined banks on either side.

Natchez Homes Spell Romance

I saw other roads around Natchez which also had been worn deeply into the loess, a soil borne into the region by the winds of centuries. In relatively few areas in the world are such deposits of loess found, notably in China.*

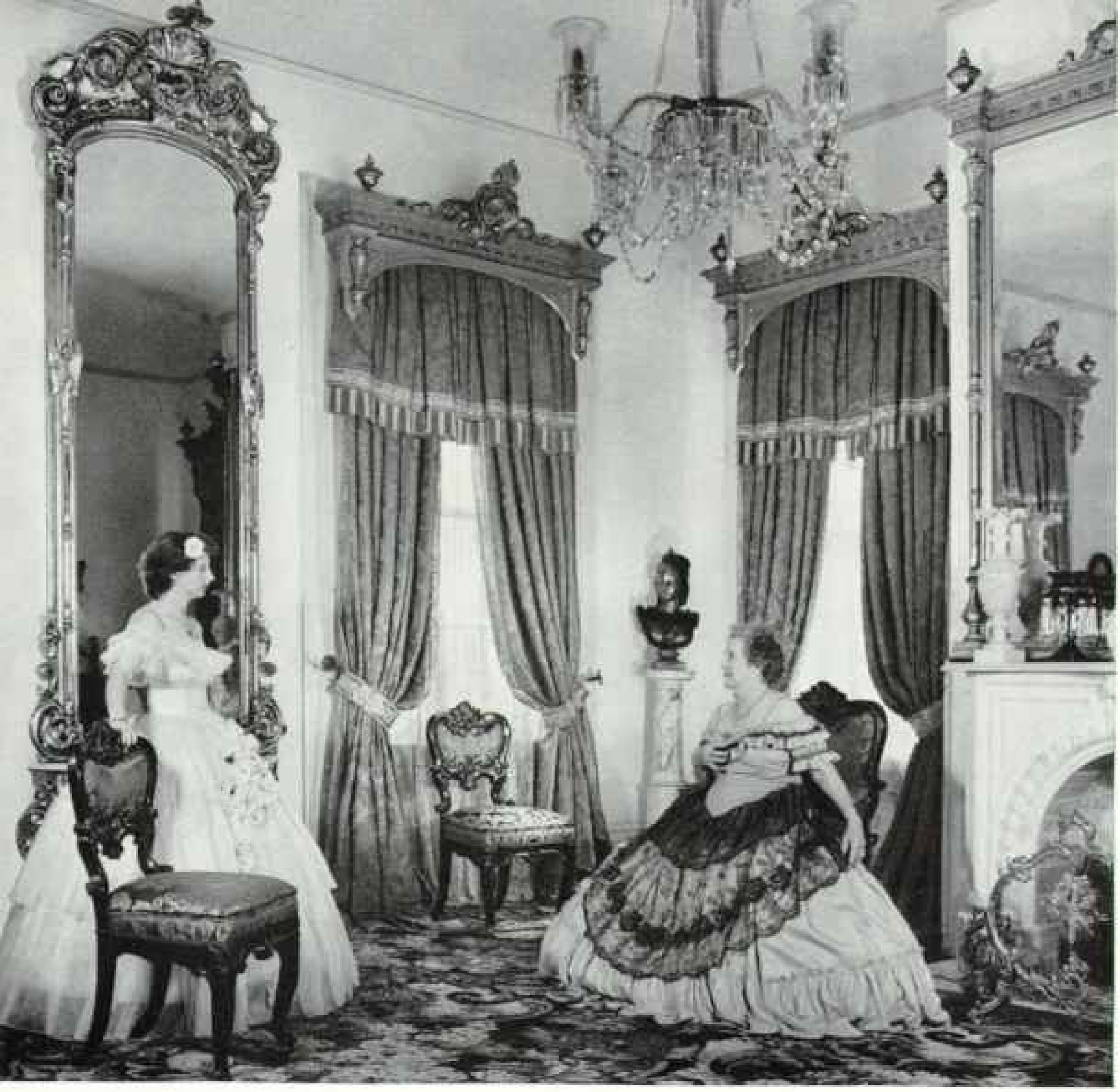
But the real story of Natchez is the story of its remarkable houses, in which, with some exceptions, succeeding generations lived for more than a century, and in which they are living today. This Natchez heritage is familiar now to thousands of Americans who have inspected many of the homes during Pilgrimage Month.

For the occasion the mistresses of the houses and their assistant hostesses don resplendent hoop skirts of silks and brocades, and welcome with true Natchez hospitality every "pilgrim" who appears. In March, 1948, Natchez entertained more than 30,000 guests.

* See "China Fights Erosion with U. S. Aid," by Walter C. Lowdermilk, National Geographic Magazine, June, 1945.

"Taking the Air" on the Natchez Trace in the Style of a Vanished Day

Mrs. Ferriday Byrnes re-enacts the scene on a strip of the original frontier trail which linked Nashville, Tennessee, and Natchez. She is a leader in the project to convert the historic Trace into a modern parkway.



Century-old, Silk-damask Drapes Hung from Gold-leaf Cornices at The Burn

Vegetable dyes gave to the rare carpeting its vivid shades of blue and red. During the War Between the States this Natchez mansion was turned into a hospital for Union soldiers. Now the Italian mirror (left), the Empire mirror (right) and cornices, and the Louis XV type chairs have helped restore The Burn to its former grandeur.

The tours began in 1932. Each year owners who open their homes receive a percentage of the proceeds. In the lean years before World War II this addition to the meager incomes of many of the households actually saved historic landmarks from ruin.

Accompanied by charming and well-informed Garden Club guides, I visited the houses and absorbed the lore of Natchez.

King's Tavern is the oldest surviving building. No one knows just when it was built. Squat construction, ancient timbers, and loopholes on the upper floors suggest that it once may have been a blockhouse of Fort Rosalie.

Richard King, an Englishman, acquired it as a tavern in 1789. For the past 130 years it has been the home of the Postlethwaite and Bledsoe families of Natchez. Among the household's prized possessions is a Benjamin West portrait of the early settler, Samuel Postlethwaite.

Homes Recall Spanish Way of Life

King's Tavern has a lurid past. It entertained the rude backwoodsmen, flatboatmen, itinerant merchants, outlaws, and adventurers who traveled over the Natchez Trace. I saw a jeweled dagger which was found between two bricks of one of the old chimneys a few years ago, when workmen were repairing it.

Three skeletons have been unearthed from the cellar.

Natchez homes built between 1775 and 1800 reflect Spanish or Louisiana plantation influence, with high steps, low ceilings, iron grilles, lacy iron balconies, or paved patios. They also recall the gay days of the Spanish governors, who brought to Natchez their gracious ways of life.

Part of Hope Farm, one of the earliest of these pleasant dwellings, was erected before 1775 and later was the home of Don Carlos de Grandpré, one of the Spanish rulers (page 198). I noted the building's hand-hewn cypress timbers, fastened with wooden pegs, all as sound today as when the house was built.

The old home was restored about 20 years ago by Mr. and Mrs. Balfour Miller. Among its exquisite furnishings, a crystal candlelight lamp suspended over the dining room table particularly caught my eye.

Mrs. Miller, a descendant of one of the town's oldest families, is the originator of the Natchez Pilgrimage. Skeptical Natchez businessmen considered it an impractical dream, but after the first tour they presented her with a loving cup.

Walls of fortlike thickness enclose The Elms, a graceful, pink-stucco reminder of the Spanish era. Low ceilings in the original part of the house, built by a forgotten grandee about 1782, contrast strikingly with the high ceilings of an annex, erected 75 years later. The graceful wrought-iron staircase; wrought-iron lanterns, locks, and keys; and an old ivy-grown ruin of an arch in the azalea and camellia garden are other Spanish reminders.

Cupid Conquers Both Blue and Gray

The most romantic episode at The Elms goes back to Civil War days. Federal guards around the home were about to be removed. But Miss Nancy Thornhill, the young lady of the house, requested that one handsome young Union officer be permitted to remain because he was "such good company." Her maidenly request was granted; they fell in love and were married.

Mrs. Joseph B. Kellogg, the present mistress of The Elms, is a member of the sixth generation to live in the mellow old home.

Lacy iron galleries in honeysuckle and rose motifs grace the faded red-brick façade of Bontura, a Spanish Creole masterpiece. Built in the 1790's, it later came into possession of Don José Bontura, wealthy Portuguese tavern keeper and wine merchant.

Tradition says Mark Twain and Stephen Foster were entertained at Bontura. From its balconies eager spectators watched the epic steamboat race between the *Natchez* and the *Robert E. Lee* (page 187). But railroads and warehouses encroached on the mansion until it so declined that it was about to be condemned.

Now Bontura has been restored and once again can welcome guests with wine and music. On the drawing room floor of original cypress is spread an Aubusson rug of the 1830's.

On Ellicott's Hill stands Connelly's Tavern, built by a Frenchman or Spaniard before 1795 (page 206). Here a Quaker, Andrew Ellicott, first flew the Stars and Stripes over Natchez in defiance of the Spanish authorities. A ship's architect was responsible for the tavern's exquisite interior woodwork.

Tavern Scene of Burr's Conspiracy

Beneath the vaulted taproom ceiling Aaron Burr plotted with his confederates to set up a Southwestern nation. Burr was tried for treason at Washington, Mississippi, six miles east of Natchez. It is said that attendance at the trial was so great that court was held outdoors, beneath giant oaks that stand today on the edge of the campus of Jefferson College.

I saw copies of tavern rules from pioneer days. They insist that guests must remove their shoes before they retire; that no more than four men may occupy one bed. The management disclaimed responsibility if a guest robbed a sleeping companion.

Connelly's Tavern was almost a ruin when the Natchez Garden Club acquired it in 1936, restored it to its former state, and made it club headquarters.

Airlie, home of the Ayres P. Merrill family, was erected by a Spanish grandee before 1790. Here silver gleams from massive mahogany sideboards; a French china set and pieces of rare crystal and other old glass grace the dining room table.

Cherokee, before which American soldiers encamped when they came in 1798 to claim Natchez for the United States; Linden, with its spacious galleries, home of the Conner family of Natchez for five generations (page 202); and a tumbled row of one-story buildings in the old courthouse square, known as Lawyers' Row, also belong to the Spanish period.

Not far from Natchez stands another famous early mansion—sturdy Springfield, where Andrew Jackson courted and married his beloved Rachel.

Concord, once the home of the Spanish governors, also was a Natchez landmark. But some few years ago it was destroyed by fire and now all that is left of this center of the

Crystal Pendants Gleam in Elmscourt's Mellow Candlelight

The ornate chandelier came from France. Gold leaf overlays the frame of the Venetian mirror, which is flanked by old wall sconces. Atop the Italian-marble mantel stand two Dresden vases and an old candelabra of odd design (page 191). An English wall table in the banquet room is said to have been made for a Duke of Devonshire; the dining table, with chairs to match, was made by Duncan Phyfe.

town's early social life is an iron-railed double stairway standing amid the ruins.

Fire has robbed Natchez of some 40 old mansions in the last half-century. Notable among these was Homewood, restored by a wealthy New Yorker and filled with rare furnishings. In 1940 this showplace burned to the ground.

Inglewood, the home of one of my guides, Mrs. Paul Schilling, was razed recently by fire. It had been one of the houses opened during Pilgrimage Month. Many of the fires, a Natchez attorney told me, have been caused by faulty electric wiring.

Richmond—Three Houses in One

Unusual Richmond actually is three residences in one. The central portion, of Spanish style, was built before 1794; the two-story back part is in severe Colonial design; the front, with lofty classic portico and entrance, typifies the architecture of the lush times before the War Between the States.

The seventh generation of the Levin R. Marshall family lives today in the 40-room mansion. The wide center hall in the front is lighted from a small dome in the ceiling. On one side are large double drawing rooms with black African marble mantels, French gold-leaf mirrors, gold-leaf-covered cornices; brocaded drapes; and rosewood furniture—all original furnishings.

In one drawing room stands a carved rosewood piano—the finest in the county when P. T. Barnum brought Jenny Lind to Natchez for a concert in 1851. The piano was

From Bontura's Gallery Onlookers Saw the *Natchez* Race the *Robert E. Lee*

Crowded along the lacy iron grillwork of the old mansion, they had a clear view of the Mississippi when the two steamboats churned upriver, firemen begrimed, boilers overtaxed, funnels billowing smoke. The epic race began at New Orleans at 5 p. m. on June 30, 1870. It ended with the arrival of the *Robert E. Lee* at St. Louis, 1,180 miles to the north, at 11:25 a. m. on July 4. John Cannon, the victorious skipper, had dared to push through a heavy fog the night before, while the *Natchez* lay tied up for six hours.

hauled to the First Methodist Church, where 770 Natchezans paid $6,500 to hear Jenny Lind sing to its accompaniment.

In the huge double dining rooms in the old section of the house, with other pilgrims I sipped coffee from the silver coffee and tea service, originally composed of more than 100 massive pieces.

Horses Tied with Silver Chains

Richmond houses a remarkable collection of old bathtubs, including a pump-operated shower bath more than a century old; a small sitz tub popular in the 1840's; a French sitz enclosed in a mahogany frame with a compartment for soap and washcloth; a gentleman's long, oval tub; a lady's round one with wide rims; and a "mint julep" tub, so called by the planters because of its steadying headpiece.

The Natchez country in its heyday was wont to boast of more millionaires than any other community in America except New York. One, Henry Chotard, built hand-carved mahogany stalls in his stables, lettered each horse's name in Gothic on a silver plate, and tied up the animals with silver chains.

Among the earliest of the more pretentious plantation mansions is Gloucester, built about 1803 on the old Natchez Trace (pages 182 and 197). Twin entrances inside the huge portico have hand-carved lintels and striking fanlights. In the drawing room a huge French mirror, carved in classic garlands and overlaid with gold leaf, hangs over a black African marble mantel, its columns and Ionic capitals carved in Italy. Old masters hang on the walls.

Green Leaves, home of the Beltzhoover family, was built before the War of 1812. One of its many treasures is a set of china, painted by Audubon, with a different design

of bird or flower on each piece (page 201). Audubon spent several years of his early married life in and near Natchez, teaching art and music, and doing much painting.

"Until the pilgrims came along," Mrs. Melchior Beltzhoover told me, "we in Natchez did not realize the value of many of our family possessions. I know when I was a girl the most remarkable thing about this set of china to our family was the fact that it had been sent to France to be fired, since no kiln was available here. The fact that Audubon had painted it made little impression."

Once a number of out-of-state newspapermen were visiting Natchez. At Green Leaves they were inspecting the Audubon service spread out on the dining room table.

One of their escorts, in a moment of preoccupation, picked up one of the plates and casually tossed it into the air, then just as casually caught it. The alarmed director of the group told him that if he touched another piece of that priceless set, he would be forcibly ejected. The plate-tosser was terribly embarrassed.

But Mrs. Beltzhoover, who had observed the incident without the flicker of an eyelash, comforted him and gave him to believe that the Beltzhoover family spent its spare time tossing Audubon plates into the air. Natchez women are like that.

Accident Revealed Silver Hardware

While rambling Twin Oaks, built on a Spanish land grant in 1814, was being restored a few years ago, one of the workmen accidentally dropped a bit of acid on a piece of hardware. He thus unwittingly brought to light one of the distinctive features of the old home—locks, hinges, escutcheons, rosettes, all painted black by someone in the past, actually were of Sheffield silver!

Elmscourt (pages 186 and 191), with its portraits of thoroughbreds from the Surget stables in the ante-bellum days when Natchez had its own race track, was the family home of Vice Admiral Aaron Stanton (Tip) Merrill, Retired. He won the Navy Cross and the Legion of Merit for extraordinary heroism and outstanding services while commanding a South Pacific task force in the Guadalcanal and Bougainville campaigns.

Square-columned, dignified Monmouth, where lived General John A. Quitman, Mexican War hero; Mistletoe, delightful "Mississippi Planter" house; Elgin, whose graceful galleries are half hidden by huge oaks draped with Spanish moss; and The Briers, where Jefferson Davis wooed and wed the lovely Varina Howell, are other beautiful early 19th-century plantation houses surrounding Natchez.

A combination of romance, religion, and business acumen account for two of the town's historic houses, Rosalie and The Parsonage.

A Parsonage for Wandering Ministers

When Peter Little, successful planter and financier, was in his late thirties, his friends, Mr. and Mrs. Jacob Low, were stricken with yellow fever (often epidemic in early Natchez). Their 13-year-old daughter, Eliza, became his ward and Peter Little was named administrator of the Low estate.

He decided to send the girl to school in Maryland, but suggested that they be married just before her departure. Eliza agreed, and immediately after the ceremony she boarded a boat for New Orleans on her way to Maryland. When she returned several years later she became the mistress of Rosalie, the fine mansion her husband built for her near the site of the old French Fort Rosalie.

The couple lived together most happily, but Mrs. Little was consumed with religious zeal. She insisted on giving lodging to the itinerant Methodist ministers who stopped in Natchez on their way up or down the Mississippi River, and extending to all circuit riders the hospitality and comforts of Rosalie. The ministers received hot coffee at their bedsides in the morning, meals at any time convenient to them, horses to drive, and maids to attend their wives and children if they happened to be along.

Peter Little grew tired of these constant guests, so he built a spacious home across the street in which to entertain them. He called it The Parsonage.

Rosalie Restored by DAR

Rosalie, a Georgian mansion, has been restored by the Mississippi Daughters of the American Revolution as a national shrine. During the War Between the States, it was headquarters for the Union general in command of the occupation forces.

The furnishings of Rosalie include massive canopied beds, red-flowered carpets, French china, and mahogany and rosewood drawing room furniture. The trim Parsonage has been the home of the Metcalfe family of Natchez for half a century.

Many echoes of the War Between the States linger on in the old town. Bayous which enclose classic Ravenna and its smiling gardens became secret passageways by which residents of Natchez smuggled food to the hard-pressed Confederate soldiers outside the town. The Burn, a sterling example of pure

Kodachrome by Willard R. Culver

Stately D'Evereux Keeps Alive Traditions of Ante-bellum Plantation Days

Built in 1840 by a wealthy planter, the mansion is one of two-score standing in or near Natchez, Mississippi, as reminders of the golden age of the cotton barons. Hollywood companies frequently film the tall white columns.

Kodachrome by Willard R. Culver

On a Bluff Overlooking the Mississippi the Natchez Ballet Pauses in Its Dance to Form the Letter "N"

The girls, all under 16, begin training when they are four or five. Peak of their careers is an appearance in the Confederate pageant held during Pilgrimage Month to entertain visitors. Each March, 30 to 35 old homes are opened to the public for the pilgrimage. Then the women bloom in hoop skirts and the men in cutaway coats.

From Belgium Came Lacy Ironwork to Grace Elmscourt, Famous a Century Ago for Glittering "Balls of a Thousand Candles"

Kodachrome by Willard R. Culver

French Brocatels and Carved Rosewood Furniture Add Luster to the Drawing Rooms of Palatial Melrose

Tradition Says a Chaperon Sometimes Replaced the Chess Table in Melrose's Swiveled, Three-seated Game Chair

Kodachrome by Willard R. Culver

Kodachrome by Willard R. Culver

From the Fireplace of the Plantation Kitchen Came Savory Roasts for Gloucester's State Dinners

"Not Too Hot, Mammy!" A Tin Tub Is Filled from a Kettle

A scene familiar before the days of modern plumbing is acted out by lamplight in front of a roaring fire in a bedroom at Edgewood.

The portable tub's wide rim permits some splashing without spattering floor and rug.

Early Natchez bathtubs were ingenious. One, a French sitz, had a mahogany frame and soap and washcloth compartments. Another the planters called a "mint julep" tub, because it had a steadying headpiece.

The Lambdin family has occupied Edgewood since it was built a century ago.

Many canvases from the brush of James Reid Lambdin, distinguished portrait painter, hang within.

Kodachrome by Willard R. Culver

Union Soldiers Stabled Horses in Monteigne's Drawing Room in the War Between the States

The beautiful mansion received rough treatment because it was the home of a Confederate general. His spirited wife saved some furnishings by defying looters. Cavalrymen turned the piano into a feed box for their horses.

Kodachrome by Willard R. Culver

Within Gloucester's Walls a Yankee Puritan Gave His Heart to Dixie

Winthrop Sargent, first Territorial Governor of Mississippi, acquired the plantation after his term expired and named it for his home town in Massachusetts. "It is a costly establishment and unprofitable," he said in his will.

Grandees Slept Here When Spain's Flag Flew over Natchez

Hope Farm was built in 1789 by the Spanish governor, Don Carlos de Grandpré.

Natchez was settled by the French in 1716. About half a century later it became part of the British Empire.

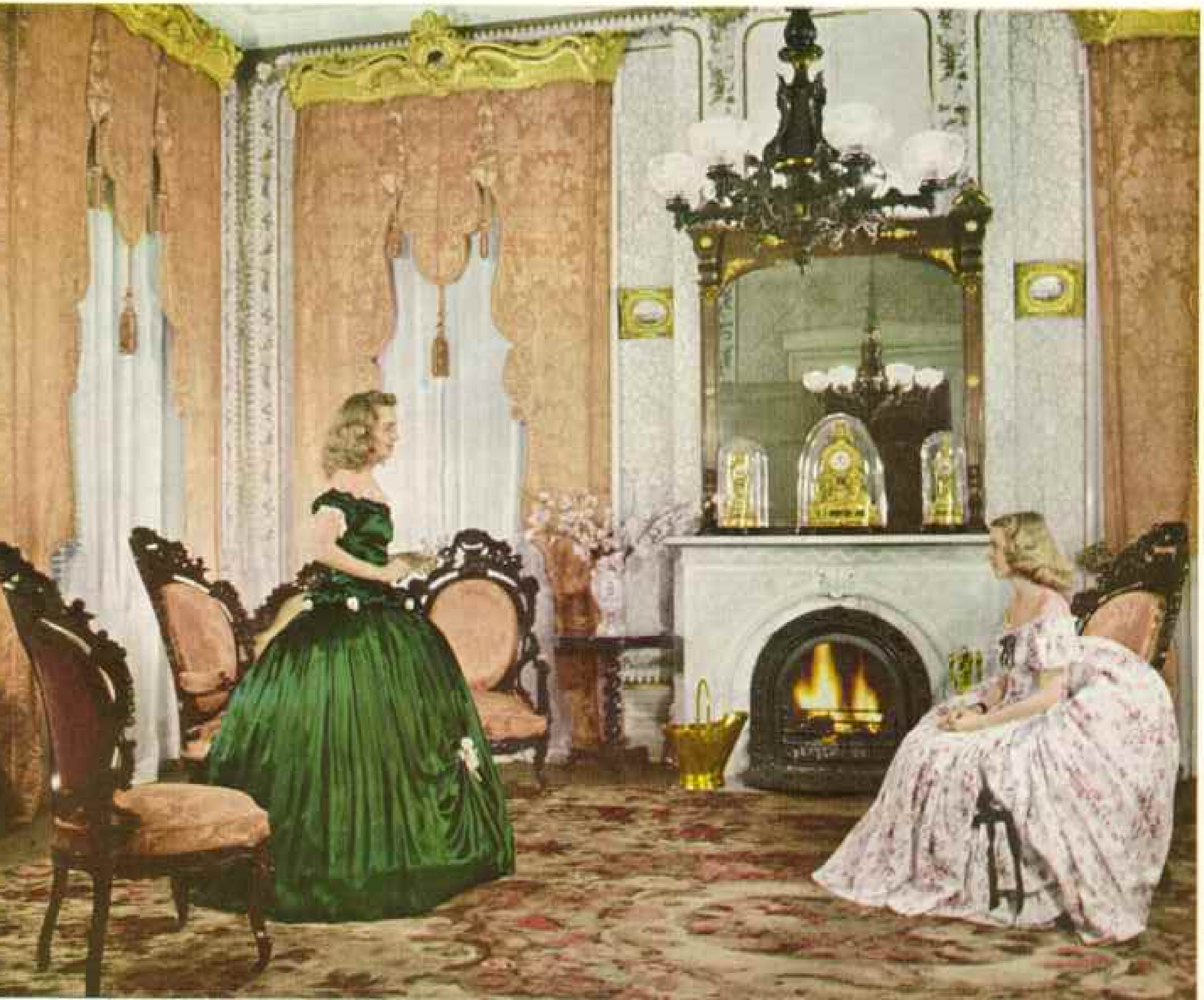
During the Revolutionary War Spaniards seized the settlement and ruled it as a province until 1798, when the United States claimed it.

Hope Farm has been restored by Mr. and Mrs. Balfour Miller. Mrs. Miller, in 1932, originated the Natchez Pilgrimage. Since then, with the exception of the years of World War II, as many as 30,000 visitors have come to Natchez each spring to see the old homes.

After the War Between the States Natchez suffered a decline which, as years went on, plunged the community into a prolonged depression.

Proceeds from the pilgrimages saved many ante-bellum mansions from ruin.

Today, general economic improvement has restored prosperity to Natchez.



Lansdowne Preserves French Wallpaper, Original Carpets

This palatial mansion, built before the War Between the States, contains its original furnishings. Descendants of the first owners make their home here.

The parlor's imported white-marble mantel has a hand-carved calla-lily design. Mahogany and rosewood furniture is upholstered in rose brocade. From massive window cornices hang brocade draperies.

Ornate bronze chandeliers were lighted by gas supplied by the first private gas plant in Mississippi.

A central hall 90 feet long connects front and rear galleries and all rooms on the first floor.

Kodachrome by Willard R. Culver

Swinging Punkah Stirs an Alternating Breeze in Mississippi's "Good Old Summertime"

Half a dozen Natchez dining rooms have these cooling devices which were originated in India. Melrose's hand-carved fan is of mahogany. Motive power is a pull on the cord. An old French china service graces the table (pages 192 and 193).

© National Geographic Society 201 Kodachrome by Willard R. Culver

Audubon Painted a Bird Design on Each Piece of This Priceless China

This dinner service belongs to Green Leaves, built before the War of 1812. Because no kiln was available in Mississippi, the china was sent to France for firing. John James Audubon spent several years in Natchez, teaching music and painting.

Moss-hung Oaks Shade Linden's Pillared 96-foot Gallery

One of the earliest plantation houses in the Natchez community, Linden was built as a four-room house during Spanish days. Additions turned the place into a huge, rambling mansion.

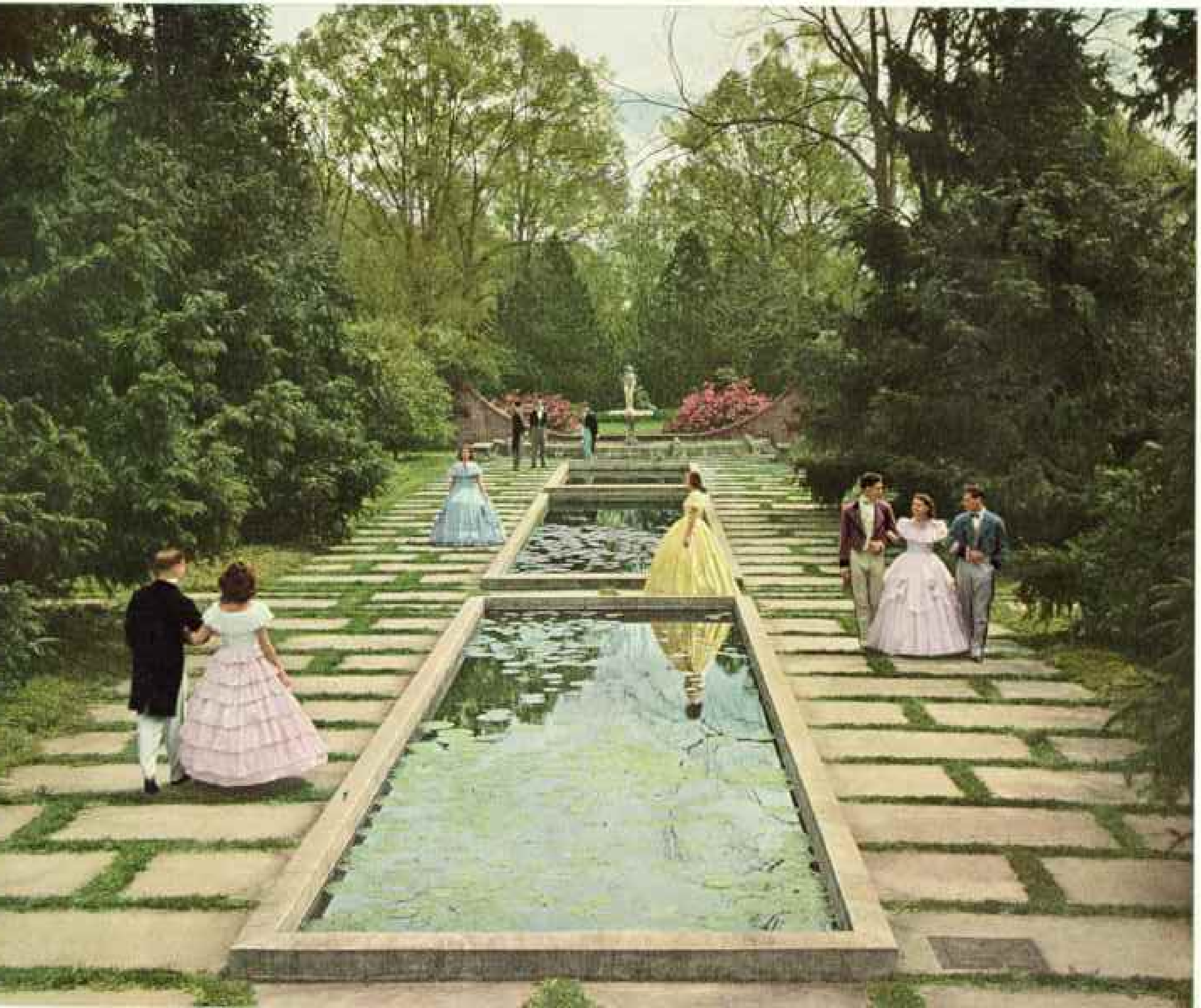
Two rear wings form an enclosure with garden and swimming pool.

Here lived Thomas B. Reed, United States Senator from Mississippi.

For a century the home has been occupied by members of the Conner family.

Among the rich furnishings are three Audubon paintings.

Kodachrome by Willard R. Culver



Camellias and Azaleas Edge Monteigne's Formal Gardens

More than 150 varieties of camellia japonica grow on the estate—an outstanding display even in camellia-minded Natchez.

Monteigne stands on an old Spanish land grant.

When it was under construction in 1855, excavators found hand-hewn timbers, evidence of a much earlier structure (page 196).

Kodachrome by Willard R. Culver

Auburn's Ingeniously Balanced Spiral Staircase Seems to Hang in Mid-air

This 1812-built mansion, ancestral home of the Duncan family, was deeded to Natchez as a memorial. It stands in Duncan Memorial Park. Despite its many years, the staircase is as sturdy as ever.

Greek architecture, surrounded by camellia and azalea gardens, was converted into a Federal hospital (page 184).

Monteigne Victim of Looters

Monteigne, classic home of Confederate General William T. Martin, suffered at the hands of troops who stabled their horses in its exquisite drawing rooms, destroyed costly furniture, and broke rare china and crystal. No sign of such ill treatment is visible in beautiful Monteigne today (pages 196 and 203).

Spacious Lansdowne, built by a slave owner of fabulous wealth, preserves its original furnishings—a priceless collection of museum pieces (page 199). The vast central hall is 90 feet long. Ornate bronze chandeliers once were lighted by gas from the private Lansdowne gas plant—before Natchez had its own. Original rose and white hand-blocked French wallpaper graces the parlor walls. Descendants of the original owners still live here.

Frequent guest of St. John Elliot, the builder of D'Evereux, was Henry Clay. Legend tells that once, when the Kentucky statesman was strolling on the grounds of this imposing mansion, a servant mistook him for an intruder and set a dog upon him, to the extreme embarrassment of all concerned.

D'Evereux, with its tall white columns, its wrought-iron balcony above the entrance doorway, and its setting among old, moss-festooned trees, has more than once been used by motion picture companies as an ideal Southern plantation mansion (page 189).

Graceful Dunleith, with its colonnade of tall pillars, stands in a park of terraced lawns—another storybook plantation setting.

Melrose Intrigued Henry Ford

When the late Henry Ford visited Natchez, he was intrigued by the furnishings of Melrose, another mansion of the "golden age" (pages 192, 193, and 200). In perfect preservation are the costly original furnishings. Here Mr. Ford found items he had never seen before in his years of experience as a collector.

Over a mantel hangs Audubon's panoramic painting of Natchez. The naturalist had been commissioned to do the painting, but when it was completed the prospective purchaser had died. Audubon tried in vain to sell it, and finally left it in a store when he departed from the Natchez country. The painting eventually wandered to France, then was brought back to Natchez and acquired for Melrose.

The mansion to outdo all other mansions in town finally was built by Frederick Stanton, who made his fortune during the "golden age." He chartered a ship to bring building materials and furnishings from abroad for Stanton Hall.

The grounds, occupying a whole block, are enclosed by a handsome wrought-iron fence. The mansion's fluted Corinthian columns rise in a park of huge trees (page 207). Grilles of iron roses surround the galleries.

Ceilings soar to a height of 22½ feet. Drawing room and music room, thrown open, become a ballroom 72 feet long. Arches, hand carved in Italy, span the entrance hall and drawing room doorway. Huge bronze chandeliers, each with a different design, hang in the four rooms on the main floor. The one in the library has carved figures of French soldiers at Natchez, complete with their armor and weapons.

Off the vast central hall a recessed stairway rises three flights in eliptical curves. Elaborately carved white Carrara marble mantels frame the fireplaces.

But Stanton Hall was too big. A year after it was completed, in 1858, Stanton died. Then came the War Between the States, and its aftermath of deflation. Valued at $550,000, the home changed hands in 1870 for $7,000. Later it was sold again for less than the cost of the wrought-iron fence which surrounded its grounds. In 1940 the Pilgrimage Garden Club acquired the property as a headquarters and a club restoration project.

Split Pants Interrupt Tour

Although history and tradition surround the people of Natchez, their daily problems are similar to those everywhere else. For example:

The morning Mrs. William Feltus accompanied me to several homes, we halted our tour about noon to drive to the grade school, pick up her son Charles, aged 9, take him home, then find a bite of lunch.

As we drew up, Charles came running toward us, his sweater pulled about his waist and hanging downward like a skirt. Before his mother could introduce us, he exclaimed:

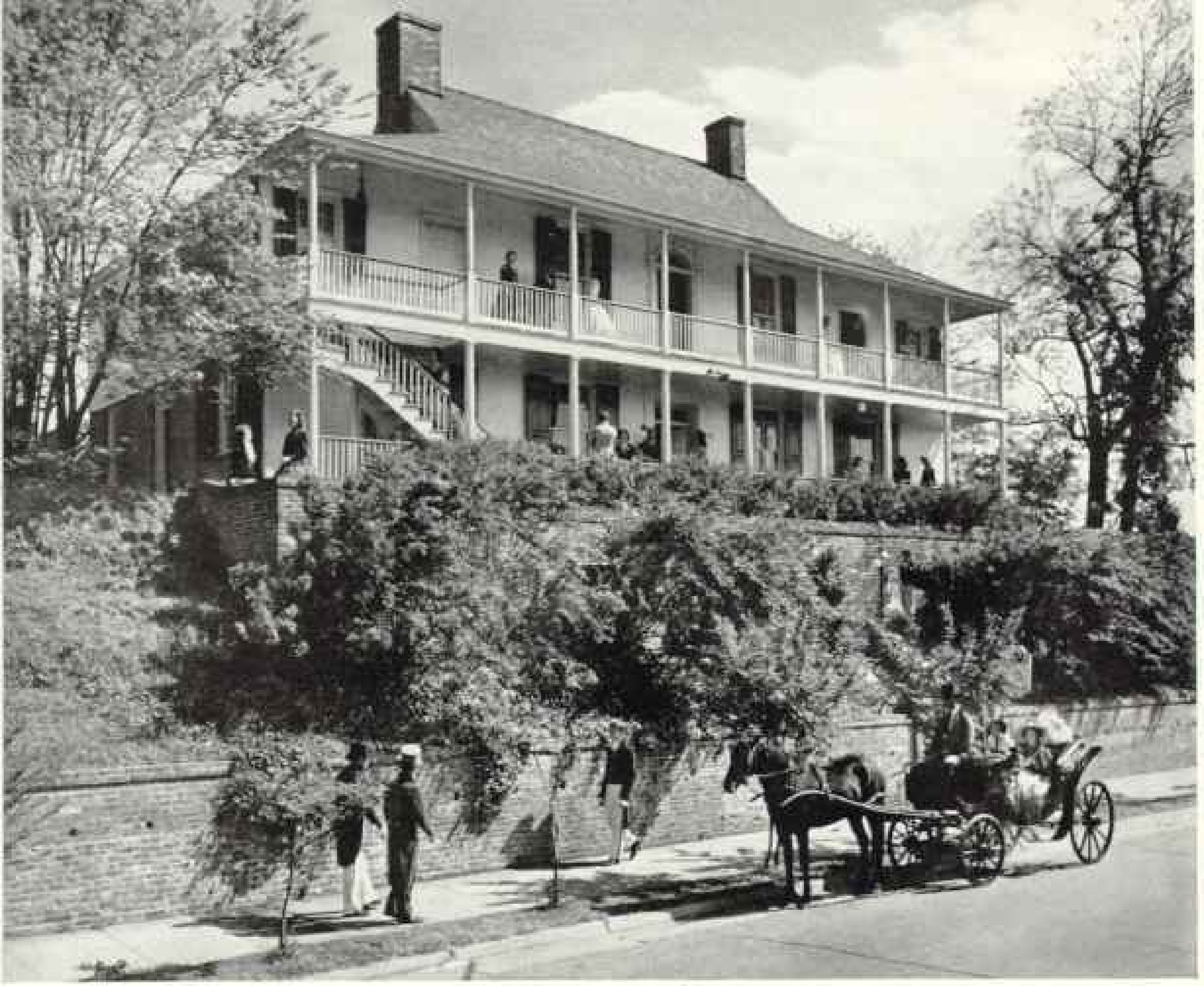
"Mother, something terrible happened."

"What was that, Charles?" Mrs. Feltus asked, prepared for anything.

"I split the seat of my pants!"

So we interrupted our schedule while Mrs. Feltus saw to it that Charles was properly clothed for the afternoon session.

Then there was the afternoon when Mrs. Bernard Wood was piloting me about in the new family car. We emerged from one house to discover that another car had backed into hers and had left a big dent in a fender. Mrs. Wood was preoccupied for the rest of the tour, but at home that evening she found, to her



From Connelly's Tavern Old Glory Waved Defiance to Spanish Rule

Vaulted ceilings of the relic, built when Spain claimed Natchez, may have been the work of shipwrights. Much of the building's construction suggests old sailing-ship design. Nine years ago the Natchez Garden Club bought the Tavern, then in a sad state of repair. Today, restored and refurnished, it is the Club's headquarters (page 185).

relief, that her husband was sweetly amiable about the matter.

Again, one morning at Twin Oaks, the day's first pilgrims started to ascend the stairs to the second floor. With a swoosh of hoop skirts, Mrs. Homer D. Whittington rushed up ahead of them, "just to make sure," she told me, "that the maid had actually finished making all the beds."

"Battle of the Hoop Skirts"

Little human problems, growing into big ones, were responsible for the rise of divergent groups in the Natchez Garden Club before World War II. This led to an open break and formation of the Pilgrimage Garden Club. For a few years tempers flared, two rival tours were held, and the newspapers heralded "the Split" in headlines as the "Battle of the Hoop Skirts."

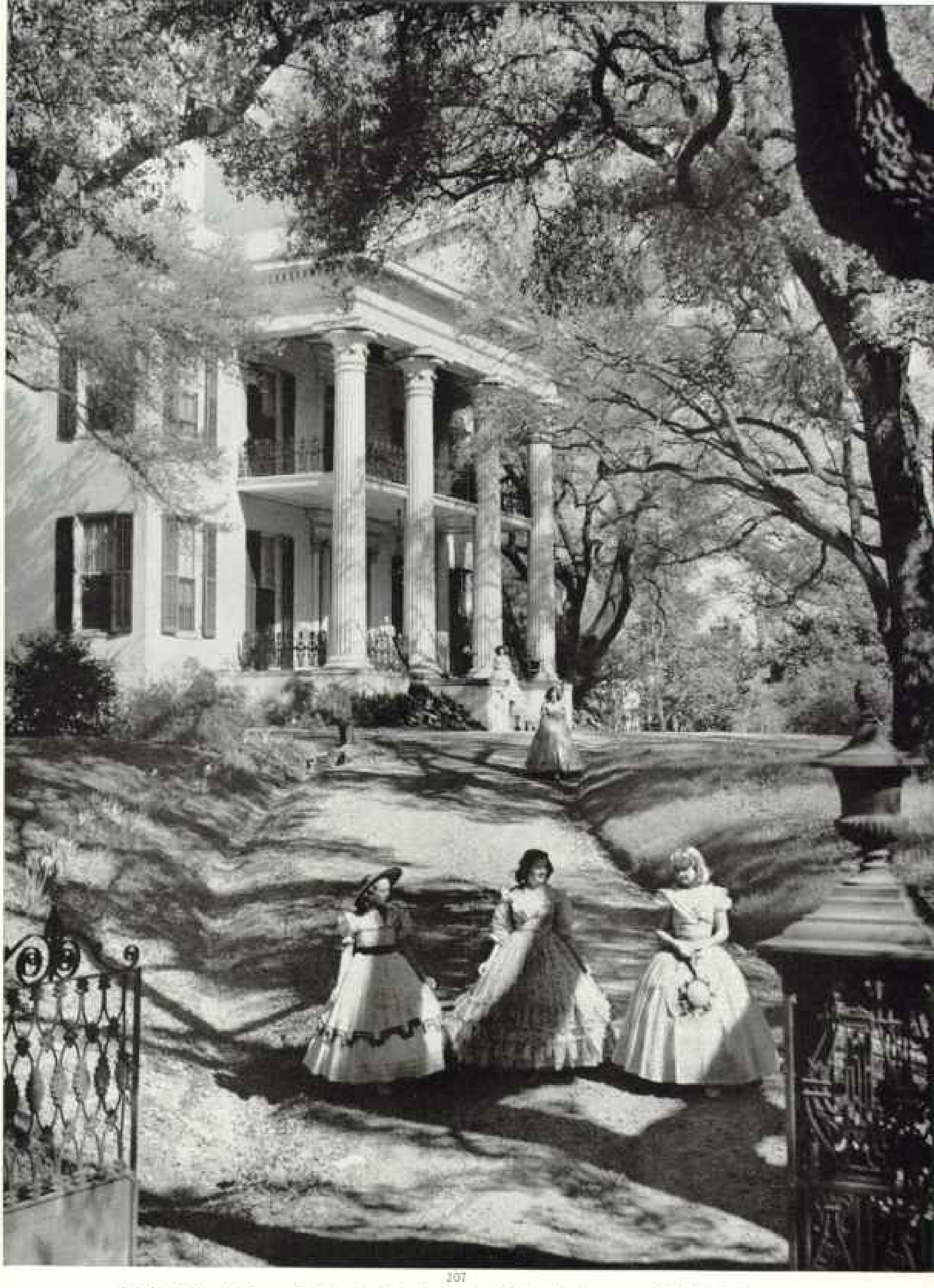
Natchez women didn't like the publicity, but it brought thousands of extra visitors to the town to see what all the fussing was about. World War II interrupted the tours, and by the time they were resumed a truce had been arranged. Now the two clubs join forces for Pilgrimage Month and hold a single tour.

Longwood's Strange "Arrested Development"

The story of Natchez would be incomplete without mention of Longwood, a dream of a Southern planter which never was realized.

Dr. Haller Nutt, a scientist and a cotton grower, engaged Samuel Sloan, Philadelphia architect, to draw plans for his new mansion, which he wanted to be distinctive and original. The building was to be of five stories, octagon shaped, surmounted by a glass cupola, a bulbous dome and a slender spire—about 100 feet high altogether. The plans were a source of interest even in the East, and were published in a pre-Civil War copy of *Godey's Lady's Book*.

Artisans came from Pennsylvania to finish



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Dixie Belles' Hoop Skirts Swish Again in Majestic Stanton Hall's Driveway

Completed in 1858, the huge mansion, with its tall Corinthian columns, was valued at more than half a million dollars. A "white elephant" since Reconstruction days, because of its size, it once sold for less than the cost of the iron fence which surrounds it (page 205).

Unfinished Longwood, a Planter's Dream Dashed by the War Between the States

Northern artisans departed to answer the call to the colors, leaving tools and paint buckets scattered about the floors. Costly statuary and furnishings en route from Europe were seized in the blockade. Only the basement was completed. Descendants of Dr. Haller Nutt, for whom the octagonal structure of Moorish design was being built, live there today. The upper floors remain as the departed workmen left them. Pilgrimage visitors find "Nutt's Folly" a fascinating sight.

Longwood after slaves had done the preliminary work. The exterior octagon walls of cypress were completed; the huge rotunda, the cupola, the dome, and the spire were in place. Ships on the high seas were bringing interior woodwork, plastering material, hand-carved marble stairways, sculpture, and costly furnishings from Europe. Scaffolding for interior work had been erected. Painters were busy.

Artisans Answer Call to Colors

Then came the War Between the States. The workers from Pennsylvania walked off the job. Ships with building materials were stopped by the blockade. Orders abroad for some of the furnishings were cancelled. Dr. Nutt died before the war ended.

To this day, only the spacious basement has been finished. There descendants of the Nutt family have dwelt, amid the old furnishings which graced the former home at Longwood—rosewood chairs, marble-topped tables, a Swiss music box, carved and canopied beds, armoires, and gold-leaf mirrors.

I ventured upstairs. There everything was in the same state of semiconfusion as when the workmen left to join the Union Army. Scaffolding stood alongside the uncompleted walls. Brushes lay on dried-up paint buckets, covered with dust. Planks on which workmen walked still stretched across the gaping floor joists. Empty niches, where statues were to have stood, looked barren and forlorn.

Outside, in front of the house, a big gap marked the place where architects' drawings called for a marble staircase. Empty window frames, like sightless eyes, stared in eight directions.

"Nutt's Folly," Natchezans called the ornate, grotesque skeleton. Today the pilgrims stare at it in open-mouthed wonder.

Oasis-hopping in the Sahara

By Maynard Owen Williams

With Illustrations from Photographs by the Author

BRIGHT-EYED British children roamed the docks at Marseille as we boarded a ship that would take us from a Europe blanketed in snow and suffering.

For many families of motor trekkers, off on a rocky road to adventure, this was the last rest before the sterile, sunny Sahara sands.

Across the once impassable desert scores of emigrants from crowded Britain were lurching in war-worn army trucks toward new homes in faraway South Africa. These modern pioneers were traveling across France and the entire length of Africa—an overland trip of some 6,000 miles.

One truck after another was lifted into the hold of the *Ville d'Oran*, back in service after a heroic war career as an auxiliary off Norway. Race horses were swung aboard in their traveling stalls. The National Geographic Society colors on my car attracted attention.

Off for Algiers—and Beyond

As my wife and I made port at Algiers (Alger) after a 22-hour crossing, a cold drizzle masked the skeleton-white Kasba, teeming hillside quarter in the heart of the Algerian capital (page 223).

In swank shops of this "Paris of North Africa" luxury goods were displayed to tempt the long-gowned Algerian or disguise a lack of staples. Skyscrapers were dwarfed by confining hills. In the gardens of Mustapha Supérieur, the newer aristocratic quarter, Easter lilies uncurled their creamy cornucopias.

One day at dawn a shiny aluminum-colored bus, labeled with exotic names, came to carry us off for two weeks of oasis-hopping across the desert. With a desert-wise driver at the wheel, this would be safer than driving The Society's car.

As the morning sun broke through the clouds, the hills behind Algiers were brilliant with verdure and red earth. Along the hilltops, tinted villas squatted comfortably above fat fields. Mules and horses plowed furrows between the close-trimmed vineyards.

Behind us lay the Mediterranean's blue. Ahead spread the rich plain of the Mitidja, where vineyards slope down to green-tufted orange groves. From the fertile soil of this onetime sea floor comes a profusion of early vegetables. Huge truckloads of hand-washed carrots roared along toward the docks and London's vegetable market at Covent Garden.

After passing through miles of fertile fields transformed from malarial swamps, we came to Boufarik, with its proud monument to a hundred years of French colonial agriculture (page 211).

Near Blida descendants of immigrants from the old Spanish province of Andalusia had directed water to the fields by methods dating back to Babylon, when agriculture was young.

Our bus now headed toward the misty slopes of the chilly Atlas. Leaving the rich and smiling plain, it corkscrewed up the Gorges de la Chiffa (map, page 222).

Monkeys Answer Chow Call

As we stopped to stretch our legs at a roadside restaurant, an Algerian beat a carrot on a pan. Down from the rocks for food came monkey after monkey. One of our companions photographed "beauty and the beast" as his wife offered a monkey a cube of strictly rationed sugar. American GI's chased the simians up the rocky cliffs (page 227).

Hurdling a 3,300-foot pass in cold fog, we rolled down toward Médéa, whose climate and fruit trees are like those of Europe. Médéa's heady white wine provided tough competition for French wine growers before wine was so scarce that it had to be rationed.

By lunchtime, at Berrouaghia, we had covered less than a third of the day's itinerary. Two ranges of the Atlas Mountains already separated us from the Mediterranean. The rain and mist were gone. Camels and goats surrounded our cars. We were in another world.

Away to the south were the Mountains of the Ouled Naïl, professional dancing beauties who used to drape their necks with gold. Now they have discovered that a good apartment house is a better-paying investment than bright baubles (Plate XVI).

Farther west is the Djebel Amour. Its name comes not from "love" but from the Beni Amour tribe.

To the descendants of Antar, hero of Arab poetry, their rocky hills, blessed with little fountains, seem desert-set fairylands.

After 200 miles, the railway quits at Djelfa. Trucks take over much of the traffic formerly monopolized by the dromedary.

Long after dark, with a real chill in the dry air, we stopped at Laghouat, beneath the

Desert Herbs and Fagots Dot Ghardaïa's Market Place Below the Hillside Town

Mzabis (Mozabites) come from four neighboring towns to gossip and trade or have a tailor sew up a new gown of scarce cotton cloth. Woolen robes, of soft homespun, last for years as dress, blanket, and shelter from noonday sun. At the top of the town is the minaret of the principal mosque of the Mzab (page 212).

Arabian Nights' balcony of a caravansary where camel burble has given way to grinding gears.

As we breakfasted, a clear warm sun flooded the town. Against the morning sky, light-tinted mosque and dwellings crowned a rocky ridge. Palms like green-fronded feather dusters shaded the gardens—el Aghouat—which give the oasis its name.

Toward Laghouat's rocky shoulder, rising above the palms, come desert trails from far and near. In springtime there are dances and football games. A famous camel race of pre-war years was organized by a Detroit corporation lawyer.

Before an early start for Ghardaïa, I photographed the bazaar. One handsome gentleman in neatly wound turban and spotless robe attracted my attention—and vice versa. While breaking his fast with a tiny cup of black coffee, he nodded semiapproval at my Contax camera.

"I use a Leica myself," he explained.

Where the Desert Begins

Laghouat, once the frontier between North African Berbers and Central African "Ethiopians," is also the gate to the desert.

In one day's journey—with each hour by motor covering a day's camel trip—we en-

Nomad Sheep Play Heads and Tails in the Boufarik Market

In the heart of the Mitidja, thousands of sheep, which have nibbled their way from the desert, may be offered for sale in a single market. Such sheep were worth the equivalent of about $250 for the group in the lower right. Thus tethered, they await purchase before slaughter for the cities or for shipment to France.

countered little sand, but two distinct types of desert, *Daïa* and the *Chebka*. Those who picture the Sahara as a succession of soft-curved dunes, atop which solemn camels turn up supercilious noses at the praise of Allah, intoned by kneeling Arabs in spotless robes, would recognize neither kind.

The gently rolling region of the Daïa is thinly tufted with alfa grass, or *esparto*. After being laboriously gathered, the stringy fiber goes into the making of the fine papers of de luxe book editions. Here and there low earthen saucers conceal scant water. Now that the winter chill was gone, the giant pistachio trees showed tiny green buds.

Chebka means "net," and the airplane traveler can well see why. The rocky brown plateau is crisscrossed with gullies. A reverent Moslem might roam these rocky wastes for hours without finding enough sand with which to perform his ablutions (sand is approved for ablutions in arid regions).

A Dantesque horror pervades this sad sterility. The hiss of a puncture chills the bones. Even in the relative security of a desert bus one thinks, "How surely death could strike in such a spot!"

At the edge of one such rock-ribbed labyrinth white-faced children peered out of a southbound truck. Its owner, an emigrating

Briton, explained: "My pal broke a spring and went back. But we haven't got too much petrol, so we're waiting for him."

Here one is filled with admiration for those abstemious desert men who make a living from barren wastes where lesser men would die. The cheery smile of a lone laborer repairing the trail seems heroic.

The Mozabites Are Mohammedan Heretics

Topping a rocky ridge, we looked down upon patchwork squares of vivid green. We had arrived at Berriane, monument to the industry of the Mzabis, or Mozabites, Mohammedan heretics who have won a proud position in the Moslem world (Plate VII).

Nearly twelve centuries ago, a Persian religious leader had his capital in a pleasant region between mountain and steppe at Tiaret. His Mzabi followers were known to the shores of Tripoli.

When a few thousand of them emigrated from Ouargla to Ghardaïa, they bored through limestone to find water and so made it one of the most populous and prosperous of Saharan oases (Plate I).

Beside us, across the desert, had marched the tall towers of high-tension lines carrying electricity to Ghardaïa. Here we still saw donkeys, plodding at the ends of ropes, hauling from wells the bloated goatskins which from time immemorial have made the desert bloom. But the squeal of the water hoists is now giving way to the soft whir of a powerful turbine pump made by Layne & Bowler, Inc., in Memphis, Tennessee.

Emancipated thus from painful digging and the ceaseless come-and-go of the water lift, Mzabis squat around low tables in the sun, playing swift games of checkers or slapping down aluminum dominoes (Plate X).

Around the main market place male seamstresses sew the long gowns gracefully worn by Algerian men (page 210).

After a lunch of *couscous*—of which there are as many varieties as there are of curry—we roamed the narrow, mud-walled streets. Laughing-eyed girls in Kodachrome-teasing colors dashed for cover.

Our second day in Ghardaïa we watched an Arab wedding procession. Dancing men brandished long muzzle-loaders; fired volleys at the tough feet of apathetic camels. Two soft-faced camels of the caravan carried tent-like litters.

From one of these mobile harem enclosures protruded a youthful ankle circled in heavy silver and a small foot in a scarlet sandal.

The Arab and Mozabite crowd poured down an empty torrent bed and stretched their bright ribbon of color along the tawny hills. We photographers stumbled along, shooting as we ran (Plates II and III).

Dusty and sweaty, we rejoined our friends at the holy city of Beni Isguen, within whose walls no man may smoke nor any foreigner pass the night.

Nowhere along our route did we find such fine specimens of male dignity. Four men out of ten were strikingly handsome.

As twilight comes on, these industrious citizens, spotlessly garbed, squat in the town square while strolling salesmen carry on an auction.

The bearded Mzabi does not go to market. Like a comfortable American, reading his ads, he sits still and lets the market come to him. No patter talk disturbs the bargaining. The auctioneer parades his priceless or tawdry stuffs back and forth, picking up a bid here and there until the deal is closed.

As we climbed to Beni Isguen's high tower, dark eyes of women and girls peered over the edges of the mud roofs. From the tower we looked down across a chaotic tumble of rocks to the Mozabite villages and broad expanses of date palms on the valley floor.

Donkeys water the bulbous but stringy roots of the palms. As they tread the slanting runways, the length of the rope indicates the height of the water in the well.

When the far end of the path is blocked off and the well ropes are shortened, one knows there is water for all and good crops are assured (Plate VI).

At dawn on our fourth day we collected new evidence on the question, "What is desert?" Climbing out of Ghardaïa's fruitful valley, we worked across the loathsome Chebka. Gradually rock gave way to gravel and an occasional stretch of sand.

In one such stretch the young English-speaking driver of a heavily loaded truck was repairing a tire. The crowd of long-gowned natives had piled off, started a fire, and were having small glasses of mint tea, sticky-sweet but refreshing.

After the tire pumpers had rolled away and we started to follow suit, one of our back wheels spun in the sand.

Desert Bus Carries Emergency Tracks

Extending across our bumpers we carried two stout pipes, seven or eight feet long. When the tires bog down in sand, one of these tubes is laid in front of each rear wheel (page 224).

First, the double tires kick the tube deep into the sand. Then the vehicle moves, perhaps one foot, perhaps four.

A Tapering Minaret, Exclamation Point in the Sky, Calls Allah's Attention to Ghardaïa

This town in the Algerian Sahara is the metropolis of the Mozabites, Puritans of Islam. Pillaged and persecuted by orthodox Arabs, they, like the Mormons, selected a new home in the desert. Irrigation made it flower.

Kodachrome by Maynard Owen Williams

An Arab Bridal Party Pours Like a Flood down the Dry Stream Bed Facing Melika, a Hilltop Citadel of the Mozabites

Once every six or seven years flash floods flush the Mzab wadis. Sahara's treacherous torrents have taken many lives.

Curtained from the Mob, the Bridal Party Rides Caparisoned Camels

Were it not for the holiday throng, this arid valley would look like the face of death. Scarcely ever a bird, never a blade of grass breaks the desolation.

To this badland the Ali-rejecting Mozabites came seeking refuge from the Ali-accepting Arabs in the 11th century. They deliberately chose a valley in the *Chebka*, a stony desert within a desert, because nobody else wanted it.

To a Mozabite, as to an Arizona landowner, water measures fortunes. The clan has sunk about 4,000 wells, some to a depth of 200 feet. Each well gives life to a cluster of palms. Gardens of verdure stand only 200 yards from this wasteland.

For centuries well water has been drawn by donkeys hitched to goatskin buckets (Plate VI). These animals face technological unemployment; a Tennessee-made pump is taking their jobs.

Under the French occupation Mozabites dwell in peace with their Arab neighbors. The photographer found both peoples mingling in this procession.

If the picture had sound as well as color, the rattle of musketry would be heard. Friends of the bride, forming an honor guard ahead of the camels, fired old guns. The ghostly bundles in white fetching up the rear are gowned not as bridesmaids but in everyday dress. They go to meet the bridegroom's party.

Kodachrome by Maynard Owen Williams

Kodachrome by Maynard Owen Williams

In the Grim Sahara, Where Delay May Mean Death, a Good Samaritan Bus Stops to Aid a Punctured Fellow Traveler

This act of mercy trapped the bus in sand as shifty as water. Extrication took four hours' work. Truck passengers brew tea (right).

Tinkling Place Names Sound Adventure's Sahara Call

A few decades ago only camels crossed the Sahara. In 1922-23 the Citroën-Haardt expedition's half-tracks made the first motorized crossing. Today the autobus opens the desert's alluring heart to any traveler with the price. Hurried sun hunters think nothing of flying in from Paris.

The African Society of Tropical Transports, operator of this bus, calls its 2,900-mile Algiers-Fort Lamy line "the longest automobile transport route on earth." Within a few days its patrons travel a distance that used to take a season's toil. By day they survey the scenery from comfortable chairs; nights they spend in modern hotels. For reasons made plain by any thermometer, they travel in winter, never in summer.

El Goléa, where this filling station was pictured, appears out of the forbidding wastes as an unexpected oasis. Palm, citrus, cypress, pine, and eucalyptus trees delight the visitor. Roses and strawberries give him a taste of home.

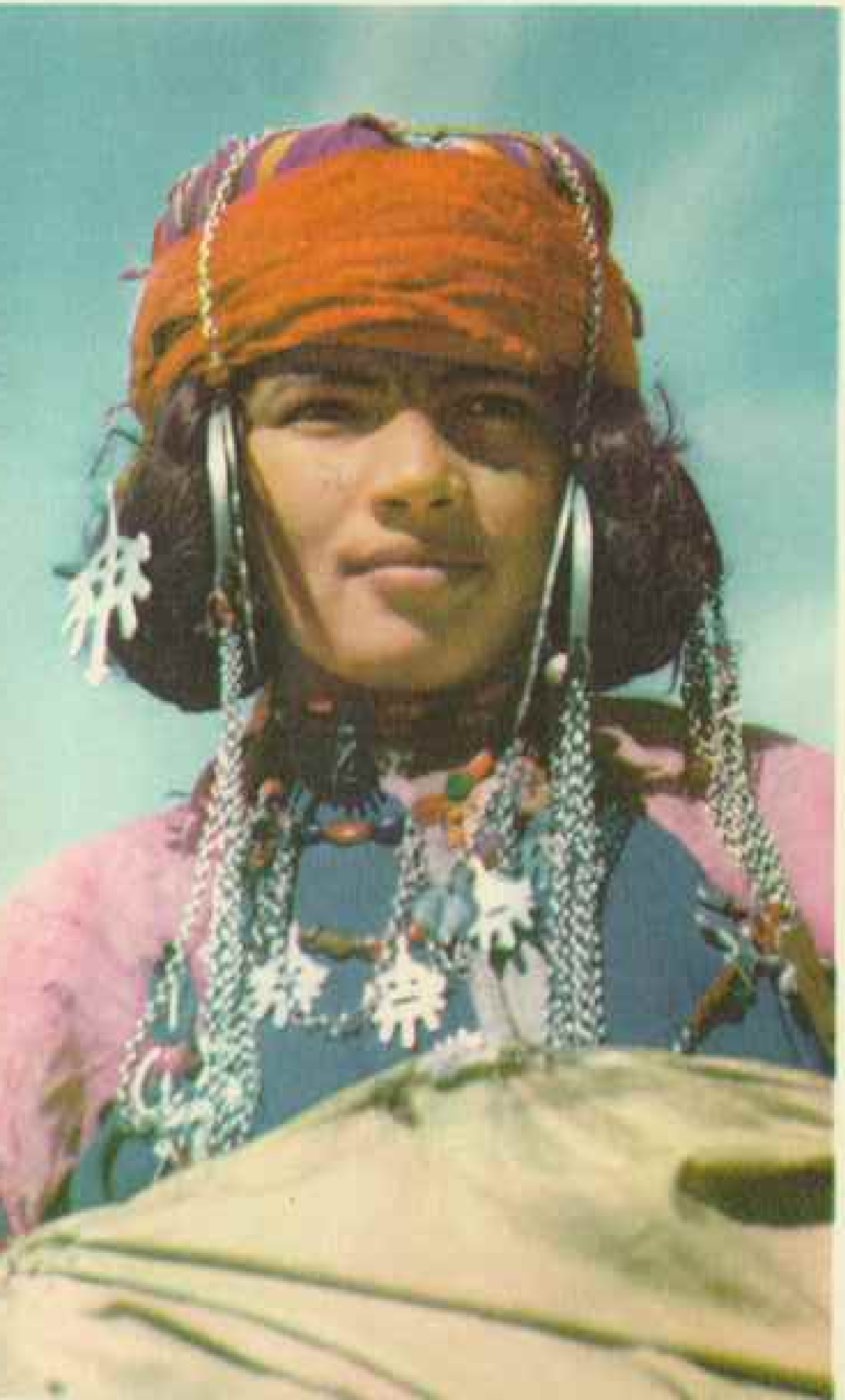
No wonder Arabs call El Goléa "the enchantress."

Kodachromes by Maynard Owen Williams

Kodachromes by Maynard Owen Williams

Many a Donkey in Ghardaïa Devotes a Lifetime to Treading the 150 Feet Between Well (Right) and Runway's End

Donkey power created this oasis. In Mozabite towns the irrigators' crooked paths wind into alleys and around corners.



Bangled Nomad and Turbaned Mozabite Typify Algeria's Racial Complex

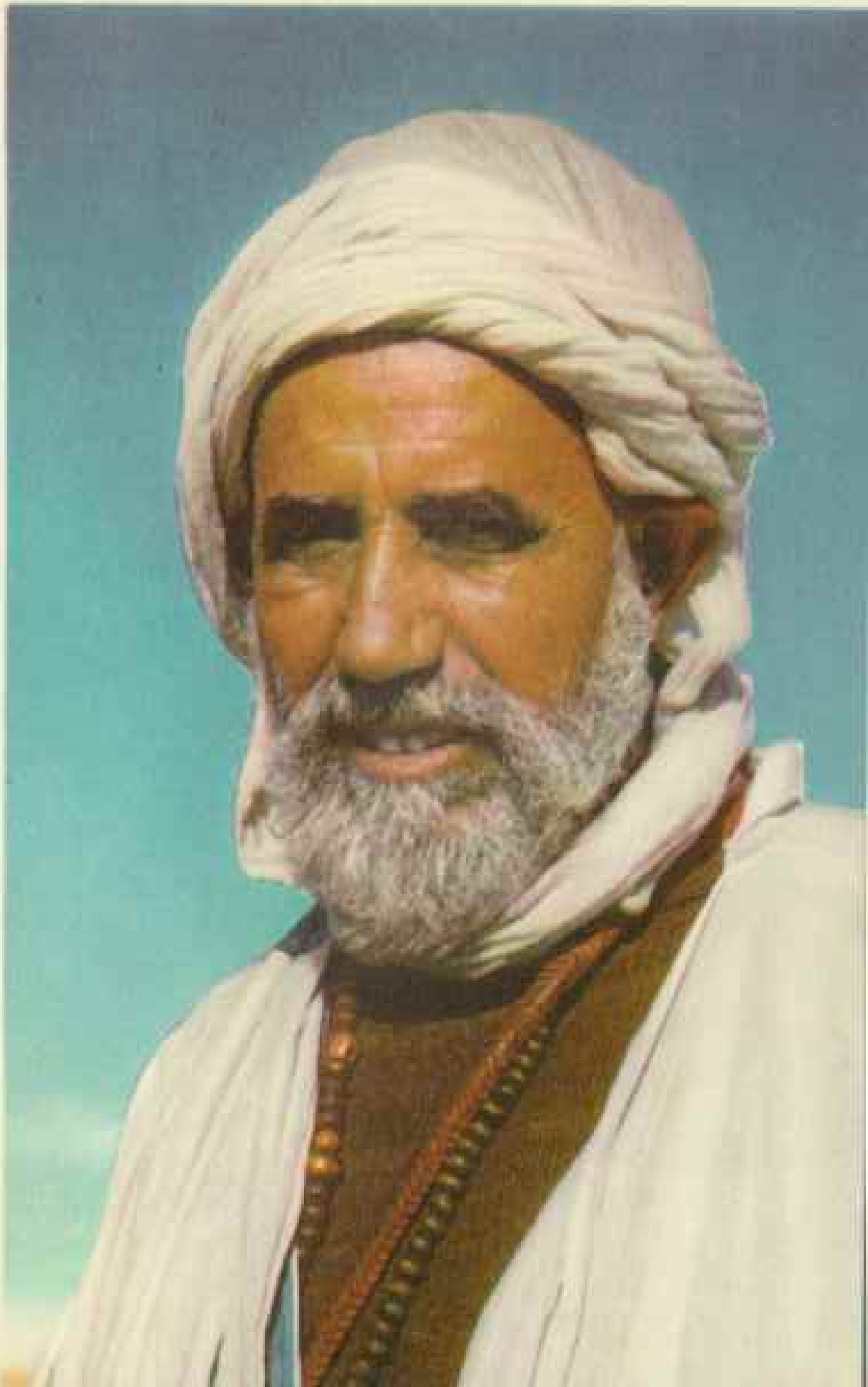
Thousands of desert folk wander across Algeria tending their camels and sheep. This girl followed her tribe's woolly herd as it nibbled its way from pasture to pasture in the north.

The bearded gentleman is a professional guide who steers Americans and Europeans through the rabbit-warren streets of the Mozabite towns. He is careful not to lead them into Beni Isguen, the sacred city, after dark, when the non-believer is unwelcome.

Many Mozabites, shrewd, energetic traders, spend their lives away from home trying to make their fortunes. Once each two years the clan calls home its wanderers, wherever they may be. Mozabite women, even the Jews in their midst, seldom travel.

The Mozabite is one of the Berbers, a linguistic group whose racial origin is a mystery.

Kodachromes by Maynard Owen Williams



Kodachrome by Maynard Owen Williams

Tumbled Ruins of El Goléa's Citadel Look Down on a Grove of Green in a Sea of Sand

This time, at the very first trial, we discovered why the heavy bus, with its 90 horsepower (American rating) motor, had bogged down. While we had sympathized with the truck driver, many miles from the nearest power-driven tire pump, one of our own tires had been flat (Plate IV).

Our one Arab passenger threw aside his heavy *burnoose* and went to work. At lunch that day he greatly improved our picnic meal by sharing his own broad sheets of Arab bread.

Getting out of the sand wallow was not simple. When the bus was jacked up and the punctured tire lifted from its deep depression, the sand flowed out from under the jack, the bus settled down for a long rest, and passengers began to tell how delightful it is to travel by plane.

Aside from jack and tire tools, the chief utensil for desert work is a short-handled, sand-polished hoe, more than a foot wide. Wielding this sand scoop was Mbarak, an ebon chauffeur's assistant, whose light-skinned wife back home in El Goléa had just given birth to a baby boy.

"I'm a black son of the White Fathers," laughed our jolly blackamoor, and a better testimonial to the character building of self-sacrificing missionaries would be hard to find.

Not once did Norbert Ballin, our Algerian chauffeur, raise his voice. For four hours he and his dark-skinned helper crawled and dug, twisted the unruly tail of the heavy jack, or swept back the sand sea with the ineffectual hoe.

It was long after dark when we rolled into El Goléa. But Mbarak, nicknamed "Ali Baba" in cordial admiration, had won his spurs. However tired and hungry, all of us were delighted to stop long enough for this home-town boy to see his new baby and proud wife.

Modern Covered Wagons Roll On

Outside the oasis we had passed British lorries from whose dark interiors towheaded children peered into the African night. Before dinner was over they lumbered in, another long day behind them in their trek toward South Africa.

Stout fellows, these tired refugees slept a few hours in their stuffy cars, then shoved on. Theirs was the same fixity of purpose that carried our forefathers in covered wagons across a continent.

We spent three days in El Goléa, all of whose sights could have been viewed in one cool morning. Yet I do not recall a dull moment (Plates VIII and IX).

Twice a day a long-gowned Chaamba guide led us about on leisurely saunters whose attractions might be the pink of fruit blossoms against a funereal cypress hedge, or the splash of crystal water for mud-walled gardens where lemon and orange glowed.

On one side of El Goléa stretches a boundless airfield, its only improvements a wind sock, fueling strip, and tumble-down warehouse drifted with sand.

On the other side rises the deserted hill town. The palm-trunk beams of its mud-brick houses have tumbled in; its crumbled dwellings clutter the narrow lanes. But from the wide platform at its top we enjoyed a splendid picture of the life-giving miracle that 15 artesian wells can work in an otherwise sterile expanse.

Only 26 years ago the Sahara had never been crossed by car.* Now a trickle of motor traffic flows back and forth across the desert from October to April. On the wall of a "last chance" filling station near our hotel were lists of provocative names (Plate V).

As casually as if the routes led to Boston or Versailles, we read such names as Fort Lamy or Tombouctou, the land of a legendary cassowary whose desire to "eat a missionary, blood and bones and hymnbook too," was part of our childish lore about "cannibal land."

We yearned to continue our travels to the Sudan. But this time El Goléa was as far as we were to journey toward the Southern Cross.

Looking back, we realize how far removed El Goléan customs are from our normal life. For example, we remember a dusky courtesan pouring tea, with a eunuch to pass it.

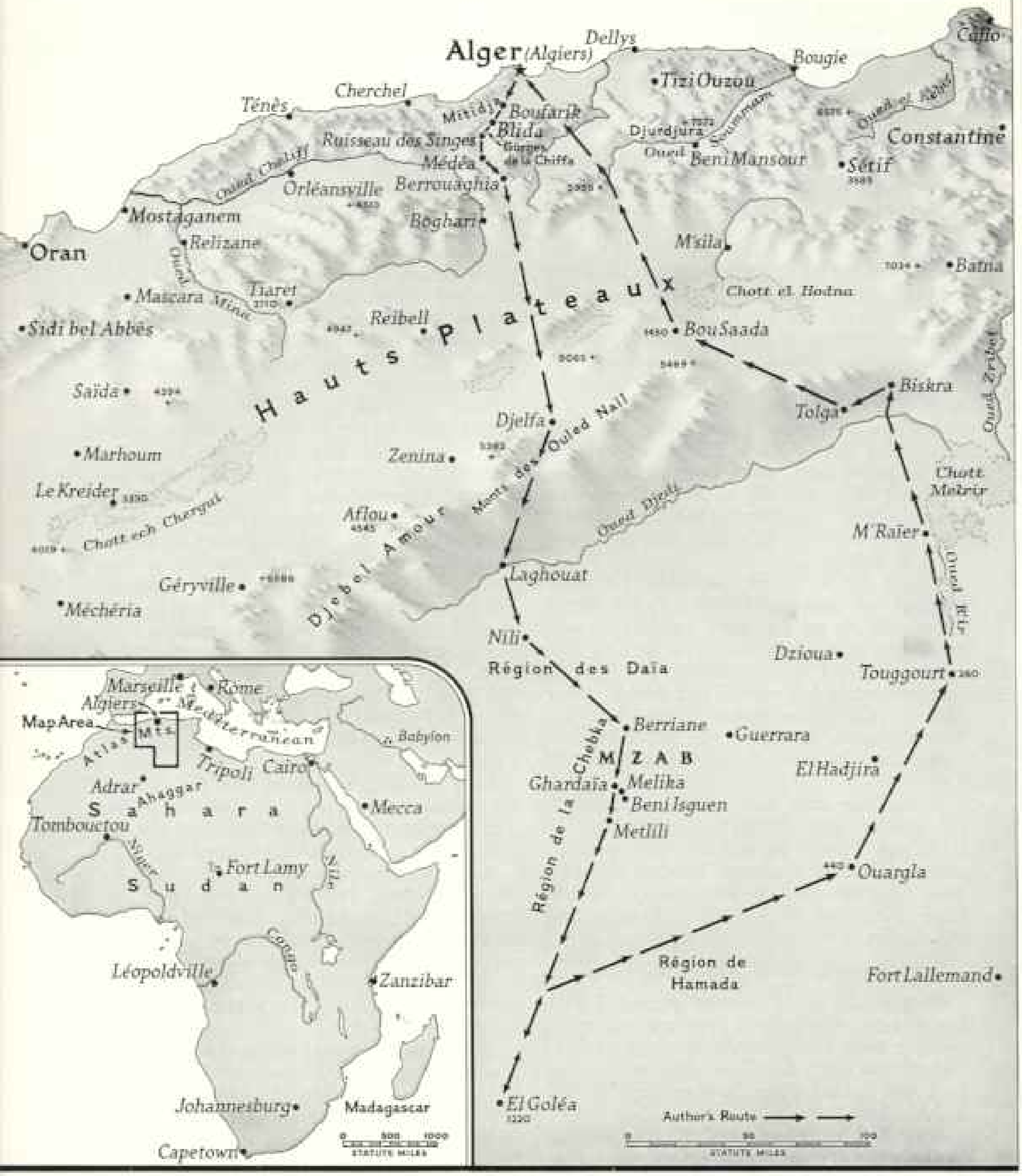
As we strolled back from a jaunt, she stood at her doorway, showing fine teeth in a professionally pleasant smile. Since Saharan picture subjects are usually male, my fellow photographer wished to photograph her.

"All right," she said, including our whole party in the invitation, "drop in this afternoon for tea."

Seated on bright rugs within the mud-walled room, we watched her pour a lavish stream of precious sugar into the pot, mixing the beverage by pouring it back and forth. Aromatic mint was added at the last moment before the wrinkled eunuch, arrayed in feminine finery, passed the drinks with self-conscious dignity.

"Never for a moment did she lose her self-possession or charm," conceded the French, Algerian, and American ladies of our party.

* See "Conquest of the Sahara by the Automobile," National Geographic Magazine, January, 1924.



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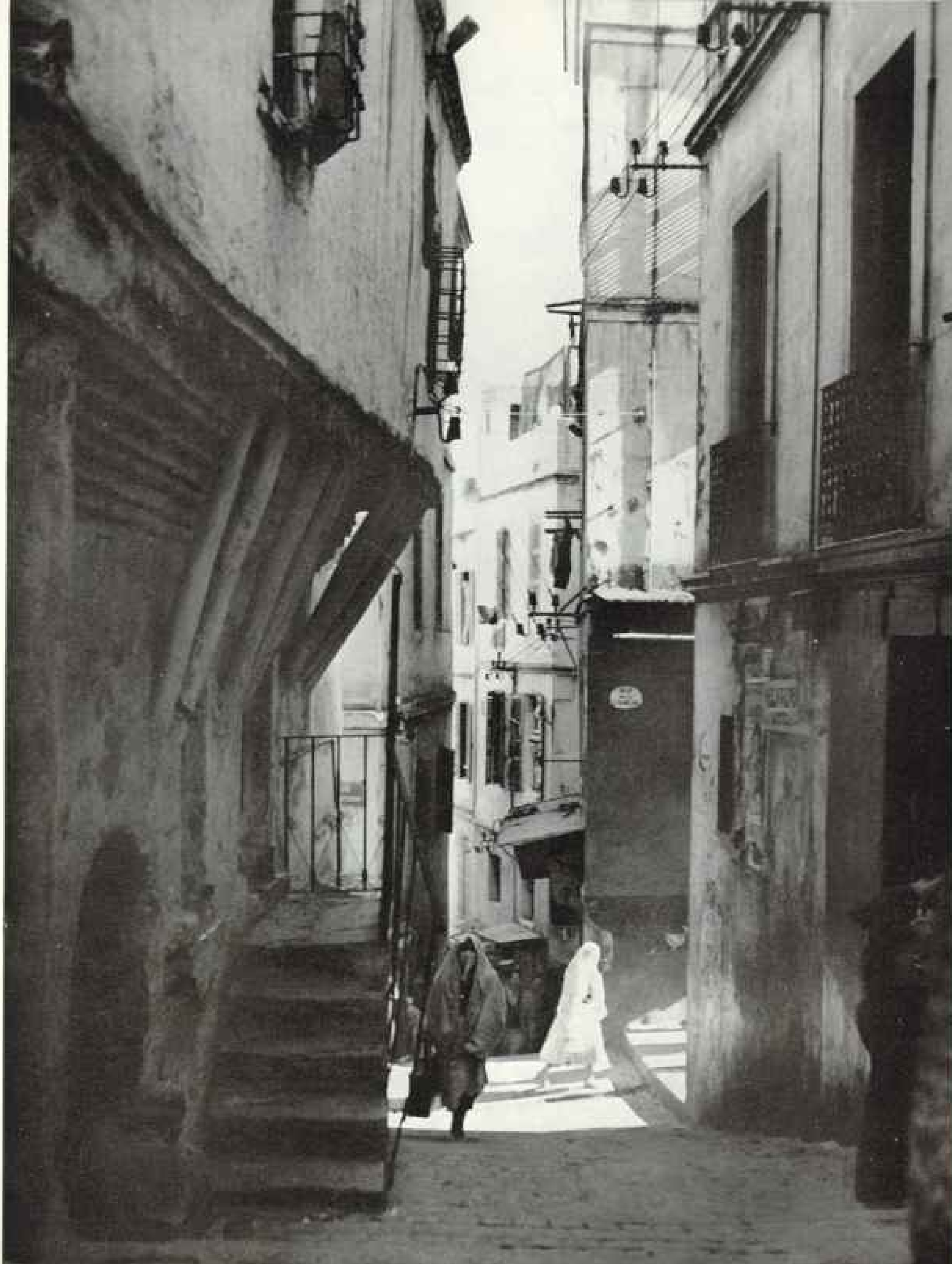
Sahara's Winter Warmth Attracts Vacationers from Chilly France and Rainy Algiers

On a scheduled bus line the author crossed the Atlas Mountains and "hopped" from oasis to oasis through 800 miles of northern Sahara's winter sunshine. Inset, lower left, relates the route to the Sahara's vast area—3½ million square miles—and the African Continent. During the 26 years in which the automobile has competed with the camel on its own sands, a web of trans-Saharan motor trails has developed. Motor trips from Algiers to Cairo and Capetown are no longer a novelty. After finishing his Saharan trip, the author, despite postwar gas rationing, drove The Society's car from Algiers to Denmark.



K. R. Grimm

Algiers' Kasba, Publicized by Charles Boyer and Hedy Lamarr, Was Out of Bounds to GI's

The old town takes its name from the citadel, or *kasba*, on the hill above. During the war its narrow alleys were off limits. Our soldiers could not answer the throb of its hand drums heralding a native wedding party.

When a Desert Bus Gets Stuck in the Sand, It Walks Tightrope Along Such a Tube

Gripping the pipe with twin-tired driving wheels, it may move ahead one foot or four at each try. When a driver digs deep enough to remove a tire, sand may flow out from under the jack and the modern ship of the desert sink in a sea of sand (page 212).

"Where she sat was the head of the table."

Our Chaamba helper invited us to tea at his house, shared by 13—mostly women and children. His mother, our hostess, had a keen eye for every nicety of etiquette.

As we left, Ali Baba's women came up with an urbane farewell (page 225).

"They want to thank France and America for providing grain after four years of bad harvests," explained our helper.

Spiritual Oases in the Desert

Amid the Saharan sands there also are Christian centers—churches, orphanages, and schools—administered by the White Fathers and White Sisters who take their names from the color of their robes. Even the street urchins show real affection for the missionaries, calling them "My father" or "My sister."

Patiently and lovingly they teach the people to weave fine fabrics and improve their crops. At El Goléa, whose abundant orange crop cannot be transported away, we wondered why women were not taught canning or the making of marmalade.

"Are you a Christian?" I asked our "Ali Baba."

"No," he replied, "but are we not all children of one God?"

Near El Goléa is the first Christian church

Even While Saying Farewell to "Ali Baba's" Guests, Chaamba Womenfolk Keep Their Fingers Busy at Homely Tasks

Each desert lord needs several women relatives to carry water, milk the flock, weave wool or goat hair into robe or tent. Here one woman weaves a reed souvenir, but a smiling youngster ignores her knitting.

in the Sahara, consecrated in 1938. Close beside it, under the hot sun, lie the remains of Père de Foucauld. His heart remains in the Ahaggar where for 11 years he lived with the Tuaregs, before an assassin struck him down.

One task to which the Vicomte Charles Eugène de Foucauld set himself was collecting the songs of war and love which the young men sing while the tribal maids strum their one-stringed fiddles. Free as the desert wind are the Targui girls of the Tuareg matriarchy. But the tribal nobles, perched on swift camels, are the lords of the desert.

On the block over De Foucauld's grave are the words, "I want to preach the Gospel all my life." And preach it he did until 1916 when a fanatic murdered this cavalry officer turned saint.

Desert Dangers Include Drowning!

We headed north again along a bit of familiar trail. Here and there it is so plainly marked and so well paved that it might be called a road. But at times in the shifting sand the more or less formal track gives way to a confusion of trails where each driver has set out for himself to cross a crest or round a soft spot in the sand.

"Beware of old signposts! Don't follow

Paul from Three Lions

Such Well-like Manholes Mark the Course of a Thousand Miles of Water Tunnels

Patiently, the *foggara* diggers capture underground water. These close-set water holes are at Adrar in a Saharan oasis.

the line of telephone wires! If you must spend the night, don't camp in a valley, because drowning kills more desert travelers than thirst! Carry two of everything!"

With such comforting advice does the old-timer send the tenderfoot on his way. As our experienced men scooped at the sand or twiddled the carburetor, I was glad I had left my shiny car in an Algiers garage.

On our way to Ouargla, across a bumpy area where sand gobs hard as rocks grabbed at our differential, we came to the *Hamada*. To a cameleer and his grotesque beasts, such a barren waste seems proper pasture. The only suggestion of food comes from a faint greenish tinge, as if the brassy desert needed polishing.

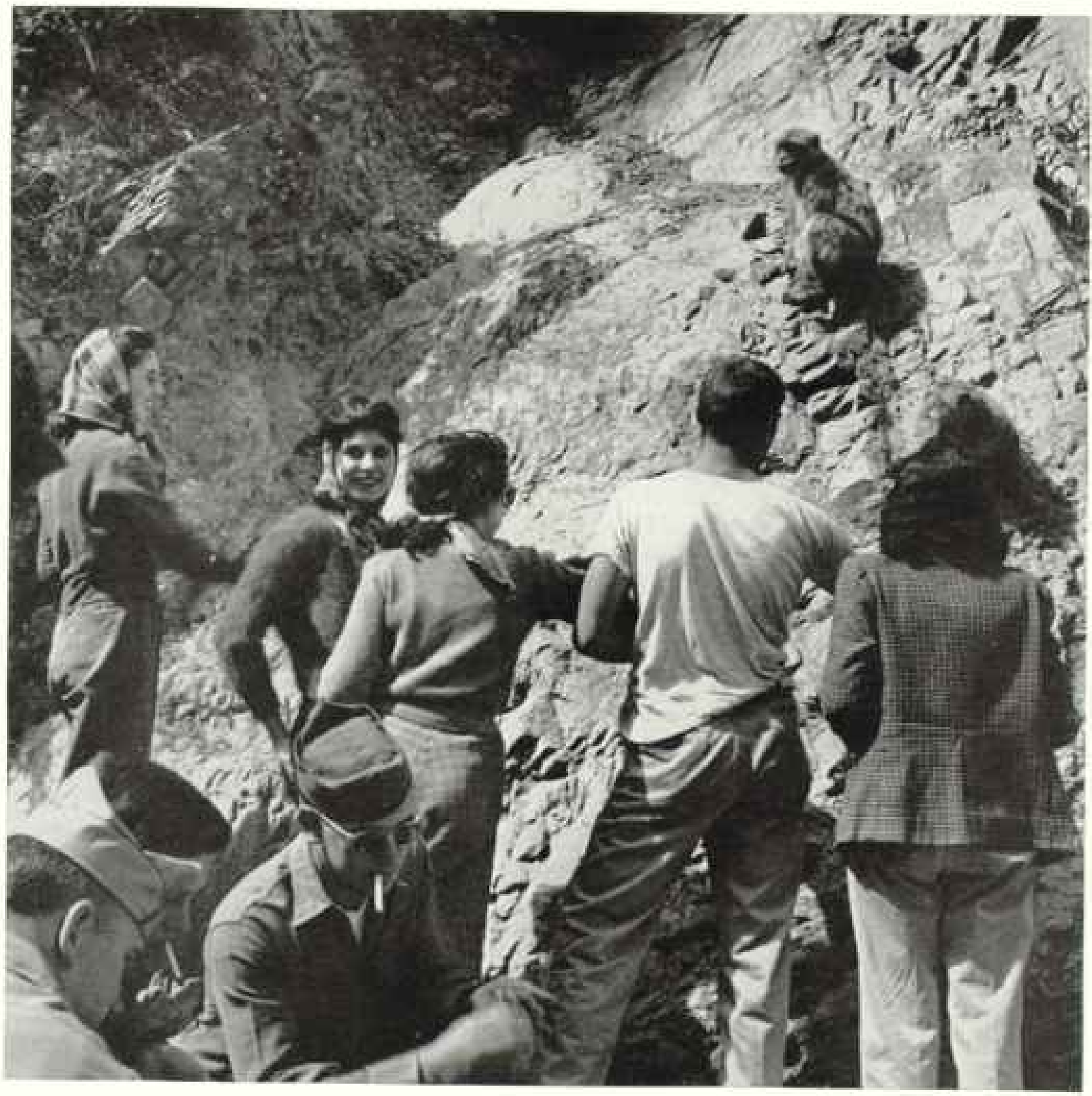
Almost within bugle call of Ouargla we wallowed again. But in a dozen pipe-lengths we had crossed the crest.

Such obstructions limit the speed and tonnage of all who use these crooked short cuts from the snowy Atlas to the steamy Niger. Since our big bus had a lower horsepower than my Plymouth, we felt that it did a fine job.

After El Goléa's modest charm, the European section of Ouargla seemed pretentious. By moonlight we passed exotic buildings which our Parisian friends found "too Colonial Exposition."

Widely set homes surrounded by gardens contrasted with the older city, crowded with dwellings, smells, and flies (Plate X). When I saw flyscreens on the windows and chubby babies inside, the European quarters looked all right to me. The new quarter has a museum filled with souvenirs of the trail blazers who opened up the desert to security and peace.

Far from any chief of police with American eagles on his jacket buttons, my wife and I had wandered about desert towns at night with no thought



GI's, Chasing Monkeys at the Ruisseau des Singes, Dislodged Rocks as Big as Footballs

Beside a tiny stream in the Atlas is a favorite restaurant for holiday visitors from Algiers. When a desert bus stops, an Algerian rattles a pan of carrots and half-tamed simians come running. American soldiers and their friends said these playful beasts were "more fun than a barrel of monkeys."

of danger. But it was not always so.

Here a letter told how Père de Foucauld met his death. There were drawings of the "Grasshopper," a propeller-driven car which preceded my friends Georges-Marie Haardt and Louis Audouin-Dubreuil down the early stages of their first crossing of the Sahara.

Tarred Roads Taming the Sahara

One of their track-type cars stands in the Invalides Museum at Paris, side by side with the "Golden Scarab," whose trail blazing I had shared along Himalayan trails to the roof of the world.*

Between Ouargla and Touggourt the black-tarred road stretches far ahead without a curve or bump. And the desert here *was* the picture postcard variety.

Whoever built this splendid bit of bituminous motor road was pretty wasteful. Mile after mile one sees precious road binder spilled from far-traveled drums.

Near Touggourt the road deteriorates. However, having driven 100 miles in a single morning, we dreamed of the day when highways will do for Africa what they have done

* See "From the Mediterranean to the Yellow Sea by Motor," November, 1932, and "Citroën Trans-Asiatic Expedition Reaches Kashmir," October, 1931, both by Maynard Owen Williams, NATIONAL GEOGRAPHIC MAGAZINE.

for the United States. Probably only one mile in five needs actual paving, but improvement of the bad stretches would facilitate through travel.

From Touggourt my former chiefs, Haardt and Audouin-Dubreuil, started on December 17, 1922, for their first crossing of the Sahara by car, arriving at Tombouctou on January 7, 1923.

Inching our way across Asia nine years later, we had often compared the great wastes of Asia with those of Africa. Not all agree upon what is the world's largest desert. First choice is the Sahara, which covers nearly half of the world's second largest continent; but oasis and rock ridge, mountain and salt lake, political boundary and traditional route divide the Sahara's vast barren areas. Central Asia's combined wastelands may rival the Sahara. None, however, has so awe-inspiring a name.

Throughout the trip we found the hotels better than we had hoped. But our welcome to Touggourt took the cake.

The names of our passengers had been phoned ahead, and someone at Touggourt had connected my name with a Citroën expedition. As we swung into the gardens of the Hotel Transatlantique, the Stars and Stripes and the Belgian and French tricolors waved a greeting.

Suddenly I realized that the American flag, so far from home, was honoring a National Geographic Society reporter and his wife. Our big room and bath somehow assumed palatial proportions, and the table around which we ate, drank, and were merry was a festal board indeed.

In the lobby were some giant specimens of gypsum crystals known as "roses of the desert." Like soft petals, countless keen-edged scallops form into petrified floral bouquets weighing 50 pounds apiece.

Bumping north toward Biskra, we came to a 1,000-foot railway bridge across the Djedi. Its rocky river bed drains a tremendous area and is subject to infrequent floods which sweep it like the Hangchow bore.

So neglected was the motor trail that we almost bogged down, close to the tennis courts, race track, and gambling casino of Biskra. Tires snarled at gears, and one of our companions muttered a Gallic equivalent of "There oughta be a law!"

According to geologists, the low way we had followed from Touggourt was once a river valley, comparable with that of the Nile or Niger. Most of the water has gone underground. To this subterranean Oued R'ir the French have sunk hundreds of artesian wells. These water millions of palm trees, newcomers, like white men and dromedaries, to these time-wasted lands.

Three distinct types of dates are found in Biskra's market place: dry yellow ones, hard as acorns, in big goat-hair sacks; so-called "greasy dates," sewed into goatskins and used for soapmaking; and the Deglet Noor, transparent as amber even when flattened into neat boxes or sealed in cellophane.

For sale, too, are bunches of male date blossoms, a sprig of which is tied in each bunch of female flowers; and piles of date pits so huge that one wonders at the labor, soil, sun, and water that will be needed before mature trees, grown from such trifles, spread their shade and produce their honey-sweet crop.

Algiers Seems Another World

Following old Numidian trails known to the soldiers of Augustus when Algeria was the granary and oil cruet of Rome's golden age, we threaded a narrow gorge and looked down on the town and oasis of Bou Saada, within easy motoring distance of Algiers.

When mists hang heavy over Algiers' summer palace or cold winds sweep on the capital from the north, fortunate folk hurdle the mountains and let Bou Saada's sunshine soothe their souls (Plates XII-XIII and XV).

Here the French painter, Etienne Dinet, and his partner, Sliman ben Ibrahim, found models among the dark-eyed women of the oasis. Here their gay sisters shake gilded stomachers in dances that date back to Salome. Here, before the travelers go back to desk and kitchen, they complete their desert fling by riding contemptuous camels along the golden dunes.

On the first lap of the return into another world, mud houses gave way to red-tiled roofs. Across the rolling countryside, farmers spring-plowed and fruit trees spread their petals to the cool and humid breeze. Near a mountain pass a splendid pine grove, planted as a memorial to the dead of World War I, spread its evergreen mantle. Once again water came from dripping clouds, not waterskins.

To the northeast the snowy Djurdjura masked the sea. By night we would be in Algiers, again aware of clothes, beauty shops, books, the day's news, and letters from home.

With regret, mingled with furtive relief, we realized our oasis-hopping days were over. From our hotel balcony we looked north along tip-tilted Algiers, glittering with electric lights. Out in the harbor a ship's whistle blew. Four hours away by air, Paris shivered. Back in the desert, camels stretched reptilian necks and burbled to the touch of sun-baked sands.

Bottles and Cattle Horns Cap the Adobe Spires of a Museum in El Goléa

Here Commandant E. M. Augiéras, a Frenchman famed for his Sahara explorations, kept a private museum and zoo. His trophies, carefully guarded, remain on display. This weird rooftop is of Sudanese design.

As Evening's Shadows Lengthen, Camels Break the Day's Thirst at El Goléa

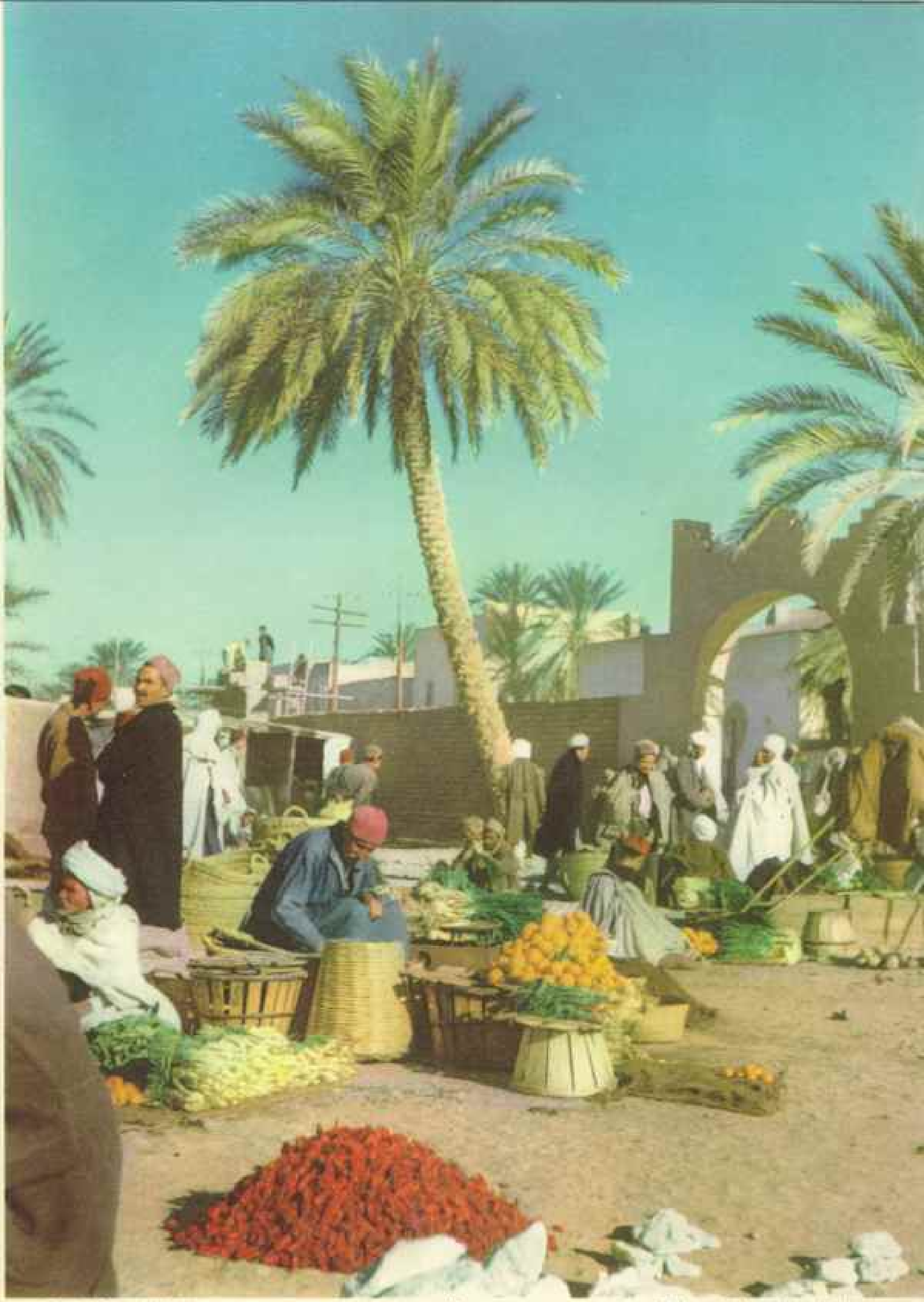
At this old oasis progressive horticulturists have drilled 15 free-flowing artesian wells. This excess water drains beyond the palm groves. It is so brackish that it has encrusted the banks with mineral salts.

♣ No Inspector in Ouargla Checks the Butcher Who Weighs In a Few Flies

By tradition, Moslems are not supposed to eat camel flesh, because in Mohammed's day the beast usually had to be saved for war and commerce. In areas where camels have increased beyond the need for them, the surplus animals go to the butcher.

♦ Business in Biskra Comes Before Pleasure, but It's a Tight Race

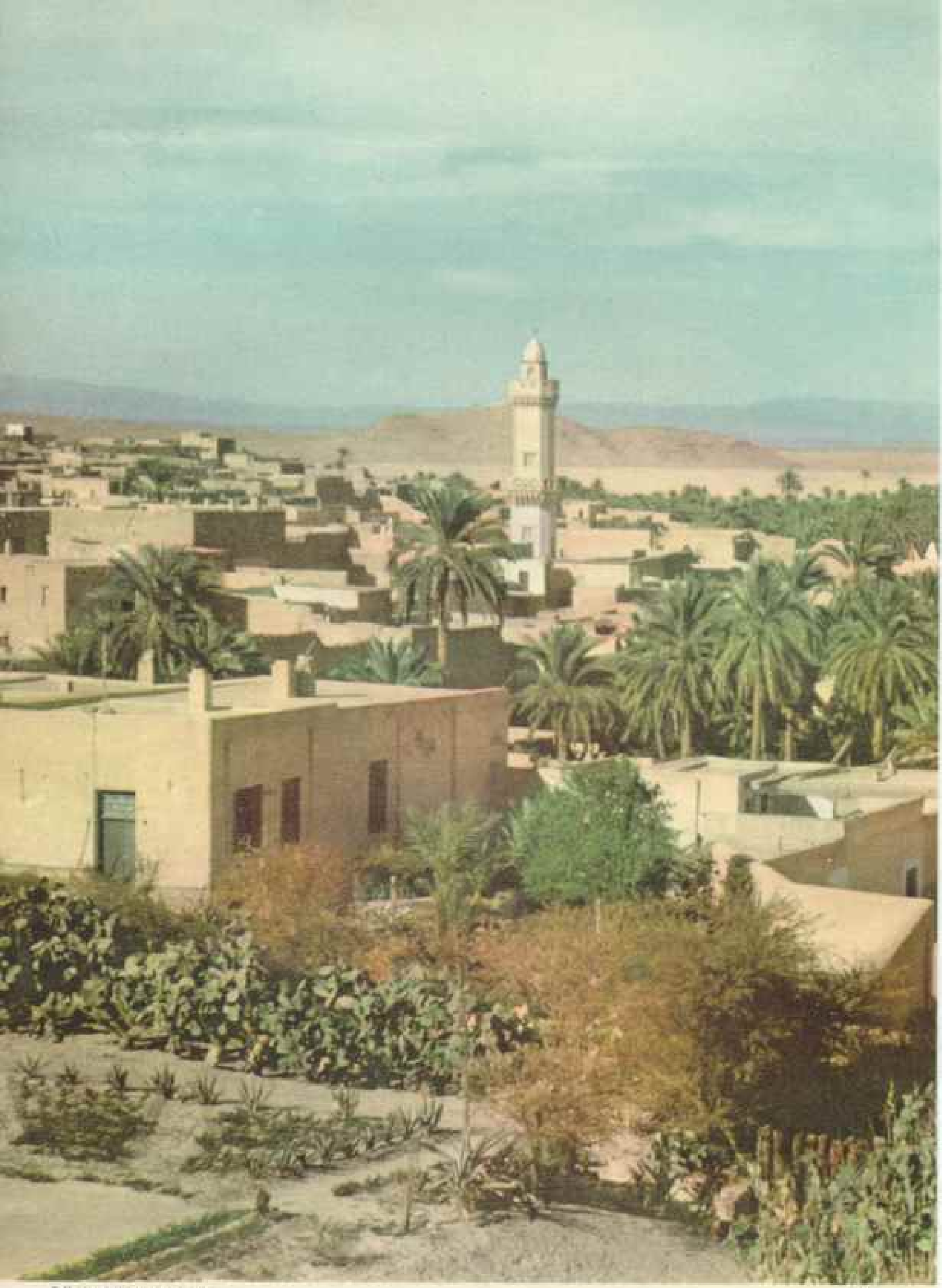
These indolent Arabs play an ancient game related to chess and checkers; its moves vary from one part of the hemisphere to another. When a chess player says "Checkmate," he mispronounces the Arabic *al-shah mat* (the king is dead).



Kodachrome by Maynard Owen Williams

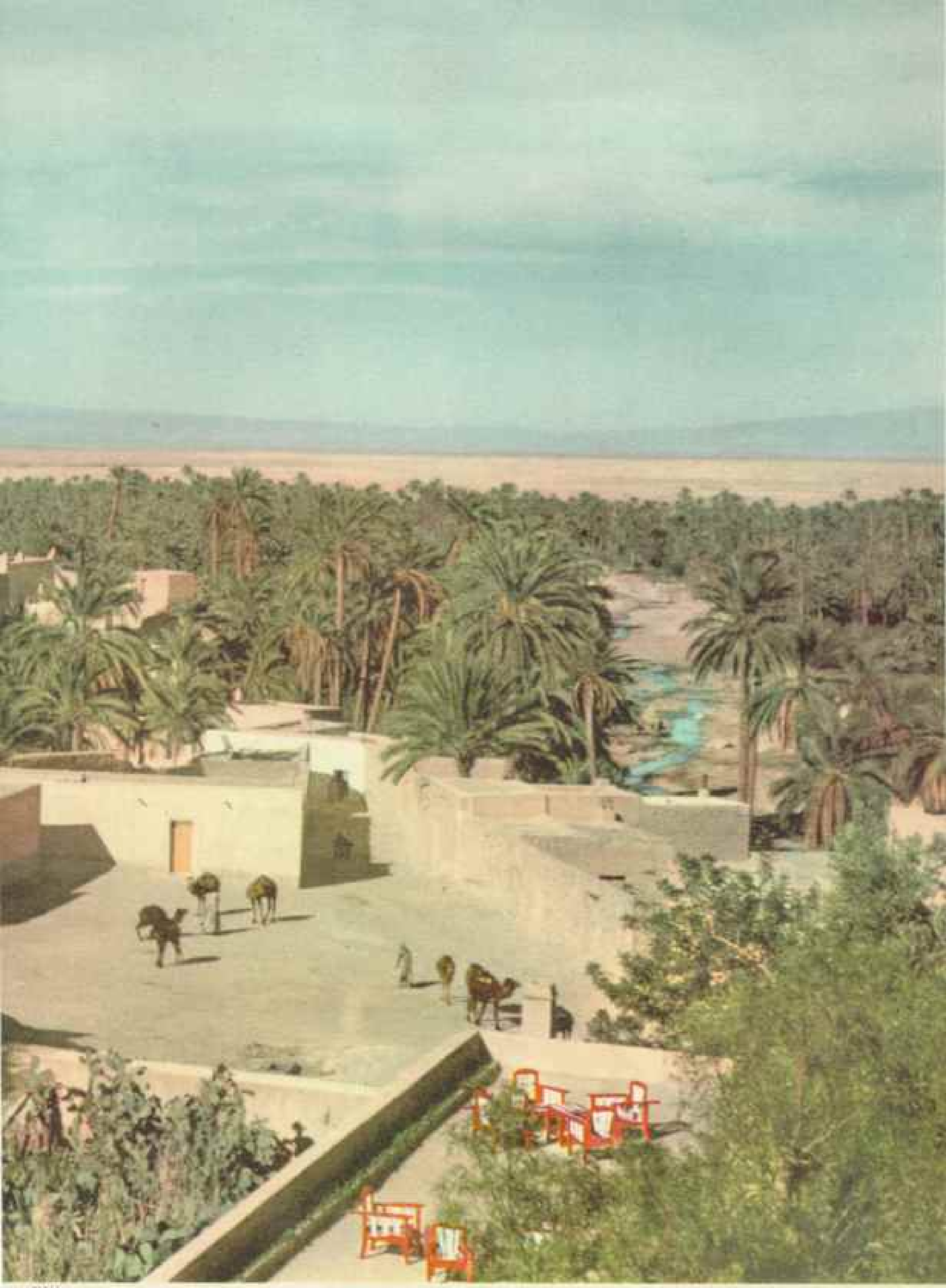
Red Peppers and Blood Oranges Glow Beneath Feather-duster Palms in Biskra Market

Midday brushes away the open-air merchants. Evening brings out a pageant of fakirs, jugglers, storytellers, and snake charmers. Laughing Negroes, accompanied by pipers and drummers, dance by torchlight.



Artists Love Desert-bound Bou Saada, Northern Algeria's "Haunt of Happiness"

Here a French painter, Etienne Dinet, and his Arab literary collaborator, Sliman ben Ibrahim, found the lovely models shown in their volume, *Pictures of Arab Life*. Bou Saada lies a day's auto run from Algiers.



XIII

Kodachrome by Maynard Owen Williams

Gentled, Saddled Camels Wait in a Courtyard to Take Tenderfeet to the Dunes

Returning oasis hoppers here take a last ride into the wilderness. Their camels, like a dude ranch's ponies, are accustomed to the unpracticed ways of vacationists. Foothills of the Atlas Mountains loom in the distance.

Kodachromes by Maynard Owen Williams

On Paved Highway or Rock-strewn Sands the Dromedary Is Slow and Stupid but Patient and Enduring

Nowadays camel freight seems expensive. Half a ton carried 20 miles is a good day's work. Trucks cost less; even planes compete.

At the Last Stopover, Bou Saada, Travelers Bid the Oases Adieu

A 12-day 1,300-mile round trip takes Sahara visitors from Algiers' Easter lilies to El Goléa's gypsum roses (formed by geologic heat and pressure).

Bus passengers spend half their time gliding down smooth highways or wallowing in treacherous sand. The remainder of their time they spend sight-seeing or loafing in modern hotels like the Transatlantique (right).

Gathered one evening beneath the hostelry's bright umbrellas, the photographer's fellow passengers delivered their impressions of Sahara travel. He heard these remarks:

"I never knew the desert could be so beautiful and yet so terrifying."

"Someday I'm coming back to ride all the way to Fort Lamy" [2,900 miles from Algiers].

"I expected many more sand dunes. The movies show much better ones."

"How good the sun feels after the winter chill of Paris" (or London, or Brussels, or Washington, D. C.).

Kodachrome by Maynard Owen Williams

Kodachrome by Maynard Owen Williams

Gone to Fort Knox Is Her Treasure; the Ouled Nail Dancer Wears Gold Sparingly

Old-time's golden headdress and coin breastplate were as heavy as chain armor. Gold being scarce, this Bou Saada girl invests in real estate, but she retains the tribal tattoo. Fortune won, Ladmiya will retire and marry.

Sea Fever

By John E. Schultz

IT ALL started with rereading the poem *Sea Fever* in the sparkling mountain air of a moonlit Quito night.

"I must go down to the seas again, to the lonely sea and the sky. . . ." *

John Masefield's haunting lines and the beauty of three snow-capped peaks of the Andes, glimmering like ghosts on the horizon, made an irresistible call to adventure.

My family had lived in Ecuador for several years, and in the spring of 1947 I had been there for some time on a visit. I intended to return to the University of Chicago for the fall quarter, but the summer was open for travel. It didn't take me long to decide to go "down to the seas again." In my case, though, it wasn't "again," for I knew little of the ocean.

It took several days to arrange passports and gather equipment. I had no plan except to start eastward from Quito, the capital of Ecuador, and somehow arrive in Chicago in time for school.

On May 11, 1947, to be exact, I started walking over the Andes. A friendly U. S. Army sergeant had given me a ride to the end of the road (page 239). My equipment consisted of an old double-barreled shotgun, a 50-pound pack, a few charts, a compass, some sandwiches for the first day, $21 in Ecuadorian money—and a wealth of misconceptions about what was to come.

Over the Andes by Mule Trail

The first few days over a rough, muddy mule trail and up through a 13,000-foot pass were pretty discouraging, although the Indians were friendly and I had no trouble buying food.

A week from home and some 130 miles away, my feet were raw; but I was over the worst of it and on the headwaters of a tributary of the Amazon (Amazonas) called the Rio Napo. The Napo rises in the Andes and flows through the jungles of Ecuador down into Peru, where it joins the Amazon, the "mother of waters," some 50 miles below the town of Iquitos (map, page 241).

At the head of the little-inhabited Napo I bought a slim dugout canoe from a native for 60 *sucres*, approximately $4.20 at the rate of exchange at the time. Sixteen feet long and as many inches wide, the craft would turn over at a stern glance.

Armed with a broad oval paddle and mental pictures of the way Canadian voyageurs propel their canoes, I began to learn to paddle in the first hundred miles or so of rapids. Miraculously my unstable craft didn't capsize, but I lost all my romantic ideas about northwoodsmen and came to use the short, choppy stroke of the natives.

After a few days, river travel became easier as my paddling muscles toughened and I learned to handle the canoe.

In Ecuador the Napo flows through the homeland of some primitive Indians called *aucas* (meaning "enemy" or "rebellious"), who are considerably feared by their neighbors. In Quito I had heard stories of white men being killed by the aucas. However, I didn't even see one, nor was I favored with a spear flung from a riverbank!

The natives, with whom I spent all my nights and whose food I shared, were uniformly friendly and hospitable, as indeed was everyone during the entire river journey.

Monkey Meat Preferred to Parrot

By the time it enters Peru the Napo has fewer rapids, is broader, and runs more leisurely. Once in Peru I began to learn many things about the jungle and its people. Going hunting for the first time, back in the cathedral-like quietness of shady forests, I shot my first monkey and found that I much preferred monkey meat to that of parrot.

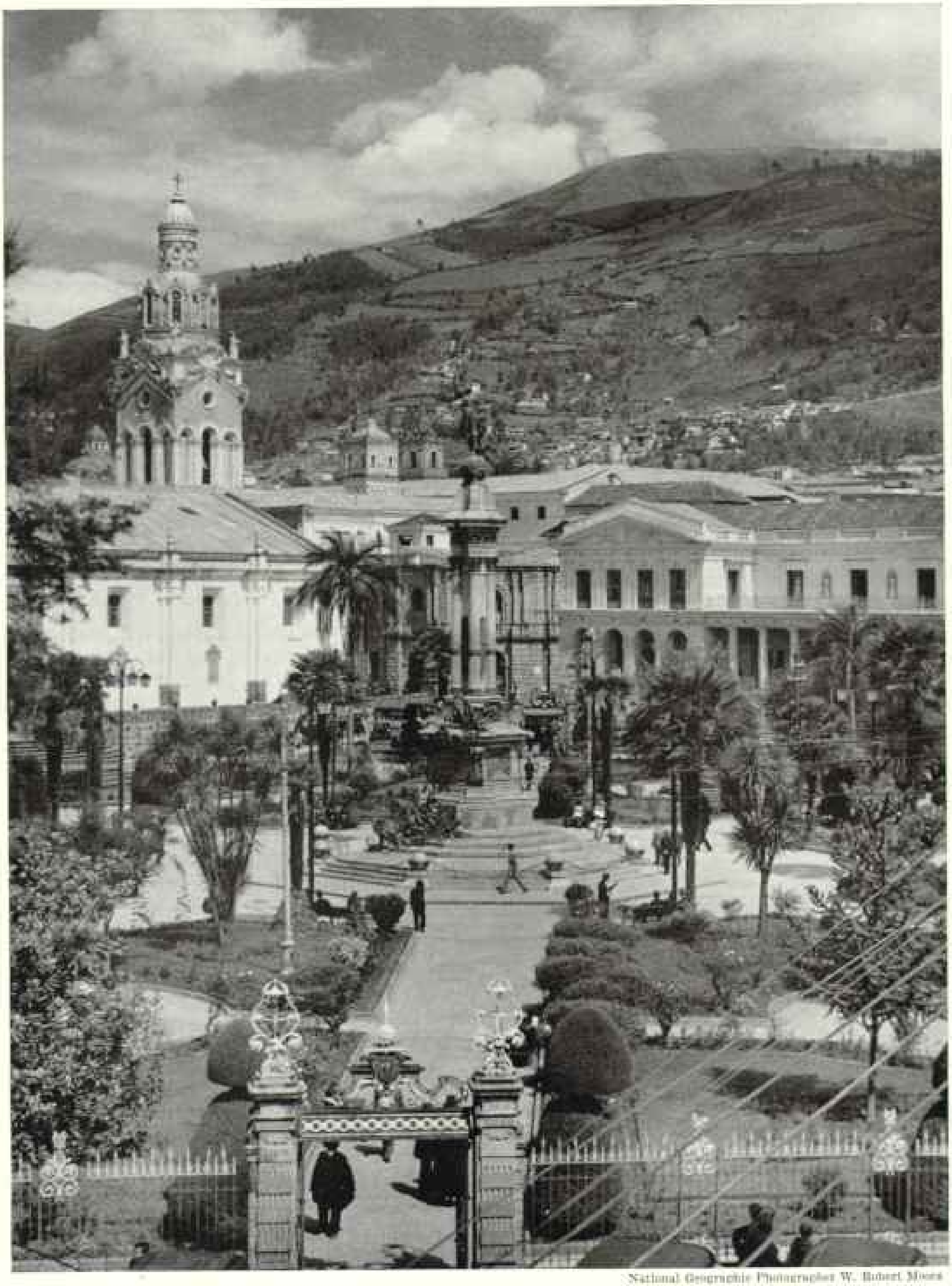
Most charts are rather vague about the Napo, but, by a rough estimate, I had walked and paddled nearly a thousand miles when I arrived at Iquitos, Peru, with my $21 capital almost gone (page 246). I worked there for five weeks as a mechanic to earn the necessary funds to continue the voyage.

Iquitos is as far up the Amazon† as ocean-going vessels can travel. Some 2,300 miles from the ocean, it is even visited, during high water, by 7,000-ton cargo ships.

Curiously enough, most heavy cargo sent from Lima, on the Pacific coast of Peru, to Iquitos, east of the Andes, is transported by water. Freight goes by ship up the west coast of South America, through the Panama Canal, down past Venezuela to Brazil, and 2,300 miles up the Amazon to Iquitos. It is cheaper

* From John Masefield: *The Story of a Round-House*. Copyright, 1912, by the Macmillan Company, and used with their permission.

† See, in the National Geographic Magazine: "Amazon, Father of Waters," by W. L. Schurz, April, 1926; and "Journey by Jungle Rivers to the Home of the Cock-of-the-Rock," by Ernest G. Holt, November, 1933.



National Geographic Photographer W. Robert Moore

From Quito, Ecuador, the Author Started His Solitary 6,000-mile Trip

Visiting his mother and stepfather here, John E. Schultz, University of Chicago student, read John Masefield's *Sea Fever* and began an adventurous homeward journey. Lofty Quito, girt with inspiring mountains, centers about Plaza Independencia with its monument to independence heroes, cathedral (left), and Government Palace (right).

From John E. Schultz

For the First Few Miles the Traveler Had Company and Transportation

Jack Schultz (right) was 18 years old when he started his lone 14-month journey from Quito, Ecuador, to Miami, Florida. His total equipment consisted of the pack, the shotgun, and the clothes he has on. His companion, a U. S. Army sergeant on duty in the Ecuadorian capital, gave him a lift in this weapons carrier to the point where the road gives way to a narrow, muddy mule trail. From here to Miami the venturesome youth walked, paddled, or sailed a dugout canoe. He is the son of Edward G. (Dutch) Schultz, major in the U. S. Army Air Forces, who was killed in China in 1943 while piloting a bomber.

to send most materials 6,500 miles around the northern end of the continent than 650 miles by land directly over the Andes!

Sea Fever a Shell-type Dugout

The proceeds from overhauling an old truck enabled me to buy a more stable dugout of the *casco* (shell) type, a wider boat being quite necessary on the broad Amazon.

Ordinary dugout canoes, merely hollowed-out logs, were undoubtedly among the first vessels man had and are found among primitive peoples in various parts of the world. But within a radius of a hundred miles or so of Iquitos the Indians build a type of canoe which I have never heard of anywhere else.

Seventeen feet long, my canoe was a casco and cost 200 *soles* (approximately $11). She was destined to take me more than 5,000 miles in 10 months. I christened her *Sea Fever* after the poem that inspired the trip.

By using the soft, light *cedro* (South American cedar) and the casco method of construction, a boat can be built with a beam much greater than the diameter of the tree used. The *Sea Fever*, for instance, which is almost four feet in beam, was constructed of a log two and one-half feet in diameter.

Instead of hollowing out the log with the sides almost vertical, as is done in making an ordinary dugout, the casco builder hollows it concavely through a narrow slit.

To get the right thickness—about an inch on the sides to an inch and a half on the bottom—he opens numerous holes about three-eighths of an inch in diameter. When the craft is finished these holes will be filled with wooden plugs: the water causes them to swell, making the hull watertight.

After the hollowing process comes the most important step. The hull blank, looking vaguely like a cigar with most of the filler gone, is supported on sticks, open side down. A fire is built underneath and as it heats the wood men pull the sides, stretching the opening.

The owner, crawling under, inserts three or more sticks to keep the widened slit open. As the artful stretching continues, he replaces these with longer ones, until finally the dugout reaches the right width. Charred and excess

© G. M. Dyott

Backbreaking Work, but These Men Can Keep It Up All Day

Boatmen on Ecuadorian rivers ply their long poles tirelessly and in perfect balance and rhythm. On the Napo the polers were Indians rather than Negroes, but otherwise this scene is typical of the mode of travel noted by the author on the shallow headwaters of that tributary of the Amazon.

wood is smoothed off, and seats and keel are installed.

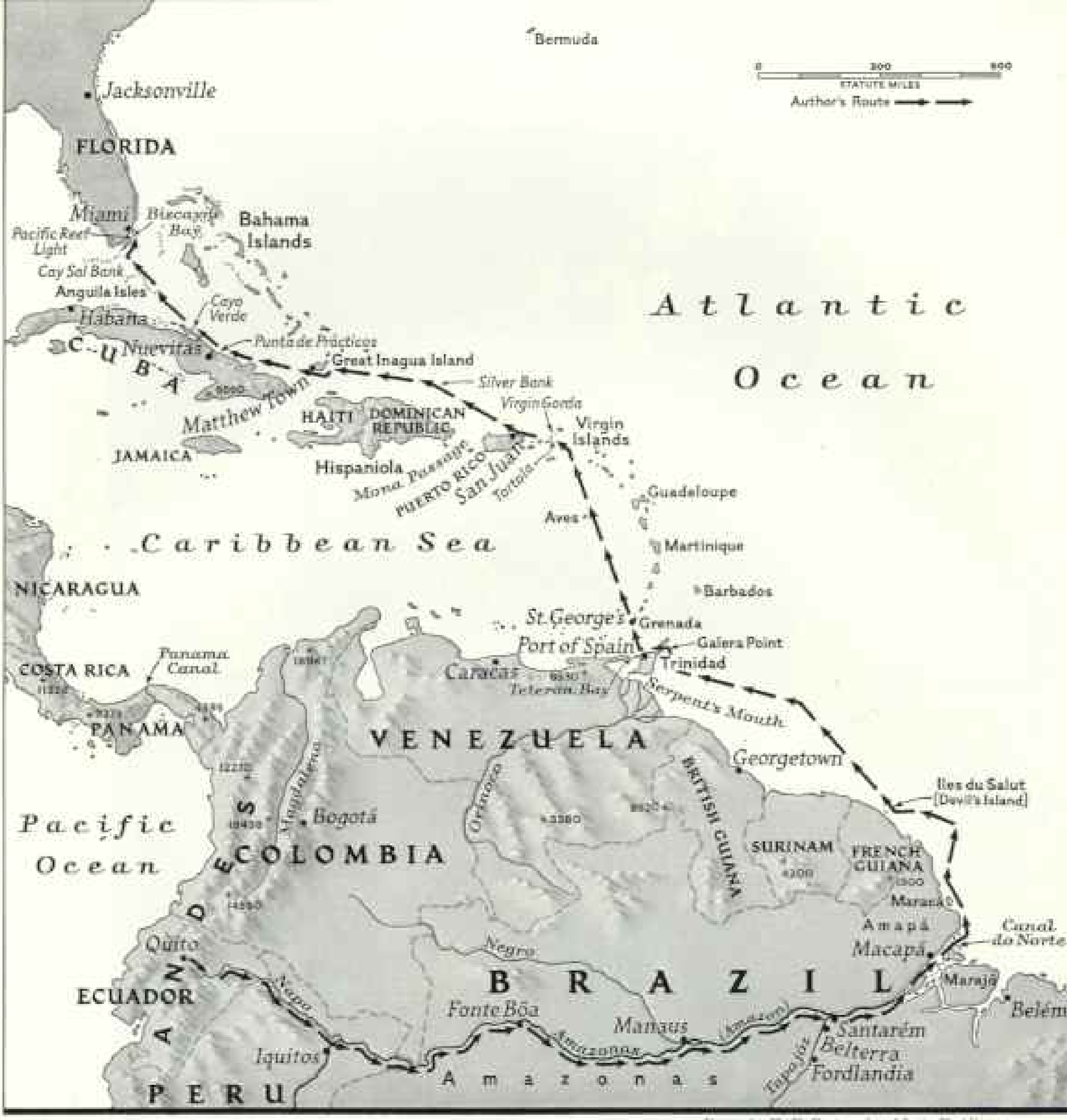
The casualty rate in fashioning such a canoe is about one in two. Half of the hull blanks split irreparably on being opened. However, the canoe which results if the cracks are not too bad makes the risk worth while.

The art of making cascos is gradually disappearing as civilization moves in.

Paddling down the Amazon

Filled with gear and an extra paddle, the *Sea Fever* left Iquitos on August 4, headed eastward down the Amazon toward the distant Atlantic. At first I tried to rig a make-shift sail, but found it not worth while because of the light and baffling breezes.

Canoeing on the Amazon is much different from on the Napo. The current is far weaker and the water is very muddy. Even as far upstream as Peru the river is often more than a mile wide and has many different channels and passages. This confusion as to the true channel with the strongest current is the principal problem in piloting down the Amazon. Often the wider opening leads to a winding passage with no current, a passage that may take a day to paddle through but may represent a distance of only 10 miles on the main river (page 245).



Drawn by R. E. Eastwood and Irvin E. Alleman

Back Home the Hard Way! The Author's 6,000-mile Route from Quito to Miami

Crossing most of the South American Continent, the youthful Schultz hiked over the Ecuadorian Andes and paddled down the Napo and Amazon Rivers to the sea. There the lone adventurer set his sails of striped awning canvas and steered his 17-foot dugout canoe out into the open Atlantic. Out of sight of land for as much as ten days at a time, he needed medical attention nearly every time he came into port, but landed safely at Miami last June, his sails still intact.

I found that debris floating downstream had a tendency to remain in the portion of the river where the current was strongest. Even the "cross-overs," where the river swerves from one direction to another, are fairly well marked by a line of trash and spume. Except in the widest places, where the current is weak, the best channel is usually pretty distinctly indicated by such debris.

On the Napo all but two of my nights were spent with Indians on the shore because of the danger from rapids and log jams during night travel. However, the great distances on the Amazon offer other problems. In the late afternoon I often was paddling far from shore with no idea where there might be a hut; so it became necessary to stay out on the river at night.

Rocked in the Cradle of the River

Since the Amazon is so full of floating trees and plants, it was easy to paddle up to a floating island of water hyacinths or a large tree trunk as dusk neared. The hyacinths were the best, for they were often matted together so densely that I could throw a sort

John K. Schultz

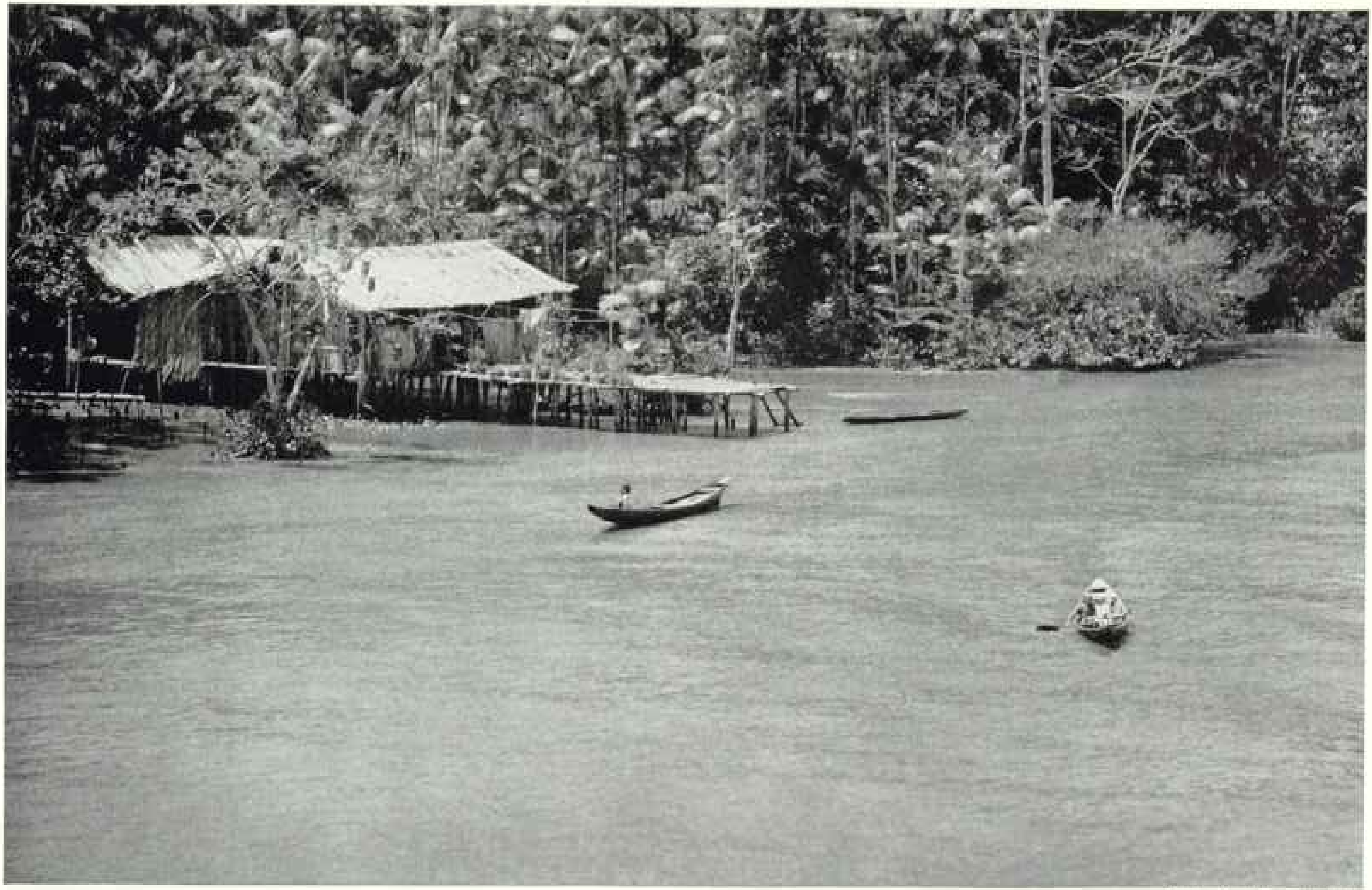
Hospitable Ecuadorians Gave Schultz Overnight Shelter Here and Soothed His Blistered Feet with Homemade Salve

Four days out of Quito, he was still two days from the Napo River (map, page 241). At the horse's head stands the kindly host, Señor Ricardo León, owner of this mountain farm, "The Water of the Little Fishes." The thatched house is largely bamboo. Its overhang shelters horses and mules while they are saddled.

Lt. Col. Albert W. Stevens, Ret.

Often the Lone Canoeist Stayed with Natives in Such Jungle Huts. Banana Plants Grow to the Left of This One on the Amazon

Walls and floors of these homes are bamboo, crushed and flattened. Thatch covers the roof. The jungle provides for the Indians' every want. They hunt game in the forest, fish in the river, and eat bananas, plantains, and cassava grown in garden clearings.



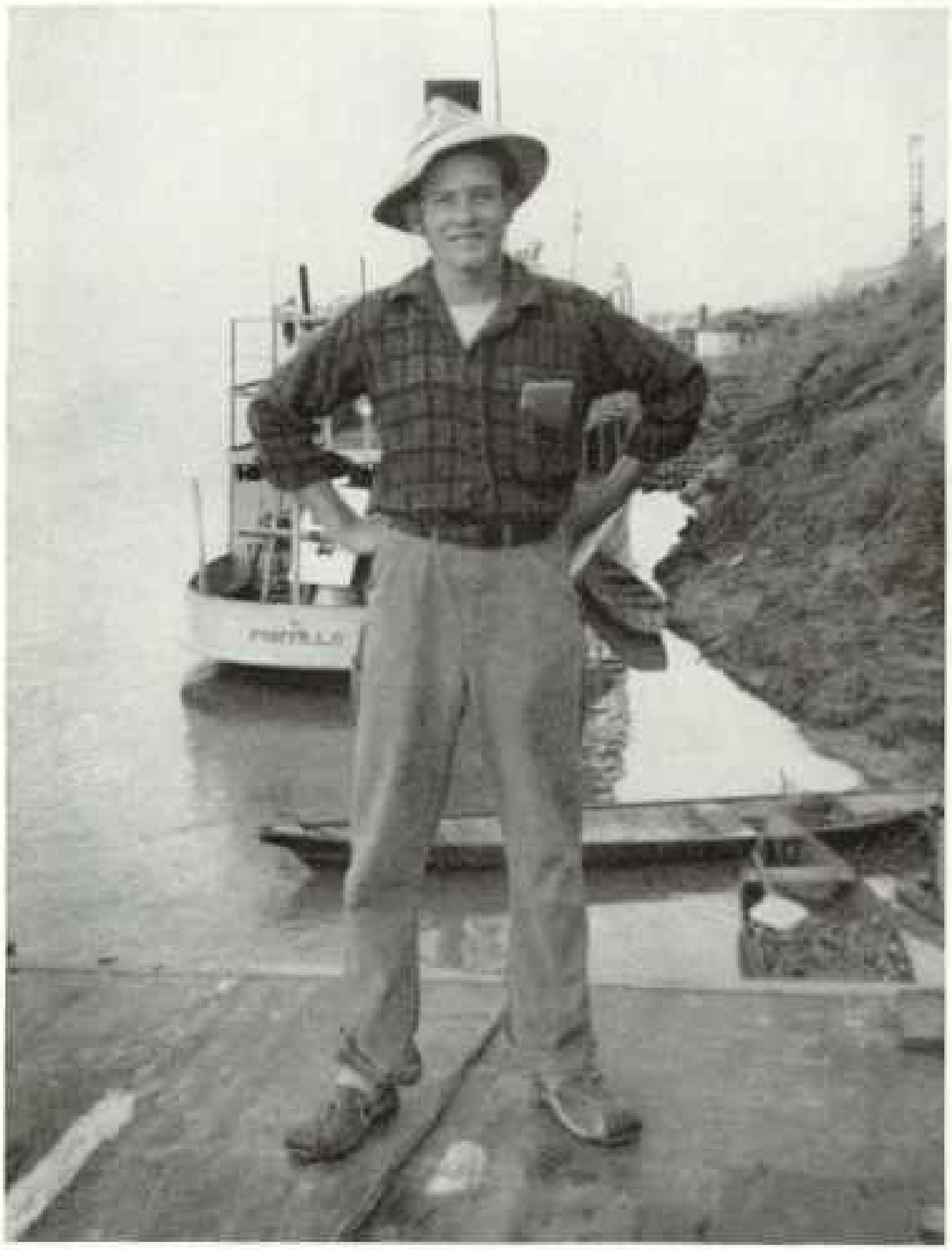
Lt. Col. Albert W. Stevens, Ret.

Amazon Indians Propel Their Canoes by Plying Their Oval Paddles from the Bow

When the author attempted to paddle *Sea Fever* from the stern in the usual North American fashion, the broad, shallow-bottomed craft tended to go around in circles. Soon he mastered the native technique (page 246). This hut on the Amazon, below Manaus, roosts on piles above the swollen river.

Many Rivers in One, the Amazon Forms a Maze of Confusing Channels as It Writhes Through Vast Brazil

"I was lost several times in this sort of thing," says the author. His few charts were of little help in solving such a jigsaw puzzle of constantly changing waterways, but he found that by watching floating debris he could usually spot the main channel (page 241).



From John R. Schultz

At Iquitos, Peru, Schultz Bought His Boat, *Sea Fever*

Larger than the dugout he had used thus far, the new craft was similar to the canoes by the riverbank. It cost him the equivalent of $11, which he earned by repairing an old truck (page 239). The vessel in background is a Peruvian gunboat. A fairly busy river port, Iquitos (population 34,200) is the only sizable urban center on the upper Amazon. Besides engaging in lumbering, cotton-ginning, and distilling, it makes straw hats and soap.

of makeshift anchor right into the middle of the mass. The large underwater area, composed of thousands of bulbs, made an ideal sea anchor.

Once secured to hyacinths or something else, I could put up my hammock between two little masts with a mosquito net over the top and tranquilly sleep while floating down the river. This method of night travel never once led me into the wrong channel, and many times I awakened in the morning 30 miles downstream.

During the first week in the *Sea Fever* I had a tremendous amount of difficulty learning to manage her. When I sat in the stern trying to paddle, as I had done in my first boat, I found her so wide and shallow that I had to lean far over and almost twist my wrist off to keep from going around in circles.

Soon I found that a casco is not supposed to be paddled from the rear, for, during the first days out of Iquitos, I met and observed natives in canoes similar to mine (page 244). When paddling along, they were invariably squatted in the very bow of the boat with the stern quite out of the water. It looked ridiculous, but they seemed to glide along effortlessly—turning to look wonderingly at me slaving in the stern of the *Sea Fever*.

Whenever I was exhausted from struggling to keep on an even course while paddling from the stern, I'd try to teach myself how to paddle from the bow as the natives did. Finally a native showed me how to do it, and travel was much easier after I acquired the knack. The paddle is put into the water to the side instead of forward and is brought in toward the body with a short, easy stroke.

After I learned how to handle my boat, the rest of the trip to Manaus was not very difficult. I found it possible to paddle many hours at a good rate, and the distance paddled in the daytime, combined with that floated at night, often was surprisingly large. Twice, my chart showed, I covered more than 110 miles in 24 hours in stretches where the Amazon narrowed and therefore flowed more rapidly.

At the Peru-Brazil border the river for a while became very wide, and I began to think of taking more time on my vacation than I

had planned. The *Sea Fever* was such a good boat and the trip so interesting that, as I neared Manaus, I decided not to send home for money and fly back to school, as I should have done, but to continue by canoe to Trinidad and possibly on to my home town, Miami, Florida.

On August 25, the day before my 19th birthday, I arrived at Manaus on the Rio Negro near its juncture with the Amazon (pages 249, 254, and map, page 241). There I was the guest of Dr. Leopoldo Neves, Governor of the Brazilian State of Amazonas.

Having paddled 800 miles on the Napo and 1,250 on the Amazon, I was ready to try some other means of propulsion. As the river widened, sails became increasingly more practicable.

With materials furnished by the Hore Lumber Industries, Ltd., a friendly carpenter helped me strengthen the *Sea Fever* for an ocean voyage. We braced her with five frames and added fittings which raised the sides. With this addition she had eight inches of freeboard when fully loaded. A centerboard was installed, a small deck was made over the bow, and a rudder was rigged aft.

I had heard somewhere that a yawl rig was good for singlehanded cruising; so I stepped two masts, each about seven feet high. An awning maker helped me decide on the sail plan and make the sails.

Since Manaus is about 1,050 miles from the ocean, little was known about sailboats, and all we could find was some blue-and-white-striped awning canvas. My sails were made of that and were still in fairly good shape nine months and 4,000 miles later.

Matto Grosso Expedition, Inc.

Man-eating Piranhas Quickly Reduce Victims to Skeletons

In a frenzy of blood lust, a school of these fish will attack man or beast, no matter how big, and tear off mouthfuls of flesh with strong jaws and sharp triangular teeth. The creatures, 8 to 10 inches long, are built like a bass or sunfish and have an undershot lower jaw. While wading chest-deep to save his canoe in a sudden storm on the Amazon, the author was bitten by such a fish, but jumped into the boat in time to escape further attack (page 253).

The mainsail was rigged on a gunter so that, when it was raised, the sail actually was 13 feet above the deck. The mizzen was 10 square feet in area, the main 45, and the jib 18—a total of 73 square feet of canvas, which was quite enough and at times was too much.

In Manaus I had the good fortune to meet Mr. E. B. Kirk, an American who had been in Brazil many years. Some years before, he had sailed in a 30-foot yawl down the Amazon from Manaus and north to Barbados.

Mr. Kirk gave me much good advice, most of which, to my later discomfort, I failed to

Maynard Jay Riss

What Gives These Youngsters Such a Thrill? An Airplane, of Course!

Far up the Amazon at Fonte Bôa, Brazil, a seaplane anchorage enthralls the younger generation. Whether Indian, Negro, or white, boys yearn to be pilots when they grow up. Jack Schultz and *Sea Fever* spent the night here on the way down the Amazon. The day before he had learned to paddle from the bow as the natives do (pages 244 and 246).

heed. He also lent me several good books on sailing from which I got some idea how to sail; my former experience in sailing had been confined to a few hours in a snipe-class boat in sheltered water. Many a time later I wished I had read those books even more thoroughly!

While in Manaus I met the second officer of an American cargo ship, up the river to load Brazil nuts. As we discussed my rather vague plans for reaching Trinidad, he seemed somewhat aghast at finding that all the navigational equipment I had was the pocket compass with which I began the trip. He gave me a plastic sextant of the sort issued by the Maritime Commission for use in lifeboats during the late war, a nautical almanac, and a copy of *American Practical Navigator*.

I have never been much good at taking advice; so, although at the time I appreciated this kindness, I must confess I wasn't terribly impressed by the importance of the generous gift just then.

The *Sea Fever* sailed from Manaus on September 21, 1947, with several hundred pounds of iron ballast lashed down securely and a variety of canned food. I thought I was ready to sail on to Trinidad.

Learning to Sail—the Hard Way!

At first there was a little difficulty in learning how to set the sails and the centerboard so that the *Sea Fever* would come about. The wind was always from downstream and it was necessary to tack the whole distance to the sea. However, after sailing several hundred miles I began to feel, with my usual overconfidence, that I knew everything there was to know about sailing.

Six days out of Manaus and 450 miles away, I tied up and visited the town of Santarém, at the union of the Tapajóz River with the

Lt. Col. Albert W. Stevens, Ret.

At Manaus, Brazil, a Thousand Miles up the Amazon, Parks, Boulevards, and Public Buildings Recall a Rubber Boom That Stretched—and Snapped

When rubber was selling at dizzy prices in the first decade of the 20th century, sleepy little Manaus suddenly sprouted into a city of fantastic wealth with a huge domed opera house. But the wild rubber tree of the Amazon Valley, *Hevea brasiliensis*, had been planted systematically in the East Indies; when plantations there captured the market, prices broke like a pricked balloon and Manaus faded. On a less spectacular but firmer basis, the jungle city of 66,800 now has an important airport, as well as streetcars, electric lights, good paved streets, and a busy water front (page 254). This is one of its principal churches.

Amazon. Shoving off in the morning, I learned rather forcefully some of the things I didn't know!

Close-hauled on the starboard tack, I sailed out from Santarém into a pretty stiff breeze, the heaviest I had yet met except for occasional squalls. To show just how little I knew about sailing, all of my sheets were on the same cleat, the mainsheet underneath with a knot on the top sheet!

About four miles out the *Sea Fever* entered the eddies and small whirlpools where the two rivers join. These swung her around to put all the sails aback. Rather quickly I found out that one doesn't tie down the sheets on a small boat! I didn't even have the topmost one, the jib sheet, free before my boat capsized.

While she was turning over, I suddenly thought of all the ballast and managed to get a knife and start cutting it loose. The canoe sank very slowly, at an angle; I must not have been more than seven or eight feet down when I couldn't hold my breath any longer and had to come up.

Luckily, I managed to free enough of the ballast to enable the canoe to float. Of course, the thick cedar had a good deal of buoyancy.

As the *Sea Fever* floated back up to the surface upside down, I also learned the hard way that one lashes things aboard when sailing in a small boat. Almost everything in the canoe was lost, except the sails and a rubber bag containing my sextant, navigational books, passport, and a few clothes. One important casualty was my camera.

A-I Nov

"Home Sweet Home" on the Rio Negro May Be Here Today and Gone Tomorrow

At Manaus, where the "Black River" meets the yellow Amazon, many families live on crude thatched houseboats. "The banks are lined with them," Schultz observes. "It is often possible to walk long distances by means of these, they are moored together so closely." Here aquatic neighbors converse over a rickety "back fence."

Lt. Col. Albert W. Stevens, Ret.

Through Belém, Sometimes Called Pará, Funnels Most of the Produce of the Entire Amazon Valley

The full name of this city of some 165,000 near the mouth of the Amazon is Santa Maria de Belém do Grão Pará, which means Saint Mary of Bethlehem of the Great River. Though founded in 1616, Belém is a highly modern city with an up-to-date airport and more than a mile of docks. While *Sea Fever* was being fitted out at Macapá, Schultz visited Belém in a fishing boat (page 253). The fisherman moored in this small-boat basin, amid romantic-looking craft that carry delta commerce.

Hammocks, Bundles, and Haunches of Meat Festoon an Amazon River Steamer

Passengers on the smaller boats find life as informal as a picnic. For days, and sometimes for weeks, they sit on their trunks and sleep in their hammocks while the great river unfolds its jungle panorama. Many of the shallow-draft, wood-burning steamboats are old stern-wheelers.

Mr. Alberto Meschede, of Santarém, who saw me standing on my overturned craft waving a pair of pajama trousers tied to a spar, very kindly came to my rescue and towed me in. He was most hospitable and helpful while I was in Santarém, where I partially refitted the *Sea Fever*. One of the bright spots in adventures like this is that you find that people everywhere are usually ready to help someone in trouble.

At Santarém, some 600 miles from the Atlantic, the effect of the tides could be noticed in that the river current slowed considerably twice a day. The winds were much stronger in this region and I was able to sail a good distance each day. There were also quite a few squalls. I met heavier squalls on the lower Amazon than ever on the ocean at any time.

Tricked by a Whimsical Wind

One night on the lower Amazon I was asleep in my hammock with the *Sea Fever* tied to a raft of floating hyacinths. I awoke just before a squall struck, at about two in the morning, as I judged the time from the position of Orion. For some reason the wind was blowing downstream at the start of the

squall, so I decided to take advantage of the opportunity to sail with a stern breeze.

Raising the mainsail, I cast loose from my "sea anchor" quickly, before the first clouds came overhead. I could see one riverbank as a dark line in the distance, but not the other. In the middle of the river at night it is often impossible to tell which way the current is flowing without some reference other than the banks; however, a look at Orion showed which way was downstream.

Until morning I sailed with all sail set. The sky had become completely overcast and I saw no stars and neither of the banks until daybreak. The wind must have veered around gradually, for at dawn I found I was sailing back *upstream* at the same rapid rate and was many miles the loser.

Fish Bites Man!

On another night, as I slept in midriver, again anchored to a floating island of matted hyacinths, one of the strong sudden squalls characteristic of the lower Amazon came upon me about midnight. I was floating a good distance from shore, but, as the wind was blowing across the river, within a short time I drifted up to the bank.

My anchor was dragging, and the strong wind and waves were threatening to pound my boat to pieces against the shore. To hold the *Sea Fever* off the sand bank, I jumped into the water, which came about up to my chest.

Just as the storm was slackening, I suddenly felt a sharp, tearing bite at my left ankle. I quickly jumped into the boat; luckily, by then the wind had abated sufficiently so that the anchor would hold alone. In the morning I found a small hole in my leg, probably the result of a bite by a piranha (page 247).

These small but vicious carnivorous fish are greatly feared by the natives. They are particularly dangerous in the shallow waters near the river's edge and in calm estuaries away from the main current. The Indians are deathly afraid of putting any part of their bodies into shallow water.

Piranhas will attack singly, but what makes them especially dangerous is that they usually travel in schools of hundreds or even thousands, and the taste or smell of blood instantly makes them killers.

I was very fortunate not to meet a school of these flesh-hungry fish. Apparently I merely ran into one that had stepped out for a midnight bite!

When the *Sea Fever* reached the Amazon Delta, I found that the current was completely slack twice a day because of the tides. I chose the northern branch of the immense and intricate delta, and, after being lost twice in the maze of sand bars and islands, reached the little town of Macapá.

"Down to the Sea" at Last

In Macapá, through the kindness of Dr. Raoul Valdes and his associates, my canoe was fitted out in one of the boatyards of the Government of the Territory of Amapá, of which this town is the capital. Decking was put on the *Sea Fever* along each side and a high coaming was mounted. A heavier rudder was constructed and a canvas cover made for the cockpit.

While this work was in progress, I visited the largest port on the Amazon, Belém (page 251). Here an American ex-naval officer, Bill Ray, who was running a surplus destroyer escort up the river as a tugboat, kindly gave me a good four-inch Navy boat compass and a small pump. The pump turned out to be far more important than the compass.

For provisions the *Sea Fever* was stocked with 10 pounds of crackers, 100 oranges, several tins of jam and chocolate, 10 cans of tomato juice, and 10 gallons of water in two 5-gallon oil cans.

For some reason I firmly believed then that the staple in my diet at sea was going to be raw fish. I somehow neglected to consider the possibility that I might not catch any fish. I saw no necessity for other provisions and much equipment. I had a sea anchor, a 20-pound iron anchor, fishhooks and line, and extra material for repairs.

Awesome Power of the Amazon Bore

I sailed from Macapá on December 9, 1947. During the four days it took to sail down the Canal do Norte to the ocean, I observed several times the phenomenon called the *pororoca*.

While in and around the delta I had often been warned of this tidal flood, or bore, caused by the advance of rising tidal waters through a rapidly narrowing channel. Always it was described as extremely dangerous.

My first experience with the Amazon bore came one morning when I was about 40 miles from the Atlantic. The tide was almost at low water and the stream was ebbing rapidly, the tidal ebb combining with the river's current. Along the shores many sand bars were exposed or awash, most of them covered with stranded trees and branches.

Suddenly I heard a low, ominous mutter, very far away, which increased within a few minutes to a roar.

I first saw the wave when it was about three miles away; it was advancing very

Lt. Col. Albert W. Stevens, Ret.

Below Manaus the Black Waters of the Rio Negro Mingle with the Amazon's Tawny Flood (Upper Right)

Floating docks, to rise and fall many feet with the fluctuations of the river level, were built during the rubber boom when "black gold" poured in from the Amazon forests and transfigured such river ports as Manaus and Belém (pages 249 and 251). Here today big and little craft, ranging from native dugout canoes to ocean-going steamers, load and unload the produce of the vast river basin. Brazil nuts, for example, are scooped up by power shovels.

Pan American Airways

Vainly Struggling, This Luckless Beast Will Be Hoisted Aboard a River Boat by the Horns

Most of the small sloops that carry cattle up and down the Amazon have heavy tackles attached to the mast. Men tie a rope around the cow's or bull's horns, haul the animal over the side by the head, then lower it into the hold. Says the author, "You'd think the cow's neck would break, but it doesn't."

rapidly along the shallow water near the river-bank. The other bank was too far away to be seen, but I am told it is visited by the same tidal wave.

As the bore drew abreast, I was about half a mile from the bank and a quarter of a mile from shallow water. For at least 400 yards in front of the first waves all of the water had been drawn off the mud flat by the receding tide, leaving it bare and exposing the waterlogged and embedded debris which covers the river bottom.

Words cannot express the awesomeness and power of this bore. The first wave seemed to be about nine feet high. It was white and breaking like a surf roller all along its upper five feet. The whole wave seemed filled with logs and branches. Long trunks were being hurled into the air and somersaulting back. The sound, even at my distance from the bank, was extremely loud.

Behind the first wave came two smaller ones, about 200 yards apart.

In the deeper water, where the *Sea Fever* was sailing, the bore took the form of three long, high swells which, though large, were not dangerous. As soon as the waves had passed, the current was flowing up the river almost immediately at full flood strength. I hurriedly turned in toward the bank to wait out the flood tide and found about a fathom of water over a bank that had not had more than a foot of water covering it 10 minutes before.

The whole thing, which came and passed within a few minutes, gave an impression of immense and terrible power. The natives are extremely afraid of being caught in shallow water when the pororoca comes roaring up the river.

I can easily believe that a boat, even a fairly large one, in less than two fathoms when the tidal wave came might be in serious danger. If it were well battened down, it might not be swamped, but probably would be badly battered by the logs carried forward on the crest of the wave.

The Open Atlantic—and Seasickness

On December 13 I sailed out into the Atlantic on the ebb tide. A very heavy onshore wind was blowing; only once in the next six and a half months did I encounter stronger winds, excepting short-lived squalls.

My plan was to sail about 60 miles out, enter the South Equatorial Current, and sail in that stream parallel to the coast to Port of Spain, Trinidad, staying offshore, out of sight of land, the whole distance.

The wind was from the east-northeast, while the land trended north. The strong current, ebbing almost directly against the wind, created a nasty chop. The *Sea Fever* never worked too well to windward, and I found it very difficult to get away from the coast.

The situation was further complicated by the fact that I immediately became seasick and remained so for the next four days. I was forced to reef my mainsail right away and during the afternoon took it down completely, sailing under only the jib and mizzen.

Pump Manned Every Half-hour

Once well out in the chop I found that the *Sea Fever* leaked very badly. She hadn't leaked much in the river because her motion had been reasonably smooth; however, in the ocean the constant plunging soon loosened the calking of the fittings and the coaming, admitting a great deal of water. Occasional seas came over the top, soaking me thoroughly.

During the whole trip to Trinidad I found it necessary to pump every half-hour or so. For three weeks I was never able to sleep more than an hour at a time, and rarely was it that long between the times when I pumped.

The first day was really a nightmare. The temptation to turn and sail downwind to the shelter of the river and the hospitality of new-found friends was always present. However, by nightfall I had worked at least ten miles out, for land was no longer visible.

Setting the rudder so that the boat would sail as close to the wind as was possible under only the jib and mizzen, I expected her to sail more or less parallel to the coast until morning while I tried to catch some sleep. It continued to be very rough, but the seas were somewhat larger and the *Sea Fever* rode more easily.

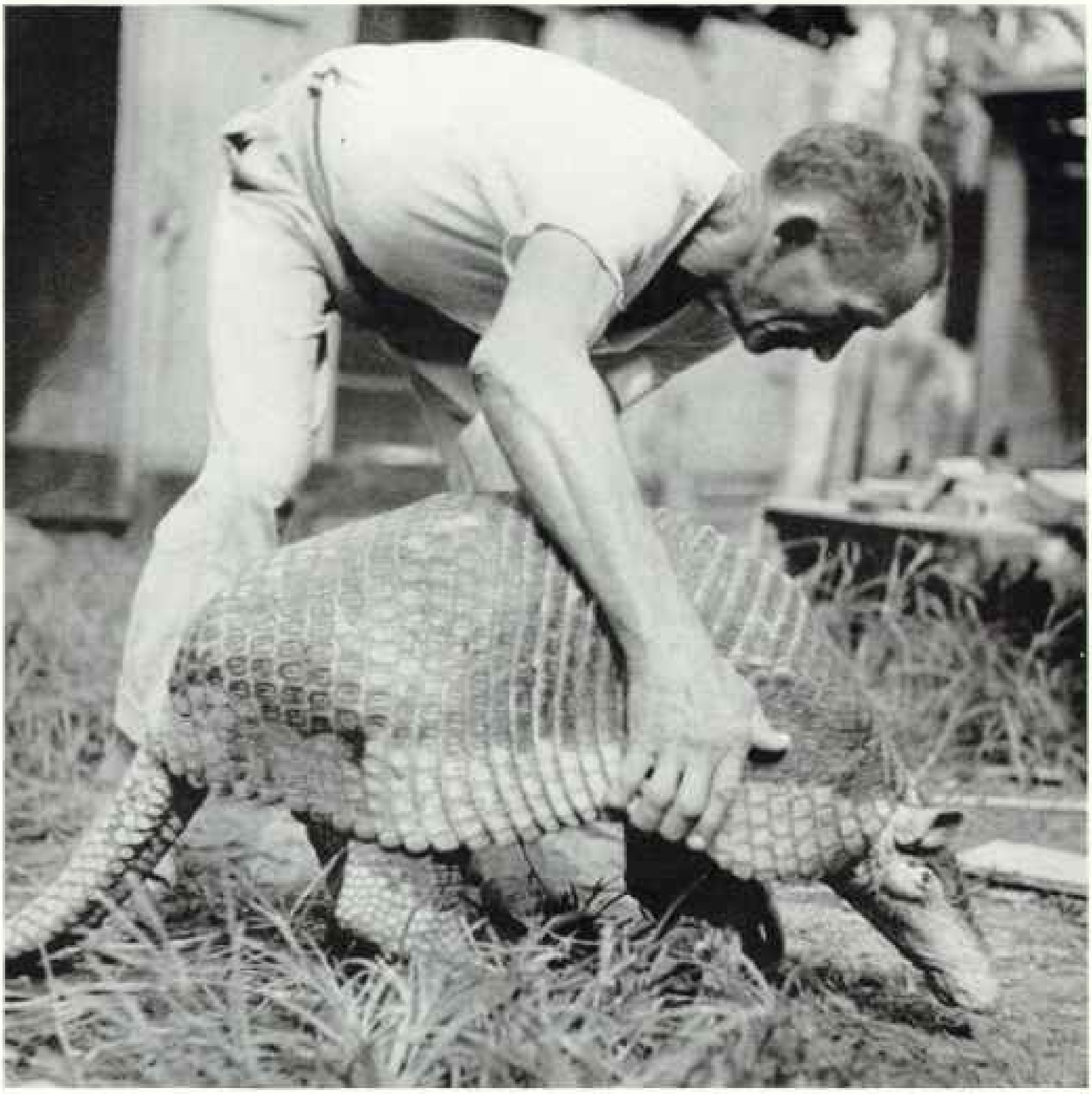
Everything was adrift inside and I was too sick to lash anything very well. There was little room in which to sleep; I could only curl up with my legs around the centerboard trunk and my head under the after thwart.

A few minutes after I pumped out the boat each time, water would begin sloshing up over the floor boards. After about 30 minutes it usually began to strike my face and thus awakened me to pump—endlessly, it seemed.

In the morning I found that I was only three miles offshore and within sight of the river mouth I had left 24 hours before!

Each of the succeeding three days was the same as the first—constant tacking away from the coast, regular pumping, and the agony of seasickness with nothing to retch.

On the morning of the fourth day out I identified Maracá Island and found that I had traveled less than 100 miles. The wind slack-



Kurt Severin from Black Star

Among the Strange Creatures of the Amazon Basin Is the Giant Armadillo

Largest of its kind, it may attain a length of about three feet, not counting the 20-inch tail, and a weight of close to a hundred pounds. The bony-armored, mild-mannered beast feeds chiefly on termites and carrion.

ened and shifted around to east-southeast that evening, December 16, and the next morning, my fifth day out, there was no land in sight. I was no longer seasick but was not very hungry.

Time to Study Navigation

I spent most of the morning squaring away the confusion in the boat. All of the food which was not in cans had spoiled; the chocolate was turning green. The fresh water had leaked out of one of the 5-gallon cans. I made a few half-hearted attempts to fish but had no strikes.

By midday on December 18 I was warm enough, and the *Sea Fever* was sailing well enough, for it to be possible to begin to read a booklet that came with my sextant, *Lifeboat Navigation*. After reading the part about finding latitude through "meridian altitudes" of the sun, I came finally to "determination of longitude."

Much to my surprise, I read that the only way to find the longitude of a position is to use a clock, and an accurate one at that. I had a watch of a sort; it had cost four dollars in Belém, and it gained two and a half minutes a day until it got wet and stopped.

There were several charts aboard: AAF aeronautical charts of the coast between the

Design Donald Kellersberger

In Tow of a Launch off Trinidad, *Sea Fever* Almost Swamps. Schultz Waves Reassuringly as He Tries to Get Squared Away

To see him off, about 35 friends, including Consul General M. H. Colladay, went along on the boat which towed him out to the open sea. "We met heavy weather just as I was about to cast loose and start for Grenada," Schultz comments. "*Sea Fever* was struck by the launch and damaged. Meanwhile, almost everyone on board got seasick!" Two days later he sailed without benefit of tow and again met heavy weather but kept going.

Lt. Col. Albert W. Stevens, Ret.

Devil's Island Seemed a Heaven to Schultz When He Landed Here, More Dead than Alive, After an 11-day Voyage from the Amazon

A kindly ex-pickpocket treated the salt-water boils that covered the young man's body. Schultz had been out of sight of land for six days and was, he admits, "very weak" when the tree-dotted Iles du Salut appeared, like a mirage. Rounding the pier at upper right, he tied up in the little cove and staggered ashore. The main prison of the French "Devil's Island" penal colony consists of the low shedlike buildings—now largely in disuse—in the center of Royale Island, the largest. At upper left appears Devil's Island and at upper right the tip of St. Joseph (page 260).

Miami Daily News

At Miami Schultz Shows How He Used His Sextant

While "shooting the sun" at sea, the bearded one-man skipper-crew usually had one leg wrapped around a stay to keep from falling overboard. In heavy seas he sometimes had to lash himself to the mast.

Amazon and Trinidad, scale 1:1,000,000; and the U. S. Hydrographic Office's pilot chart of the region for August.

Before I left Brazil I made a "chip log" of a sort—just a board secured to a line of measured length—but never used it consistently. I was too seasick to take the speed of the boat every hour; and I found during the entire trip that it was impossible to keep at all close to a definite course even when I was well. A boat as small as mine yaws too much at each wave to permit sailing in a straight line; so mileage figures would be of little use.

After a couple of days of practice I was able to use the sextant as instructed in the booklet. I found that when taking a sight the best method was to guess the time so that about one-half hour before noon I could heave to and take down the mainsail. Then, by wrapping one leg in the windward shroud, the other around the mizzen, and wedging my shoulder up underneath the shroud, I could get my hands free.

Of course in fairly heavy seas it was necessary to tie myself to the mizzen as well.

Waiting until the boat swung up to the crest of a wave, I would try to get a shot somewhere near the top. I usually took one or two sights about half an hour before noon, and from them could judge how soon the sun would be on the meridian.

The pamphlet that came with the sextant made it relatively easy to determine latitude. Depending on how rough the sea was, I usually found my latitude to within five miles.

Devil's Island a Welcome Sight

The original plan had been to stay well offshore in the South Equatorial Current and sail to Trinidad without sighting land during the entire 1,200 miles from the Amazon. However, on the morning of December 24, after six days without sighting land, I saw an island quite near.

I had made some error in navigation. The sky had been partially overcast at noon the day before, so I had failed to get a sight. Also I had only the haziest notion of my longitude.

I had no idea what land it was. But by then I was very weak and covered with salt-water boils, so it seemed best to go ashore for a visit.

Not until I reached a little dock on one of three islands and was greeted in French by

a man dressed in red-and-white pajamas, the prison uniform, did I realize that I had landed upon the French Devil's Island penal colony, the Salut group (page 259). There were only a few prisoners left—fifty or so—and three guards.

The small colony is on Royale Island, which is the highest of the three and has a lighthouse. M. Maurice Gesret, head of the guard detachment for the "Health Islands," was most hospitable. My boils were treated by the prison nurse, a trusty who was formerly a Parisian pickpocket. M. Gesret furnished me some drinking coconuts, fresh water, and more food.

For several days after leaving the penal colony *Sea Fever* ran into squally weather. By this time I was very weak; raising and lowering the mainsail became more and more of an effort. The constant pumping was weakening me, and the spreading infections gave much pain.

Often Cold, Though in the Tropics

Curiously enough, during the whole voyage and particularly during the stretch from Devil's Island to Trinidad, I suffered quite a bit from the cold. Spray in the daytime and sleeping in the water which leaked inside the canoe at night combined to cause a constant chill.

It may seem implausible, but this suffering didn't seem very important. It was accompanied by a kind of abstraction in which I could think very clearly and seem to be quite independent of the pain in my body. It took a great deal of concentration to do even the simplest thing that involved motion, but this physical inertia seemed to have no effect on thinking. The whole experience was a sort of spiritual elevation.

A few days' sail from the penal colony I developed a method of determining a line of position. On my several-months-old pilot chart was much valuable information—winds, currents, etc. These charts also show the shortest routes between principal ports. For instance, there is a heavy black line showing the shortest route between Port of Spain and Belém. Large ships traveling between major ports shown on the pilot charts usually stay pretty close to the courses on them, in order to cut down expenses in fuel and time.

I thought of those things; so on sighting a large ship I'd try to estimate her course. Then, since I usually knew my position to within one or two hundred miles, it was easy to look for one of the black lines in my general area which slanted in the estimated direction.

Since the ship was probably on the line and I was near her, it was easy to decide that I was on the "line of position" that was already marked out for me. If I was able to get a latitude observation near the time that I sighted a ship, I usually felt that I knew my position rather well.

Trinidad and a Hospital Bed

Six days out of Devil's Island I saw a great number of sea gulls for the first time, all coming from the west early in the morning. This seemed to indicate that I was closer to land than I should have been at that latitude.

I changed course considerably to the north and the next day, about 8 o'clock in the evening, sighted Trinidad's Galera Point Light, with no further changes in course.*

It was most fortunate that I saw the sea gulls, for if I had continued on the former course I would have come down on the rocky and harborless eastern coast of Trinidad during the night. Galera Point is on the island's northeastern extremity. It took me until the evening of the next day, New Year's, to land in Teteron Bay at the U. S. Naval Base.

The authorities here were most generous and helpful. I was in rather bad condition, but within eight days the penicillin given me in the naval hospital cleared up most of the infections and I felt much stronger.

After leaving the hospital I met Mr. Montgomery H. Colladay, American consul general in Port of Spain. He and his family were most hospitable and made my stay in Trinidad pleasant (pages 258 and 262).

Time Out for a Contracting Job

Since I had only about four dollars left, I was on the lookout for ways to finance the rest of my trip. Accordingly, I was all attention when Mr. Colladay casually mentioned that some difficulty was being encountered in finding a contractor to do a job for the United States Government. When I expressed interest, he referred me to Mr. Jan Nadal, of the U. S. Army Engineers, who explained the situation.

During the war the U. S. Army had driven 10 pilings into the sea bottom about a mile off the southwest end of Trinidad. These pilings were in 20 feet of water and were used as mooring dolphins for supply ships serving our coast artillery base guarding the Serpent's Mouth, the strait between Trinidad and the mouth of the Orinoco.

This camp was no longer in use, and the United States had an agreement with the

* See, in the National Geographic Magazine, "Crossroads of the Caribbean," by Laurence Sanford Critchell, September, 1937.

© Guardian Photonews Service

On Sailing Day Schultz Loads Supplies Before Heading North from Trinidad

From the end of the Trinidad Yacht Club dock, Jean Colladay, daughter of the American consul general at Port of Spain, hands him a can of fruit juice. Calling for items one at a time, Jack carefully packs the forward hatch to make the most of the little boat's limited storage space. A can of juice takes on enormous importance when drinking water runs low.

Trinidad colonial government to return that particular site to its prewar condition. A navigational hazard, the mooring dolphins now had to be removed.

For several months, Mr. Nadal said, he had attempted to find contractors for the job. To remove pilings commercially, he explained, a large ocean-going tug is tied securely to a pile, the tug pulls full speed ahead, and the pile breaks off below the bottom. His difficulty was that there were no tugs in Trinidad powerful enough. He added that some contractors had other ideas for doing the job, but that all bids so far had been over $2,000, which he thought too much.

The thought came to me—$2,000, 10 pilings; that is $200 a piling! If necessary, for $200 a pile I would swim down and *gnaw* them off!

I suggested to Mr. Nadal that I might be interested in the job. It must be admitted that, with an eight-months' beard, I looked rather disreputable. This undoubtedly explains much of Mr. Nadal's reluctance to consider me seriously for the contract.

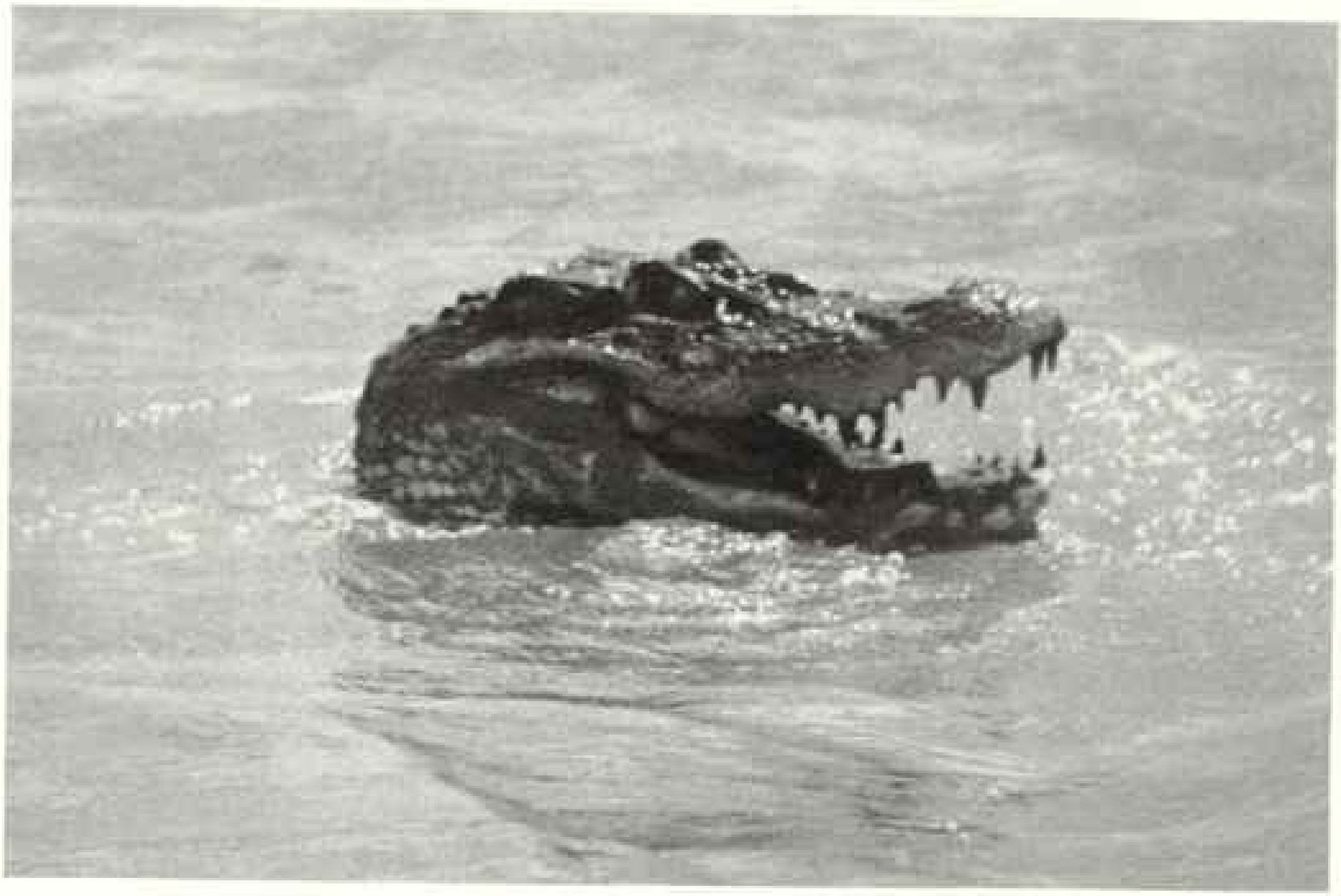
He seemed even more dubious when he asked how much capital I had available and I told him four dollars. He said it was impossible to take out pilings without an ocean-going tug, and, even if there were some other way, the job required capital and experience, neither of which I had.

I suppose it is one of the faults of youth, but when I am told that something is impossible, it intrigues me; in fact, it makes me stubborn! I decided to invest my four dollars in transportation to the south end of the island to look over the job. Once there, I hired a native boatman to take me to see the pilings. I took along a swim glass and a handsaw.

I dived to the muddy bottom, felt the bases of the pilings, and even tried my saw under water. The pilings were of greenheart wood and so hard I found it almost impossible to cut them. They were driven 10 feet into the bottom.

Still feeling that the job was somehow possible other than by use of a tug, I returned to shore.

On my way back to Port of Spain, I had the good fortune to meet Frank de Boehmler, a general contractor in Trinidad. We talked for a while of my several ideas on how the



© Karl Salvatin

Giving Its Last Gasp, This Monster Will Carry Off No More Calves

Harpooned, the cayman fought for hours before it tired and could be killed by Brazilian cowboys of Marajó Island (see "Wonder Island of the Amazon Delta," by Hugh B. Cott, NATIONAL GEOGRAPHIC MAGAZINE, November, 1938). The black cayman (*Caiman niger*), largest of the island's crocodilians, has been known to attain a length of 20 feet.

job might be done and finally decided to form a partnership—he to furnish the capital and I to perform the job.

Mr. Nadal seemed little more impressed by the Schultz-De Boehmler engineering firm than by me alone. He felt certain that, if we got the contract, we would not only be unable to complete it but might well leave the job in worse condition for the next contractor. As a guarantee against that, he suggested that we place as a deposit 20 percent of our bid's value.

Done in Three Days for $87.50

There were three bids—one at $2,300, one at $2,000, and ours at $1,100. As low bidder, we were awarded the contract.

After that it was simple. First, I rented a diving helmet, air pump, and hose; then I bought 100 pounds of dynamite and a little booklet, *How to Use Dynamite*. I had been assured that dynamite would only splinter the piles and not remove them completely, as the contract specified. However, I decided to try that plan first.

Hiring the same native boatman and two others to pump air to me, I went down to the bottom. The first day was mostly experimental, since I had never been in a diving helmet before and the pump didn't work properly until I made some repairs.

The piles, near the Serpent's Mouth, were in a strong swirl of the current formed by the merging of the Orinoco River and a branch of the South Equatorial Current. The current and the muddy discharge from the Orinoco made diving at first difficult and very frightening. However, once started it was really quite easy. In three days dynamiting had cleanly removed the whole ten piles at a total cost of $87.50.

Most of my share of the profit was used in preparing the *Sea Fever* to continue the voyage.

I had a very large centerboard made, one weighing 115 pounds. Also, canvas was put down on the deck to stop it from leaking—which it didn't. The fittings were refastened and recalked to stop them from leaking—which they didn't. The centerboard trunk was braced and refastened to stop it from leaking—which failed, too.

I made a new sail, a jiblike one to be used in running before the wind; it didn't work.

A new sea anchor and the fitting of the boat with oars (she was much too heavy to be paddled by now) completed the list of the major work done on her. Mr. Peter Stoute, commodore of the Trinidad Yacht Club, gave me invaluable advice.

Last Five Miles Take 24 Hours

The *Sea Fever* sailed from Trinidad on May 4, 1948. It rained hard the first afternoon, and I had not sailed 10 miles before I learned how little use was all my refitting in Trinidad. The boat leaked even worse than before, and in the choppy seas off the north coast of Trinidad I soon became very seasick.

However, the 90-mile passage between Trinidad and Grenada was made in good time. I sighted the island almost exactly 24 hours after sailing from Trinidad—then spent the next 24 hours sailing five miles into the harbor of St. George's. A combination of unusual tides and currents and a choppy sea kept me tacking back and forth all night and most of the day, slowly working to windward.

During this tantalizing day, so close to the shore I wished to reach, my seasickness grew much worse. Having had nothing to retch for more than a day, the morning after sighting land I began to retch blood. I was most unhappy until I reached St. George's that afternoon.

Under the circumstances it was something of a shock to read the port officer's return and find the voyage listed as "Pleasure cruise." The *Sea Fever* was dignified with the designation "Canoe yacht."

After several days in St. George's I set sail again, intending to go through the Mona Passage between Puerto Rico and the Dominican Republic. My plan was to stop at Aves Island, a barren rock owned by Venezuela.

Of course I was seasick again for the first two days, and after five days I realized that I had missed Aves Island. By then my watch was useless and accurate navigation difficult.

Sharks followed the boat, but I was unable to catch any. Again I was very weak and ill. Salt-water boils once more were breaking out all over my body.

On the sixth day and part of the seventh I had very heavy weather and found it necessary to take down my sails and lie to a sea anchor. The *Sea Fever* was still leaking badly, and, since I had left most of my warmer things in Trinidad, I was often cold. I navigated, pumped continually, and sailed, but it was as if those duties and actions were independent of me.

One morning I awakened to find the *Sea Fever* sailing straight for a high cliff, the first land I had seen in seven days. I had not expected to sight land for another couple of days and was unsure about my longitude.

The obvious thing to do was to use an ancient and extremely accurate method of navigation—I went ashore and asked where I was! I found that I was in the British Virgin Islands and had struck the island of Virgin Gorda.

I was very sick and asked the way to the nearest hospital. I sailed over to Road Town, on Tortola, where the Commissioner of the group placed me in the hospital under excellent care.

Since no one was aboard to pump, the *Sea Fever* filled with water at the dock the first night in Road Town—to demonstrate again how "seaworthy" she was. However, her natural buoyancy kept her from actually sinking.

When my infections partly cleared up, I sailed on from Tortola to San Juan, Puerto Rico,* sailing 114 miles in 29 hours.

In Puerto Rico the *Sea Fever* was kept at the Club Náutico and further trimmed and calked by the club's shipwrights. Here, in response to invitations, I gave several lectures on my voyage. As the guest of Mr. and Mrs. George A. Stuckert, Jr., I had a most comfortable stay.

After taking on rations and water, *Sea Fever* sailed on June 4 for the last leg of the voyage to Miami. Again I was seasick, but, since the weather was mild, not seriously so.

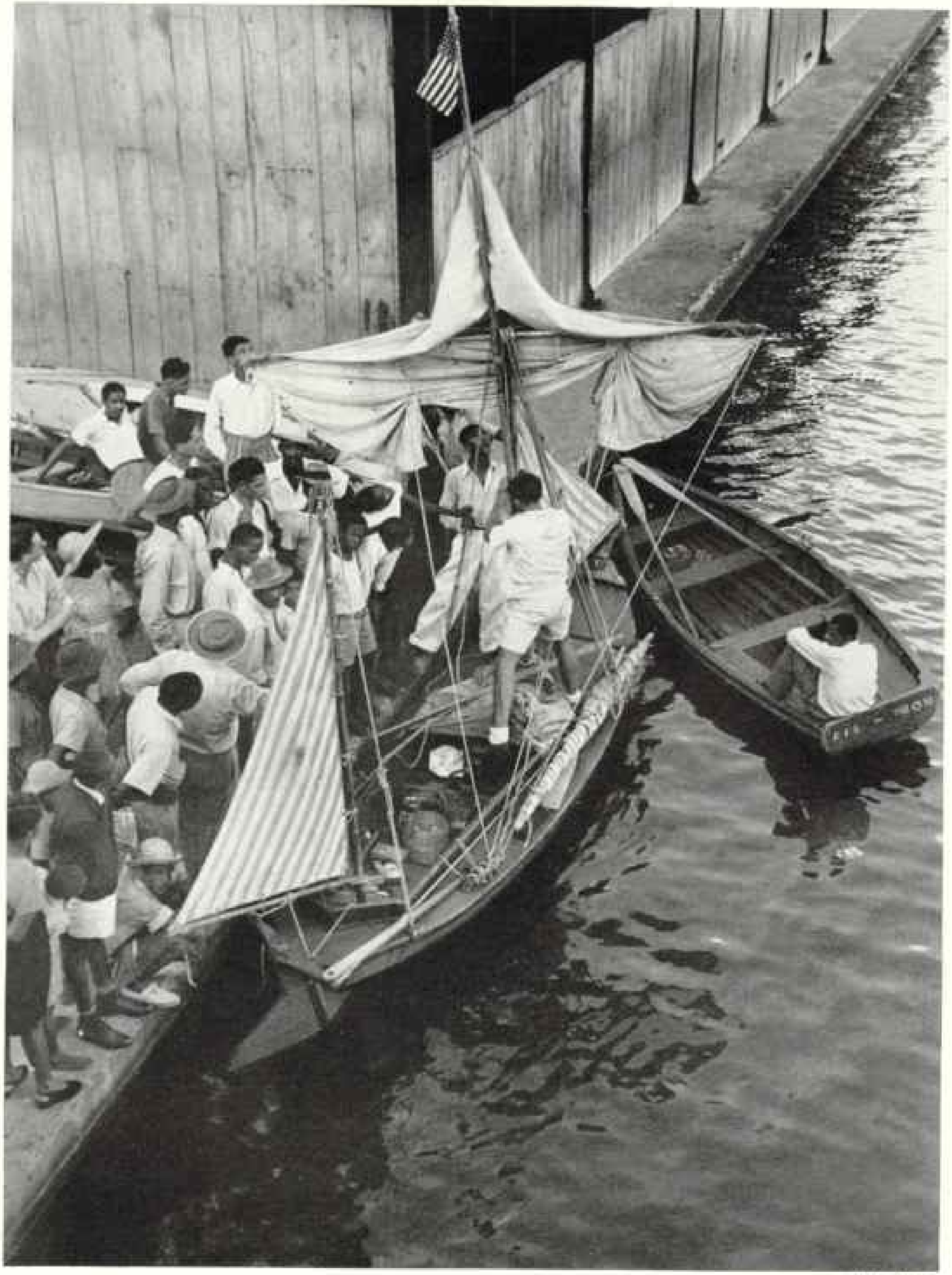
Aground 60 Miles from Land

Five days out of San Juan, about 10 o'clock one calm evening, I suddenly struck something—hard. The boat heeled over, my kerosene running light went out, and water started streaming in one side as I pounded on a reef. The anchor chain became fouled around a rock as the canoe keeled over on her side, almost swamped.

In my eagerness not to strike the northern coast of Hispaniola I had sailed too much to the north and struck Silver Bank, a group of coral reefs some 60 miles from the nearest land. I took down the sails and spent the rest of the night pumping, for the boat leaked badly all night long.

In the morning I found that the shock of striking the reef had torn a large eyebolt from the bow, leaving a hole below the water line.

*See, in the National Geographic Magazine: "Porto Rico, the Gate of Riches," by John Oliver La Gorce, December, 1924; and "Puerto Rico: Watchdog of the Caribbean," by E. John Long, December, 1939.



G. C. Horton

Sea Fever Draws a Crowd at St. George's, Grenada. Even Kilroy Is Here!

At every port bystanders exclaimed at the smallness of the boat in which Schultz had sailed so far. The leaky craft once swamped at a dock because no one was aboard to pump. On deck Jack tightens stays before sailing on to Puerto Rico. He used the square sail and triangular raffee when running before the wind.

Miami Daily News

Schultz and *Sea Fever* Reach Miami After a Fabulous Voyage from the Amazon

One of the planks added to the 811 dugout canoe's hull to raise its sides shows clearly in this picture, taken about an hour after the youth sailed into Miami's harbor. He flew the American flag continuously from Trinidad. Above his head as he holds the tiller hangs his kerosene running lamp.

I cut a wooden plug and, swimming down, pounded the plug into the hole. This stopped much of the leaking.

Running into two days of calm weather after leaving the bank, I often went swimming and read a good deal after drying out the few books I carried. Sometimes, with just a light following breeze, I put a rope over the stern and dropped back to the end, being towed through the water by my own boat. This pleasure was occasionally marred by the appearance of a shark. Then, of course, I got into the boat in a hurry.

First Landfall in 10 Days

One day, shortly after hitting the reef, I sighted a sail in the distance and gradually came up to it. The craft was a Bahamian sloop carrying dried conch to Haiti. From her crew I got some fresh water and a loaf of bread.

On the tenth morning out of San Juan I awakened to find myself eight or nine miles north of my intended landfall, Great Inagua Island. Sighting land was even more exciting than usual, since this 10-day passage was the longest I had had between landfalls.

Shortly after, two other exciting things happened.

I always left a fishing line trailing behind the boat but rarely looked at it. I suddenly saw it in violent motion and pulled it in to find a 25-pound dolphin, almost dead from its struggles against the line.

Sea Fever was rolling wildly in a rough beam sea, and a lot of spray was coming over the boat. As I sat on the windward rail to hold her down, a little brown sea bird landed on my bare head. This bird, a noddy tern, seemed to have little fear of me and grasped my hair tenaciously whenever a particularly violent roll of the canoe started to unseat him. He seemed not even frightened by the strenuous steering necessary because of the heavy rollers.

I postponed pumping as long as possible so that the bird might have a perch. He flew away only when I finally had to stagger forward to pump.

It took all day to sail around a point and along the southern coast to Matthew Town. I arrived there after dark and spent several days repairing some of the damage done by the reef.

Mast Touches Water in Storm

Sailing again, I intended to make Miami nonstop; but on the third day out I encountered the strongest storm I met on the whole trip, excepting short-lived squalls.

Occasionally one of the mountainous seas would break under the *Sea Fever*, rolling her over so far that even the top of the mast touched water. The large centerboard that I had made in Trinidad was of great value then. Even when the boat was knocked down and half swamped, the centerboard brought her back after the breaking wave had passed—but left me the job of pumping out all the water.

During one of the "knock-downs" my sextant fell out into the boat and I stepped on it. Navigational officers, who seem to regard sextants as somewhat holy instruments, to be treated with great reverence, would be shocked at the things it was necessary to do to mine. A piece of matchstick, carefully whittled down, replaced a rusted mirror spring. The shades were replaced with a broken pair of sunglasses, and the whole thing was used upside down, for the mirror was almost gone.

I finally sighted Cuba* and went ashore at the Punta de Prácticos, where the pilots for the port of Nuevitas allowed me to stay overnight.

Next day about sunset I was skirting the long barrier reef which guards the northeast coast of Cuba when I sighted an islet and thought there was a passage to it. There wasn't!

Tremendous breakers smashed the *Sea Fever* hard against the coral reef on three separate bounces. She filled with water. I lost a lot of equipment; the main boom, the gunter, and the bowsprit were carried away, and the sail was ripped in several places. However, I was lucky and was washed by the waves into the quieter lagoon inside. I managed to get ashore on the little island, Cayo Verde.

Fisherfolk Find Peace of Mind

I spent three happy days with a fisher family living on this isolated rock. With the father and son I went turtle fishing. They set their big nets in 10 fathoms of water. Turtles swam into the nets and entangled themselves. Every two months the family took salted turtle and precious tortoise shell into near-by Nuevitas for sale.

This kind family lent me tools to patch my rigging, and the women sewed the sail.

One afternoon while I was on Cayo Verde some shark fishermen came over the same reef I had crossed and were wrecked. Their flat-bottomed sailboat was sunk, and several thousand pounds of shark were lost. We helped them salvage what they could.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Cuba—American Sugar Bowl," by Melville Bell Grosvenor, January, 1947.

Fred Miller

No Speedster, *Sea Fever* Rarely Sailed Faster than a Man Can Walk

"I have the wind on my port quarter," Schultz observes, "and am making about 4 knots. In a heavy breeze I can do maybe 6½, but it is very dangerous to do so and I rarely sailed that fast, always shortening sail when the wind was strong." Here he enjoys a Sunday sail off Biscayne Bay Yacht Club about a week after reaching Miami. Blue-and-white-striped awning sails, bought in Manaus, Brazil, are still in good condition.

The spirit in this fisher family strengthened an impression I have often had of other fisherfolk—an impression of tranquillity of soul, an acceptance of whatever comes. Those who depend on something as capricious as the wind, the weather, and the fish seem to have a better outlook on life than many in the city who have more conveniences but less quietness of heart.

I left the family and sailed along the coast of Cuba, not touching land again until I reached the Anguila Isles on the Cay Sal Bank, between Cuba and Florida.

It made me feel king of the world, at least of my island, when I went ashore on beautiful Anguila, walked naked over its hills and sand dunes and long white beaches, and knew that I shared this bit of earth with only the birds. In a little cove spread a field of seaside morning-glories and white spider lilies—like a carpet for regal feet. An abandoned light-house on the island gave just the touch of loneliness needed to make my hours complete.

In the afternoon I swam out to the *Sea Fever*, anchored a few hundred yards off the beach, and set sail to the north. There were squalls all night and most of the next day, but the next evidence of land I saw was Pacific Reef Light, about 25 miles south of Miami.

That afternoon, June 30, 1948, I sailed into Miami's quarantine station. The next day, after several hours of form-filling and discussion as to just how the *Sea Fever* and her one-man crew could be classified, I was formally admitted to the port by the U. S. Customs.

When I was asked the valuation of my boat and answered $11, the customs officer did a double take. He finally wound up by listing her not as a boat but as my "personal baggage."

Biggest Worm Farm Caters to Platypuses

By W. H. Nicholas

IN THE CELLAR of its lion house, New York's Bronx Zoo operates the biggest earthworm-breeding farm in the world. The Zoo's pampered duck-billed platypuses, Cecil and Penelope, are the cause of this wholesale worm manufactory. They demand 25,000 big earthworms in their diet each month, along with an assortment of night crawlers.

Even the untimely death, last September, of their comrade in captivity, Betty, didn't help the situation much. Winter was coming on and a worm's growth in winter is slow. To supply the main dish on the menu for two platypuses in cold weather is as much of a job as doing it for three in the summer.

When Cecil, Betty, and Penelope embarked on the high seas, en route from their Australian homeland to New York, in the spring of 1947, Zoo authorities began to worry about supplying them with worms. To Christopher W. Coates, curator of the New York Aquarium, went the dubious honor of assuring the platypuses a regular daily handout.

Food Worms Short—and High-priced

"I wrote to commercial earthworm farms, of which there are about 10 or 15 big ones in the country," Mr. Coates told me, "asking them for prices and quantities. I soon received a rude surprise. I discovered, first, that costs were prohibitive, and, second, that the commercial worm farms in the country couldn't supply enough earthworms to meet the needs of our platypuses.

"So we had to start from scratch and build up our own supply from what breeding stock we could purchase.

"The platypuses need two pounds of worms a day. Depending on size, from 150 to 1,000 worms weigh one pound. Of the large size we generally supply, the platypuses consume 25,000 worms a month.

"Our initial order for worms was for 25,000. After three months had elapsed, the dealer finally shipped us 3,596. They arrived about 4 p.m. on Friday, December 20, in the middle of a snowstorm. Christmas fell on the following Wednesday, and I had made plans to go away from the Zoo for a long week end. My trip had to be abandoned, for the worms demanded immediate care.

"No one at the Zoo, including myself, knew much about worms. I distinctly recall picking them up gingerly, one by one, with a pair of tweezers. I soon got over that, and so did tankmen Thomas Callahan and James Malcolm, two Aquarium attendants who were assigned to the actual work of handling the worms.

Worms Flown to Panama

"We felt our way along, and by early April, 1947, we had built up a stock which encouraged us. Then we received a telegram from Mr. David Fleay, the Australian naturalist who was bringing the platypuses to America, advising that he had run out of worms in mid-Pacific and requesting that we fly a consignment of 10,000 to Panama to meet his ship when it passed through the Canal. This we did, although we felt sorry about depleting our breeding stock at this point.

"Then came another blow. The platypuses rejected some of the worms. That meant we had to grow better ones. We went all over Bronx Park looking for various types of worms. By the time the platypuses arrived in late April, 1947, we had found an unidentified species that turned out to be satisfactory. We called them 'fighter worms' because they are so active, although now we refer to them as 'leafworms,' because they occur in decayed leaves. We haven't had time yet to identify our worms scientifically.

"We discovered that our stock thrived best on a basic mixture of soil and elm leaves (page 272). We also discovered that night crawlers were satisfactory as supplemental rations, although the platypuses will not eat them exclusively for more than two days at a time.

"Callahan and Malcolm entered into the spirit of the thing, for this was a definite challenge to all of us. They would come back to the park after dark and spot likely places for finding worms. And they have become adept at catching night crawlers, too.

"With a red lantern one man walks along the grass parallel with a strip of sidewalk, picking up the crawlers as fast as he can and tossing them on the concrete. He sometimes walks 100 feet doing this and then retraces his steps, scooping the crawlers off the sidewalk. The crawlers aren't bothered by the red light, and do not vanish as they do when prospective fishermen go hunting for them with a bright flashlight.

"We have bred night crawlers in captivity, for the first time to my knowledge.

"In the early days we used to count the worms, but, as our volume of production rose, we discarded that tedious method and now measure them out in containers which hold two pounds, or a one-day supply.

New York Zoological Society

Cecil, Bronx Zoo Platypus, Eats Thousands of Worms but Gains Little Weight

He and Penelope, his partner in captivity, each eat from one-half to three-quarters of their weight every day. Principal item in their diet is earthworms. To feed them, the Zoo operates a wholesale earthworm farm in the basement of its lion house. Cecil and Penelope also like crayfish (page 276). At this weighing, Cecil showed a gain of four ounces in six months.

"Our long pits in the lion house cellar are walled with cinder block. To prepare one, we fill it up with clean soil to a depth of about 18 inches and then put on a layer of about 6 inches of elm leaves. These pits must always be kept moist.

Wormlets Require Balanced Diet

"We breed the worms in small boxes and remove the eggs, or capsules, which the worms deposit. The capsules are so tiny that 150 of them scarcely fill a teaspoon. In about three weeks the eggs hatch, and we transfer the wormlets to the growing pits. Here they receive a balanced worm diet of stale pastry, pea pods, sour milk, eggshells, apple skins, toast, ashes, corn meal, citrus skins, decayed fruits and vegetables, sand, coffee grounds, Pablum, and newspapers" (pages 272, 279).

Experimental breeding and scientific diet tests at the Zoo all are pointed toward one objective—to raise as many of the creatures as possible, as rapidly as possible.

Each earthworm has both male and female reproductive organs, located near its neck. When a tiny, gelatinlike band forms back of a worm's neck, it shows the creature is ready for breeding (page 273). When a pair

New York Zoological Society

▲ Cecil, One of Bronx Zoo's Two Duck-billed Platypuses, Thrives on Worms

To feed both requires 25,000 earthworms a month (page 269). Imposing scientific name of this queer Australian mammal, *Ornithorhynchus anatinus*, simply means "creature with a bill like a duck." Platypus, from the Greek, means "flat-footed." Platypuses have rubbery, ducklike beaks, fur-covered bodies, and webbed feet.

▼ Grapefruit Attracts a Host of Diners at the Bronx Zoo Worm Farm

Earthworms normally do not congregate this thickly, but on a piece of rich land there may be more than a million to an acre. Charles Darwin, the famous naturalist, and one of the first to study earthworms intensively, believed that a fertile acre might support 50,000 worms. Modern scientists have learned that he vastly underestimated the number.

National Geographic Photographer Justin S. Locke

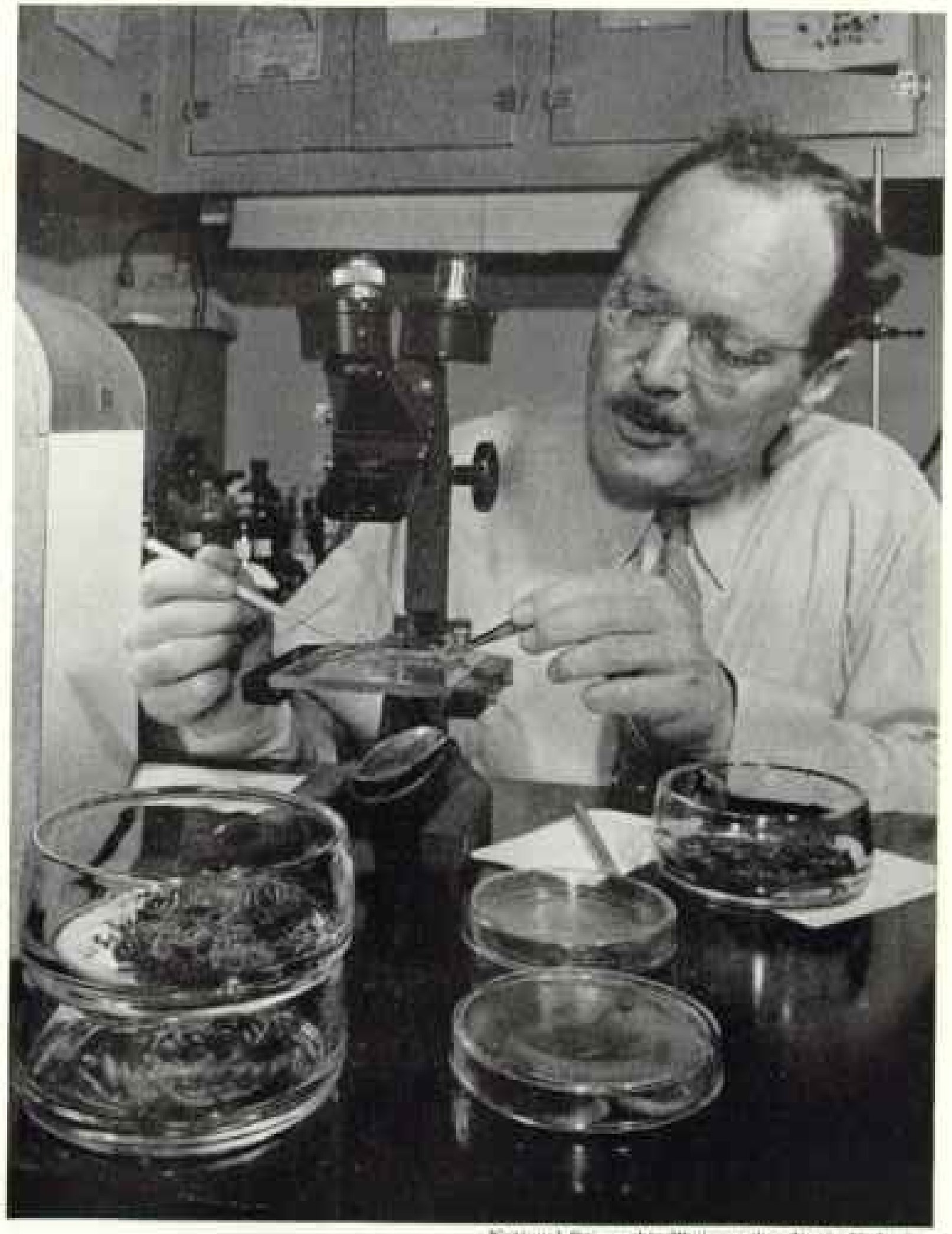
In These Pits 25,000 Earthworms Fatten Each Month to Feed Two Duck-billed Platypuses

Here one attendant moistens the dead elm leaves on which the worms thrive, while another adds a garbage diet. This is a second feeding. In the first, the food was placed along one edge of the pit (opposite). Now the big worms move inward to the new food, giving smaller ones growing room and permitting newly laid eggs to hatch.

New York Zoological Society

An Aquarium Man "Plants" Succulent Food in a Worm-growing Pit

Stale pastry, pea pods, sour milk, eggshells, toast, corn meal, citrus skins, decayed fruits and vegetables, sand, coffee grounds, Pablum, dry leaves, and newspapers are welcome. Apples are not. Robert Frost, the poet, sent the Zoo a barrel of windfalls from his Vermont farm, but the worms spurned them.



National Geographic Photographer Justin N. Locke

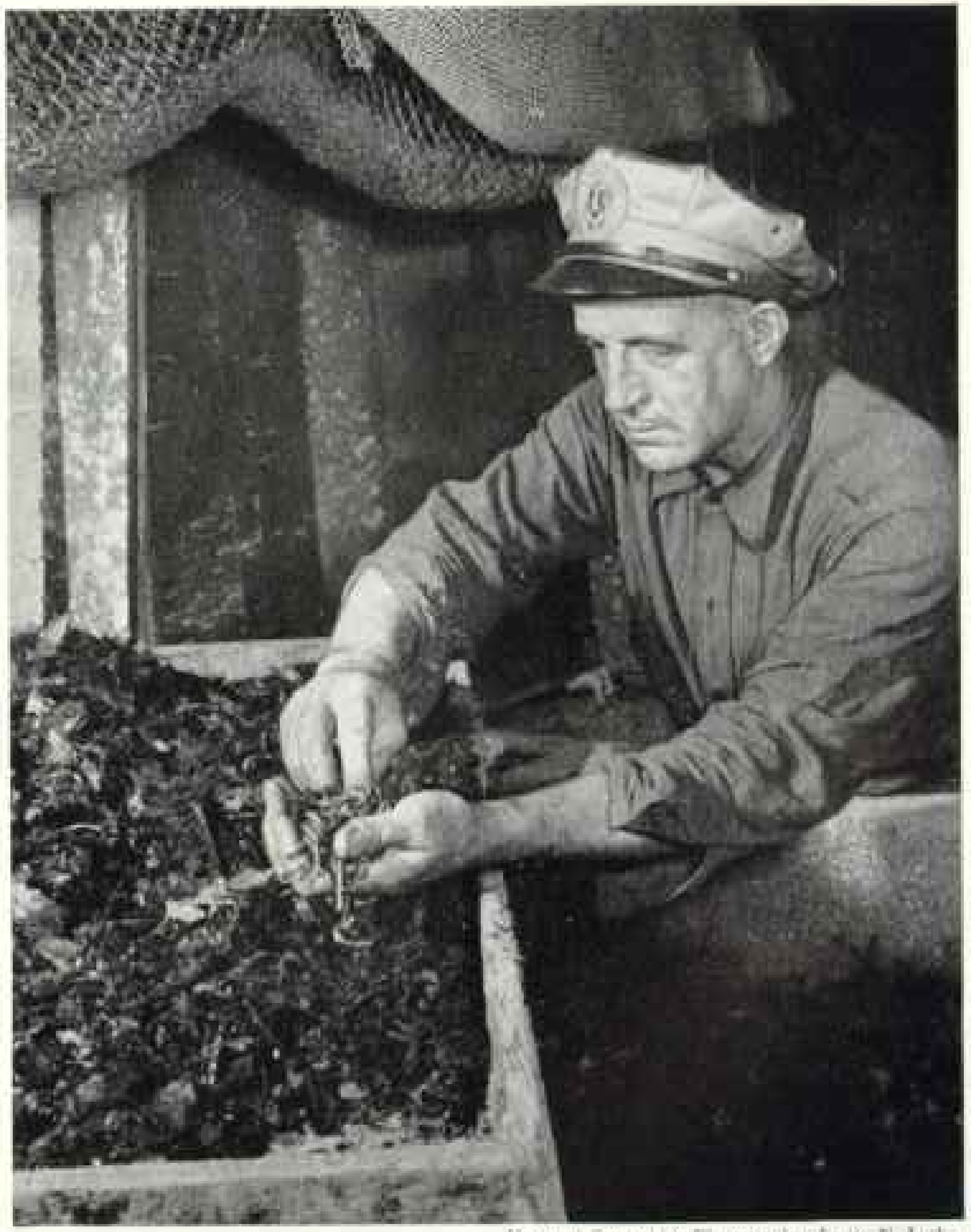
He Studies a Leafworm for Experimental Breeding

One of the two worms in the Petri jar (center) has a gelatinlike band near its head, showing it is ready for breeding. Earthworms have both male and female reproductive organs. When a pair breeds, each fertilizes the other's eggs. The bands slip from their heads and become tiny capsules, enclosing the eggs.

New York Zoological Society

Little Worms and Soil Sift Out; Big Ones Remain

Platypuses prefer the larger sizes. Leafworms grow to a length of four inches in four months on a concentrated diet; from eight to ten inches in a year. Night crawlers grow only two inches in a year, but live from 10 to 12 years. How long an earthworm can live is not known. Some have survived in laboratories for ten years. Birds, scorpions, and many animals seldom give them a chance.



National Geographic Photographer Justin N. Locke

Lowly Earthworms Have Buried Parts of Ancient Cities

A worm burrows into the ground, swallowing the earth in front of it to clear a passageway. Organic matter is digested and the soil itself is enriched by the worm's body. From time to time the worm emerges and deposits the enriched earth on the surface as castings. Such undermining has buried buildings erected by the Romans in England and ancient dwellings in Central and South America.

New York Zoological Society

Not a Face, Leg, Voice, Eye, or Ear in This Squirming Heap; Yet Each Earthworm Enriches the Soil for Man

Big wigglers in this batch of about 2,000 are leafworms; small ones are common garden worms. At Bronx Park worms concentrated 1,000 to a cubic foot were placed in a pit floored with 18 inches of yellow, sandy soil. This was covered with a six-inch layer of dead leaves. The worms began to eat the leaves and some of the earth. In 28 days the yellow soil had sunk four inches. On top of it the worms had cast a six-inch layer of rich, black topsoil. Numerous worm castings often appear overnight on golf greens, creating bumps capable of deflecting putts, much to a golfer's annoyance. Greenkeepers use an arsenate of lead mixture to drive the worms away.

New York Zoological Society

Eggs and Nest of a Duck-billed Platypus Bred in Australia

The contradictory platypus, although a mammal, lays eggs, then suckles its young (opposite). Bronx Zoo officials hope to breed their charges, Cecil and Penelope, this spring. Experience with captive platypuses in Australia indicates that April or May will be the proper months for breeding in the Northern Hemisphere. A mud bank has been built close to Penelope's summer outdoor burrow, so she may build a nest there if she so chooses.

breeds, each fertilizes the eggs of the other.

To remove the grown worms from the pits, handfuls of the mixture of soil and leaves are dumped onto a wire-bottomed sifter and shaken briskly (page 274). Small worms fall through the wire back into the pit, along with most of the soil. Picking the big worms out of the leaves that remain is easy. As Mr. Callahan gave me a demonstration, I asked him whether he ever yielded to temptation and helped himself to a few worms to take on a fishing trip.

"When I am through with my day's work," he said with conviction, "I don't want to see another worm until I come back next day."

The platypuses do not live exclusively on earthworms. They also enjoy crayfish and egg custard. Cecil relishes a frog or two daily for dessert, but his feminine companion usually spurns even the legs.

Mr. Coates also was made responsible for obtaining crayfish and finally completed arrangements to have them shipped in insulated containers from Louisiana by plane. The platypuses could eat 50 every 24 hours, but the daily air consignment does not always contain that many.

Platypus Keeper Doubles as Egg-custard Chef

The platypus keeper, Johnny Blair, also an Aquarium man, makes the egg custard for his charges. Blair, who served in the Army during the war, returned to the Zoo just when the platypuses arrived, and thus happened to get the job of caring for them. He puts three hen eggs and three duck eggs in the daily custard ration.

The odd appetite of the duck-billed platypus, native to southern and eastern Australia

New York Zoological Society

On the Hind Legs of a Male Platypus Grow Poison Spurs, Like Snake Fangs

The platypus is the world's only venomous furred creature. The hollow spurs are connected with venom glands and can inflict wounds which swell painfully. Although the Bronx Zoo platypuses do not recognize their keeper, they are sensitive to his handling. If a stranger picks them up, the nervous creatures refuse to eat for several days.

and Tasmania, is no stranger than anything else about it.* Up until a century and a half ago, scientists believed that the creature was a clever Nature fake.

When I inspected Cecil closely, I could appreciate their misgivings. Cecil is a mammal; yet he has a ducklike beak, a fur-covered body, four webbed feet, and poison spurs on his hind legs which suggest the fangs of a snake. Penelope does not have poison spurs. But if she ever becomes a mother, she will lay and hatch one or two eggs and then will suckle her young. Ordinary mammals never lay eggs; ordinary birds and reptiles have no milk glands.

Blair is sure that neither Cecil nor Penelope recognizes him, despite the months of constant care which he has given them.

"But they are very sensitive animals," he told me, "and they are aware of who is handling them." They react to varied types of handling strongly, even to the point of not eating when someone other than Blair picks them up.

Sensitive to Bright Lights

Since platypuses are nocturnal, they are sensitive to bright lights. That is why, when they are outdoors in the summer months, their pools are covered with a canopy. They live in a specially designed "platypusary" with two pools, one for Cecil and the other for Penelope.

A doorway leads from each pool into a series of wooden chutes filled with straw, which simulate the burrows the animals make in mud banks in their natural state.

In winter months they make their quarters in the warm basement of the bird house.

* See "Australia's Patchwork Creature, the Platypus," by Charles H. Holmes, NATIONAL GEOGRAPHIC MAGAZINE, August, 1939.

New York Zoological Society

Few American Indians Ever Went Fishing with Worms Like These

Dr. G. E. Gates, of Colby College, an authority on earthworms, points out that the glaciers which spread over a major portion of North America in prehistoric times killed all earthworm life. After the ice receded, a few native species moved up from the south into Indiana, Illinois, and Ohio. But most of our earthworms in Canada and northern United States, Dr. Gates believes, are descendants of worms brought from England by the colonists in dirt around roots of potted lilacs, roses, and other plants.

The summer platypusary was designed to make the animals feel perfectly at home; yet when they first were introduced to it, they refused to settle down and lose their nervousness. By a trial-and-error method some 13 changes were made to suit their sensitive natures.

The piping framework supporting the canvas had been left unpainted. It was given a coat of dull paint, and that seemed to help. Then the natural wood sides of the pools were painted, and that helped, too.

Each day in warm weather either Cecil or Penelope may be viewed by the public for one hour, from 3 to 4 p.m. "They can't stand it any longer," said Blair. During this period a recording of a description of the platypus is played. "It can't be too loud," said Blair. "That makes them nervous, too."

The chief way a platypus shows nervousness is by standing on its hind feet and patting its front feet against the side of the pool.

Whenever an airplane from La Guardia Field comes over the park, the platypuses tremble all over. "But the worst of all," said Blair, "was when some road repairs had to be made right there beside the platypusary, and we had a steam roller operating for several hours. I was afraid it was going to kill them."

Feeding Time Fashionably Late

Twilight is feeding time for the platypus. During the public showing crayfish are placed in the pools, but they go unmolested until dusk. Then, when it is growing dark, the worms, embedded in a box of dirt, are placed in the water. Platypuses seize all of their food under water, returning to the surface to pulverize it before swallowing. If the box were put into the water before the proper

Breeding Worms Get Pablum and Corn Meal for Supper

Concealed beneath the slats, the worms will crawl up to the food and deposit their egg capsules near by (page 270). Boxes are left unmolested for 15 days. Then capsules are removed and placed in growing pits.

National Geographic Photographer Justin S. Locke

Each Pinhead Capsule Holds from 1 to 20 Worm Eggs

The gelatinlike cocoons are about one-eighth by one-sixteenth of an inch in size; 150 barely fill a teaspoon. Here the attendant touches one gingerly with a paper match, for it is extremely fragile. Fertile eggs hatch in about 18 days. Leafworms breed when about 120 days old; garden worms a few days earlier.

National Geographic Photographer Justin N. Locke

Applied Biology: Weighing the Merits of Overripe Orange and Banana

Earthworm growers at New York's Bronx Zoo are primarily interested in one problem: how to grow earthworms as fast as possible to appease the insatiable appetites of the Zoo's duck-billed platypuses. Earthworms thrive on humus, but grow and fatten more quickly if their diet is supplemented by decayed fruits and vegetables.

feeding time, the hungry crayfish would gobble up all the worms before the platypuses got around to them.

Close observation has shown that the platypus does not sift the worms out of the dirt with his ducklike bill, but eats dirt, worms, and all.

Cecil and Penelope eat between one-half and three-quarters of their own weight each day, but all this food hasn't resulted in fattening them up much. Each is about a quarter of a pound heavier than upon arrival at the Zoo. Both are in excellent health.

This spring an attempt probably will be made to breed the animals. Proper breeding season in the Northern Hemisphere should be in April and May, Blair told me, but last year the weather was so cold during those months that no attempt was made. A covered mud bank has been built adjacent to the burrow of Penelope, to which she can retire to raise her young, if and when that day arrives.

In the meantime, New Yorkers take increasing pride in their platypuses, the only ones in captivity outside of Australia.

The first live platypus ever seen anywhere else in the world was exhibited here in the Bronx Zoo in 1922. The little animal died 49 days after its arrival. The two now on hand are the only other platypuses which, with the exception of Betty, have ever been seen alive outside Australia.

Mr. Fleay has kept platypuses in captivity in Australia as long as nine years, and has successfully bred them. Bronx Zoo officials hope that record will at least be equaled by Cecil and Penelope.

The cause of Betty's death was undetermined. She started to lose weight last August and finally refused to eat. Within a month the end had come.

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Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 15, 1939, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 291 B. C. (Spinden Correlation). It antedates by 200 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

The National Geographic Society-U. S. Army Air Forces Expedition, from a camp in southern Brazil, photographed and observed the solar eclipse of 1947. This was the seventh expedition of The Society to observe a total eclipse of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted $25,000, and in addition $75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1938.


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how he looked
on his first
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Remember how his eyes popped when he saw his first birthday cake? Remember the wish you made for him then—that he would grow up straight and fine?
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Nails inside the tire above appear as a picket fence in this x-ray photo taken on March 8, 1948. Thirty days later, the amazing General Puncture-Sealing Safety Tube still retained full air pressure!

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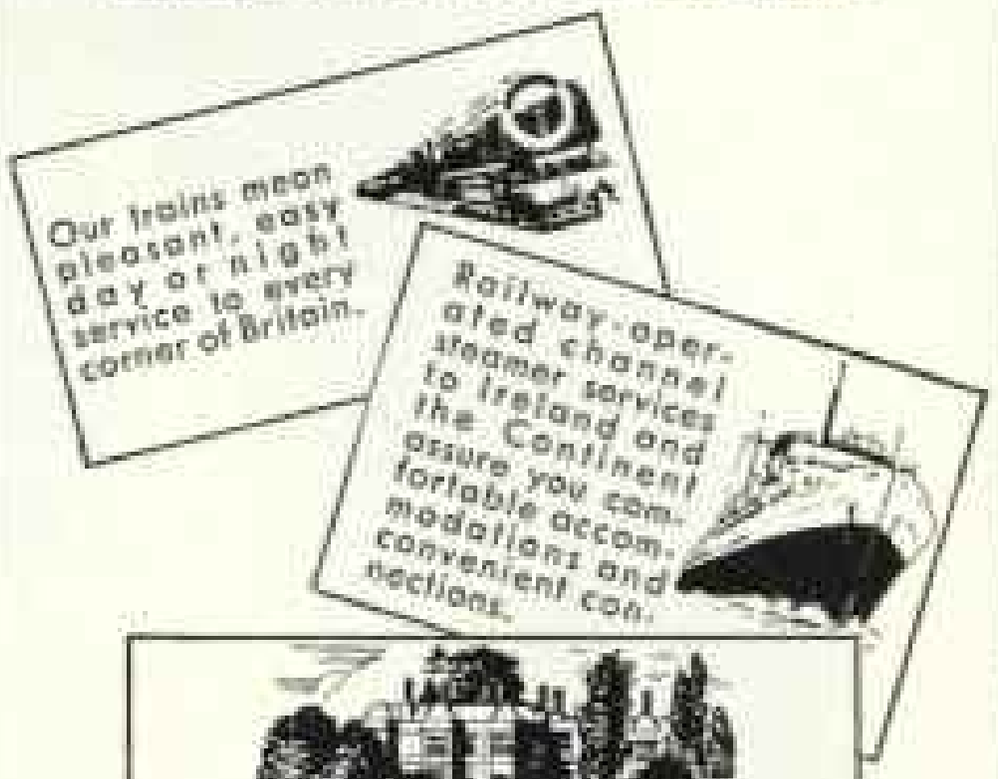

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Below is a strange and colorful formation in the Painted Hills, near Burnt Ranch, in the picturesque plateau country of Eastern Oregon. ¶ Easy-to-drive highways invite you to explore both these areas, and many other famed scenic attractions. Oregon's natural charm will please your whole family.

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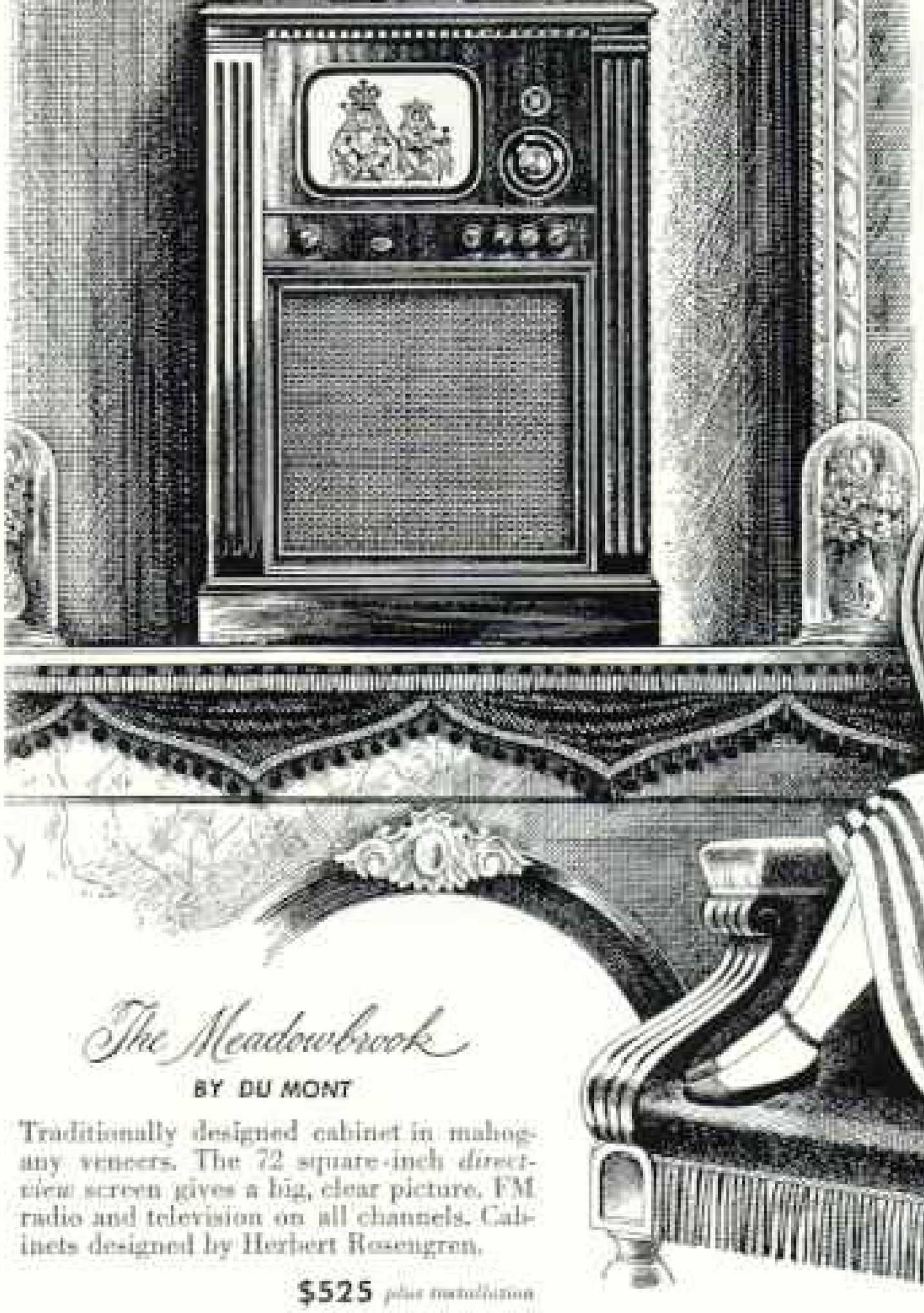

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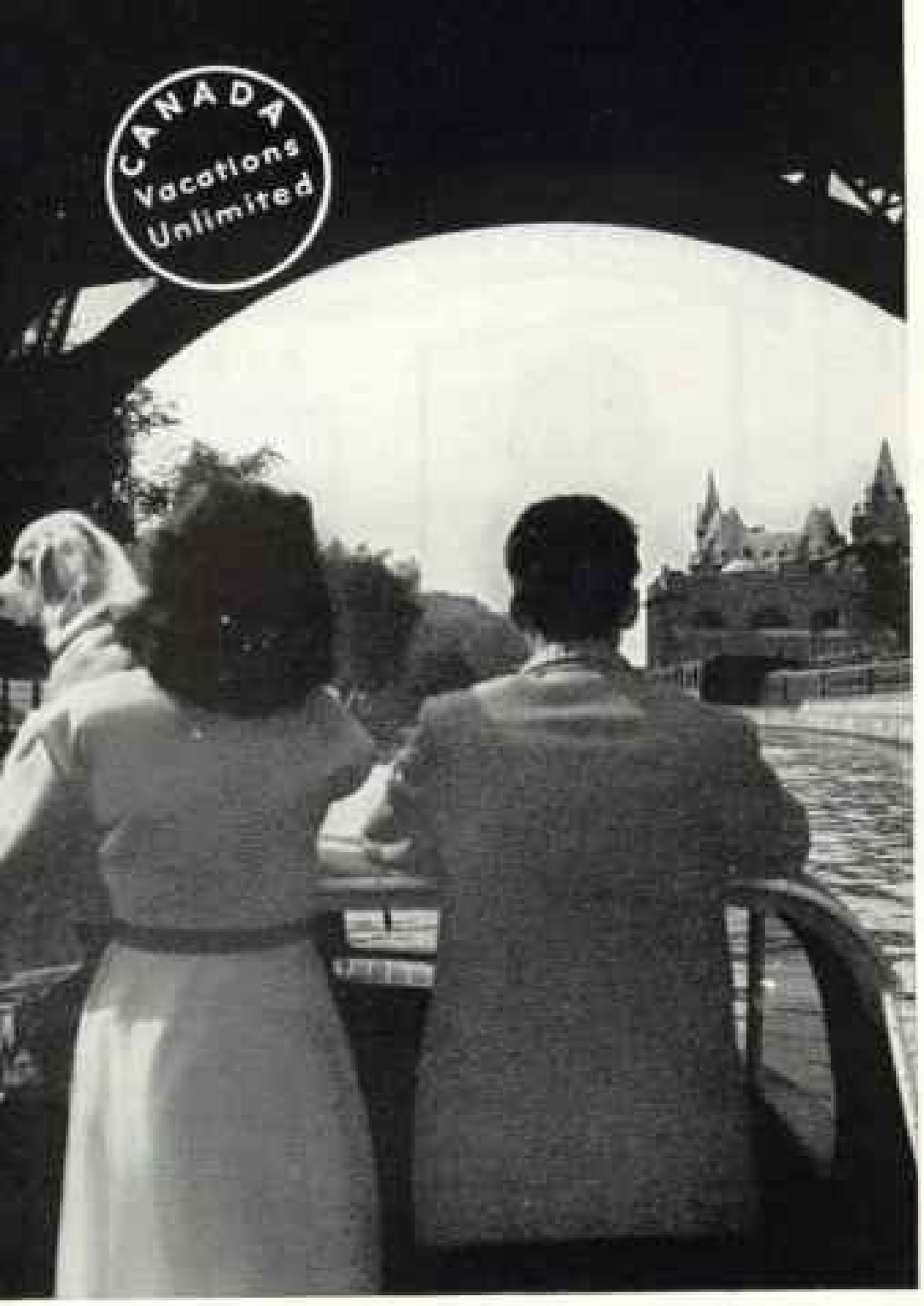

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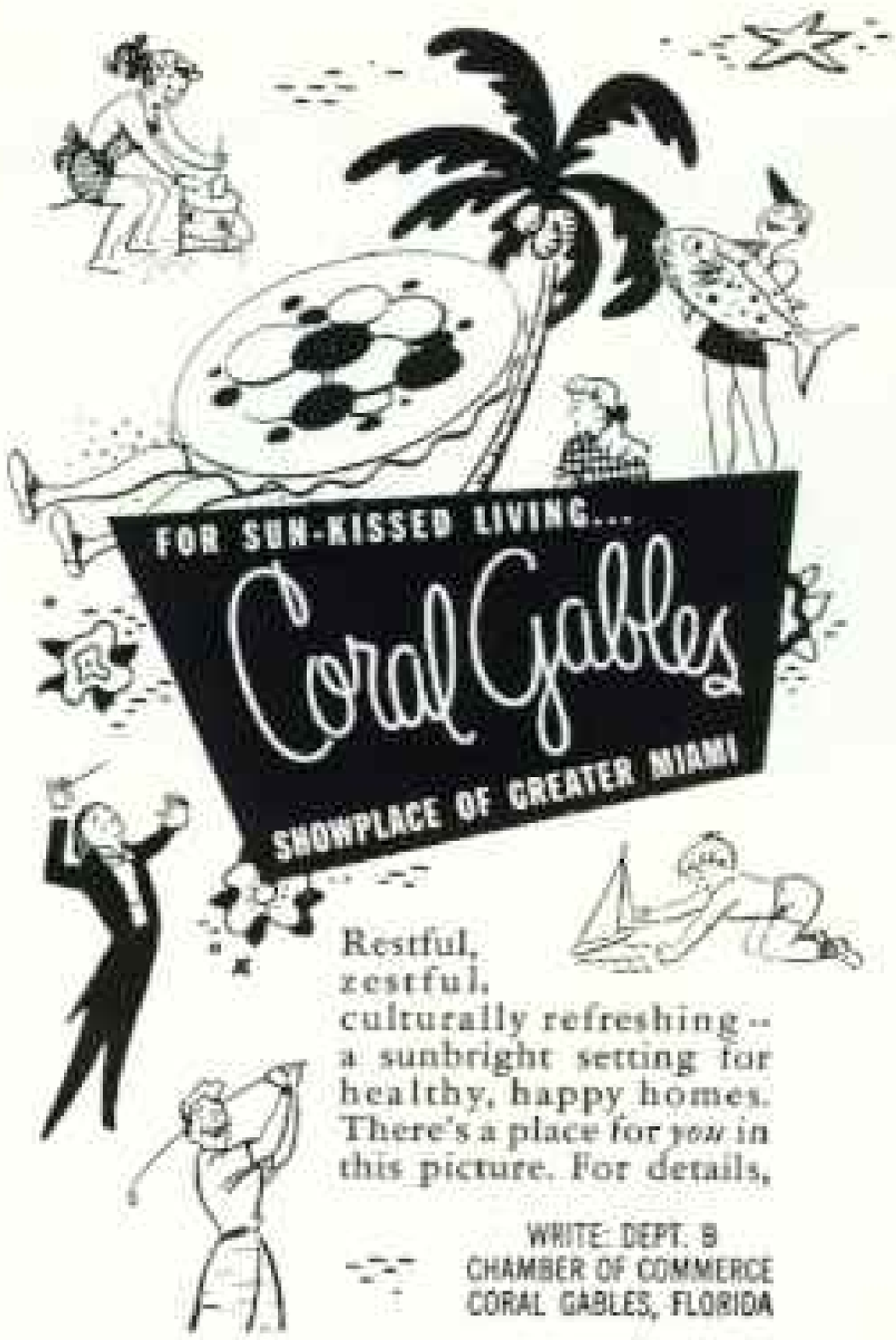

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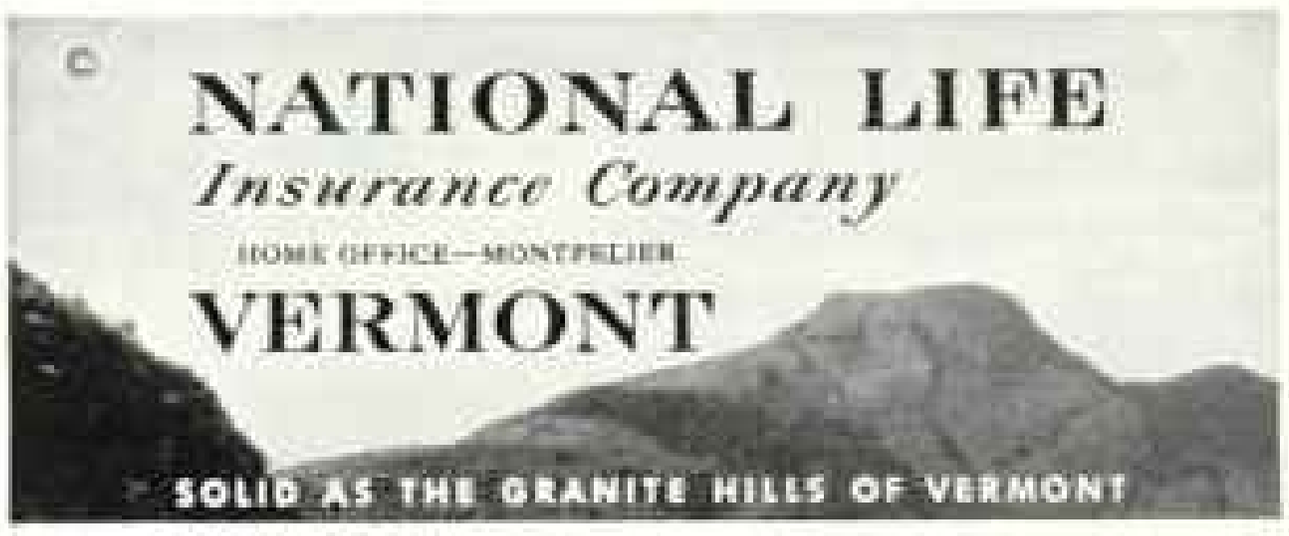

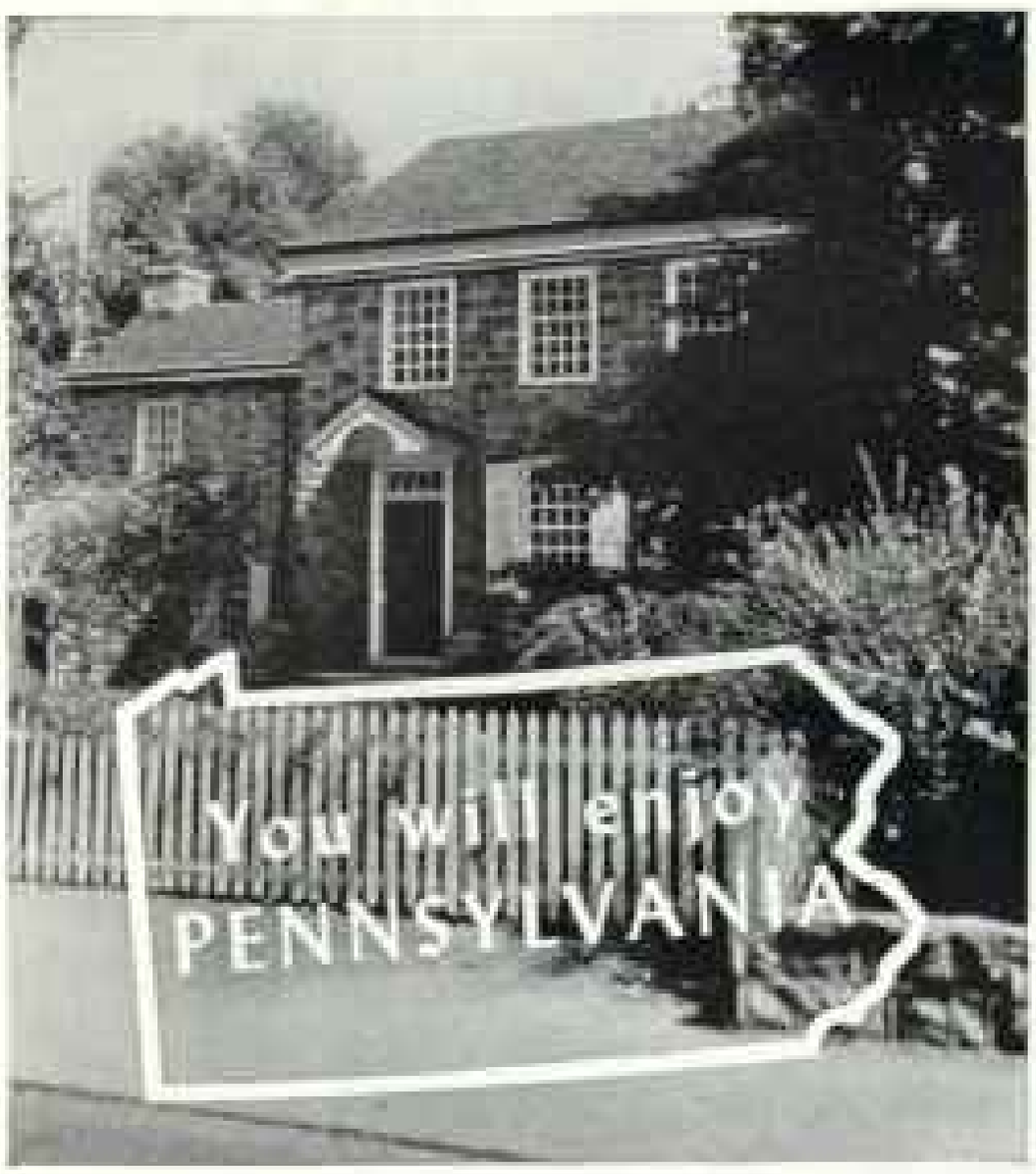

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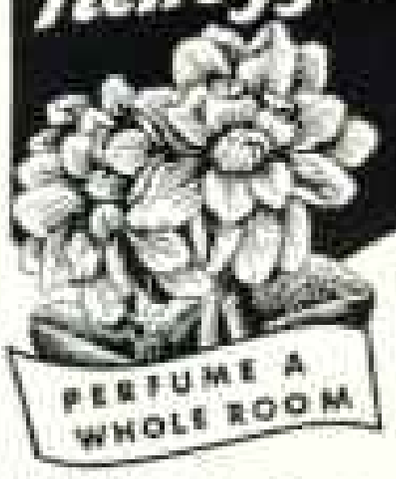

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Meet one happy housewife!

Her days of garbage-lugging are over. She's said "good-by forever" to messy, sloppy, drippy garbage. She has seen the last of the garbage can—breeder of filth and germs.

Today, all food waste is disposed of *immediately*—right in the sink. Her Disposall means a brighter, cleaner, more sanitary home!

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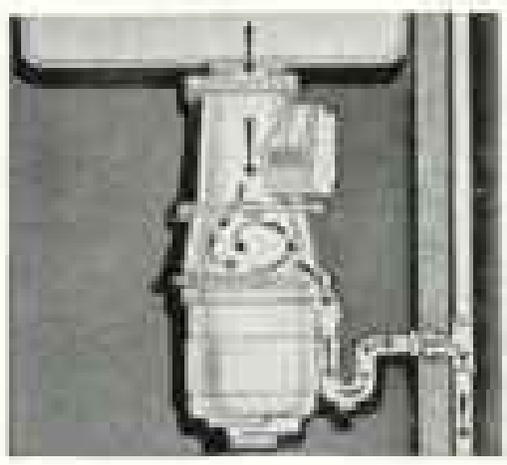
A recent survey shows 97% of users questioned enthusiastic about the Disposall. They say: "I'd never want to be without it again!" "Saves me 32 minutes each day!" "No more garbage to handle . . . no garbage odors!" "It's perfect!"

You'll agree—once you've installed this new kitchen marvel!



1. Under-the-sink view. A simple appliance that fits almost any sink. Works perfectly with sewer or septic tank.

MEET THE GENERAL ELECTRIC DISPOSALL! →

2. You can dispose of all food waste immediately, this easy, sanitary way. Disposall's swirling action helps keep drains clean.

3. You lock protecting cover on drain with a twist, once waste is scraped into drain. Openings let in clean, flushing water.

4. Turning on cold water automatically starts the Disposall. Food waste is shredded, flushed into sewer or septic tank.

DISPOSALL

DISPOSALL MEANS
GOOD-BY TO GARBAGE
AUTOMATICALLY!

*General Electric's registered trade-mark for its food-waste disposal appliance.

So easy to "Go Modern" in your kitchen! First step is to your retailer's. He'll show you how easily a Disposall can be installed in your kitchen. Ask him, too, about the perfect laborsaving combination, the All-Electric sink that teams up a General Electric Dishwasher with the Disposall! General Electric Company, Bridgeport 2, Conn.

GENERAL ELECTRIC

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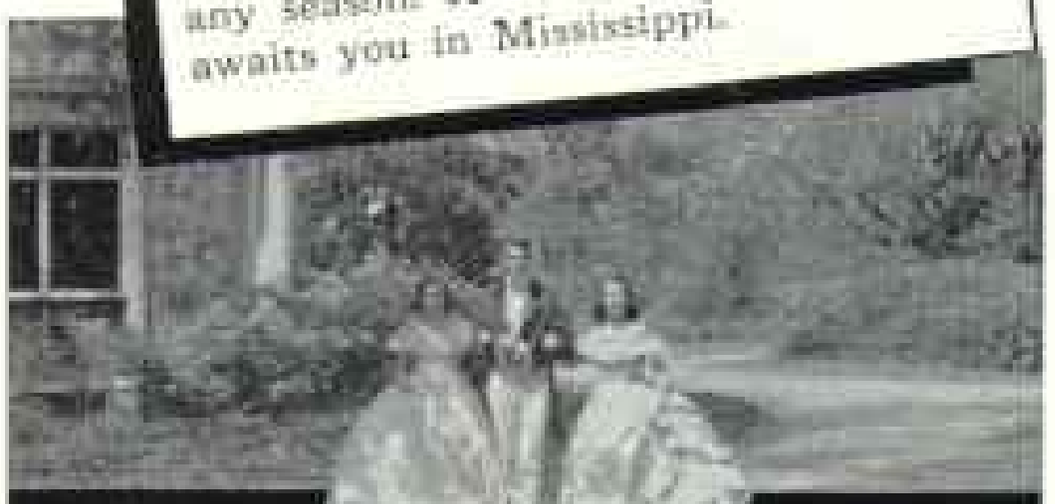

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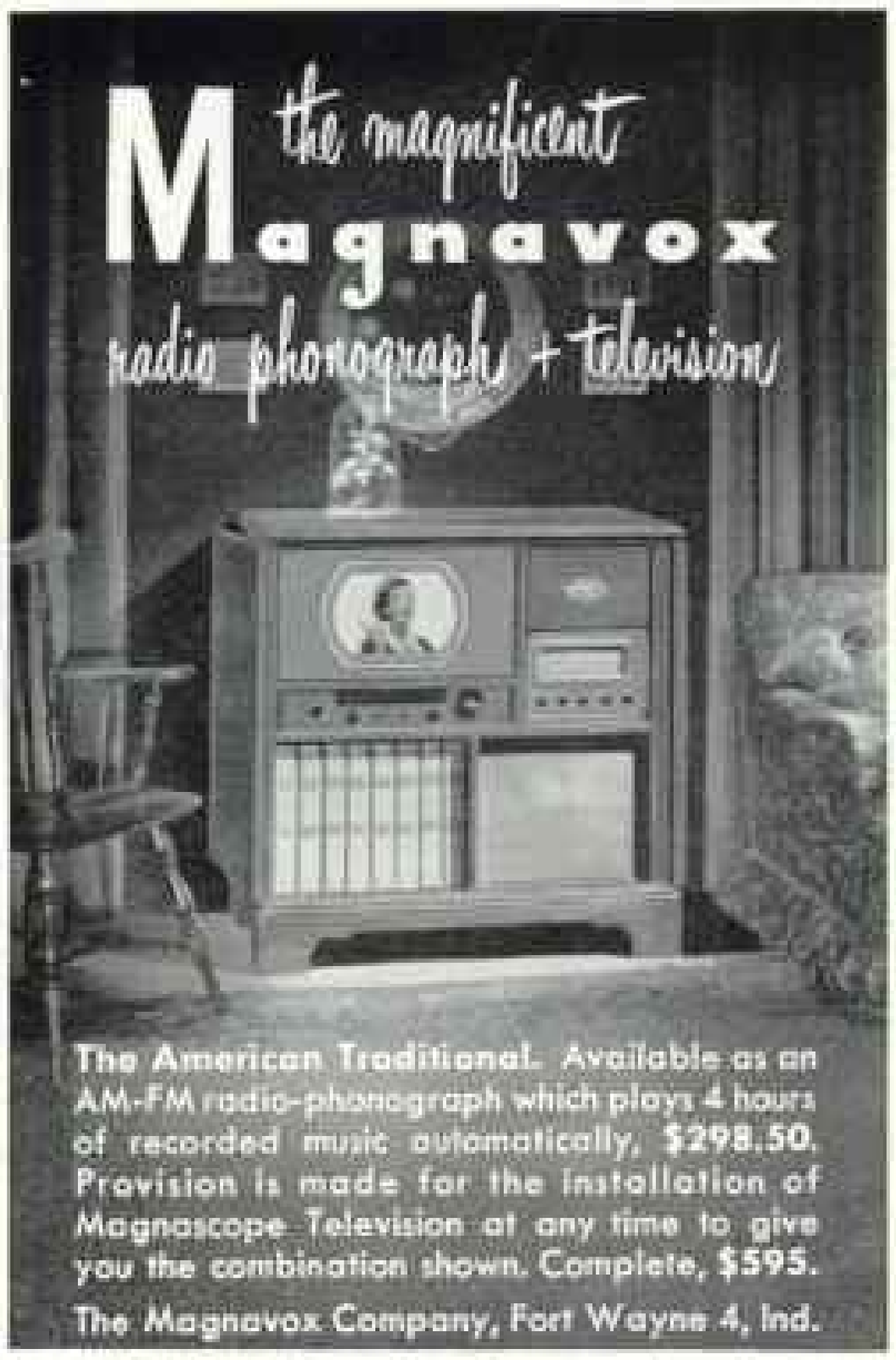

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When you go Pullman you relax on deep-cushioned, comfortable seats. You sleep on big, soft, clean beds.

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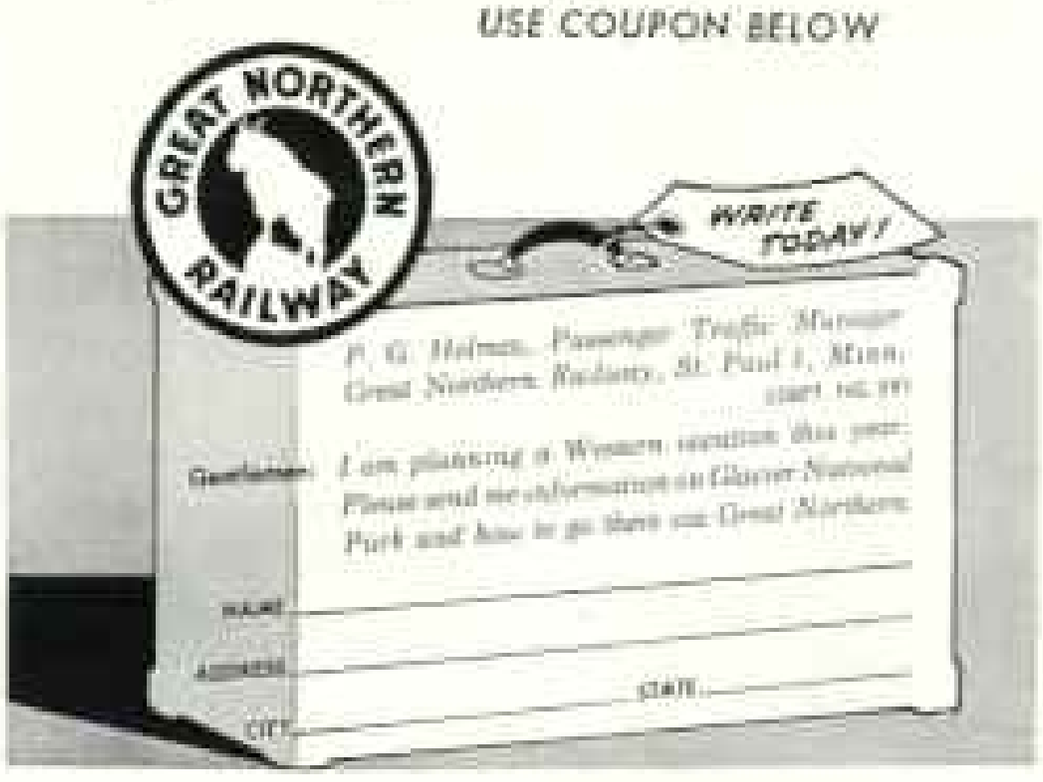

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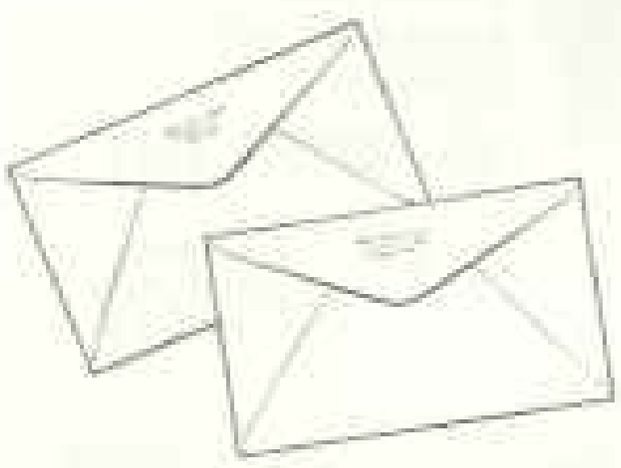

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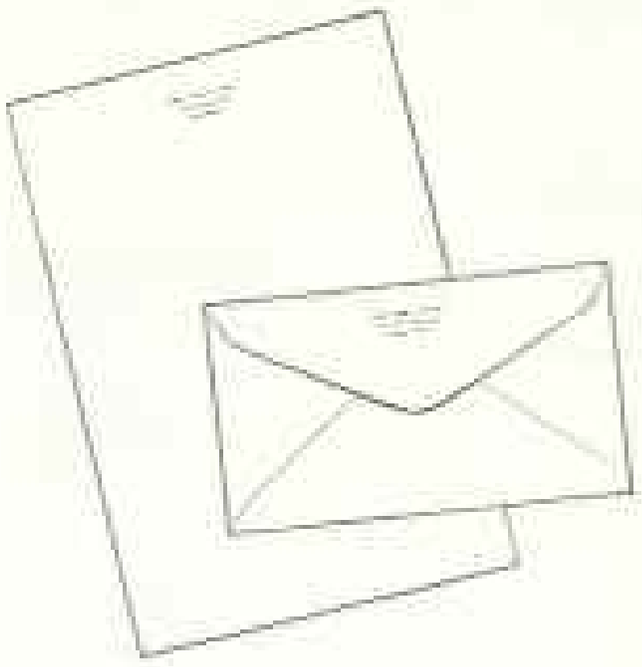

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You'll sleep under blankets! And there'll be swimming, sailing, deep-sea fishing. Pine-shaded lakes. Open-air concerts.

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"We never close in"

Southern California

There are *four* wonderful vacation seasons in Southern California . . . thanks to DRY SUBTROPICAL CLIMATE. Climatologists say it's: *Exclusive to Southern California in North America. Occurs only between the humid tropics and the weather to the north, and usually where mountains are close to the sea. Characteristics are: Mild weather year-round; little rain; much sunshine; many fruits and flowers.*

America's 4-Season Vacationland

See old missions, citrus empire, movie center, horse racing tracks *in any season!* Mail coupon for color booklet about Los Angeles County and all Southern California. Visit All-Year Club's Free Visitors' Bureau, 517 West 6th Street, Los Angeles, on arrival.

No one should plan to move now to Southern California unless assured of permanent housing.

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Now two famous Cobra† Tone Arms—the sensational new way to play records! One Cobra Tone Arm for the new 45-minute Long-Playing Records. Another Cobra with famous Silent-Speed Changer, for regular records.

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A superb full-powered radio—combining Genuine Zenith-Armstrong FM for static-free, "living broadcast" tone, and famous Zenith AM, for powerful, long-distance reception.

The Zenith GOTHAM. Zenith Television, Twin Cobra Record Changer and FM-AM Radio are combined in this console of breath-taking beauty in imported mahogany veneers. Available with Zenith "Big B" television screen. See it at your Zenith dealer's.

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"William and I have always looked and planned ahead *together,* both for ourselves and the children. Buying our home . . . William's insurance program . . . our wills . . . all our plans for the future we worked out as a family. So it was natural for us to buy a family monument, too—and it's wonderful to know that it's the one each of us would have chosen—because we chose it *together.*"

More and more people are choosing their family monument *before the need arises.* And more and more people are choosing Rock of Ages because they know its beauty will last for generations to come. Every Rock of Ages Family Monument is backed by a signed guarantee to you, your heirs or descendants.

MANY THOUGHTFUL PEOPLE choose their family monument—as well as their cemetery plot—*before the need arises.* Write for "HOW TO CHOOSE A FAMILY MONUMENT," *a large illustrated booklet available without charge or obligation. Simply write to Rock of Ages, Barre, Vt. Or ask for a copy from the Rock of Ages Dealer in your community. You'll find his name in the Classified Section of the Telephone Directory.*

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Living a Good Life with a Bad Heart

1. To look at him, you would never guess that there is anything wrong with this man's heart. He is just a bit over 50 years old, active, happy, and getting a lot of enjoyment out of life—yet he has heart disease.

Like everyone else his age, his heart had beaten about *one and three-quarter billion times.* Of course it was not as strong or as adaptable to sudden demands as it had been in youth, but he had no warning signs of heart trouble.

As a result of periodic medical examinations, his doctor was able to detect his impaired heart *early*, when chances for improvement are best. Today, by following his physician's advice, this man can lead a useful life of nearly normal activity.

2. He enjoys many mild forms of exercise, but carefully avoids any *overexertion* which might further strain his weakened heart.

3. By eating moderately, he lightens the work of his heart during digestion. This helps to avoid overweight, which is always a burden for the heart.

4. He is able to carry on his daily work, but allows plenty of time for sleep and rest. His heart then will have a chance to rest, too.

5. He maintains a calm and cheerful outlook, for his doctor explained that fear, worry, or nervousness might make his condition more serious.

MEDICAL SCIENCE has made many advances in treating heart ailments and more research than ever is being done on these diseases. The Life Insurance Medical Research Fund, supported by 148 Life insurance companies, is devoting all its resources to studies of this problem. For other helpful information about heart disease, send for Metropolitan's free booklet, 29N, entitled, "Your Heart."

Metropolitan Life Insurance Company

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TO VETERANS—IF YOU HAVE NATIONAL SERVICE LIFE INSURANCE—KEEP IT!

The happy medium that's happy

BETWEEN the frivolous night life of the luna moth and the humdrum existence of the working ant there is a sharp contrast.

For one there is a short, irresponsible life and a merry one, full of gorgeous display. For the other there is nothing but slavery, labor without recreation. Nature has doomed these animal forms to prescribed, proscribed designs for living. There seems no choice. Man, however, is neither moth nor ant.

To enjoy some of the luxuries of life, no family needs to ignore responsibilities. To meet its obligations, no family needs to forego all the pleasures of life. There is a happy medium, for the human race, between the precarious and the dull.

There are ways of providing for your future and for any misfortune that may come. Those ways are the various forms of insurance—economic inventions which rival the mechanical in the labor they save, the worries they eliminate, the pleasures they make possible.

Life and accident insurance make provision against the rainy days so that families may enjoy the sunshine of today.

Life insurance, carefully planned, is a happy combination of insurance, thrift, and investment. It protects when protection is most necessary. And it can provide an income in later life—an income one cannot outlive.

For expert counsel about the ways that insurance can assist your plans, we suggest that you see your Travelers agent or broker.

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CINE-KODAK MAGAZINE 8 CAMERA, with magazine load, built-in exposure guide, Lumenized *f*/1.9 lens, four speeds, including slow motion — $140, plus tax. See it at your Kodak dealer's. And ask, too, for the free booklet, "Home Movies the Cine-Kodak Way."

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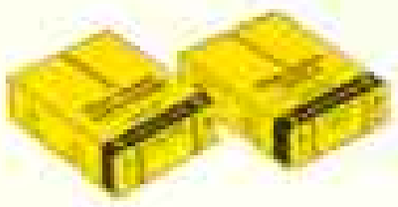

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Can You Guess the Name of This City?

It's a very important city to many millions of people, but you won't find it on the map. It's the Telephone City that the Bell System has built since the war. Every building shown in the picture is a telephone building.

We've taken 392 major building projects and additions that the Bell System has completed throughout the country and had the artist show them in one picture. And that's only one-seventh of the Bell Telephone buildings erected or enlarged since V-J Day. There wasn't room for 2400 others.

These buildings are more than brick and stone and telephone equipment.

They are jobs for thousands of men and women. They are more business for the towns and cities in which they are located. They are more and better telephone service for millions of telephone users.

When you look at all these buildings you can see how the Bell System is growing to catch up with the nation's needs. You can also see why it is necessary for the telephone business to have reasonable earnings.

For the money for buildings like these does not come out of the money you pay for telephone service.

It must come from investors — hundreds of thousands of everyday men and women all over America who are willing to invest their savings in the telephone business.

Reasonable earnings are needed to attract additional investors' dollars. You have an interest in this because these dollars are used to provide you with more and better telephone service.

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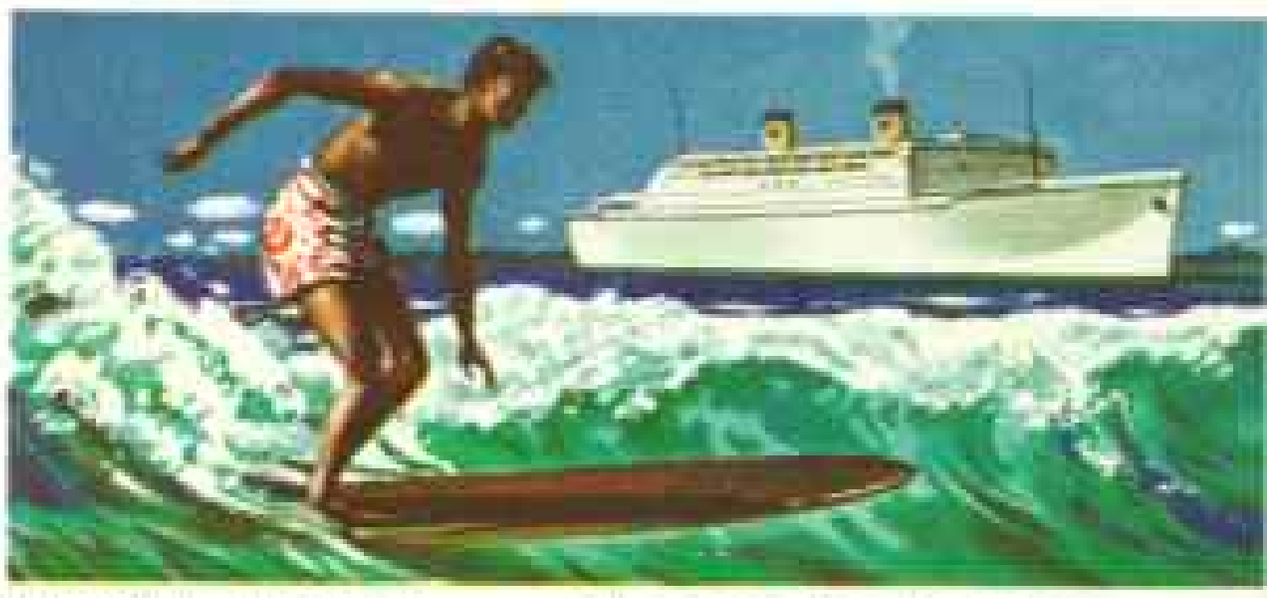

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