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Map of Asia and Adjacent Areas

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Long Island Outgrows the Country

By Howell Walker

With Illustrations by National Geographic Photographer B. Anthony Stewart

"SOME PEOPLE still think of Long Island as a sandy strip of shore line off New York with a lighthouse on one end and Brooklyn on the other."

So one of the island's five million residents recently told me. Yet this slim stretch of land under the very nose of the country's greatest metropolis is one of the fastest-growing regions of the United States. In the last few years the population of its so-called rural counties has increased more rapidly than New York City's or the Nation's as a whole.

Here on Long Island multiple housing developments mushroom. Along with them sprout streamlined factories and modern shopping centers, transport and recreational facilities. Much of the activity burgeons where it seems only yesterday myriad acres of potatoes grew.

Between Long Island and New York's towers, hundreds of trainloads of white-collar commuters daily ebb and flow. Increasing thousands call the island home, and many now earn a living in its hundreds of new industries.

631 Trains Daily Carry Suburbanites

Not quite as flat as a flounder, Long Island on a map resembles a big fish nosing into New York Bay. Its forked tail reaches 120 miles out to sea; its highest hill rises only 410 feet above the surrounding waters. Long Island Sound washes the north shore and separates it from Connecticut's coast. Against the south shore swell the restless tides of the Atlantic (map, pages 282-3).

Although smaller than Delaware, Long Island has about 16 times as many people as that State. Of the island's four counties, urban Kings and Queens in the west belong to New York City; to the east lie Nassau and Suffolk, with numerous little towns and splendid estates, together with fishing villages, truck farms, growing suburbs, and expanding industries.

Fifteen hundred miles of boulevards, highways, and State parkways cover the island. Operating over 420 miles of lines, the Long Island Rail Road reaches most major points, runs 631 trains daily, and hauls about 92 million passengers a year, thus making it the leading carrier of suburbanites in the United States.

In addition to subway, elevated, trolley, and bus systems, six major airports serve both the island and the New York metropolitan area.

Eight Roads over or under East River

To reach Long Island from Manhattan by automobile, I could have used any of six bridges over the East River or two tunnels which plunge beneath it. The newest—shiny-tiled Brooklyn-Battery Tunnel—opened to traffic in late May of last year (page 288).

I chose the Triborough Bridge, swung onto Grand Central Parkway, and breezed eastward through Queens into Nassau County.

From the congested west end, four-lane parkways stream out like broad ribbons in the wind. Each year they carry more traffic farther eastward as new home and business construction pushes ahead. Cross-island highways link the axial arteries.

Engineers planning these modern highways sometimes turn back a century or two to Indian trails; red men made more topographical sense than their first white successors in laying out lines of communication!

280

1,300,000 Bathers Obscure Coney Island Sands. Hot-weather Worries Melt Like Ice

Subways, automobiles, and excursion steamers take 70,000,000 pleasure seekers annually to New York's playground by the sea. Stretching along three miles of boardwalk, the resort offers 900 amusements.

A dozen or more small Algonquian tribes were scattered the length of the island. In 1609 they accepted the first foreign intrusion without much fuss; Henry Hudson with a score of men landed, tradition says, on what became known as Coney Island. But Hudson, the Englishman sailing for the Dutch East India Company, didn't linger; he had set his heart on finding a short passage to India.*

For the next 25 years the Indians had Long Island to themselves. Then came Dutch, closely followed by English settlers. European intervention thinned out the aborigines. Smallpox spread with fatal results. Fifty years after the first settlers arrived, histories tell us, a third of the native population had died; by 1761 red men had virtually vanished from large parts of the island.

Today only one real reminder of the Indian survives: his place names. Villages, towns, coves, bays, hills, roads, and streams still carry them.

Seventeenth-century colonization continued. Around their original holding at Breuckelen, now Brooklyn, Dutch settled in the west; English mostly in the east. International jealousy over land and its government kept the two colonies in a constant squabble. Finally, in 1674, England won complete control of the island.

During the next 100 years, the island enjoyed relative peace and the homey task of domesticating itself. Farms expanded; villages sprang up; small industries increased; roads took shape; news traveled faster.

The American Revolution split the island folk. The Battle of Long Island, initial engagement in the campaign of 1776, took place at Brooklyn. Well-trained troops led by England's General Howe forced outnumbered Americans under George Washington to retreat across the East River. And the British remained for the duration of the war.

Link with the World—and the Future

Now look at Long Island in 1951, but quickly, before what you see today becomes obsolete tomorrow.

"Only permanent thing around here is the temporary aspect of it all," said an executive of Long Island's newest airport. "And the only monotonous thing about it is the constant change."

To illustrate, he spent part of a morning and a whole afternoon showing me one of the world's largest commercial air terminals. Although far from finished, New York International Airport in southern Queens has already begun to steal La Guardia's thunder as New York's busiest flying field (pages 290, 291).

International Airport, formerly known as Idlewild, covers a reclaimed area equal to all of Manhattan from 42d Street to the Battery, or about 4,900 acres. We saw 10 miles of runways and three gigantic hangars, each with a floor the size of a football field. Of the many administrative buildings now there, most will be replaced by more adequate, up-to-date permanent structures.

By 1960 this airport plans to handle about 700 plane movements a day. And the vast terminal area will become a city within a city, having everything that designation implies.

Levittown Leaps onto the Map

From the air International Airport looks even more impressive; but nothing I saw during a flight over the whole island impressed me as much as Levittown—an outstanding example of mass home production.

Up from the potato fields of a few years ago rises "rural" Long Island's largest community, new home of 50,000 persons. Here, in the heart of Nassau County, stand 14,000 houses built by Levitt and Sons, Inc. Here is the epitome of suburban growth—more than a new place name on the map (page 294).

Picture a parking lot a hundred times bigger than the biggest you've ever seen, and fill it with identical small cars. That's vaguely what Levittown from the air looked like to me.

Down on the ground a friend guided me through and around endless regiments of homes, as uniform and numerous as tents of a vast army. We passed six swimming pools, playgrounds, school, and shopping centers. With its intensive landscaping program, "Levittown is destined to be one of the garden spots of America," says a sign there.

Except for exterior color, one house looks like the next; but each is home to a family. In front of most we found baby carriages and tricycles; children's clothes hung from backyard lines.

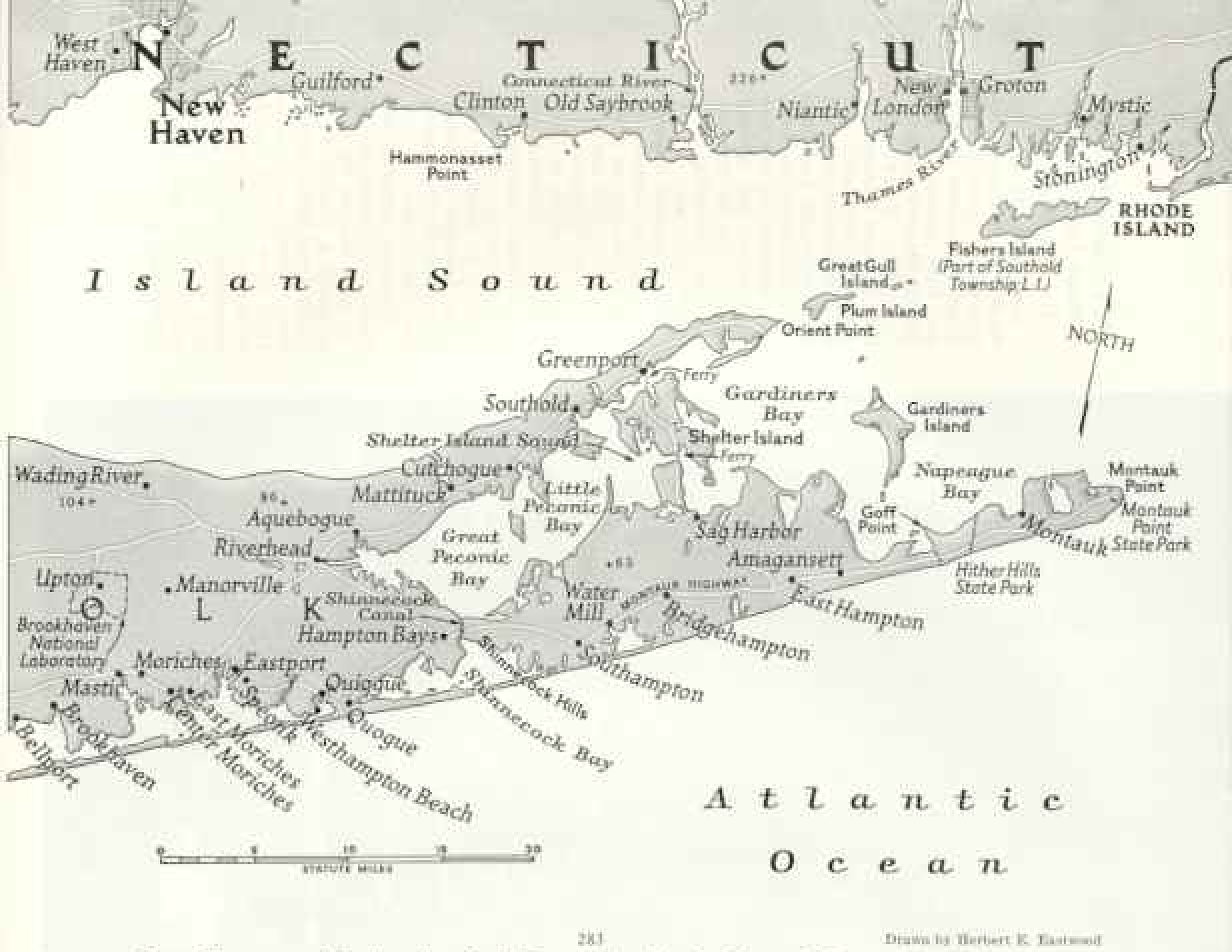
Levittown encourages youth, especially young war veterans and their families; it makes real the ex-GI's dream of a home of his own.

At the office where house sales take place across a long counter, I watched a veteran slap down a thick wad of green bills. While he filled out application to purchase, a clerk counted the deposit. The bundle of cash contained 80 one-dollar bills and four fives.

In July, 1950, this veteran bought a house

* See "Spin Your Globe to Long Island," by Frederick Simpich, and "Henry Hudson, Magnificent Failure," by Frederick G. Vosburgh, both in the National Geographic Magazine for April, 1939.

Suffern
Spring Valley
NEW YORK
Ossining
Ramsey
Nyack
Tarrytown
Park Ridge
Ridgewood
White Plains
Hudson River
Paterson
NEW
WESTCHESTER
Yonkers
Mount Vernon
New Rochelle
Passaic
Hackensack
Teaneck
JERSEY
George Washington Bridge
BRONX
Union City
Newark
Jersey City
Long Island City
Flushing
NEW YORK
Great Neck
Port Washington
Syosset
NASSAU
Mineola
Hicksville
Jamaica
Bethpage
Bethpage State Park
Farmingdale
Central Islip
Smithtown
Kings Park
Stony Brook
Selden
MacArthur Airport
Bohemia
Patchogue
Hempstead
Levittown
Valley Stream
Freeport
Amityville
Babylon
Bay Shore
Islip
Oakdale
Sayville
Blue Point
Lindenhurst
Great South Bay
Fire Islands
Long Beach
Jones Beach State Park
Upper New York Bay
Statue of Liberty
STATEN ISLAND
Brooklyn
KINGS
QUEENS
Coney Island
Lower New York Bay
Jamaica Bay
Rockaway Inlet
Rockaway Park
Far Rockaway
Floyd Bennett Field
Woodmere
Lynbrook
Valley Stream
Rockville Centre
Freeport
Baldwin
Bellmore
Long Island Sound
Oyster Bay
Glen Cove
Northport
Huntington
Setauket
Fort Jefferson
Milford
Stratford
Westport
Fairfield
Norwalk
Springdale
Stamford
New Canaan
Bridgeport
Housatonic River
Greenwich
Bayville
Glen Cove
Oyster Bay
Roosevelt Bird Sanctuary
Great Neck
Port Washington
Lincoln Tunnel
Union City
Queens-Midtown Tunnel
Holland Tunnel
Jersey City
Brooklyn Bridge
Brooklyn-Battery Tunnel
Statue of Liberty
Buttermilk Channel
BROOKLYN-QUEENS EXPRESSWAY
Upper New York Bay
The Narrows
Lower New York Bay
Coney Island
Prospect Park
Ebbets Field
Erie Basin
Gowanus Bay
Hudson River
Central Park
Triborough Bridge
Bronx-Whitestone Bridge
U.S. Merchant Marine Academy
Manhasset Bay
Kings Point
Little Neck Bay
Francis Lewis Park
La Guardia Airport
Queensboro Bridge
Flushing Airport
Long Island City
United Nations
U.N. General Assembly
Flushing
Bayside
Flushing Meadow Park
Fresh Meadows
Forest Hills
Newtown Creek
Williamsburg Bridge
New York Naval Shipyard
Manhattan Bridge
Lake Success
United Nations Secretariat
Glen Oaks
Queens
Jamaica
Belleross
Garden City
Franklin Square
Roosevelt Field
Mitchel Air Force Base
Hempstead
Westbury
Mineola
Jericho
East Norwich
Greenvale
Levittown
Hicksville
New York International Airport (Idlewild)
Atlantic Ocean
NORTH
STATUTE MILES



283 Drawn by Herbert R. Eastwood

New Towns and Industries Stud Long Island. Its Growth Paces the Nation's

Glaciers shaped the island. It rises nowhere more than 410 feet. Bathing beaches, harbors, and fishing grounds crowd its 600-mile shore line. Lower left: Map of western end shows most densely populated section on larger scale.

that didn't exist. Not until January, 1951, could he move into his brand-new home. A long waiting list, not construction time, created the delay.

"Levitt can build 600 houses a month," the clerk told me, "but we sell twice as many in that period."

In his oak-paneled office, master-builder Bill Levitt and I got right down to Levittown figures, for he still had a lot of houses to build that afternoon. He spoke calmly, I scribbled frantically: by December 31, 1949, his company had erected 10,101 homes in Levittown alone, all since July 1, 1947; the figure would increase to 14,366 a year later, and go up to 15,046 by March 1, 1951.

Farmlands Sprouting Houses, Apartments

Although not on a Levittown scale, hundreds of other housing developments are changing the face of Long Island. Farm or woodland one day becomes a series of concrete foundations the next. Extensive estates long associated with wealthy New York families frequently are sold and broken up into suburban lots.

Besides mass construction of individual houses, colossal apartment buildings, complete towns in themselves, offer homes to thousands moving to Long Island (page 305).

I visited Fresh Meadows at Flushing in Queens County. It includes 3,000 apartments in two 13-story buildings and 137 two- and three-story units. Begun in July, 1946, the community was finished and fully occupied by October, 1949. It has a population of 12,000 and hopelessly long waiting lists.

"Our tenants come from all over the United States," a resident manager said. "Industries mostly bring them, but many ex-service personnel stationed in the area during the war liked it and decided to stay. A large number of transport pilots live at Fresh Meadows because of its proximity to important airports."

Along with the popular eastward migration goes industry. Homeseekers want space for their families, business needs space for its plants. The general trend is a healthy one: transplanted factories find available labor in the growing suburbs, and residents find jobs close to home.

The New York Times summed up the

The United Nations Made Long Island the World's Hub

Since 1946 the UN has worked for world peace in makeshift quarters at Flushing Meadow, Queens, and Lake Success, in adjoining Nassau County (page 295). Four years later it began moving into a 39-story Secretariat and other permanent buildings on Manhattan's East Side.

First meeting of the General Assembly at the new headquarters will be held in 1952. For the 1951 session the delegates will gather in Europe.

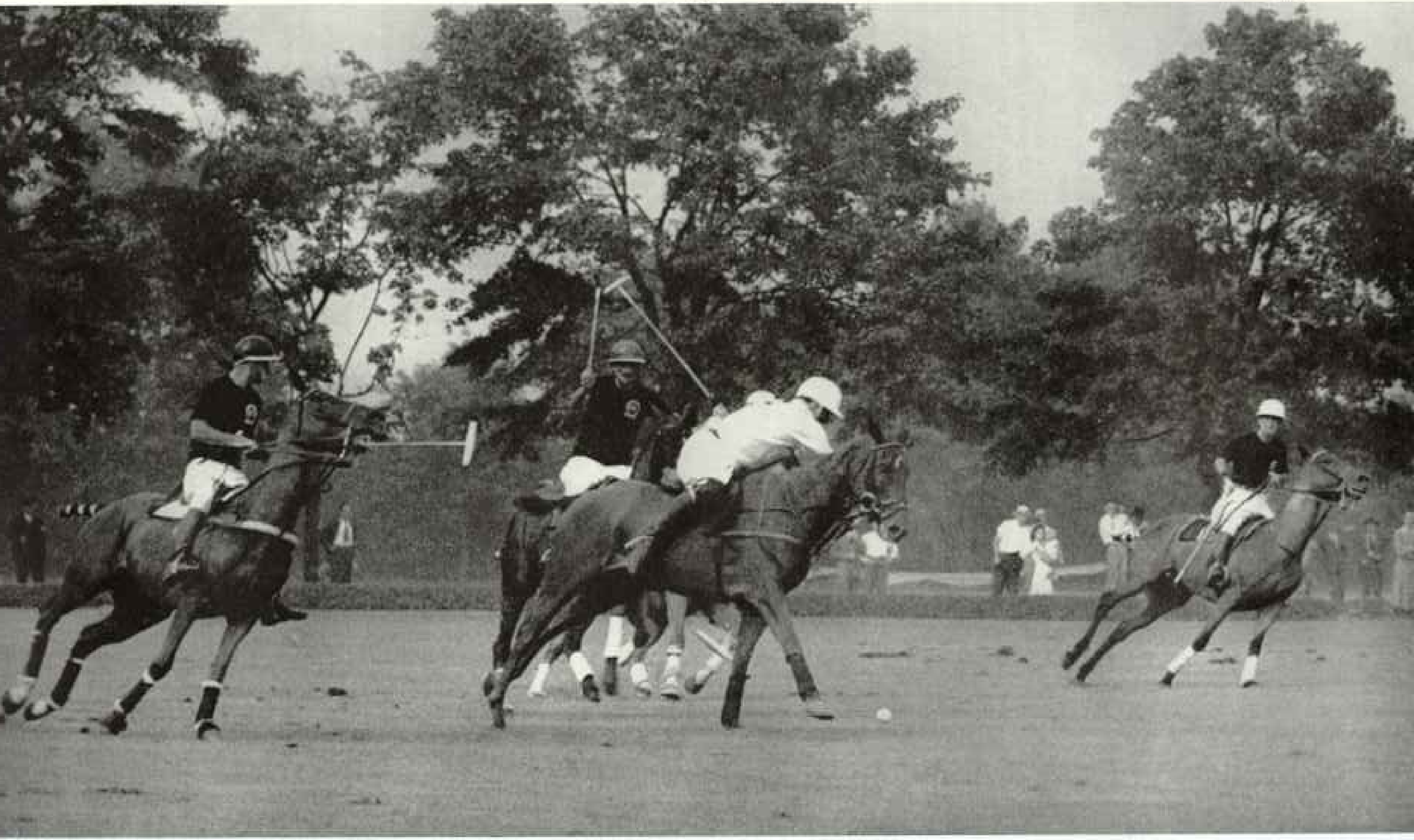
Here President Truman addresses the Assembly at Flushing Meadow on October 24, 1950, fifth anniversary of the UN charter. He urged new efforts to bring about disarmament and international control of atomic energy. Russia's Andrei Y. Vishinsky and other Assembly vice presidents flank Mr. Truman on the speaker's dais.

Delegates, advisers, and distinguished guests occupy the main floor of the hall, originally a World's Fair building and later a skating rink. Translators, television crews, and radio broadcasters work in soundproof galleries (right and left). The press watches from raised seats (foreground).

Wide World

Hard-riding Poloists, Battling for an International Title, Swing Mallets at Westbury's Meadow Brook Club

With a backhand shot, Cecil Smith, Texas star, drives the ball goalward, leading the United States team to victory over Mexico's four Gracida brothers (dark jerseys). International matches, called off in 1939, returned to Meadow Brook in 1946. Planned for 1951 is a series between the United States and Argentina.



growth of Long Island as a "revolt against the city—any city—and the cramped, noisy bustle of urban life."

In Nassau County I found a number of smoke-free light industries in handsome modern plants. They moved out from the big-city district after the war.

I went through a toy factory formerly at Brooklyn (page 293). Now in a low building covering a generous ground area, it began assembling plastic toys here in January, 1950. Most of the 750 employees either live near by or expect to soon.

Not far from this factory I entered what looks more like a large university library than an industrial house which turns out office filing supplies. The firm originally started at Manhattan in 1880, transferred to Brooklyn about 40 years later and to Garden City in 1948. Of 300 employees, the majority have found homes around Garden City; others, because of frozen rents, must stay in or close to Brooklyn.

But the company didn't desert those workers unable to move with the plant. It tried to get them new jobs in Brooklyn; even granted them traveling allowances to test commuting.

On the outskirts of Mineola a potato farmer sold his 30-odd acres to the first big-scale factory to make candy in Nassau.

"We've been here only since January, 1950," said a sales manager. "Used to have three plants in Brooklyn. Everything's under one roof now, better than being scattered; and look at all the room we have."

Yards of Sweets

An endless procession of thin mint patties put on chocolate overcoats, then braved a cooling tunnel 120 feet long. We paused by women packaging candies. A full box slipped from the hands of one and smashed on the floor. She glanced at me as if to say, "This *would* have to happen when the sales manager is watching"; then looked helplessly at the mess and went on with her job.

At a new-idea bank in Franklin Square I saw a drawer full of lollipops. Children earn the sweets when they open new accounts at special low counters in the Children's Department.

Behind its handsome colonial exterior the bank building has much more the atmosphere of a department store than a money temple. It displays kitchen equipment, baby carriages, oil burners, cameras, television sets, jewelry, upholstered chairs, and other products of local dealers. For such items customers may borrow money on the spot.

At one time an automobile stood on the show floor, and an airplane hung from the ceiling; and they weren't toys (page 300).

In Suffolk County I found a lithographic company operating at Islip. Only a few months earlier it had shifted its whole plant from New York City. Machinery, including a six-color, sheet-fed offset press, stamps out 1½ million greeting cards a day. It also prints gift wrapping paper, cloth faces for dolls, children's rag and paper books, pictures, and allied products.

"Before the company came to Islip," said the transplanted southern gentleman who showed me the works, "I was living on Long Island."

He knew, he said, the next best place to North Carolina when he saw it. And I know at least one place where millions of the millions of Christmas cards come from.

Jets Thunder from Plane Factories

As a cradle of aviation, Long Island has played a major role in aircraft manufacture, which, with allied industries, grew mightily during World War II (page 303). Nassau and Suffolk Counties hold large units of the business: Republic, Grumman, Sperry, Fairchild, and Liberty.

"How many employees here?" I asked my Grumman guide.

"Sixty-three hundred, but we had more than 25,000 in wartime."

With my guide I trekked through part of the immense Grumman factory near Bethpage. My feet envied workers who use bicycles to get from one section of the floor to another.

At the time, the plant was turning out more Panther jet fighters than any other type (page 320). We also watched finishing touches to the country's largest single-engine plane, the antisubmarine Guardian. And we followed assembly of the Albatross, a ship-sized amphibian to replace the old but faithful Catalina.

Grumman's boat division, only as old as the end of the war, makes aluminum canoes, dinghies, and sport craft. NATIONAL GEOGRAPHIC MAGAZINE staff members paddled two of these canoes on assignments from the source to the mouth of the Susquehanna River, and more recently down the turbulent Hamilton River in the wilderness of Labrador.

Near Farmingdale I visited another aircraft factory.

"Republic's philosophy, strengthened by the last war," said an official of that company, "is that a plane must fly fast; otherwise, you might as well walk. And the jet models conform to this policy. At the moment we're producing F-84 Thunderjets mostly; but we're

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Kodachrome by B. Anthony Stewart

Summer's Fairest Breezes Drive Racing Yachts Across Long Island Sound

New York and Connecticut clubs take turns accommodating the Sound's week-end regattas. International-class sloops here hit the starting line off Port Washington's Manhasset Bay Yacht Club.

© National Geographic Society

Kodachrome by B. Anthony Stewart

Brooklyn-Battery Tunnel, Diving Under the East River, Links Long Island's Western Tip to Manhattan Island

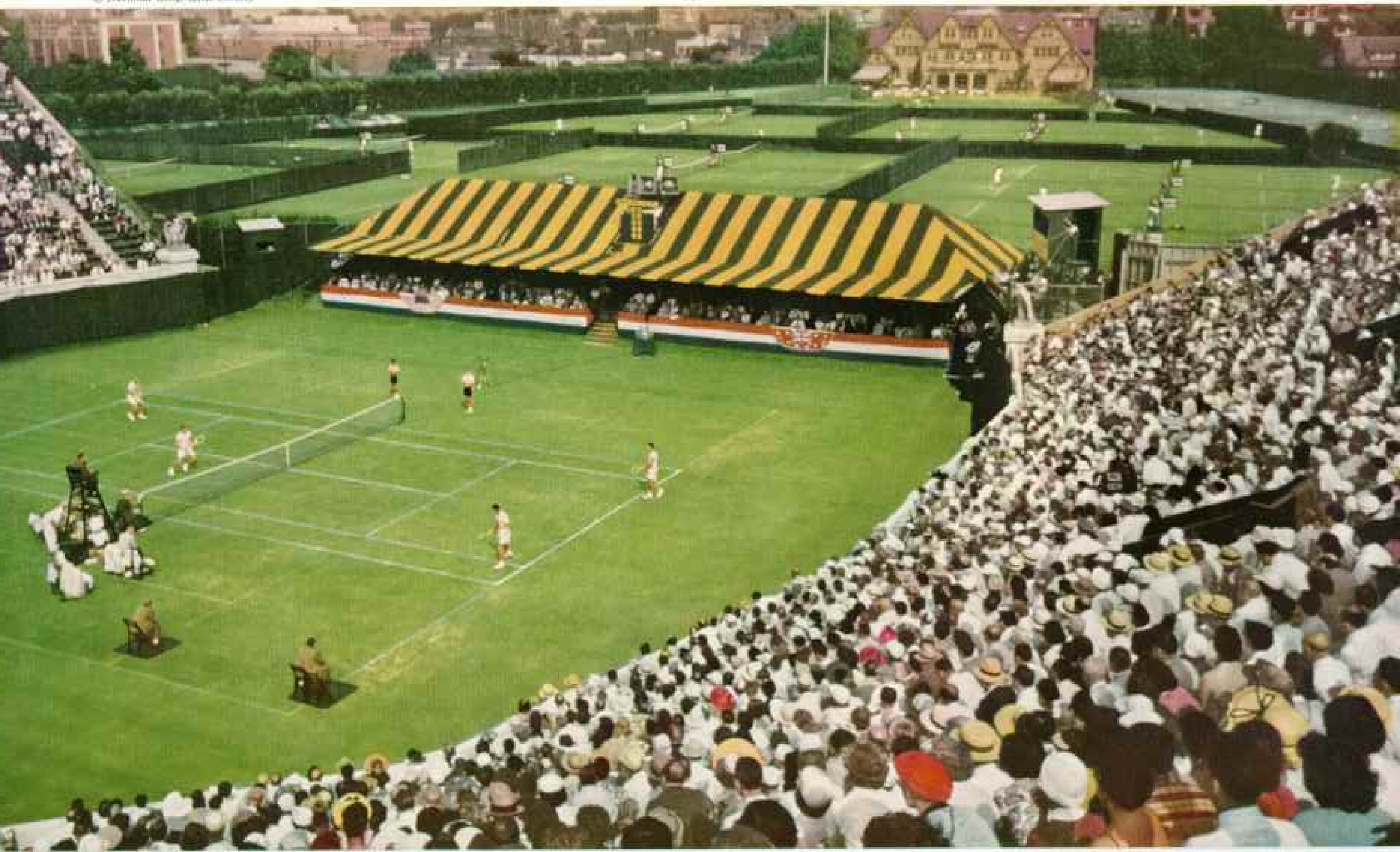
This new artery eases congestion in the older Queens-Midtown tube and on bridges. Each car pays a 35-cent toll to help defray the $80,000,000 cost. Unfinished Brooklyn-Queens Expressway curves on stilts across the tunnel's approach. Blocks of residential and business properties are sacrificed to such improvements.

When a Tennis Player Reaches Forest Hills' Famed Center Court, He Is Playing for a Top Championship

Australian and American doubles teams here meet in the 1930 Davis Cup challenge round at the West Side Tennis Club. Lesser matches proceed on distant courts.

© National Geographic Society

Kodachrome by B. Anthony Stewart



© National Geographic Society

Kodachrome by B. Anthony Stewart

Pan American's Stratocruiser, Seemingly at Rest, Roars Across an Underpass at New York International Airport (Idlewild)

One of the world's largest commercial airfields, Idlewild covers 4,900 acres reclaimed from Jamaica Bay. By 1960 the new field expects to handle 600 to 700 plane movements a day. These sight-seers ignore a no-parking rule to watch a silver giant taxi in from runway to terminal.

Airline Hostesses at Idlewild Speak in Many Tongues . . . Training for Emergencies, They Put to Sea in Rubber Boats

French, British, and American girls chat beneath posters advertising Air France, Scandinavian Airlines System, British Overseas Airways Corporation, American Airlines, and Sabena Belgian. Right: a life-raft drill in Rockaway Inlet teaches hostesses to use distress flare, marker dye, and radio transmitter.

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Kodachromes by B. Anthony Stewart

© National Geographic Society

Kodachrome by B. Anthony Stewart

Bronx-Whitestone Bridge, Gracefully Leaping the East River, Carries Long Island Motorists to Westchester and Connecticut Parkways

Opened in 1939, the world's fourth largest suspension span was widened and strengthened eight years later. More than 16,000,000 vehicles cross it annually. Here an excursion steamer, bound for Long Island Sound and New England ports, passes between Francis Lewis Park, Queens, and the distant Bronx shore.

Playtime on Long Island: It May Mean Plastic Toys or a Rousing Afternoon at Ebbets Field

These youngsters soberly inspect tugboat, fire engine, truck, furniture, and dolls made by the Renwal Manufacturing Company, which moved plant and employees to Mineola, Nassau County, to escape city congestion. Right: Teen-agers of the Peewee Reese Club worship their hero, the Brooklyn Dodgers' shortstop.

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Kodachromes by B. Anthony Stewart

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Kodachromes by B. Anthony Stewart

▲ Up from Nassau Potato Fields Spring 600 Levitt Homes a Month

New homes, new apartments multiply on Long Island, whose population grows like California's. Largest home development on the island is Levittown, named for the builder, William Levitt. Some 50,000 people have moved into more than 14,000 low-cost homes.

▼ "What? You Mean We Can't Move In for a Year?"

Levittown homes, produced by assembly-line methods, go up almost in a flash; but, owing to a long waiting list, buyers must post deposits far in advance. One home looks much like another, but swimming pools and playgrounds make a big appeal.

putting still newer types of jet aircraft on the line.*

"By the way," he added, "as you go through the plant, listen for a rhythm in all the noise. If it's regular and steady, all's well. If not, something's fouled up."

I heard the rhythm.

"We anticipated Pearl Harbor," said Preston R. Bassett, president of the Sperry Gyroscope Company. "Our 30-year-old Brooklyn plant had to expand. We scoured every State in the country before locating here near Lake Success.

"Why this site? Because of 1½ million potential employees within a 10-mile radius. Thousands of young women worked for the new plant during the war. Ours is a clean, precision-type industry that requires intelligent labor."

Compass Needed at Sperry Plant

Six months before Pearl Harbor this Nassau site was an open field. By February, 1942, production had begun. The company engaged 33,000 workers at the peak of war activity. Even today Sperry keeps 9,000 busy.

President Bassett left his desk to show me the enormous establishment. Had I tried to find my own way, I should have needed a compass—I mean a gyrocompass. Sperry makes all its own parts; assembles them; and has its own foundry.

Here, as at Grumman, bicycles are available to cover long floor distances in the huge plant.

Since Sperry's original production of the gyrocompass in 1910, this has remained the steadiest item of output.

"Not magnetic, the gyrocompass points to true north," Bassett explained. "It is simply based on kinetics, or the physics of motion."

World War II's Sperry bomb sight worked on the gyro principle.

We looked at automatic pilots and radar equipment, then concentrated on the Zero Reader—latest thing in air instrumentation. It gives a flyer only one thing, instead of a score, to watch on his instrument panel.

For altitude, direction of flight, and radio beam he can set the proper dials, then keep an eye on just the Zero Reader indicator. He knows that as long as he keeps the intersection of two wires on the center dot, the plane is flying as desired.

After the war Sperry rented extra floor space to United Nations for offices and council chambers. This remodeled section of the factory at Lake Success has served as temporary headquarters of the Secretariat, one of the principal UN organs. Here 3,500 persons work for international peace and security (page 284).

I walked past flags of each of the 60 member countries to enter the UN headquarters. Along seemingly endless corridors I passed peoples of all nationalities, some Orientals in native dress but most in Western garb.

Then at last, in the Security Council Chamber, I stood behind the president's chair and looked over the members' horseshoe table toward stepped-up rows of seats for the public. The Council held no session this day. At the moment I alone peopled the great chamber and thought, of course, that if these walls could talk. . . . Actually, the walls don't have to speak; every word spoken here is permanently disk-recorded—verbatim in English and French.

"United Nations took over housing developments in Nassau and Queens," said a press relations officer in the interim headquarters, "and they put apartments at the disposal of member workers.

"Long Island has had no trouble absorbing foreign elements of UN. Their children go to American schools. A Burmese housewife learns the currency, prices, and how to shop. UN people buy cars, patronize stores, and spend money just like anybody else. In fact, they fit into the American picture.

"Many settled in Great Neck and made it generally more cosmopolitan. I know, because I live there myself," the press man continued. "Another thing: awareness of international problems has greatly increased on Long Island since the coming of United Nations. The interchange of ideas has been profitable.

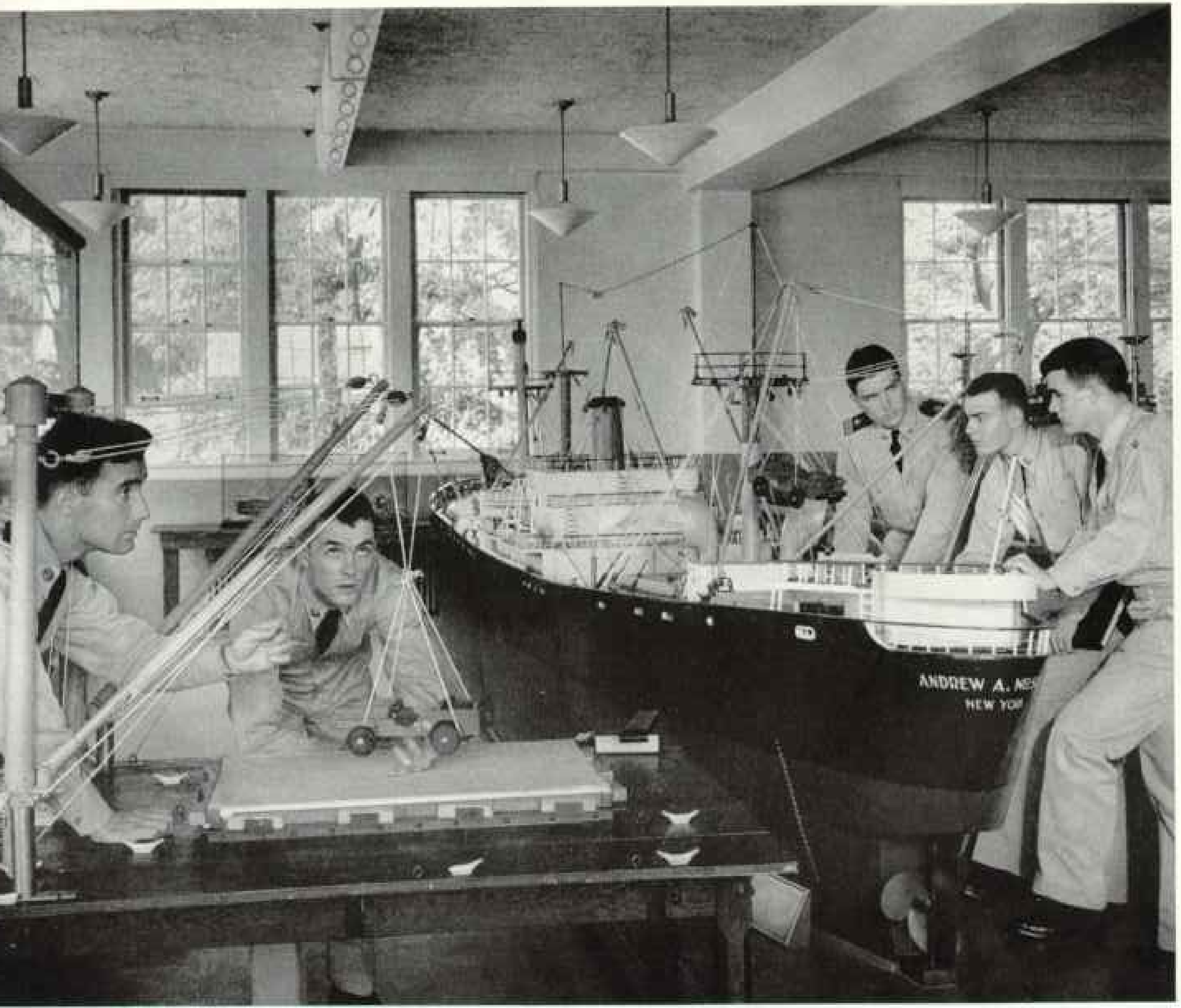
"A large number of UN employees will stay on Long Island; they have homes here now, and they like the place," he concluded.

Grade and high schools for swelling communities must cope with rapidly growing student bodies matched only by a few other areas in the United States. So Long Island keeps on building.

I visited three colleges: Adelphi in Garden City; Hofstra at Hempstead; and the Long Island Agricultural and Technical Institute near Farmingdale. In interviews with their presidents, each told a story of recent expansion. All have added new buildings for enrollments which have leaped from three or four hundred to several thousand.

Long Island is a natural playground; but Robert Moses, the talented engineering and

* See "Flying in the 'Blowtorch' Era," by Frederick G. Vosburgh, National Geographic Magazine, September, 1950.



Kings Point Trains Cadet-Midshipmen to Run Merchant Ships

The United States Merchant Marine Academy at Kings Point gives future officers a four-year course under discipline like that of West Point and Annapolis. Upon graduation they are commissioned ensigns in the United States Naval Reserve; hence the dual designation "cadet-midshipmen."

The Academy covers 62 acres on Long Island's north shore, including the estate of the late Walter P. Chrysler. Officer candidates must compete for appointment. They have one year of training aboard a merchant vessel at sea (page 315).

These young men take a lesson in handling cargo gear. They use miniature jeeps, a Liberty ship model, and a mock-up of a vessel's deck, complete with king posts, booms, blocks, and rigging.

Opposite page: The New York Naval Shipyard, familiarly known as Brooklyn Navy Yard, sprawls in a bend of the East River facing lower Manhattan (page 318). Just beyond Manhattan Bridge the carrier *Enterprise* ("Fighting Lady") lies at a pier. An adjoining pier bears a 150-ton hammerhead crane, largest in the Port of New York.

U. S. S. *Missouri* and other fighting ships came from Brooklyn's building ways.

Ira Bilenberg, New York Herald Tribune

Wild Ducks, Safe from Gunfire Within New York City Limits, Blacken the Sky over Little Neck Bay

In spring and fall thousands of scaup, canvasback, and mallard find sanctuary near Bayside, Queens, where law forbids discharge of a gun. With wisdom born of experience, the birds shun near-by Nassau County areas open to hunters. During their stay the ducks feast on clams and mussels.

A Bird's-eye View of Bird Watchers: Audubon Society Members Scan the Sky from a Long Island Dune

With more than 360,000 members, the National Audubon Society and its affiliates interest an estimated 2,000,000 people in their programs to conserve wildlife. As part of the organization's 1950 convention in New York City, about 200 ornithologists, amateur and professional, swarmed across beach and marsh in a record-breaking expedition. These enthusiasts combined lunch with watching near Westhampton Beach. They counted gannets, mute swans, ducks, geese, cormorants, gulls, and others.

Nat Fein, New York Herald Tribune

International News

This Is a Bank? The Franklin National Belies Appearances

Republic Seabee, Ford convertible, and kitchen gadgets may be purchased through credit arranged over the counter (foreground) in Franklin Square, Long Island. Each child opening an account gets a lollipop (page 286).

Long Island's Aerial Ambulance Makes Travel Swift and Easy for the Disabled

Chief pilot Frank Steinman (cap) once landed in the Labrador wilderness and flew a stricken coal-mine owner to a New York hospital. In winter he rescues skiers injured at New England resorts. Here at Roosevelt Field, near Mineola, he loads a stretcher case aboard his custom-built hospital plane. Mrs. Steinman (at door) serves as medical attendant, copilot, and navigator.

planning genius, doesn't let it go at that. Head of the Long Island State Park Commission (among other public-project commissions), he aims to improve its recreational possibilities. Establishment and maintenance of parks scattered from Brooklyn to Montauk, and miles of superb parkways leading to them (page 307), are largely results of his vision.

Hundreds of Miles of Bathing Beaches

He planned it this way back in 1924. And he has by no means finished: park improvement continues, parkways reach farther out. In one recent year nine million persons played, picnicked, and relaxed at places reserved for their enjoyment in Nassau and Suffolk.

Robert Moses doesn't wish to beat Nature; he strives to save it.

The island's gentle topography and relatively mild maritime climate help him. The 600-mile shore line forms virtually one continuous bathing beach (page 280). Sheltered bays and inlets harbor thousands of small craft; 81 yacht and motorboat clubs sprinkle the water front. Fishing grounds are ubiquitous.

Nearly 100 golf courses roll with the land. No one seems to have counted tennis courts, but every sports follower knows of the internationally famous West Side Tennis Club at Forest Hills (page 289). Racing, steeplechasing, and trotting draw enormous crowds. Polo is played on the International Field of Meadow Brook Club at Westbury (page 285), as well as on other Long Island fields.

Bethpage State Park, not far from Levittown, has clubhouse, polo, bridle paths, golf, and tennis for the average or even poor man. Anyone can walk into the spacious colonial clubhouse and use lockers, showers, lounges, or dining rooms. Here I found everything usually associated with the most exclusive clubs except high fees and exclusiveness.

A friend and I went to Jones Beach on the south shore one Sunday; so did 138,998 others; even more tried to get there. For 40 minutes police had to barricade thoroughfares to the shore where concrete parking fields hold 16,000 automobiles at once. Carloads turned away, but more waited for the blockade to break.

We joined throngs on the boardwalk along a third of the six-mile beach. Bodies in every stage of sun-tanning or under big bright umbrellas almost completely obscured the yellow sand (page 308). Games areas invited adults and children to play shuffleboard, paddle tennis, table tennis, and handball, or try archery and the 18-hole pitch-and-putt golf course. Many refreshment pavilions, cafés, and restaurants with tables on outdoor terraces satisfied mass appetites.

Steer with Window Aids Research

Have you ever seen a live, healthy steer with a window in his side? Such a thing exists at the National Dairy Research Laboratories in Oakdale. Through the extraordinary aperture scientists painlessly take samples of partly digested fodder straight from the first compartment of the bovine's four-part stomach. They look for bacteria that help the animal digest his food.

The Research Laboratories hope to find the ideal food ration for animals. Working with low-grade fodder only, they want to discover what bacteria to combine with it instead of using corn and other grains suitable for humans. Then food-short areas could support a cattle industry.

Since 1947 National Dairy Research Laboratories, Inc., has occupied the former William K. Vanderbilt estate at Oakdale. The company has converted a large part of the 110-room mansion, carriage house, and stables into laboratories. Microbiologists and dairy technologists study in the former indoor tennis court. Animals for feeding experiments fatten in air-conditioned quarters under what was once a squash court. Test baking with dried milk utilizes a section of the vast kitchens.

With some members of the staff I lunched in a paneled cafeteria, once the mansion's billiard room.

One hundred and thirty or more scientists do research on milk, ice cream, cheese, butter, animal and poultry feeds, salad dressing, many other dairy and food products, as well as on by-products of the dairy industry which find uses in fields other than nutrition.

Into the Pine Barrens I drove north to look at MacArthur Airport. In a matter of minutes I had jumped from milk and microbes to giant bombers and jet planes testing the air instruments of tomorrow.

Down on the south shore again, I went east along roads which stayed nearest the water. I touched at Blue Point, breeding ground of that celebrated oyster appearing on menus all over the map. And in the vicinity of Mastic and Moriches I entered the farming region which some 60 years ago first hatched the ducks that helped make Long Island famous. White as new-fallen snow, they blanketed the banks of tidal streams; and they prattled more garrulously than an army of old hens!

Some place names appropriately sounded like quacking ducks—Speonk, Quiogue, and Quogue—as I drove on. Soon I crossed the canal linking Shinnecock and Great Peconic Bays.

In the Shinnecock Hills area white man's sport took over the Indian's hunting ground. Here spread the exclusive domains of the National Golf Club of America and the Shinnecock Hills Golf Club.

Down I coasted to Southampton, one of the oldest English settlements on the island; it dates back to 1640. But one would never guess its venerable span, seeing this fashionable and utterly modern resort by the sea. Fancy branches of Fifth Avenue emporiums line the main shopping streets. The rush of summer visitors dispels the quiet charm of the centuries-old village.

I did see, however, a "vest-pocket" bookshop in a gambrel-roofed cottage wearing a 1686 date line.

Palatial homes and elaborate estates have turned the once humble hamlet into a seasonal capital of society. Meadow Club invites the world's foremost tennis players to its velvety grass courts. To the Beach, Riding and Hunt, and Sebonac Yacht Clubs, social-register names lend tone. Society news reporters and photographers rarely miss a wedding at St. Andrews Dune Church.

True natives of Southampton in old clothes were really working for a living. Knee-deep or deeper in a marshy lagoon they grappled with long tongs for clams. I wondered about the owners of near-by mansions on the dunes, where drifting sand and rising taxes piled higher and higher.

Hollyhocks and *Home, Sweet Home*

Through some of the most productive potato country on Long Island I resumed my eastward journey along the Montauk Highway. Occasionally the green acres yielded to fields of ripening wheat or ready-to-harvest rye; they formed warm golden patches in the late afternoon sun.

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Kodachrome by B. Anthony Stewart

Miniature Airliners Flown on a Plastic Tower Test New Radio Equipment

Airborne Instruments Laboratory, Mineola, designed its Fiberglas-reinforced tower to support models carrying new antennas. Electrical conditions at any flight altitude can be simulated. Running, the shaft points straight up.

Long Islanders in Plaids Revive Lawn Bowling

Henry R. Sutphen, a New York PT-boatbuilder, became a lawn-bowling enthusiast during a visit to England. Later he equipped his East Hampton summer estate with a smooth greensward (above). On the right, Mr. Sutphen in Scottish bonnet leads contestants in Bruce tartan skirts marching to a piper's skirl. (Mr. Sutphen died December 10, 1950.)

Bowls are made elliptical so as to roll in a curve. Players try to place them near the jack, or white target ball.

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Kodachromes by David W. Edwards

Brooklyn's Vandeveer Estates, 65 Geometrical Units, Rise from a Condemned Business Section

This new project shelters some 2,700 families. Elevators whisk them up and down the six stories. Rooftops solve the laundry-drying problem. Four underground garages take 2,000 automobiles off the streets. Inset: Mothers and children enjoy the sun at Fresh Meadows, Flushing.

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Long Island Skill Makes Arrows Fly Straight and True

Louis E. Stemmler's Manorville plant grew from his boyhood enthusiasm for archery. Today he supplies clubs and hunters. His hunting bows shoot arrows that can kill deer at 100 yards. This employee fletches brass-tipped birch and cedar shafts with turkey feathers.

Freeport's Propellers Meet Exacting Tests for Balance

Columbian Bronze Corporation's five-foot manganese-bronze screw is polished to mirror brightness. Made for a Navy mine sweeper, it must be extremely accurate, for any noise-making flaw might betray the sweeper to submarine-detection devices.

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Kodachrome by B. Anthony Stewart

No Stop Signs, No Traffic Lights. Long Island Parkways Cross Like Bridges over Rivers

Cross Island Parkway sweeps beneath Winchester Boulevard; Grand Central Parkway (dual center lanes), and Union Turnpike. Glen Oaks (left) and Bellerose spread over Queens acres that grew vegetables five years ago.

Bathers and Umbrellas Cover the Sand at Jones Beach

On summer Sundays as many as 139,000 people flock to this south shore State park, 33 miles from Manhattan. They can choose a swimming place from the rolling Atlantic, quieter Zachs Bay, or a heated salt-water pool. They can satisfy appetites at seven refreshment stands and two restaurants. Entertainment includes a nightly water show in the pool.

These three ballet performers admire the National Geographic photographer's camera.

Opposite page: Thousands of other New Yorkers and Long Islanders cool off in the city's Flushing Meadow Park pool. Here Billy Rose staged his Aquacade during the 1939–40 World's Fair.

In the morning the pool offers free swimming to children. In the evening professional entertainers give a water show.

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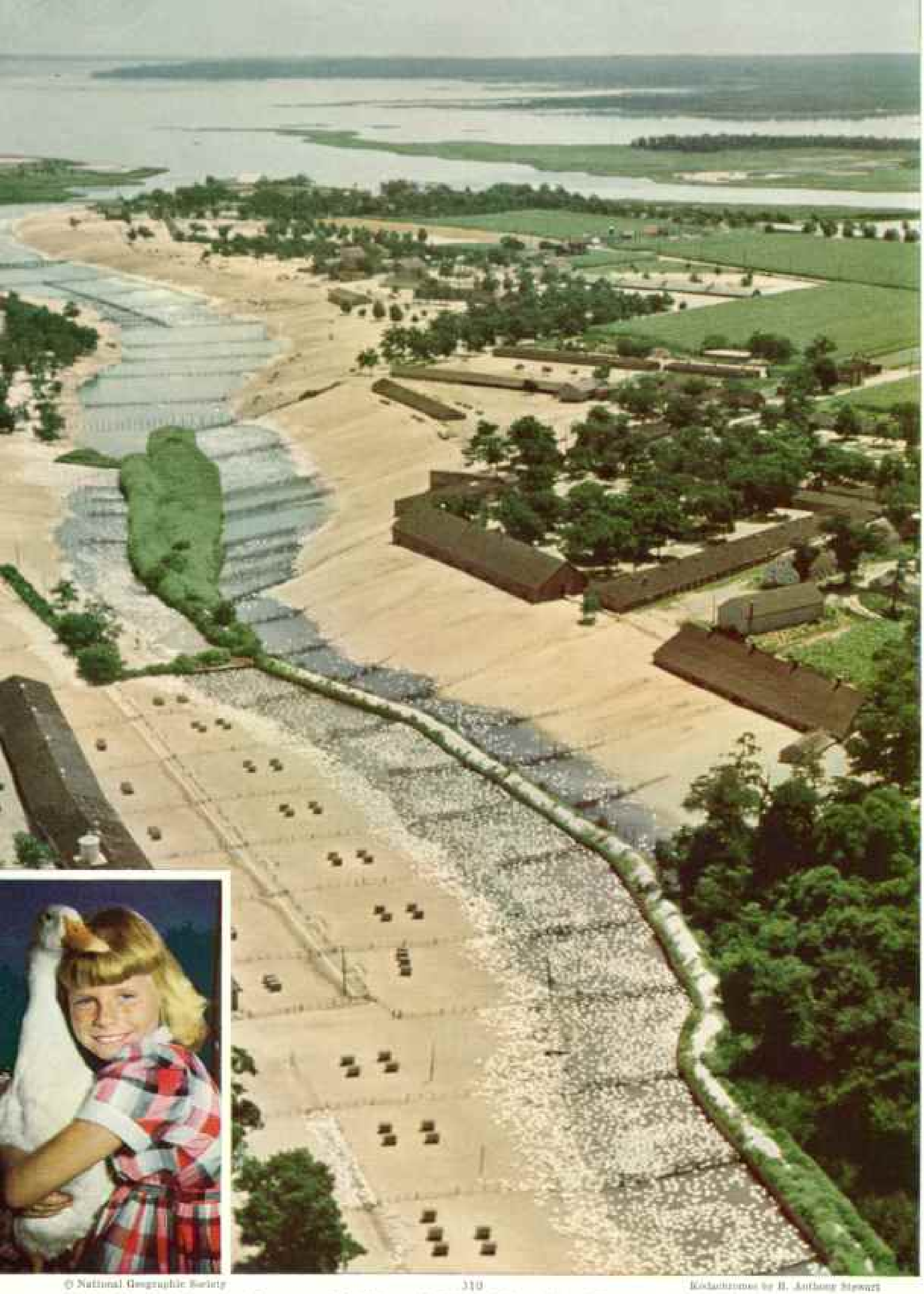

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Pekin Ducks Cover a Stream with "Snow." They Live Nine Weeks; Then—the Quick Freeze!

Suffolk County's 70 duck farms grow about two-thirds of the Nation's total. Here on Warner's Duck Farm the typical flock moves one pen upstream each week. The final enclosure admits the birds to their doom (page 319).

At last I reached East Hampton and soon found out what inspired John Howard Payne, who once lived here, to write the immortal *Home, Sweet Home*. Whether or not one of America's most beautiful villages, there's no place like East Hampton—for me.

A salt-box type with shingles all over, Payne's home stands in the shadows of aged trees and a hoary windmill. Hollyhocks grow along its picket fence and near the front door. Vines wriggling up walls brush against windows with the breeze.

A woman at the entrance of this house collected a modest admission fee, pointed out lusterware, 17th- and 18th-century furnishings, and talked of John Howard Payne. When I started to leave, she asked if I'd like to hear an old music box. Its wiry bristles fairly melted into the soft, slow melody of *Home, Sweet Home*.

A slight chill ran along my spine; the skin on my wrists sprouted goose flesh. I looked at the woman. Her eyes were moist.

"It does something to you, too," I said.

"I've been around here for years," she confessed, "but I can't hear that tune without feeling it."

As I went out the door, she called, "I'll watch for your story because I think you'll remember this place." I do indeed!

At the East Hampton Free Library I called on Mr. Morton Pennypacker, to see the most complete collection of Long Island volumes and documents in existence. Forty years ago he set out to gather 200 books dealing with the island. Authorities tried to discourage him; that much had not, they insisted, been written on the subject. Now a fireproof section of the library holds 120,000 items, including 20,000 books, all relating to Long Island.

Prize of Long Island Collection

"Which single item do you prize most highly?" I asked the gracious elderly gentleman.

He unlocked a drawer and took out a volume stained with age. Known as the *Duke's Laws*, it was written in longhand and published in 1665 by Richard Nicolls, then English governor of the Duke of York's lands in the New World.

A windmill still grinds grain at one end of Main Street; a mossy-banked duck pond reflects at the other. In between, old homes, magnificent elms, and pleasant greens help preserve the peaceful appeal of three-centuries-old East Hampton. To raise funds for maintenance of public lawns and trees, the Ladies' Village Improvement Society annually stages a one-day fair; from the looks of things, they do well (page 321).

In East Hampton I stayed at a friendly guesthouse across the street from the John Drew Memorial Theater, named for the renowned actor, who lived in East Hampton.

Montauk, Mecca of Lure and Lens

Montauk, easternmost point of Long Island, used to be considered the end of the world. Cattle grazed around a lighthouse built in 1797 (page 322). A handful of people lived there, tending the herds or fishing. A few outsiders went there, mostly to fish. Difficult sandy roads discouraged communication with the rest of the island.

Carl Graham Fisher may not have been the first to see Montauk's possibilities, but in the 1920's he took the lead in trying to develop them. With amazing success he had already transformed an uninhabited tract of south Florida shore into the fabulous Miami Beach. Except for a series of misfortunes, including the Wall Street crash of 1929, Fisher might have made Montauk a world-renowned resort.

Since 1940, however, more and more people have been going to Montauk. An excellent highway now extends to the eastern tip and to two State parks in the area. Permanent population of Montauk village has doubled in the last ten years. Crowded hotels turn summer visitors away; other hostels under construction will absorb some of the future overflow. Today the community continues to grow on the multimillion-dollar foundation laid by Carl Fisher.

"All aboard for great fishing!" shouts the Long Island Rail Road.

From mid-May to November the "Fishermen's Special" leaves New York City every Saturday and Sunday at dawn. Three hours later it discharges swarms of anglers at the Montauk docks.

I saw some 300 men, women, and children pour off one of these trains and race for the pier at "Fishangri-La." Within 15 minutes nearly all had put to sea on chartered fishing boats. Late that afternoon they returned, laden with sea bass, tuna, pollack, fluke, porgy, blackfish, bluefish, and striped bass, large and small. At troughs built for the purpose along the pier, the city fishermen cleaned their catch. Well offshore record catches of swordfish, huge tuna, and blue and white marlin lure sports fishermen to Montauk (pages 324, 325).

Generations of Long Island fishermen have lived by what they could take from surrounding waters. Besides the fish we've already

met, tons of clams, crabs, oysters, lobsters, mussels, and scallops bring millions of dollars each year.

Whaling Built Salty Sag Harbor

Whales, for historic example, built Sag Harbor, which nestles in a safe haven of Shelter Island Sound. Between 1820 and 1850, the village's most prosperous era, the local fleet collected nearly a million barrels of whale oil and more than 5 million pounds of bone.

Then came the discovery of petroleum in Pennsylvania, and harpoons went the way of arrowheads. As whaling blew right out of its life, Sag Harbor limped landward like a tired old salt.

Still, the rich memory of Moby Dick lives on in the little village. Big homes, some palatial, attest the splendor of the good old whaling days (page 326). On a particularly imposing mansion, now the whaling museum, I admired a decorative pattern alternating blubber spade with whale tooth.

Friendly residents showed me the Presbyterian Whalers' Church; its steeple took off for kingdom come with the hurricane of 1938. The interior's simple beauty remains intact: clean white walls, pews with gates and silver name plates, and, of all things, shiny brass cuspidors on the floor!

Whaling alone, however, didn't distinguish Sag Harbor. As early as 1789 our first Congress opened a United States customhouse here, the same year that one was established in New York City. And two years later the village scooped the entire island by publishing its first newspaper.

"The most significant change at Sag Harbor in recent years," said a friend who lives there, "is the growing interest of residents in local history and their heritage. They no longer take these things for granted; they now make an effort to preserve them."

An Edison Sparks New Craftsmanship

And an outsider caught the spirit. In 1945 Charles Edison, former Governor of New Jersey and son of the revered inventor, bought and renovated a rambling old home once occupied by a whaling family. Governor Edison also saved the original customhouse from possible demolition and helped finance its restoration.

Although he already had huge industries in New Jersey, Governor Edison looked for something more personal than mass labor and mass production. He sought a closer relationship between employees and their jobs. Craftsmanship interested him; the ancient art of using one's hands with skill, not simply turning switches or pressing buttons, fascinated him. In a phrase, he wanted to humanize industry.

He liked Sag Harbor and its people; affectionately they called him "Governor." He sensed the community's self-reliance, respected its solid American background. So here he set up several small-scale industries, employing village folk.

At one of the new Edison plants I watched women arranging coils for the Ediphone (dictation machine). A team in an adjoining room turned out cardboard cylinders to encase the delicate parts of this instrument.

"Now I'll show you something more in line with the Governor's fondness for things made by hand," and a supervisor took me to another little factory.

We looked over the shoulder of a man working with fire and glass. From heated tubing he made delicate pestles for stirring beverages; and at one end of each he deftly fashioned a miniature animal, bird, boat, or something of the sort—all done in glass and by hand. He used no mold, seldom relied on models.

Sea and Land Yield Heavy Harvest

North of Sag Harbor a quick ferry trip put me on Shelter Island, wedged between the north and south forks of Long Island. I could have lingered indefinitely, exploring gentle forest slopes, pleasant meadows, and lonely beaches; but I had to keep an appointment with oysters. Another short ferry ride, and I landed in Greenport.

There I met Charles Wooley, manager of a company that plants, breeds, transplants, dredges, packs, and ships upwards of 150,000 bushels of oysters a year. Quality? They come from some of the best oyster grounds in the world: Long Island Sound, Gardiners and Peconic Bays. By train they go to tables as far afield as California.

"Since it takes four to five years to raise a crop," Wooley said, "and since we've been working these waters for more than 40 years, we should know how good they are."

As we moved through the plant, Wooley explained the steps in preparing oysters: grading, washing, some shucking, and packing in sizes ranging from quart can to three-bushel barrel. Because of Long Island's extra-large varieties, 75 percent are shipped in the shell.

Farmlands around Greenport import labor for the potato harvest. Driving toward Orient Point, I saw scores of dusky field hands digging spuds. I stopped to talk to the colored

An Electronic Diagnostician Protects Atomic Researchers Against Contamination

This biology technician at Long Island's Brookhaven National Laboratory checks herself for contamination. The machine contains five Geiger counters, two for each hand and one for the feet. Dials register the amount of radiation. To decontaminate, employees scrub with special detergents. Sign at left refers to another method of detection: badges containing a sensitized film which "logs" under radiation (pages 315, 319).

headman of one crew. He sat in a big black sedan with a Florida license.

"How are potatoes this year?" I asked.

"Lot better than the price they bring," he replied with a shrug.

To get down to the real bottom of the island's potato barrel, I headed for Riverhead. My route passed peaceful Southold, which claims the first English settlement on Long Island.

Five miles farther along the road I stopped in Cutchogue to see the Old House, built in 1649. I like to remember its two fireplaces on the ground floor, each 9½ feet long, 5 high, and 3 deep.

Millions of Bushels of Spuds

Riverhead lies in the heart of one of New York State's richest farming districts. From this region enormous quantities of potatoes, cauliflower, brussels sprouts, lima beans, and ducklings flow to nationwide markets.

Potatoes are to Long Island what they mean to Maine. Suffolk County comes third in the country's growing potato race. On about 42,000 acres it grows 80 percent of the island's entire crop. The Department of Agriculture estimated Long Island's 1950 harvest at 18,615,000 bushels.

Harold Evans slowly drove his truck through a field while husky field hands tossed 60-pound sacks of spuds aboard. When loading was finished, Evans walked over to talk with me.

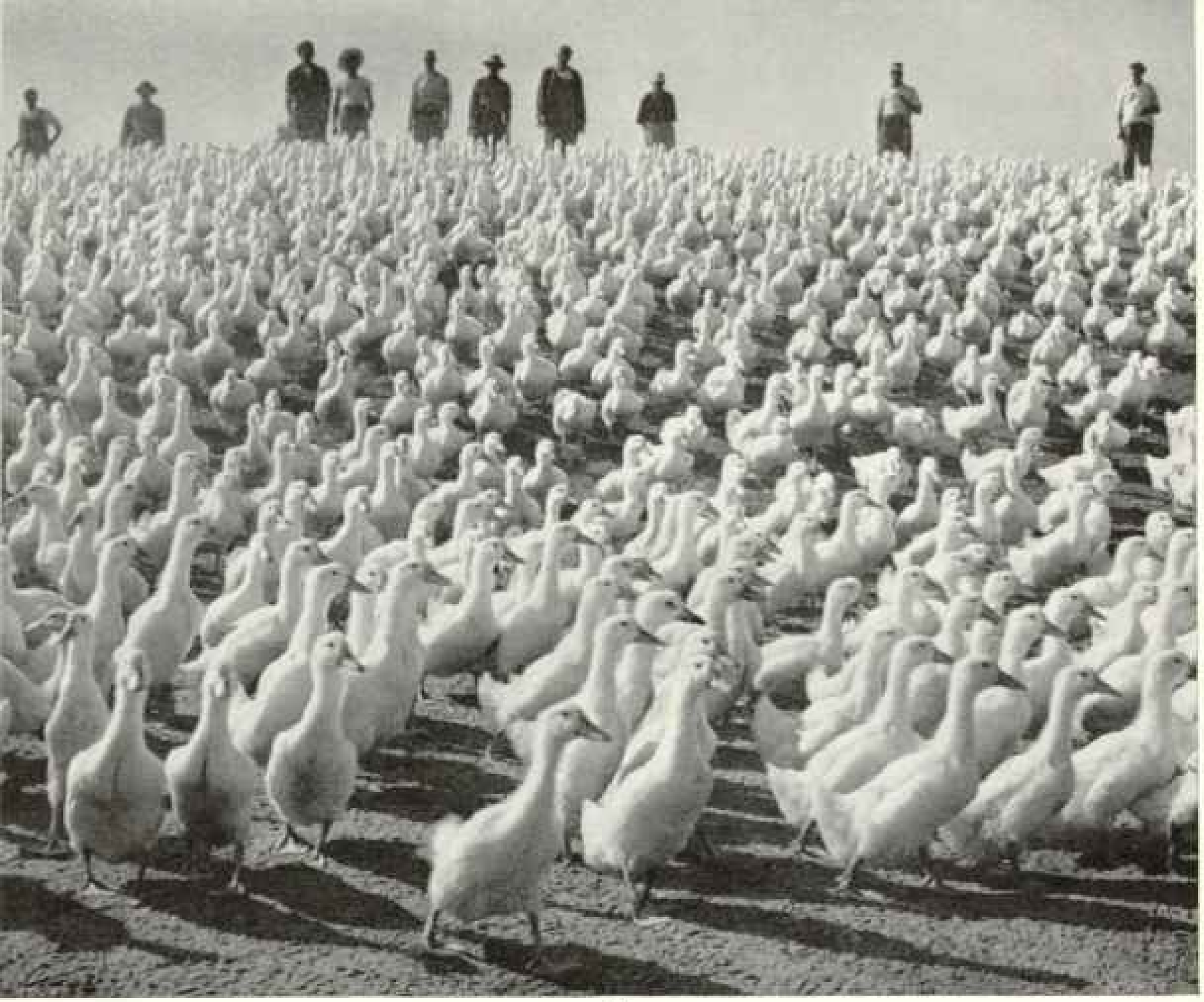
He mentioned the use of new insecticides which doubled potato yield; stressed the value of irrigation and said that this farm installed an extensive surface pipe system; credited machinery, including airplanes for spraying and dusting, with relieving the farmer's usual backbreaking burdens.

"See that haystack over there?" he pointed. "Our hands never touched it; all done by machine from cutting to piling.

"Nowadays, a farmer must be a mechanic, too," Evans summed up.

At other farms I saw much cauliflower in early growing stages. It ranks as second largest crop on Long Island, first area in the United States to raise this vegetable on a big scale. Suffolk's annual production of upwards of two million crates keeps it among the country's leading cauliflower counties.

Altogether, Long Island grows 68 different



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Pampered but Short Are the Lives of Long Island's Downy Ducklings

Riverhead farm hands drive these quacking youngsters to a pond for their first swim. Until the end of their nine-week span they will fatten on vitamin-rich feeds (pages 310, 319).

vegetables. Not in a class with producers of potatoes or cauliflower, about 300 farms in western Suffolk and Nassau specialize in market gardening for metropolitan consumption.

Farmers of various nationalities, particularly Polish, take naturally to this industry. They plant closely with hand labor, make high investments, and hope for high returns. Mostly they raise spinach, lettuce, beets, carrots, sweet corn, snap beans, and some asparagus.

Ducks and Drakes

One can't stay in the Riverhead area long without seeing and hearing a lot of ducks. They tell a story that began in 1873 when a drake with three wives left China for the United States. These few members of the White Pekin breed started something which today makes Long Island claim to be the foremost duck-raising section in the world (page 310 and above).

Now I know why restaurant menus from Mobile, Alabama, to Missoula, Montana, invariably call duckling by its first name—Long Island.

I talked with Henry Corwin and his son on their farm near Riverhead. We had to raise our voices, for they raise ducks. The quacking and peeping sounded like a successful stag chowder party.

"I'm raising 'em only because I love to," the father said. "Started out to make it a hobby, but the thing grew and grew, the way ducks do."

Corwin began business 40 years ago with 30 ducks. Now his 50-acre farm sends to market as many as 200,000 ducklings a year. In one of his buildings I saw a battery of incubators capable of holding 60,000 eggs at once; looked into a chain of brooder houses through which ducklings pass in successive stages of their nine weeks of life; and ended up at the dressing station where the finished product is mechanically picked and washed, then packed for shipment. Feathers, as a by-product, bring a tidy sum.

I dropped down to Eastport to visit the Long Island Duck Packing Corporation. Vaults kept at 65 degrees below zero yearly freeze millions of pounds of farm produce—largely poultry and vegetables. For farmers it can hold ducks in frozen storage until prices favor sales (page 319).

Nation's Biggest Research Reactor

In 1946 a group of scientists from leading universities of northeastern United States discussed the type of machines needed to learn important new facts about the atom. The machines, they agreed, would be too big for their own institutions to afford. So Associated Universities, Inc., was formed and now operates Brookhaven National Laboratory at Upton as a Government-financed project under contract with the U. S. Atomic Energy Commission (page 313).

"Brookhaven scientists," explained an officer of the organization, "are studying the atom much as primitive man studied a bird's egg. In both cases the object is broken open to see what's inside. But the smaller the atomic particle, the harder it is to break open, and, therefore, the bigger the equipment needed to do the job. In fact, some of our tools are almost as large as a Navy destroyer, in contrast with the traditional test tube symbolic of the science laboratory.

"With such devices, scientists hope to make important discoveries about the nature and the characteristics of neutrons, protons, mesons, and other particles much too small for the naked eye to see."

The first such tool, the Nation's largest and most powerful reactor designed for research, went into action August 22, 1950, at Brookhaven.

The new reactor (or pile) is an "atomic furnace" in which the "burning" (or chain reaction) of uranium atoms produces quantities of neutrons for experiments.

Brookhaven scientists are also studying the physical, chemical, biological, and medical effects of nuclear radiation on matter of all types, including living cells. For example, I saw a cornfield under atomic radiation. It was a strange sight, with yellow signs warning persons to keep a specified distance from the "hot" experiments.

Atomic Knowledge to Improve Life

But knowledge gained from tests such as these may help man learn how to apply radiation to improve—not destroy—plant and animal life. Brookhaven, in short, does not produce atomic bombs—it produces knowledge (page 319).

The tall chimney of one of the most modern power plants in the United States guided me to Port Jefferson on the north shore. The district before December, 1948, had little need for a station capable of generating 100,000 kilowatts. Then, there wasn't much industry in this region, today experiencing the sudden growth and change felt by the entire island.

West of Port Jefferson I found a striking change at Stony Brook. Before the war the village looked like any run-down suburban community, with shabby shops and decadent dwellings.

Now civic spirit has re-created the 300-year-old settlement as an ideal village of the colonial era.

Its shops, firehouse, post office, even a gas station, conform to traditions of 18th-century architecture. No overhead wires or signs mar the purity of these buildings facing a wide village green. The civic center models—1750 style—for the 1951 planning and construction of other Long Island communities.

Westward along the north shore I continued to Oyster Bay. I walked up a quiet path to the grave of former President Theodore Roosevelt. The plain stone that marks the spot gives simply his name and dates of birth and death. Beneath this inscription appears the similarly understated epitaph of his wife, Edith Kermit.

The 12-acre Roosevelt Bird Sanctuary adjoins the cemetery. Owned and administered by the National Audubon Society, it stands to the memory of the 26th President of the United States.

I followed a lane through the wooded vale where Roosevelt as a boy observed birds, animals, and trees.

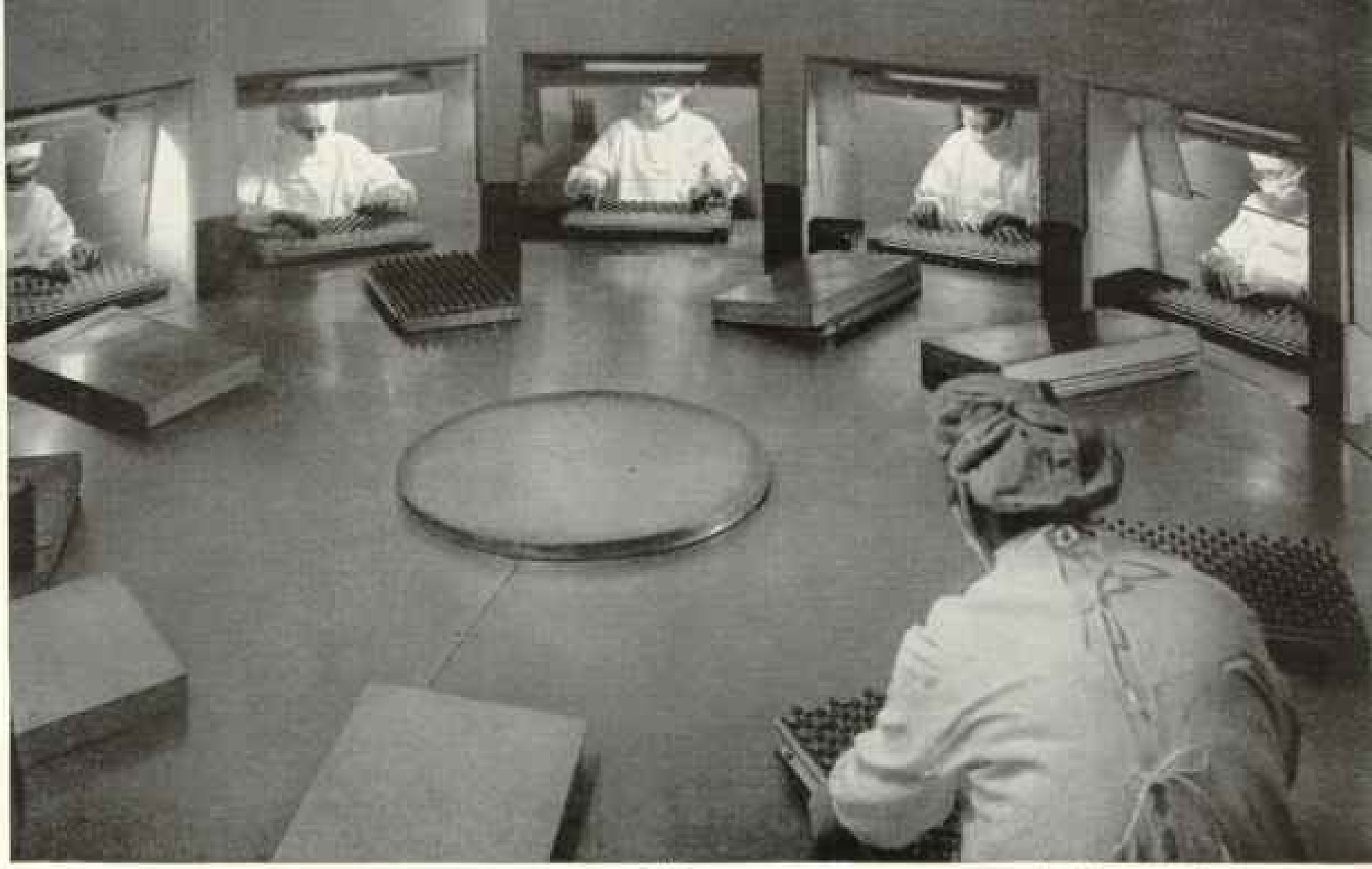
I couldn't count the fleets of racing boats I watched one Sunday at Port Washington's Manhasset Bay Yacht Club. Off harbors all along the north shore, the coasts of New York and Connecticut, the Yacht Racing Association of Long Island Sound stages sailing races each week end of the summer season. Clubs around the Sound take turns at being host (page 287).

Annapolis of the Merchant Marine

Circling the head of Manhasset Bay, I drove through Great Neck to Kings Point. Here, in quiet days before Pearl Harbor, spread the elaborate estate of the late automobile engineering genius, Walter P. Chrysler. A month after Pearl Harbor this property became the site for the Annapolis of the Merchant Marine. By 1943 the United States Merchant Marine Academy had enrolled 2,670 potential sea captains.

Young Brooklynites Desert Hot Sidewalks for a Dance on the Green in Prospect Park

Brooklyn is Long Island's oldest settlement; Indians sold the site to the Dutch in 1636. Today its population is almost 3,000,000, and its water front handles about 60 percent of all Port of New York shipping (page 318). Here, in the center of Grand Army Plaza, rises the Soldiers' and Sailors' Memorial Arch, honoring men who died in the Civil War. General Sherman laid the cornerstone in 1889. Close by is 526-acre Prospect Park, which is surrounded by miles of quiet residential streets contrasting sharply with the hurly-burly of Manhattan. On an August afternoon these boys and girls walked to the park's Long Meadow to take part in a folk-dance festival.



317 Chas. Pfizer and Co., Inc.

Revolving Table Delivers a Magic Drug to Masked Workers in Bacteria-free Cubicles

These women stopper vials of the new antibiotic, terramycin, at Charles Pfizer and Company, Inc., Brooklyn. Pfizer scientists, mass producers of penicillin, discovered terramycin, also a soil-mold product, in 1949. It is effective against virus pneumonia, amoebic dysentery, venereal disease, and other ills (page 318).

During World War II, 6,634 men sailed through accelerated courses at the Academy. Two-thirds of these officered merchant ships; the rest went on active duty in the U. S. Navy. Up to June, 1950, a total of 8,125 had been graduated (page 297).

Back on the early Indian trails (improved out of sight) I rolled into Long Island's oldest settlement—Brooklyn, honestly bought from the red men by the Dutch in 1636.

How does it look after 315 years? I saw this city of nearly three million people from four acute angles: on the roof of one of its tallest buildings; aboard a tug along the water front; inside industry; and, of course, in a grandstand seat at Ebbets Field.

Ride first to the roof of the St. George Hotel. There's New York City across the East River, only the length of Brooklyn Bridge away from Long Island. This end of that mighty span stabs Brooklyn's heart where work has started for an expansive civic center; that's why all those old buildings are coming down.

And over here, on the residential side, more homes like skeletons with dark, hollow eyes will make way for a unique triple-deck highway, the Brooklyn-Queens Expressway, to be completed in 1952 (page 288).

How many trees grow in Brooklyn! Church spires, too. Besides the 526 green acres of mid-city Prospect Park, 145 other parks range in size from less than a quarter-acre to 1,800. You can't see Coney Island from our roof, but you can drive there along tree-lined Ocean Parkway in half an hour or less (page 280).

It amazed me to find its 3-mile beach and boardwalk, midways, fun clubs, and cafés less crowded than expected. "Gone to work, back next Sunday," might explain.

Seeing Brooklyn's Busy Water Front

To see Brooklyn's water front, take a tug—any one of more than 600 on New York Bay. I boarded the *Moira Moran* and joined Capt. Anton Huseby in the wheelhouse.

He steered toward the Army wharves at South Brooklyn; from here ships carried thousands of soldiers and tons of fighting material in wartime.

Now heading north, *Moira* poked by the Bush Terminal piers; nosed into ship-jammed Gowanus Bay under a gigantic grain terminal; slid past stacks of lumber into Erie Basin; churned through Buttermilk Channel; skirted 2½ miles of the New York Dock Company's frontage.

As we made our way, I began to see where several hundred ships of some 65 lines loaded, unloaded, or made repairs.

We passed under the Brooklyn and Manhattan Bridges and into the delicious aroma of roasting coffee. It came from one of the

processing plants that make Brooklyn one of the biggest handlers of coffee on the globe. The smell reminded the skipper.

"Three coffees, all with cream, one with sugar," he called through a wheelhouse window to someone on deck.

Hefty steel cranes towered above Brooklyn Navy Yard (New York Naval Shipyard) like a group of Gullivers in Lilliput (page 296). At this "mother of all our navy yards" more than 50,000 men worked in World War II. Now packed with nearly every type of warship, it seemed one long floating fortress.

Moira found factory-banked Newtown Creek too clogged with freight barges to proceed; so headed back along the East River. The skipper picked up the ship-to-shore telephone to notify his head office of our return. We had covered a water front that handles about 60 percent of all the shipping business done by the Port of New York.

Brooklyn's water front forms America's biggest commissary, just across the water from America's biggest market. Part of Bush Terminal Buildings Company is a grocery store in itself. Tremendous trucks and small flatcars in tractor-drawn trains moved cases, cans, sacks, crates, jugs, and drums of familiar foodstuffs. We even saw rolls of wrapping paper as big as those that go to news presses.

Bush Terminal Buildings Company rents 16 buildings, covering approximately 10 city blocks, to industrial concerns. On a total floor area equal to 110 football fields tenant companies engage 25,000 workers.

They manufacture anything from aircraft parts to chewing gum, from biscuits and bedding to champagne and lamp shades, cosmetics, farm implements, wooden heels for women's slippers, raincoats, and wholesale grocery items. The company rightly calls its huge properties "Industry City."

Brooklyn's Trade World-wide

Brooklyn trades with the world. In one of numerous warehouses at Bush Terminal Company I noted such imported items as tea, crude rubber, pepper, African palm oil, cocoa butter from Brazil, spices, wool, green coffee, cocoa beans, soybeans, cinnamon, mica, shellac, nails from Germany, gum copal from Indonesia; also toys made in Japan; egg yolk, feathers, and horse hair from China.

One hundred years ago a chemical company under the name of Pfizer used mud from bottoms of wine casks to make cream of tartar for baking powder. Today this company, with modern laboratories in north Brooklyn, has grown into one of the world's largest producers of penicillin and other life-saving drugs (page 317).

In January, 1950, Pfizer announced its own discovery of another multiple-purpose drug called terramycin—"penicillin's newest cousin makes dying still more difficult."

Pfizer produces tons of antibiotics (antimicrobial substances isolated from the soil, for example). These affect the microbes but not the cell tissues of the host. Terramycin is an antibiotic; it stifles the life processes of germs; it helps patients recover from many ills, among them blood poisoning, virus pneumonia, whooping cough, tonsillitis, strep throat, amoebic dysentery, shingles, and venereal diseases.

Drugs and Bugs for Saving Life

To all corners of the earth Pfizer sends kits to collect soil samples to be tested in its Brooklyn laboratories. Of 100,000 such samples put through long-time screening experiments, only terramycin proved effective enough to become medically important. Still, clinical evaluation of it will continue for months to come.

"Bugs are our employees," said the president of Pfizer. "Everything here stems from fermentation technique; in this work we use organisms to a great extent."

Pfizer has developed tremendously in the last 10 years. Employment (not counting bugs) jumped from 500 to 3,000 workers. The products traveled everywhere with United States forces during World War II; go with them now. Natives in far-off lands who can't read English have learned to recognize the label on Pfizer bottles and packages.

The natives of Brooklyn are remarkable. A friend of mine asked a Brooklynite how to find Montague Street.

"Well, if it's tickets to the ball game you want," he began, then gave explicit directions to the downtown ticket office at No. 215.

So we went to Ebbets Field and watched Brooklyn's beloved Dodgers knock the Boston Braves back to Beacon Street, 8 to 3 (page 293).

With darkness I returned to the roof high above the borough. Myriad lights of Manhattan and Brooklyn merged like the traffic on bridges between them and made two cities one.

An easterly breeze cooled the August evening. It smelled fresh as a Montauk meadow. Had it, I wondered, rustled the vines against a weathered cottage in East Hampton, or filled the sails of a windmill somewhere in Suffolk?

I felt the breath of a new Long Island—growing home of increasing millions.

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Kodachromes by B. Anthony Stewart

Once This Rock-hard Package Swam, Ate, and Quacked

Now it's a quick-frozen dinner prepared by an Eastport firm. Long Island plants freeze millions of pounds of poultry and garden produce a year. Some ducks go to market unfrozen. Farmers often leave birds in storage until prices favor sales.

Peaceful Atoms Irradiate Corn for the Good of Mankind

Brookhaven National Laboratory, at Upton, operates the Nation's largest atomic research furnace. Not concerned with A-bombs, its scientists study radiation's effects on life. Here biologist W. Ralph Singleton examines corn for changes in inheritance factors.

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Kodachrome by B. Anthony Stewart

600 Miles an Hour or 6? Grumman Satisfies Speed Tastes with Deadly Jet Fighters and Bright Aluminum Canoes

Panthers, like this swivel-winged Navy job, now hold first priority at the huge Bethpage plant. Guardian antisubmarine planes and Albatross amphibians also are produced. Grumman designs its aluminum canoes, dinghies, and other small craft to be durable but light.

East Hampton in Carnival Spirit Stages Its 55th Fair to Enhance the Village Scenery

Each year the Ladies' Village Improvement Society runs the show to gain funds for maintaining greenery. Last year's amusements and refreshment booths were set up on the grounds of the Old Mulford Farm. Two sisters (left) marched in the children's fancy-dress parade. Costume prizes were awarded by Hedy Lamarr.

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Kodachrome by B. Anthony Stewart

Montauk Point Light, a Landmark to Mariners Since 1797, Stands Like an Exclamation Point at Long Island's Eastern Tip

Montauk, scene of a boom that died with 1929's Wall Street crash, today enjoys a quieter revival as a vacation resort. Hotels, fishing lodges, and a dude ranch accommodate visitors to the Empire State's land's end. Here surf fishermen cast from the beach (pages 324 and 325).

Their Bare Feet on Windswept Dunes, Vacationists Forget Tight Shoes and Hard City Pavements

Glacierlike, the greater part of the dune is shifting south under strong northwest winds. Remorselessly it engulfs trees 30 feet high. This beach grass may in time anchor the dune. It stands on Goff Point, which thrusts into Napeague Bay from Hither Hills State Park.

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Montauk Fishing Is Not All Fun; Dad Has to Clean the Catch (Right)

So popular is Montauk's sport that hundreds ride the Long Island Rail Road Fishermen's Special from New York City every Saturday and Sunday from mid-May to November.

Those content with smaller game board party boats for bottom fishing or trolling a few miles offshore. There they may catch pollack, fluke, porgy, blackfish, bluefish, and striped bass.

The more adventuresome ride out into the depths in search of giant tuna, swordfish, or a white marlin like the prize at left, the hook still dangling from its mouth. For such sport they charter swift boats like *Caliban II* (opposite page). *Caliban* carries trolling outriggers, harpooner's pulpit, and ship-to-shore telephone.

Troughs for cleaning fish are part of the accommodations for guests at Fishangri-La, a Montauk lodge.

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Sag Harbor in Period Dress Honors the Whalers Who Built Its Stately Mansions

Yankee Roams the Orient

By Irving and Electa Johnson

ONE pleasant part of a *Yankee* world cruise is sailing away from the world's troubles. We discontinue the newspapers, shut off the radio. Does the cold war reach zero? We do not know for days on end.

On our 96-foot ship we come to know each other as only families do. We choose our amateur sailors not for experience but for companionship. Their personalities must be capable of harmonizing in close quarters.

Like the nursery rhyme's old woman and her many children who lived in a shoe, we are one big family, boys in the main cabin, girls in the two double cabins, and the Johnsons in the skipper's cabin across the stern.

Masts Serve as Exhaust Tubes

Yankee, a former North Sea pilot schooner, combines size, comfort, sailing ability, and strength—a marvelous ship for our purposes. Rigged as a brigantine, she carries square sails on the foremast, fore-and-aft sails on the mainmast, and staysails between the masts. When we have set 7,775 square feet of canvas and nylon, *Yankee* is a noble sight (pages 335, 365, 368).

For strength and durability, the yacht's hull is steel. Her lower masts are hollow steel. One of these tubes serves as an exhaust outlet for her Diesel engines, the other as a chimney for the oil-burning galley range. This arrangement keeps the smells, smoke, and noise clear of the deck.

Meals are served on the main cabin's balancing table, which remains horizontal no matter how the ship rolls. We sailed 45,000 miles around the world on one set of dishes (p. 328).

Our crew of young men and women, sharing the work and expense of the cruise, devoted 18 leisurely months to a trip that steamers make in four (map, pages 330-331).

Fourth Voyage Aboard a *Yankee*

We Johnsons—Irving, the skipper, and Electa, his wife—were making our fourth world voyage aboard a ship named *Yankee*. With us was our 12-year-old son, Arthur, who climbed the old schooner *Yankee's* rigging when he was 22 months old.

Our mates were Stephen Johnson, Irving's nephew; Jack Braidwood, and Frank Power. Charles Bothamley was the ship's doctor; and Donald Crawford, the only paid hand, was the cook (pages 367, 369).

Our seamen, mostly boys just beyond high-school age, included Jack Trevett, John Wright, Peter Sutton, Hazard Campbell, Richard Bartow, James Wells, Alan Pierce, Eric Wolman, Raymond Moeller, and Edward Douglas.

Girls, who painted, scrubbed, and took their turn at the wheel, were Mary Booth, Louise Stewart, Mildred Young, and Terry Glenn. They were a little older than the boys.

Such was the crew when, at the end of March, 1948, we left Honolulu, which we described to readers of the National Geographic Magazine in the January, 1949, issue.

Right now, after a long, quiet stretch on the Pacific, we could sense the crew's dreaming of country-club dances, porterhouse steaks, and other landlubber luxuries. They craved excitement, and Malekula, New Hebrides, was just the island to provide it.

We Learn About the Big Nambas

Malekula is the home of the undefeated, uncivilized men of Melanesia—the Big Nambas, who dwell in stockaded villages beyond reach of missionaries, labor recruiters, and tax collectors. Until a few years ago they had a reputation for murder and cannibalism (page 341).

Big Nambas owe their tribal name to a peculiar item of dress. Below their fiber belts the men wear an enormous and extraordinary hank of maroon-dyed grass which, with charity, might be called a loincloth. This bulky wrapper is the *nambas*. Other tribesmen, the Small Nambas, substitute a mere twist of banana leaf.

During the war Big Nambas were known, by reputation only, to 300,000 servicemen stationed at or passing through Espiritu Santo, the big American base in the New Hebrides.* A few Yanks there acquired as souvenirs the Big Nambas' bracelets made from circular tusks of hogs.

We learned more about these tusks from a French planter who visited *Yankee* in Oleman Bay, Malekula.

Wives Nurse Pigs with Circular Tusks

"Pigs," he said over the coffee cups, "mean everything to these people, not for pork but for prestige. And it is not thoroughbred pigs that count, but those with circular tusks. The owner of such tusks, like the possessor of a million dollars, rises to a high social plateau.

* See, in the National Geographic Magazine: "Painting History in the Pacific," by Lt. William F. Draper, October, 1944; "Palms and Planes in the New Hebrides," by Maj. Robert D. Heinl, Jr., August, 1944.

328 Irving Johnson

Sailors Pound Tossing Typewriters with Arms Resembling Praying Mantis Legs

Many on board *Yankee* recorded her 18-month voyage in diaries; others wrote articles. The proximity of a mail port brought about this rash of letters. Typists use the dining room's balancing table, which never spilled a dish, even during storms. Swinging on a pivot, it remains level though the brigantine heels down. Here, as the ship rolls, writers on the left bank rise and their opposites dip.

He celebrates promotions in the men's societies by killing his pigs, thus demonstrating his disregard for mere wealth.

"To develop circular tusks," the Frenchman continued, "Big Nambas remove a pig's upper canines. The lower teeth, now unopposed, grow in circles, piercing the flesh. I've seen two-circle pigs and have heard reports of triples.

"Naturally, such valuable animals cannot go rooting around. It's the wives' job to feed the pigs, even cook for them. Husbands have been known to strangle women for carelessness with pigs."

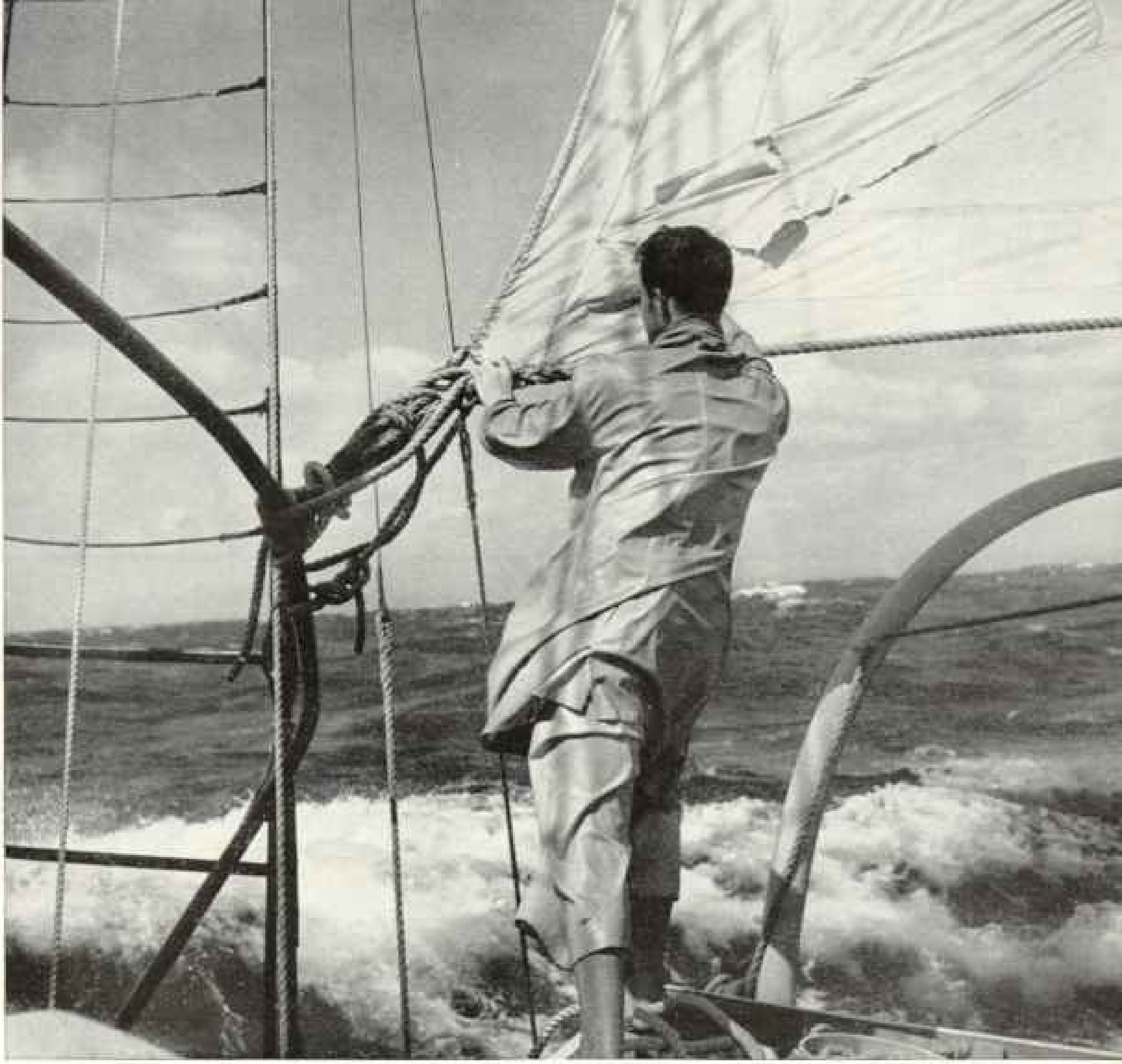
The Frenchman said he guessed that the wartime Americans' reputation for friendliness had penetrated even to the Big Nambas. It should be safe for us to visit Amok, a Big Nambas village about to install a new chief. For a guide he offered his servant, who had relatives in Amok, though he was clad in shorts and answered to the mission name of John Bill.

"Just keep telling them you're Americans," our visitor said, "and not the Government. To them, government means enemy."

Wives' Front Teeth Knocked Out

Loaded with cameras and trade goods, we started inland under John's guidance. After a 16-mile hike we arrived at Amok's impregnable fences, which were made of high posts laced with split bamboo.

At a sally port we encountered the Big



329 Irving Johnson

Powerful Winds Bent *Yankee's* Two-inch, Solid-steel Traveler Bar Six Inches out of True

Reinforced canvas on the main staysail, one of the brigantine's strongest, burst under the buffeting of a Cape of Good Hope storm (pages 350 and 366). The sail, sliding along the bar, moves from one side of the ship to the other when coming about. Ray Moeller, who surveys the damage, was one of the young men who worked and paid their way around the world learning the art of seamanship in old-fashioned sail.

Nambas women. They wore almost nothing but a hat with a long grass streamer. Girls in our party were horrified by their beaten look. Cringing, the women shrank out of our path behind bushes. Like the pigs, they had suffered a disfiguring dental operation. In lieu of a marriage ring, each wife had had two upper front teeth knocked out.

Meanwhile, the men came out to look us over. In addition to the coconut-fiber belt and grass nambas, they wore bone or wood nose plugs, manes of fuzzy hair, and scowling expressions. That was all.

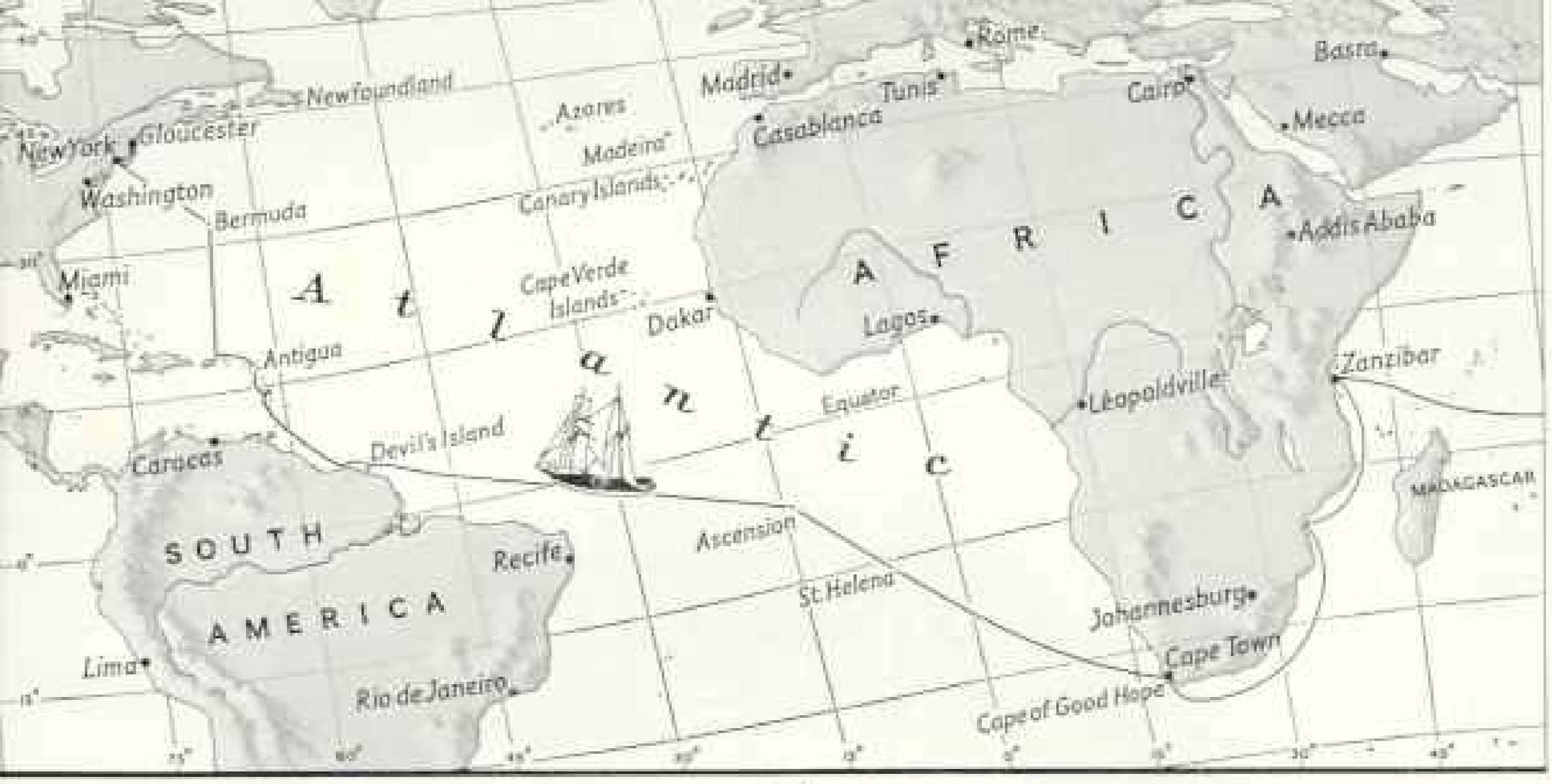
Through John's interpretation we learned we had arrived too early for the chief's installation. We could come back, the men said.

We kept the date. Sixteen of us, accompanied by five native carriers, returned six days later. Entering the village, we observed a narrow quarter-mile-long glade cleared out of the jungle for a dancing ground. Music—12-foot-long tom-toms hollowed out of logs—was ready. Near by, 200 upright poles bent beneath burdens of coconuts and five-foot yams.

Dancers Make Up in Orange and Black

Our hosts gave us shelter in an unfinished thatched house which evidently was being used as a robing room. Enormous feather headdresses hung from its lashed beams.

We ventured into the village, taking care to keep on the fringe of things, and wandered



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Honolulu to Gloucester: the Second Half of *Yankee's* Leisurely World Voyage

Commercial cruise ships circle the globe in four months. *Yankee*, trading in romance, does it in 18. Her crew watched barbaric Melanesian dancers, traded with tattooed Polynesians, and courted a Malay princess.

into a jungle glade. There 64 dancers, like actors behind stage, were decking themselves out. Two make-up artists worked on each performer.

Already brown bodies had been painted pitch black from the waist up. Now a coat of orange was applied from the belt down. Bean-pod rattles were attached to ankles and colored tassels to belts. Fans of leaves were tucked under belts to simulate tail feathers.

Finally, enormous feathered headdresses were attached by wooden skewers thrust up through wiry hair. Each dancer leaped high into the air to test the stability of his 4-foot bonnet. A thousand feathers shivered.

Boom! boom! boom! The tom-toms were sounding. Sixty-four dancers, advancing out of the jungle, lined up beneath the yam posts in four columns. Half black, half orange, they towered 10 feet in their high shakos.

With balletlike precision the men started dancing. Columns of fours became single files and squares turned into circles, but the incredible spectacle never stopped for a moment. With each step 64,000 feathers shook, 128 ankle castanets rattled, and 64 tails swayed.

Meanwhile, women in maroon headdresses occupied the sidelines. They shrank back like seaweed in a current whenever the men drew near. Their cringing, we learned now, was just a form of politeness, like our bow.

As darkness set in, we returned to the unfinished house for a campfire supper, but the dancers took no intermission. Eerie bonfires lit their dancing ground; drums beat louder than ever.

Such a savage din filled the air that we feared to venture back. Our five mission boys, equally cautious, crouched beside the campfire.

We stretched out on piles of coconut fronds, but the ominous tom-toms permitted only fitful slumber.

At times we awoke to the light of torches borne past our shelter. Occasionally a torchbearer peered into the hut and, as we held our breath and said our prayers, quietly went away.

A Black Goblin Counts Us Off

One shadowy figure ventured in. We watched like children pretending to be asleep as our visitor, torch held low, made his way from one recumbent figure to another, like a warden counting prisoners in a cell block. No one dared say a word; but Irving, who was going to resist if necessary, grasped his heavy flashlight as a club and prepared to sell our lives dearly. Finally satisfied, the inspector departed.

Daybreak halted the dance and stilled the drums. Spirits recovered, we awaited the sacrifice of pigs. No such ceremony was given.

Instead, the coconuts and yams were distributed as gifts. Burly warriors, not unlike college boys after a football victory, tore the 200 yam sticks from the ground like goal posts (page 333). They distributed the presents amid savage yells.

At this interesting moment, something—perhaps it was the sight of human skulls on sticks our crew was trading for—alarmed our mission boys. "Master, master," they pleaded, "more better we go along salt water. No good here any more."

We took a last look at shouting mob and falling yam posts and attempted a polite goodbye. Our hosts ignored us completely—a

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Drawn by Irvin E. Alleman

The Brigantine Sails Where Adventure Beckons; She Shuns Ocean's Beaten Paths

During a 45,000-mile voyage sailors bartered tobacco for pearls and inspected Cocos Islands' celluloid money. They visited St. Helena, scene of Napoleon's exile, and Devil's Island, where freed convicts ran loose.

breach of manners which all of us were happy to overlook.

While deep in Melanesia we turned our attention to two Polynesian outposts planted nearly a thousand miles west of their kind, possibly by canoe wrecks long ago.

On Tikopia, which lies north of the New Hebrides, *Yankee* was welcomed by swarms of outriggers (pages 336-339). Beneath streaming manes red-dyed with lime, the canoemen reminded us of the savage Polynesians of the woodcuts illustrating the books of old-time Pacific explorers. Just such mobs besieged Captain Cook's ships.

Afraid to let the men on board, we traded fishhooks and knives over the side for mats, fans, bowls, model canoes, tapa cloth, and tattooing instruments.

Chief's "Belly Belong Me Full Up"

On the Stewart Islands, the second Polynesian outpost, we found women draped in saronglike garments. Old wives tucked these high under the arms, but girls started the "neckline" around the hips (page 353). Some wore a bib-and-collar which, when they danced, bobbed up and down, concealing nothing.

The island's chief took lunch aboard *Yankee*. Manifestly half-starved, for food is not plentiful on these low islands, he gorged on beef stew until he arose and announced, almost painfully, "My word, belly belong me full up!"

In the Solomons, *Yankee* sailed into the Slot to an anchorage off Guadalcanal (page 349). Four Allied cruisers sunk in a single night in 1942 lay almost beneath our keel. We toured Henderson Field and Edson's Ridge, where the Marines made history. Irving alone among us was able to picture the jungle-grown battlefields as they were, for he had charted these environs with a Navy survey crew.*

One night *Yankee* felt her way into Mboli Pass, on Florida Island, and tied up to shore with her yards sticking in the trees (page 352). There we discovered a wartime pipeline which used to carry water from the hills.

Now, if there is any luxury which our crew truly appreciates, it is a superabundance of fresh water. *Yankee* carries 4,000 gallons, enough to satisfy thirst but not laundry or bath. We scrub ourselves in waterfalls, rivers, and rain squalls. On visits ashore we beg baths from newly made friends. We have studied the bath situation all around the world (page 349).

The pipeline, naturally, was a delight. We flushed out the rusty water and turned on the tap full blast. For an afternoon we reveled in a clear, cold stream. We washed clothes and hung them on deck until *Yankee* looked like a laundry yard.

Native Scavengers Hunt War Supplies with Zest

Many Solomon islanders, we observed, were engaged in a treasure hunt, not for pirate gold but for war's leftover supplies.

Since these goods could not be transported home economically, could not be sold, and could not be given away lawfully, they had to be destroyed. Refrigerators and canned

* See, in the National Geographic Magazine: "Adventures with the Survey Navy," by Irving Johnson, July, 1947, and "At Ease in the South Seas," by Frederick Simpich, Jr., January, 1944.

Mary Booth

Scheherazade, a Sultan's Daughter, Performs a Ternate Island Dance

Yankee crewmen adored this Malay princess, who spoke English and drove a jeep. She took the boys touring her palace; then, in diving helmet, joined them inspecting the sea floor's coral wonderland. Scheherazade's name comes right out of the *Arabian Nights*, but she preferred to be called Rinny (page 334).

food were dumped into the sea; jeeps were driven off dock ends.

Natives have dug up barrels of oil and cases of Coca-Cola. One chief wired his village for telephone service; another got electric lighting for a while from a gasoline generator.

Tipped off to a gasoline cache, we used it in our outboards the rest of the voyage.

Wartime's free spending is still felt in the Solomons. Yanks who paid $5 for a grass skirt left plenty of money but nothing to buy. We met natives, wallets bulging with bills, who begged us to sell shirts, shorts, and trousers.

Since the war, natives have acquired the curious belief that an American deliverer is coming in a huge ship or plane. Labor-saving devices and social equality are the expected gifts of this latter-day Santa Claus.

In Langalanga lagoon, on Malaita, Irving met an islander who, looking for the messiah's ship in exactly three weeks, sought advice on how to welcome it (pages 340, 342).

Some of the islets in the lagoon are taboo to women, who can't even canoe past them on a certain side.

Northwestward now *Yankee* set sail for Rabaul, New Britain, to see what was left of the "most bombed spot in the Pacific."

Americans, by-passing Rabaul, raided it so often that every building was shattered and 265 ships and landing craft were sunk in the harbor. Japanese defenders with pick and shovel dug nearly 300 miles of deep hillside tunnels. Into them they dragged themselves and their armaments, including landing craft (page 354).

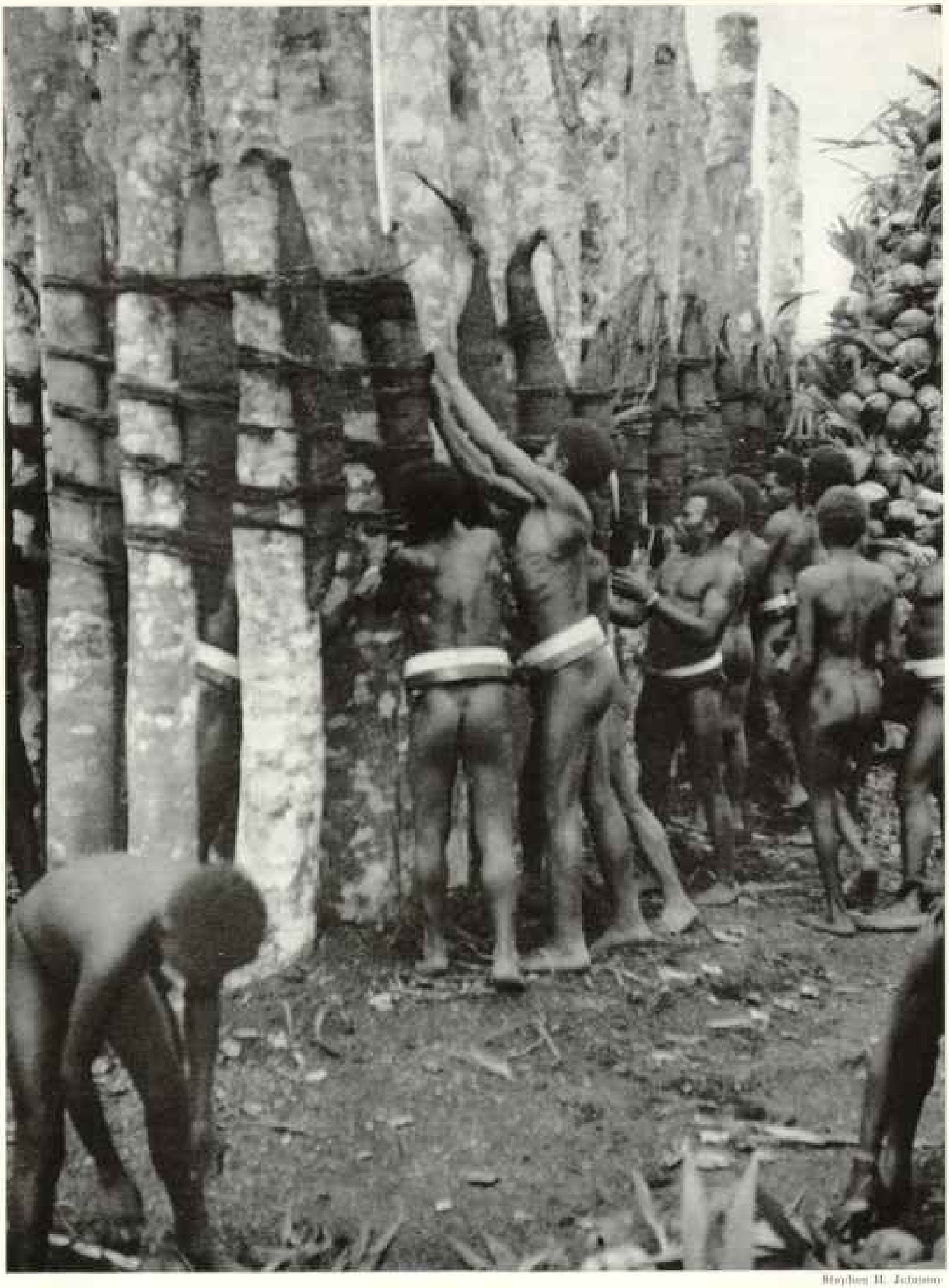
We visited a school which used American parachutes for roofing. Children had to learn to leave unexploded shells alone.

Here, as on other islands, Japanese imported African snails, nearly as large as a man's fist, for food. These slimy pests (*Achatina fulica*), seemingly multiplying overnight, have become an uncontrolled menace to crops. Ship-borne, they spread from island to island, and now there is a constant vigil to keep them out of the United States.

In Rabaul our boys were challenged to a basketball game. They found themselves playing a Chinese team before an all-Chinese audience. Handicapped by their sea legs, they stumbled into defeat.

We Trade Tobacco for Pearls

The Trobriand Islands, famous for pearls, were our next stop. We bargained over the rail until we collected 136 lustrous gems, the



Blaydon H. Johnson

Malekula's Wild Men, Fresh from a Nightlong Revel, Rip 8-foot Yams from Posts

Yankee's travelers spent a tom-tom-haunted night among the New Hebrides' Big Namhas. They saw savages painted half black, half orange, dancing a jungle ballet. At daybreak a howling mob tore down gift yams and coconuts (right). Ignored by their hosts, the Americans felt happy to escape without incident (page 330).

best of which cost Jack Trevett a paltry $8.

Virginia stick tobacco, of which we carried a case, proved a powerful trading currency. Smokers rolled it into cigarettes, using newspaper wrappers.

Scarcely able to believe that old newspapers were valuable, we ransacked lockers for copies and traded sheets and even quarter-sheets for use as cigarette paper. Newsprint did not buy pearls, but it did command curios such as betel-nut spatulas.

Picking up a fair wind, *Yankee* flew along the north New Guinea coast to Madang (page 356).

At Wewak, between Madang and Hollandia, we saw the ruins of 350 Japanese planes destroyed by an American low-level raid. One Zero, sitting in the administrator's pigpen, shaded his hogs with its wings. On rainy days the whole lot took shelter in the cabin by entering a shell hole in the plane's side.

We sailed into Hollandia, Netherlands New Guinea, one midnight. The harbor master, turning his searchlight on us, was so amazed to see a sailing ship that he came aboard. He was more astonished at finding a woman at the wheel and another signaling to the engine room. Our visitor was convinced that females ran the entire ship until he heard a masculine voice up forward singing out, "Hard aport! Back full!"

Dutch Enjoy War's Leftover Comforts

Thousands of Americans have passed through Hollandia, which was General MacArthur's springboard for the attack on the Philippines. Here as elsewhere the Yanks left mountains of equipment.

Thrifty Dutchmen, having bought this material, convert every profitable item into cash. They make themselves comfortable in Quonset huts; they enjoy hundreds of miles of American-built roads. MacArthur's "million-dollar" headquarters, moved from its site on Lake Sentani, serves as the Dutch Residency.

On Biak Island, another war base, we took an air tour above a warplane graveyard. On the field sat a thousand four-motor bombers. From the air they appeared to be in perfect condition, but a bulldozer had broken their backs to prevent illegal use (page 345).

Sioux City Sue, Eight Ball, Oklahoma Rose, and *Who Dat?*—The planes' names revealed the spirit of their gallant crews. Painted rows of bombs tallied their scores. One had 136 missions.

Now we were getting away from the South Seas and entering the Orient. Somewhere between New Guinea and Borneo and south of the Philippines, we were to cross Wallace's line, named for Alfred Russel Wallace, co-discoverer with Darwin of the origin of species. This invisible line divides Australian-type fauna, such as kangaroos, from Oriental beasts like tigers, elephants, orangutans, and rhinos. Some channels only a few miles wide separate these divergencies, which reflect the cleavage between Asiatic and Australian land masses.

We could have drawn a similar line to divide our cruise into its South Seas and Oriental phases.

Crew Courts a Malay Princess

When we anchored off Ternate, one of the Moluccas, we were definitely at the threshold of the East. Proof positive was Scheherazade (her real name), Moslem-Malay daughter of a Sultan. As her father was away, the princess undertook to be our hostess (page 332).

Scheherazade called herself Rinny, pronouncing it Ree-nee. Seventeen and beautiful, with smooth Malay skin and huge brown eyes, she captured the crew's affections. Commander of a jeep, she took the boys touring her island and spoke to them in English acquired as a war refugee in Australia.

Rinny's cute Western ways intrigued the crew. The boys plagued her with questions: "Can you marry anybody you wish? Does he have to be a Mohammedan? Why don't you come to the United States?"

We overheard Jack Trevett saying, "Gosh, if the fellows back home could hear me calling you 'Princess,' they'd die!"

Visiting the ship, Rinny reveled in our phonograph records and she thrilled the crew with her own singing.

Rinny Goes Diving in a Helmet

In her father's palace, a half-timbered structure, Rinny put aside her Western ways and became the Malay princess of batik sarong, embroidered silk jacket, and dangling diamond earrings. She presided over a retinue of servants.

Our hostess showed us the palace treasures —curved swords in silver scabbards, antique pistols and bullet molds, and shining helmets with bird-of-paradise plumes, many of them relics from the 16th-century Portuguese occupation.

Our farewell day in Ternate found the Sultan's daughter down under *Yankee's* keel in dungarees, navy shirt, and diving helmet. The boys were showing her the wonders of a coral formation.

It was time to go.

Her pretty hair still wet from the dive, Rinny jumped into her jeep and drove away.

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Kodachrome by Irving Johnson

Globe-circling *Yankee's* Crew Sets the Topgallant Sail to Catch Indian Ocean Trades

Following adventure's course, *Yankee* visited 104 ports or islands, from Gloucester to Gloucester, and covered 45,000 miles in 18 months. Square sails on her foremast, fore-and-aft rigging on the mainmast make her a brigantine. The former give her power in the trade winds, the latter permit quick maneuvering in tight places.

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Kodachrome by Irving Johnson

Barbaric Canoeists from Tikopia Mob *Yankee* Just as Pacific Islanders Besieged Captain Cook's Ships Two Centuries Ago

Tikopia, an island between New Hebrides and the Solomons, is a Polynesian outpost in a Melanesian world. One of the white man's first discoveries in the South Seas, it is now one of the least visited. These men, who wear their lime-dyed hair in fuzzy manes, have little supervision. Their wild ways made the crew nervous.

Wild-eyed, Giggling Tikopians Surround the Ship, but a Day's Fingering and Staring Fail to Satisfy Their Curiosity

One visitor (right) wears hibiscus in hair, dyed-grass necklace, and tattoo. His pipe and the reversed English lettering on his arms show a faint connection with white men. He carries a pandanus mat to trade for tobacco. Offered a comb for his streaming hair, he regarded it with incomprehension. His female relatives clip their locks down to the skull. Though the islanders professed friendship, they appeared so unstable that the voyagers feared to linger.

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Kodachrome by Irving Johnson

Kodachrome by Alan Pierre

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Yankee, Afraid to Trust Her Savage Visitors, Allows Only Two to Come Aboard

Here the chief and his aid climb on deck for presents. Ice amazed them. Laughing like children, they tossed cubes from hand to hand like hot coals. One, dropping ice into his loincloth, hopped like a frightened kangaroo.

Kodachrome by Alan Villiers

An Armada of Tikopian Outriggers Clusters Around the Ship's Awninged Stern

Crewmen resorted to stratagem to keep the mob at bay. One boy, dressed as a pirate, held it spellbound with "magic." Opening and closing his mouth, he made a false tooth appear and disappear by shifting it with his tongue.

Skipper Johnson Conns the Ship Across a Shallow Lagoon

As *Yankee* threads her way through Langalanga lagoon, Solomon Islands, Commander Johnson judges the lessening depth by the varying color of the water. As a wartime Navy commander, he performed similar tasks while charting reefs in the Pacific. (See his "Adventures with the Survey Navy" in the National Geographic Magazine, July, 1947.)

On this voyage Mr. Johnson had a very old chart to Langalanga, but it proved to be absurdly inaccurate. As a result of his observations, it has been canceled.

The miniature atoll rising from the lagoon was made not by polyps leaving their coral skeletons but by men laying stones. Natives use the structure as a fish trap. Paddling out in canoes, they churn the water with coconut fronds and drive fish into the open end, which they then seal with a net.

Malaita Island's distant mountains are peopled by ferocious bush natives, whose raids the peaceful salt-water people greatly fear. As their enemies cannot swim, the shorefolk have taken refuge behind a moat of their own design. Their home and fort is an artificial island built up, stone by stone, in the lagoon. *Yankee* here approaches their village (page 342).

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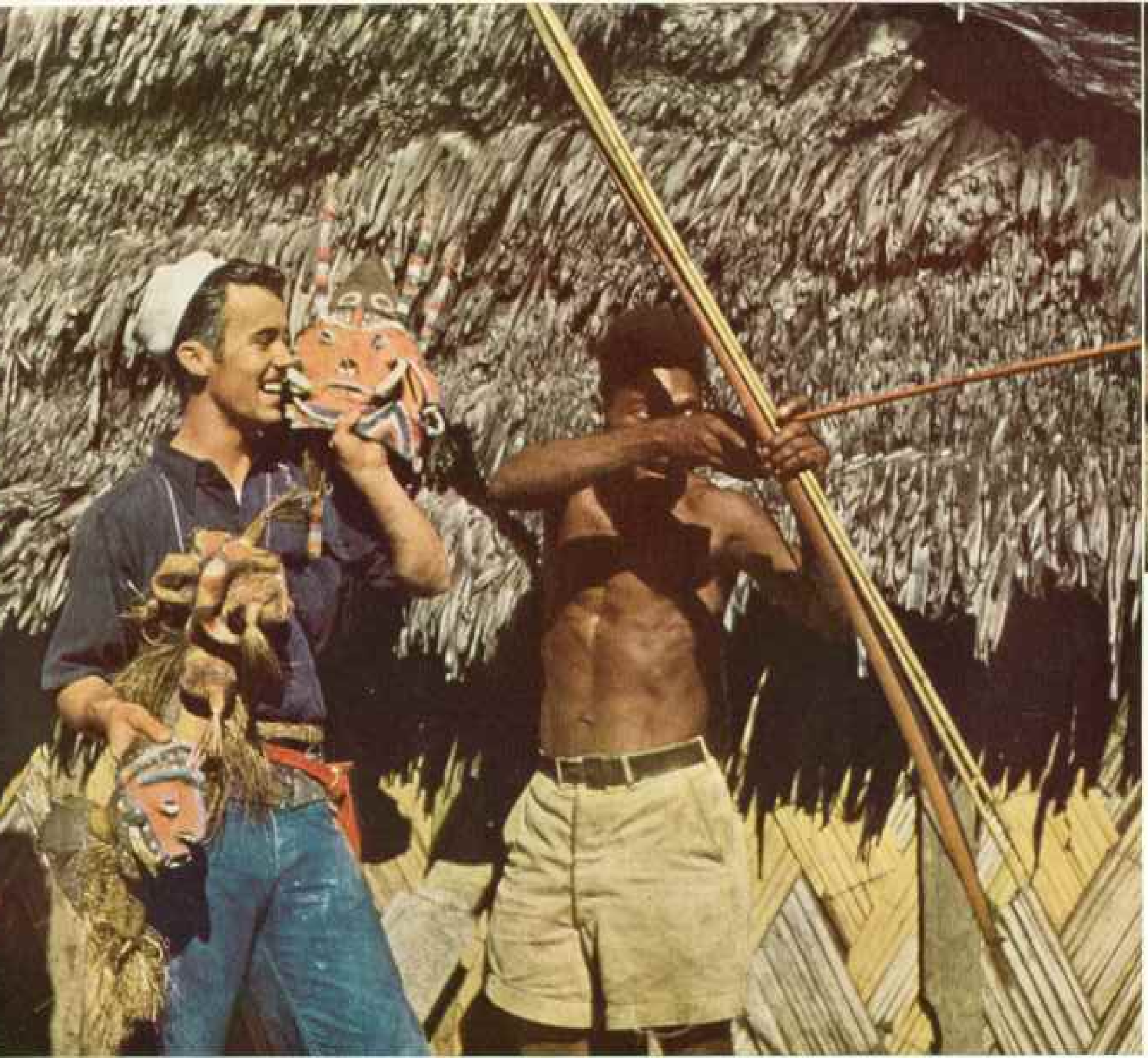
Kodachrome by Alan Pierce



How to Shoot Fish: Use Bow and Arrow

Don Crawford, *Yankee's* cook, collects New Hebrides ceremonial masks in a Ur Island village, giving tobacco and rubber balloons in exchange. His host is a Little Nambas, "civilized" with a pair of shorts.

The bearded Big Nambas (above) scowls at the camera during a savage ceremonial witnessed by *Yankee* crewmen, who spent an exciting night in his village, Amok, on Malekula. Bone in nose, the tribesman wears a vine necklace resembling a coil of insulated wire. His girdle, lodged uncomfortably on his hips, consists of layer upon layer of bark, decorated with the leather strap from an old rifle bandoleer.

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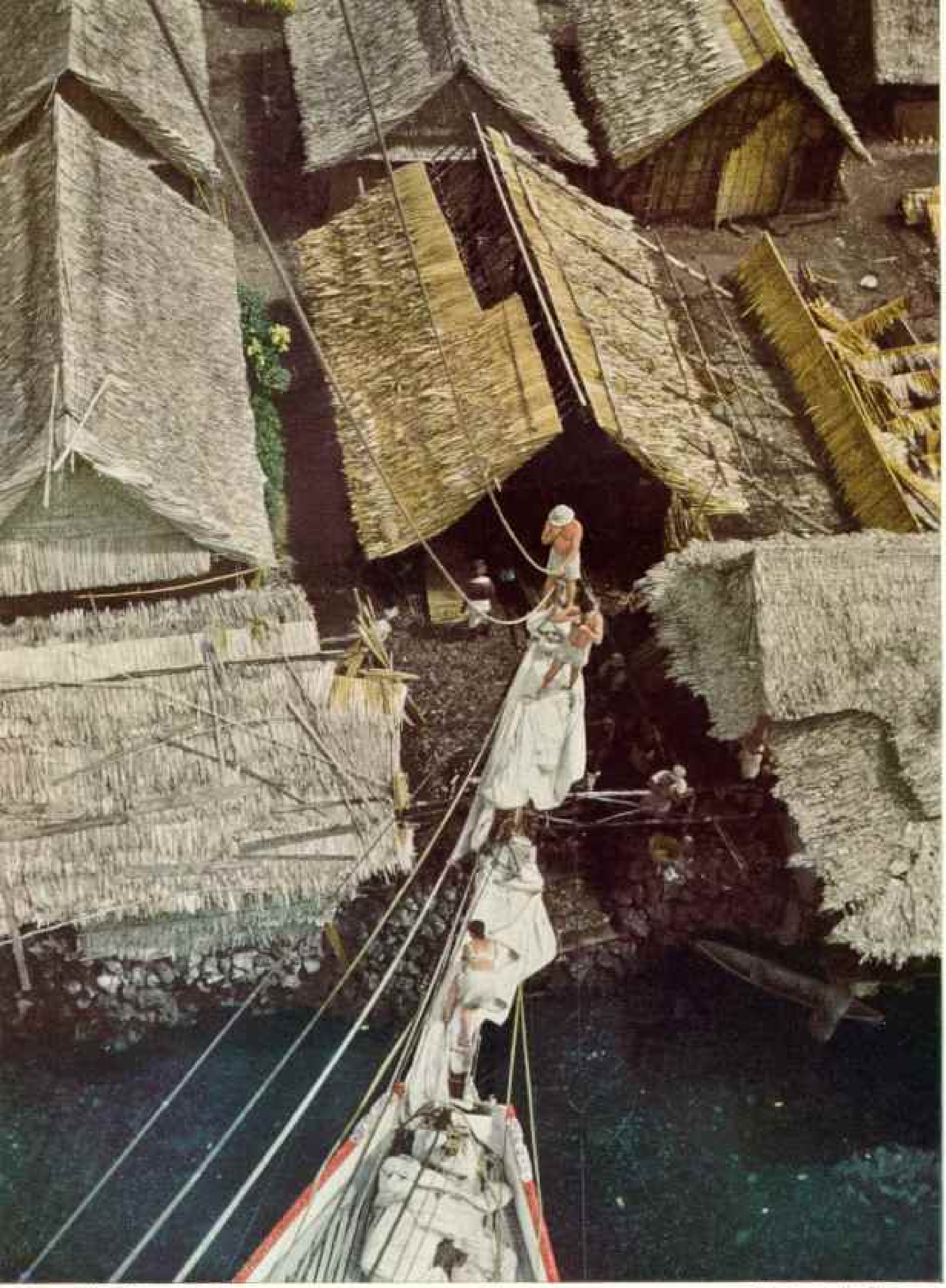
Kodachromes by Irving Johnson



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Kodachrome by Alan Pierce

Yankee, Prowling Langalanga Water Front, Sticks Her Nose into a Thatched Village

Shortly after the picture was snapped, the ship swung, and the bowsprit pried up the roof of the chief's house (right). Damage was quickly repaired. This man-made island has been built up from a reef (page 340).

As *Yankee* passed the palace, we saw her, a lonely little figure, waving good-bye from the balcony.

Al Pierce waved an ensign, Frank Power swung a bright Tahitian pareu, and Pete Sutton blew the ship's horn.

"Good-bye, Princess; good-bye, Rinny," we all cried.

Arthur, the Reluctant Scholar

Another parting awaited us in the Philippines. The time had come for Arthur, our eldest son, then 12 years old, to go back to school in the United States.

It had been a wonderful year for Arthur, who enjoyed every bit of the ship. He spent hours decorating his bunk, but deserted it at the slightest excuse to sleep on deck.

Ever ready to investigate any island, Arthur peered into every hut. Dealing in mirrors and five-and-ten jewelry, he excelled us all in trading. He neglected no opportunity to collect stamps or sea shells.

One dark cloud obscured Arthur's sunny days; that was school in the after cabin, with his mother for a teacher. Arthur, who was doing a sixth-grade correspondence course, never ceased to think of schoolwork as drudgery. We can hear him now, pacing the cabin and muttering, "I wish I was free."

School at sea, vacation in port—that was the rule.

In Davao, Arthur managed a brave departure, but a passport picture taken in Manila showed a downcast boy, a far different fellow from *Yankee's* eager diver and explorer.

Robert Joins Up

With his mother at his side, Arthur watched the liner *President Monroe* bring in his grandmother, who was to take him home. The first passenger off the gangplank was 9-year-old Robert, Arthur's brother, who was to sail with us the rest of the voyage (page 348).

If it was a job for us to divide the world up between our two boys, it was a matter of confusion to the immigration authorities who had to effect the exchange of the children. Plainly, the problem staggered them. In the Immigration Office the boys, who look alike to strangers anyway, got restless, changed places, and baffled the authorities still more. It is a wonder they let us go.

Arthur, carrying a pair of water-buffalo horns, wistfully moved aboard the liner. Robert and his mother joined the brigantine in Zamboanga.

Yankee gave us a weird passage across the bar into Bangkok, Thailand. Though Irving followed the navigation ranges at the mouth of the muddy Chao Phraya River, which winds into the city, the ship struck a bar where none should have been. Observing small boats sailing across the chart's "shoals," the skipper followed them and found deep water.

Bangkok Fascinates the Crew

Obviously the channel had changed, but Thailand pilots, not wishing to make navigation easy, had declined to buoy the course.

Yankee berthed a delightful, fascinating two weeks in Bangkok.*

The muddy Chao Phraya swarmed with junks, lighters, sampans, and river steamers (page 359). We never tired of watching them scurry by like pedestrians. Once we counted 46 barges towed by one steamer. Restaurants, drink stands, and school buses were all little sampans.

A tour of the main canal revealed an amphibious community where houses built over the water used sampans as doorsteps.

Ashore, the bazaars were just as interesting. Thousands of little places combined shops with homes. Living quarters were in the rear, but babies, swinging in net cradles, always seemed to be up front.

Crocodile Leather and Live Birds

We inspected cloth, silver, crocodile leather, books, paper lanterns, and live birds. Food stalls offered bright tangerines, pomelos, bananas, mountain apples, durians and other exotic fruits, fish, and hunks of red meat.

Food was cooking everywhere. Fried pancakes appealed to our appetites, but who knew what germs they harbored?

While the rest of the crew journeyed to Indochina to see Angkor, the Johnsons entrained for northern Thailand to watch elephants at work in a teak forest. The sight of them pushing logs into a river with their tusks—"elephints a-pilin' teak in the sludgy, squdgy creek"—was enough to delight poet or photographer.

We intended to take an elephant ride, but these beasts would not cooperate with strange white people. They regarded us, we thought, with downright hostility.

A small Siamese boy, we learned, is always safe with the family elephant. Usually the animal outlives his master and goes to work for the son.

After a brief stop in Singapore we visited the island of Bangka to witness the mining of tin from a diked-off area in the open sea.

* See, in the National Geographic Magazine: "Scintillating Siam," February, 1947, and "'Land of the Free' in Asia," May, 1934, both by W. Robert Moore.

National Geographic Photographer W. Robert Moore

Ebb Tide on Zanzibar Leaves a Muddy Promenade for Arab Traders and Fishermen

On this East African island the Americans inspected elephant ivory, clove plantations, and old slave quarters with barred windows (page 350). The mud flats show boatmen exchanging visits, loading goods, and making repairs. Fishing vessels dry nets and unload catches; larger dhows roam the Arab seas.

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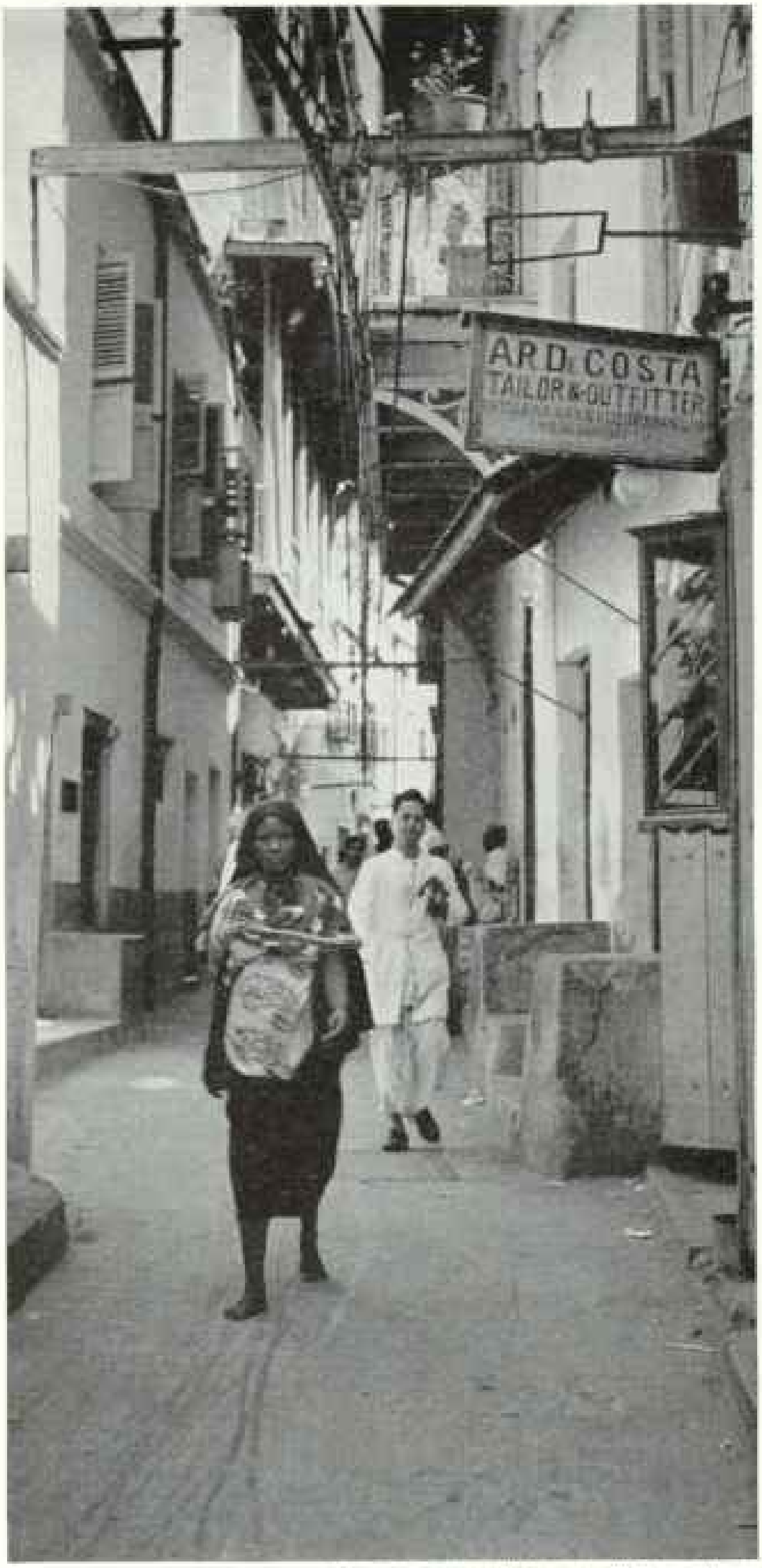
Irving Johnson

A Thousand Weary Warbirds Crumble into Junk on Biak Island. Abandoned B-24's Illustrate War's Wasted Treasure

Most of these bombers had 60 missions or more. Gallant crews painted their sides with bomb tallies and gaudy girls. When hostilities ended, bulldozers broke the planes' backs so that no one could use them again. Burial on a junk heap was cheaper than transportation home (page 334).



National Geographic Photographer W. Robert Moore

Zanzibar: a Maze of Narrow Chasms

Many Zanzibar city streets were so constricted that *Yankee's* men could touch buildings on either side; they were so crooked that the visitors lost all sense of direction (page 350). This Swahili woman walks through the more elegant section, Stone Town, which is built of plastered stone. Its companion quarter, known as the Other Side, consists of wattled mud huts. A bridged creek separates the two.

In Bangka Strait we had a narrow escape from a wreck. Fortunately it was a moonlit night, and Dick Bartow, alert at the wheel, spotted two big masts sticking 30 feet out of the water. He swung *Yankee* around just in time.

Small Loss Found in Bali's Charm

Luckily, too, we found small loss in Bali's charm as a result of the Japanese occupation.* Only one change was readily apparent: the girls were wearing more clothes. Our American money made living so cheap that we moved into the best hotels; a dollar a day covered room and meals.

Bicycling, we made trips in all directions and found new friends everywhere. Jack Trevett teamed up with a Britisher and climbed Agung, or Peak of Bali, a 10,000-foot volcano dominating the island. Robert spent two weeks with friends ashore and even visited a Balinese prince. The Balinese wife of a foreign artist posed for us in exquisite brocaded sarongs (page 362).

We suspect that Robert neglected shipboard's regular hours, for we saw him late one night at an extraordinary monkey dance. One hundred and fifty men, performing around an open fire, swayed in unison and uttered chippering monkey noises.

On other nights we watched curious trance dances in which young girls performed like hypnotized Trilbys. We had a marvelous time photographing the daytime dances (pages 360, 361).

Passing south of Sumatra, *Yankee* found a strong fair wind on her way to the Cocos, or

* See, in the National Geographic Magazine: "Republican Indonesia Tries Its Wings," by W. Robert Moore, January, 1951; "Bali and Points East," by Maynard Owen Williams, March, 1939; and "Artist Adventures on the Island of Bali," by Franklin Price Knott, March, 1928.

Irving Johnson

Tropic Breezes Lure Crew Members Up on Deck for a Balmy Night Beneath the Stars

The moon riding above ghostly white sails was a never-to-be-forgotten sight for city-reared youngsters drifting into slumber, but rough weather sometimes awakened them with a briny shower. Frank Power (center) and Hazard Campbell sleep. Louise Stewart and a friend stay awake.

Keeling, Islands, a British protectorate and home of the remarkable Ross family.*

Various principalities have been described as feudal, but none, we believe, fits the word so well as the Cocos. Five generations of Rosses have ruled the islands like fathers, judges, and kings. Their thanes have been five generations of Malays, an original 12 families now grown to 1,800 members.

Queen Victoria granted the family a 999-year lease.

Landing on Home Island, site of the Ross coconut plantations, we were greeted by all the children of the Malay community. They trooped along with us through their village, its streets neatly paved with coral, and led us to the $150,000 Ross mansion, its rooms filled with Chippendale and Sheraton antiques.

Four bronze busts in the entrance hall introduced the first four builders of the Ross empire. One showed a full-bearded Scotsman, John Cluniès-Ross, who imported the 12 Malay families and established his kingdom.

The second Ross was all Scots, the third half Malay, the fourth three-quarters. We remembered the fourth Ross, a wise administrator, from a visit 14 years earlier. He had died

* See "At Home on the Oceans," by Edith Bauer Stout, National Geographic Magazine, July, 1939.

Irving Johnson

"Gosh, Mom, This Old 'Rithmetic Is No Fun!" Robert Takes a Dim View of School

Young Johnson suffered school at sea, enjoyed vacation in port. He liked storms because they interrupted study. When he returned to the United States, Robert was a hero to his geography class—he knew so much about the world. Here Electa Johnson teaches her son's fifth-grade correspondence course (page 343).

in 1944 following a Japanese air raid on the group.

A portrait showed the latest lord of the islands, 20-year-old John Clunies-Ross V, son of an English mother and product of an English education. He was away from home.

Cocos Money Is Made of Celluloid

We wondered whether the islands or the outside world would claim John's interest. Already the Ross holdings on phosphate-rich Christmas Island, also an early family settlement, had been sold. Now there was talk of settling the 1,800 Malays on Borneo and replacing them with indentured Chinese. If copra prices tumbled, the Malays' upkeep would strain the Ross purse.

Serfs or not, the Malays gave us the impression of having one of the healthiest, happiest communities we had ever seen. They had no money problem; their currency was celluloid coins minted by the Rosses for exchange at the company store.

Between Cocos and Zanzibar, our next stop, lay 25 days of sailing across the vast and lonely Indian Ocean. These delightfully empty days we devoted to writing letters, overhauling gear, and painting the ship. We even found time for a bridge tournament. Electa drafted

Stephen B. Johnson

A Battered Hulk Seems Poised to Slip Beneath the Waves: Guadalcanal

This Japanese cargo vessel took a knockout punch in World War II; her stern rests deep in Iron Bottom Sound. Close by, *Yankee* anchored above four Allied cruisers sunk in a single night (page 331).

Mrs. W. J. Donovan

Robert Presides Over a Swimming Party in *Yankee's* 14-Foot Dinghy

Yankee carried fresh water for drinking and cooking, but not enough for bathing; that had to be done in sea water. This brimming, salt-free tubful, taken aboard in the Philippines, was a true luxury (page 331).

half our new book, *Yankee's Wander World*.

Robert was the disappointed one. He wanted a cyclone, and all he got was 25 consecutive school days. Robert loved school no more than Arthur. He demonstrated enthusiasm for shipboard crafts but dislike for fifth-grade books. Reproached for this attitude, the boy explained what he called "the difference between learning and teaching."

"If it is something you want to know," said he, "it's learning. But if you don't want it, it's teaching."

Zanzibar's Strange Sights

Bright moonlight flooded white Arab buildings as we arrived at our African destination one morning at 2 a. m. The island was Zanzibar, clove plantation, ivory emporium, and former slave market (page 344).

The clove trees were suffering from a blight called "sudden death." Some elephant ivory was still coming in from the mainland; we saw curving tusks carried on naked black shoulders. Trading in human flesh was no more, but old barred windows suggested the perils of slave times, and some houses were considered haunted because slaves had been sealed alive in their masonry.

Our boys, exploring the town, wandered into alleys so narrow that they could touch buildings on either side (page 346). They quickly got lost among the curving streets. There did not seem to be a right angle in all Zanzibar. It was useless to ask directions; no resident could point out a straight line.

By dint of wandering we eventually found the bazaar, where we bought fresh provisions for the ship. The fish market offered shark, sailfish, eel, barracuda, skate, and albacore. Dealers sharpened knives razor-sharp, flourished them, and invited us to buy. Cats slunk around corners; stray goats pawed the pavement.

Porters with huge loads shouted for passageway through the shopping mob. Bearded Arabs, curved daggers at their waists, strode by in long white robes belted with silver. Tall Indians walked in Nehru-style tunics and trousers. Africans in rags and tatters loped past; others boasted full white nightshirts.

Christmas Turkey from an Oriental Bazaar

Swahili women wore reds, oranges, and blacks. Moslem ladies veiled themselves in baggy black until only their eyes, peeping out of cloth cages, were visible.

Barber and customer sat cross-legged on the ground, one shaving the other. Tailors worked in cubicles just large enough for man and sewing machine.

Among these Oriental surroundings, just about as far from America as it was possible to get, we bought our Christmas turkey.

The second Christmas of our voyage was celebrated between Madagascar and the African mainland. Pete Sutton led the singing of carols. The girls distributed presents to everyone on board. Our Zanzibar turkey, a tender bird, turned up for dinner on *Yankee's* balancing table.

We were rounding the Cape of Good Hope when a southwester of almost hurricane force tested the *Yankee* as neither she nor her predecessor, the schooner *Yankee*, had been tested on our four world voyages.

We doused all but two tiny sails, but these heeled the brigantine over until her lee bulwarks dipped into the sea. The wind's pressure on the main staysail's solid-steel traveler bent that two-inch rod six inches out of true (pages 329, 366, 370).

Loose lumber on deck was set awash. Below, Steve Johnson was tossed out of his bunk. He picked himself off the cabin floor and went back to sleep. On awakening he had no memory of the tumble and refused to believe his shipmates until bruises confirmed their story.

Robert, wide awake in his bunk at the height of the storm, asked, "What sails are set?" Upon learning, he whooped, "Hooray, only two!" Clad in oilskins, he spent the rest of the night on deck. He loved every bit of the storm, and not only because it meant no school.

Yankee, grandly proving her seaworthiness, rode every mountainous sea. Most of the time her deck was dry, and it was never necessary to shut the two companionways. Our amateur crew, real sailors now, met every emergency, and they stowed away three meals a day.

Cape Town Recognizes Us from Pictures

It was raining when we put into Cape Town January 22, and that evening, as we danced in evening clothes, the patter of raindrops on windows mingled with the strains of soft music, a medley more comforting than the screech of wind through the rigging.

Progressive South Africa seemed a lot like home.* The climate, when it was not raining, was Californian. Stores were full of American goods. The people were extremely hospitable.

Every day Cape Towners came aboard inviting us to sample home cooking or take tours.

*See, in the National Geographic Magazine: "Cities That Gold and Diamonds Built," December, 1942; and "Busy Corner—the Cape of Good Hope," August, 1942, both by W. Robert Moore.

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Kodachrome by Terry Glenn

Like a Gothic Spire, a Thatched Temple Soars 80 Feet Above Maprik, New Guinea

Here the jungle gods dwell as idols; their painted symbols adorn the triangular façade. Native women may not enter this sacred place. From the ridgepole, slanting up at a 65-degree angle, a chain of vines sways in the wind.

© National Geographic Society Kodachrome by Irving Johnson

Yankee Ties Up to Trees on Florida Island. Boys on the Yards Could Pick Fruit

In wartime the skipper charted this passage. Damaged American ships hid in the foliage from Japanese bombers.

© National Geographic Society

Kodachrome by Alan Pierre

▲ Polynesian Eves of the Stewart Islands Give Small Attention to Wardrobes

Their coral atoll sits so low that seas submerge it in hurricanes. Then the people lash themselves in stout palms. Babies have been born in such refuges. "Two go up, three come down," islanders say.

▼ Efate Police Boys in Pagan Regalia Do a Ghostly Dance by Torchlight

These peaceful New Hebrideans whitened their faces, howled and yelled, and imitated a war raid by their missionary-killing ancestors. Two hold tomahawks. Necklaces are made of shredded bark.

Kodachrome by Irving Johnson

© National Geographic Society

Kodachrome by Irving Johnson

War's Immense Waste Impressed the Travelers; Rabaul Jungle Closes Over Japanese Guns

Electa Johnson found this antiaircraft gun easy to turn. She saw miles of tunnels where Japanese defended one of the Pacific's most bombed spots. Unexploded shells still menace children.

© National Geographic Society

Kodachrome by Irving Johnson

New Guinea Girls in Mother Hubbards Visit *Yankee* and Stare in Wonder

Scrubbed by their missionary guide until they shone, the visitors walked six days out of the jungle for a glimpse of the sea. They found the ship full of things they had never dreamed of. Shyly they lined the rail and sang English hymns.

Skipper Conducts Class on Deck for Amateur Navigators

Not celestial navigation but inshore piloting was the most vexatious problem. Unexpected currents, reefs, and wrecks left no substitute for an alert lookout. Left to right: Jack Trevett, Eric Wolman, Terry Glenn, and Irving Johnson.

Kodachrome by Stephen H. Johnson

Women at the Paddles, Man in Idle Dignity: a New Guinea Family

Going to market in Madang, natives drive their outrigger through a maze of lovely islands. Father works perhaps on a coconut plantation amid palms rising straight and tall. Only wild trees have such lovely curves as this "leaning tower." Its nuts fall in the sea.

Since missionaries have converted the natives to clothing, the canoeists had to be persuaded to pose in the old style.

Madang's missionaries earned *Yankee's* gratitude. A Lutheran electrical genius rigged up a resurrected Japanese generator, giving her electric power again. A bearded Catholic hurled her pitcherless softball team to victory.

Here the visitors learned some fascinating stories about the Coast Watchers, an improvised force of irregulars who helped the Allies win the long battle along the New Guinea coast. These men—peacetime's traders, planters, and labor recruiters—hid in the jungle back of the Japanese-held coast, organized native assistants, rescued downed airmen, spied out the enemy's movements, and radioed reports to military headquarters. Their intelligence resulted in some shattering ambushes for the Japanese. Coast Watchers had to trust their lives to their native boys.

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Kodachrome by Irving Johnson

Sailors of Valif, Protected by Their Devil-chasing Figurehead, Unload Woven Coconut Fronds from a Cargo Canoe

The painted image (close-up) perches on the stern. Beside it an insulated cord, salvaged from war, substitutes for a vine as a backstay for the mast. The sail, made of matting, appears clumsy but draws well. Its weakness is rain. With every shower it has to be put under cover to escape waterlogging. The cargo of roofing goes to a village beneath the palms, where a newlyweds' cottage will be erected by community effort. Valif is a small island off New Guinea.

© National Geographic Society Kodachrome by Irving Johnson Kodachrome by Alan Pierce

© National Geographic Society

Kodachrome by Irving Johnson

Sails of a Makassar Prau Droop in a Java Sea Calm While the Brigantine Speeds By, Using Her Diesels

This twin-rudderred craft carries rice, kerosene, pigs, and passengers. Her ketch rig shows European influence. Mary Booth, the volunteer barber, cuts Frank Power's hair.

Soaring, Tiered Temples and Teeming, Muddy Waterways Fascinate Visitors to Bangkok, Thailand's Amphibious Capital

Yankee crewmen could scarcely tear themselves away after two weeks. For days they toured canals thronged with sampans and lined with stilted houses. They saw Siamese catching fish, washing laundry, bathing babies, and drinking water, all in the same spot. Here Wat Arun, the Temple of Dawn, lifts its lovely spires.

© National Geographic Society

Kodachrome by Irving Johnson

© National Geographic Society

Kodachrome by Irving Johnson

Girls Gesture and Smile in Unison, Boys Sway and Clap. Balinese Dance in a Temple Courtyard

Poor is the village without a dance group and gamelan orchestra (right), the components of Bali's living theater. Balinese believe the gods inspired them. Dancers, showing no fatigue, rehearse routines until they become virtually double-jointed. They dance themselves into trances. Some girls train from the age of 5, retiring at 13.

Dancers in Rich Brocades Display Fan-shaped Crowns with Flowers; Arms Work More than Legs

This group in Pliatan performs the *djanger*, a modern musical comedy inspired by a Malay troupe. A quarter-century ago it was the rage of Bali; today it is reserved for visitors like the *Yankee* crew. Most Westerners instinctively love the tinkling music, though the scale consists of only five notes.

© National Geographic Society

Kodachrome by Charles A. Bathanley

Kodachrome by Alan Pierce

Artist and Model, Belgian and Balinese, Are Husband and Wife

In Sanur, Bali, artist Adrien-Jean Le Mayeur has found his own heaven-on-earth together with his dancer-wife, Pollok. Though people wander in and out of their house all day, the Le Mayeurs' hospitality is unending. Twice they invited the entire crew to dinner, and the wife modeled her most stunning sarongs for every guest's camera.

Here, in their garden, Pollok poses in dancing costume while her husband finishes a portrait showing her in everyday attire.

Few spots on the world cruise proved as idyllic as Bali, whose charming people and lovely countryside enticed the *Yankee* voyagers into a 2½-week stay.

Crew members, cycling across the island, made friends everywhere. They invited a party of Balinese girls aboard the ship. These visitors, who like their countrymen owned very little, were amazed by their hosts' many possessions. They sighed longingly at pictures of a debutante's luxurious coming-out party in the United States. The crew was amused to think that many Americans, weary of their own complicated lives, pine just as avidly for Bali's simple ways.

© National Geographic Society

Kodachrome by Irving Johnson

Eleeta Johnson Counts the "Loot"—Curios Collected in Bali

Nothing is more fun on a *Yankee* cruise than the trading of American "junk" for the fascinating but impractical odds and ends of the world's out-of-the-way places. Dealing with savages right out of the Stone Age, crew members gathered a shipload of souvenirs to stimulate memories and conversations in days to come.

In places enriched by American wartime spenders, the crew encountered dollar-rich natives who offered fantastic prices for the very shirts off the visitors' backs. The Johnsons hesitate to think how much they could have made if they had capitalized on the opportunity to profiteer.

Most islanders wanted fishhooks, soap, cloth, razor blades, jackknives, pipes, and tobacco; and a few were madly enthusiastic about *Yankee*'s stock of inflatable rubber balloons. In return the voyagers picked up war clubs, model canoes, mats, idols, carved bowls, pig's-tusk bracelets, bows and arrows.

In Bali, where the dollar went a long way, crewmen purchased these keepsakes. They include dance masks, hand-painted cloths, wood carvings, figurines, and hats.

Doodle, the lifeboat, is obviously the second half of *Yankee Doodle*.

© National Geographic Society

Kodachrome by Terry Gloux

© National Geographic Society

Kodachrome by Irving Johnson

English Harbour, the Ghost of Antigua's Mighty Naval Base, Shelters *Yankee* as It Once Protected Nelson's Ships

The Naval Dockyard, which Horatio Nelson commanded in 1786–7, has long been abandoned, but the visitors could almost see the old-time pigtailed seamen and hear the bosun's pipe. *Yankee*, a month from home, stayed three days for her last overhaul. Terry Glenn watches.

Home! *Yankee* Returns to Gloucester Flying 7,775 Feet of Canvas

On May 1, 1949, the ship completed her 18-month, 45,000-mile schedule right to the day. Skipper Johnson, who had been loafing up the coast to kill time, was chagrined at being 4½ minutes tardy. He takes great pride in finishing his world voyages right on the minute so as not to disappoint waiting parents of boys and girls gone a year and a half.

The day was perfect for a welcoming party. Thousands of people jammed the piers and cheered. Every siren in the harbor shrieked acclaim.

So much excitement made it easier for shipmates to quit a home to which they had become attached. At a final crew's dinner that night they got together for farewells.

Here *Yankee* carries eleven sails, the most she ever sets. They are main topsail, mainsail, fisherman staysail, main staysail, fore-topgallant sail, fore-topsail, foresail, balloon jib, inner jib, and nylon upper and lower studding sails (pronounced stuns'ls). Fore-staysail and outer jib are furled. Jib topsail and storm trysail are in the locker.

Yankee's brigantine rig is one of several hundred variations. Her style, designed by skipper Johnson, has caused a spirited debate over nomenclature.

© National Geographic Society

Kodachrome by Charles Allmon

© National Geographic Society

Kodachromes by Irving Johnson

A Southwester Aims a Knockout Punch; *Yankee* Tests Her Stamina Off Cape of Good Hope

The brigantine, a former German pilot boat well acquainted with North Sea gales, easily rode out the worst storm of the Johnsons' four world voyages. A howling wind of almost hurricane velocity cut the ship to two sails. Its pull on the main staysail's solid-steel traveler bent that two-inch rod six inches out of true. Once a sea leaped the rail and set unlashed lumber to swimming. Then, as the ship dipped into a trough, a mountain of water seemed to rise above the yards. Heaving bunks ejected sleepers, but no one got seasick. Three meals were served daily on the main cabin's balancing table. The two companionways were never closed.

All over town crew members were recognized and hailed as those lucky fellows appearing in the NATIONAL GEOGRAPHIC MAGAZINE, whose January issue, just out, described the first half of our voyage. Even as we dropped out of the sky hundreds of miles inland, a farmer met our plane with word that he had been reading about us.

We were interviewed and photographed. The girls talked on the radio about sailing around the world with a crew of young men. Ed Douglas prospered by selling newspaper articles on strange places we had visited.

Irving Johnson

A Miniature *Yankee* Sails Across a Tempting Pie

Don Crawford, the ship's cook, was the only paid hand aboard, but in ports he had just as much fun as the others, collecting ceremonial masks from savages (page 341). He taught himself to knit; once he tailored a suit of clothes. Something of an artist as well as a chef, Don here combined his talents.

We Peep into Napoleon's House

Our next stop was St. Helena, the South Atlantic isle where Napoleon spent his last six years in exile.*

Flax, the main crop, waved its big blades all over the island. Fields were tended by the kindly, deferential St. Helenans, a light-brown people of mixed European and African descent.

Napoleon spent much of his St. Helena exile quarreling with the British Governor.

When the Emperor died, his aide had a dispute with the Governor concerning the inscription to be placed on the tomb. As a result, the French decided against any inscription; so the big white marker stands without so much as an "N." The grave, surrounded by a high iron fence, is still tended, though the Emperor's body was removed to Paris in 1840.

Longwood, Napoleon's last home, was under repair, so we could only peep in. The woodwork was so rotten that the house barely held together. Longwood's grounds are French soil, a gift from Queen Victoria.

Next we visited Ascension Island, where so many warplanes refueled on flights across the South Atlantic.† In wartime the island held 3,000 Americans; now their wooden buildings were boarded up. The abandoned airfields, preserved by a dry climate, seemed in good condition.

While *Yankee* lay at anchor off Ascension, a school of small fish ate every vestige of grass off her hull within half an hour. No power

* See "St. Helena: the Forgotten Island," by Quentin Keynes, NATIONAL GEOGRAPHIC MAGAZINE, August, 1950.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Greens Grow for GI's on Soilless Ascension," by W. Robert Moore, August, 1945; and "Ascension Island, an Engineering Victory," by Lt. Col. Frederick J. Clarke, May, 1944.

Ted Kell, New York Herald Tribune

Under a Cloud of Canvas, *Yankee* Passes New York's Ferry Slips

Homesick crewmen, coming in off the Atlantic, were thrilled. So were shorebound parents, some of whom followed the ship in cabs, waving greetings. But a few blasé ferry riders never looked up from newspapers (page 370).

scraper could have done a neater, faster job.

Sailing west once more, we enjoyed a thousand miles of perfect studding-sail (pronounced stuns'l) weather. These extra nylon sails, patterned after those of the old China tea clippers, seemed to give us wings. The crew grew so proficient that Braidwood's watch could set a studding sail in eight minutes.

Devil's Island Convicts Run Loose

France was closing her penal colony when we arrived in the Iles du Salut, commonly known as Devil's Island. Expecting to be turned away by wardens, we were welcomed instead by prisoners.

About 65 convicts, all pardoned, were still running loose, waiting for a ship home. They were about to get their first glimpse of the world in 20—in some cases 30—years.

With freedom so near, the men took pride in their prison's evil reputation. They cheerfully recited their crimes and exposed scars and tattoos to our cameras. They showed us solitary cells where prisoners used to be chained down by night. We inspected the site where the guillotine had chopped off heads.

A bottomless metal coffin, used over and over again, was pointed out as the box in which dead convicts were rowed out to sea and dumped to the sharks.

Arriving in Antigua, one of the West Indies, *Yankee* stopped three days in English Harbour for painting. She tied up to the stone pier used by Lord Nelson's ships (page 364).*

On the run to Bermuda we said good-bye to tropic voyaging. Shivering from unaccustomed cold, we examined the thermometer and read 68°! As we voyaged farther north, the mercury fell into the low forties. Layers of woolens could not shut out the chill.

Putting our radio to work, we startled our families ashore with telephone calls.

Irving Johnson

John Wright Feels Sure the Yanks Are Coming

Dr. Charles Bothamley, the ship's surgeon, had to "bone up" for his unfamiliar dental operation in the Indian Ocean. Dick Barlow stood ready to steady the patient, who was losing two wisdom teeth. Fifteen cameras watched the "fun."

We Sail Through New York Harbor

For this homecoming Irving planned a sail up New York Harbor. Some of us were so excited at the prospect that we stayed up all night. In the morning we gave the ship more sail and moved in toward the Battery and the skyscrapers. Coal dust, the first encountered in 18 months, settled on deck.

* See "*Carib* Cruises the West Indies," by Carleton Mitchell, National Geographic Magazine, January, 1948.

370 Terry Gloom

"All Hands, Down Mainsail!" Wind-lashed, *Yankee* Runs through the Heart of a Gale

The brigantine encountered this storm, worst of the voyage, off the Cape of Good Hope (pages 350, 366). Eyes aloft, Irving and Electa Johnson watch a crewman's efforts to free the main boom lift, snagged high overhead. Others tug on a downhaul while dousing the mainsail. "This job," says the skipper, "is worse at night when so many things can't be seen. Then winds seem to shriek louder and waves break higher."

A newspaper plane buzzed the ship for photographs (page 368). Some New Yorkers, habitually blasé, did not notice us. Passing close to ferries loaded with office-bound workers, we observed a few passengers who preferred their morning paper to a cloud of canvas.

Taxis Chase *Yankee* Up East River

As we passed into the East River, sailing beneath the bridges, we witnessed excitement galore. Taxicabs on shore chased the ship. Stopping, they let out waving, yelling passengers. Several of our crew recognized parents.

Sunday, May 1, our last day on board, was clear. We set everything, including the studding sails. Our prize sail was the main, whose patches told of 45,000 rugged miles.

And so, flying 7,775 square feet of canvas, we came back to Gloucester 18 months after setting sail (page 365).

"Down stunsails! Furl topgallant! Down fisherman! Down mainsail!"

Yankee's first line touched old Rocky Neck dock just 18 months and 4½ minutes from the time she left.

The skipper apologized for being late and said he would try to do better on the fifth voyage.

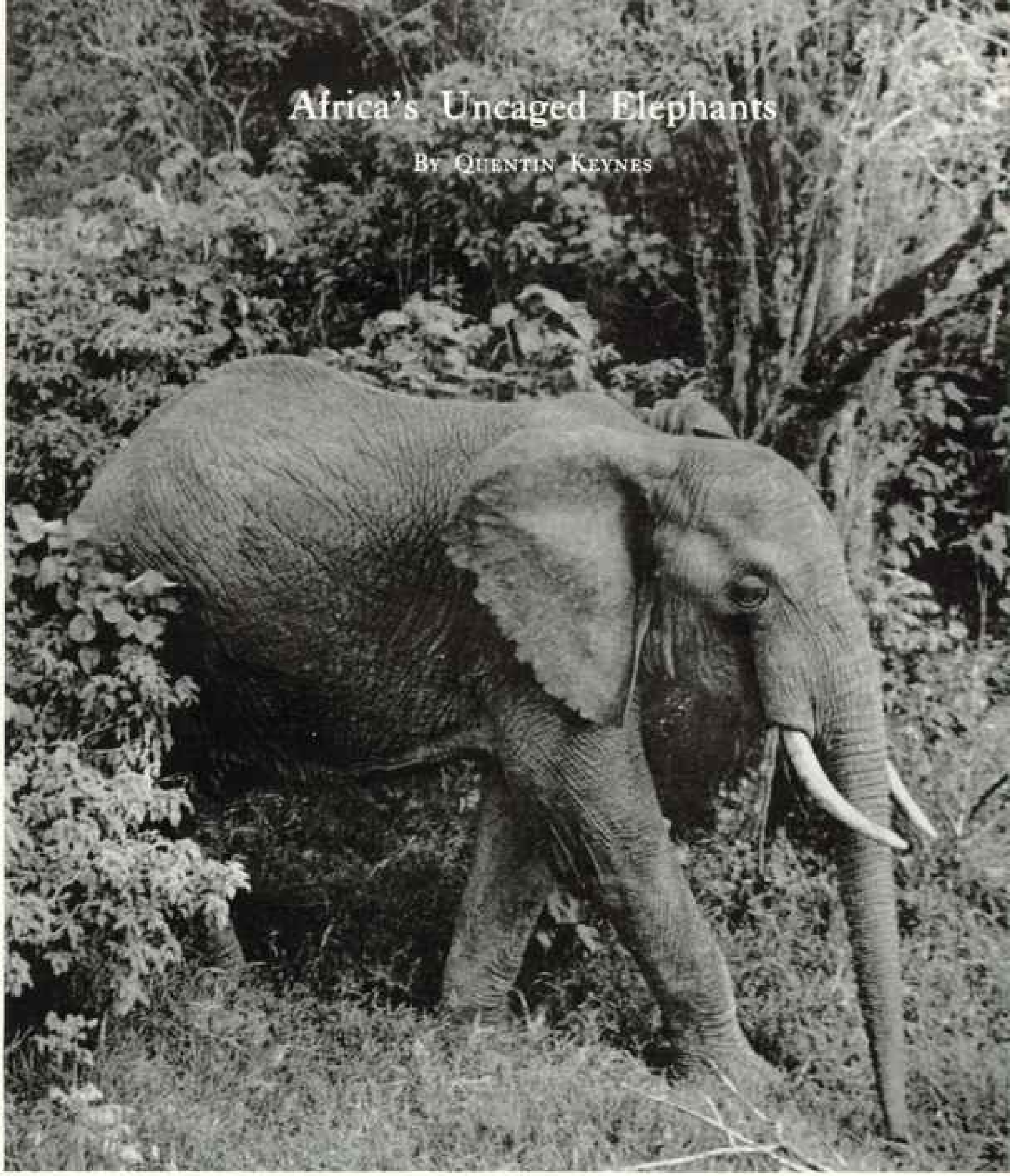
Crew members met that night for a farewell dinner, then scattered to their homes.

We Johnsons began our new voyage around the world October 29, 1950.*

* For additional articles on the islands and areas mentioned, see "National Geographic Magazine Cumulative Index, 1899–1950."

Africa's Uncaged Elephants

By Quentin Keynes



TO CAPTURE elephants with a miniature camera, Quentin Keynes, great-grandson of Charles Darwin, journeyed from New York to equatorial Africa. A dozen miles from Nyeri, Kenya Colony, he stationed himself in a tree house (page 372). Toward sundown a herd of nearly 70 elephants emerged from the dense forest and gathered at a water hole close by. Before darkness, Keynes made all but one of these pictures. Every view shows tuskers which have always lived in a wild state.

Here an old cow with tattered ears leads the half-hour parade past the treetop photographer.

Principal difference between the only two living elephant species, African and Indian, lies in the ears; those of the African are three times as large. Two knobs prominently mark the Asiatic head; the African has a relatively smooth brow. Sometimes reaching a height of 11 feet or more, the African stands a foot taller than its Oriental cousin. The Indian has a bulkier, rounder body. An average adult weighs between three and four tons.

Man has not captured, trained, exhibited, or harnessed African elephants to the extent found in southern Asia; hence the Indian type is much better known as beast of burden, circus performer, and zoo resident. Africa's only elephant farm, begun in 1900 in the Belgian Congo, domesticates the animals for agricultural work, road and bridge building.

From This Tree House the Author "Captured" 67 Elephants

According to the game watchers' logbook in the building, such a large herd had never before been seen in daylight at this site. Keynes had only from 6:15 p. m. to 6:45 p. m. to photograph the animals.

Thirty-odd feet up in a giant wild fig tree perches the singular house, some 90 miles northeast of Nairobi. Reached by a ladder, it sleeps several persons and has a rudimentary washroom. Rain from the roof collects in a tank to supply water. Batteries provide electricity for lights.

Visitors travel most of the dozen miles from Nyeri by automobile, then follow a short bush trail on foot. They usually arrive in afternoon and leave after breakfast next day. During the short stay, one may see, in addition to elephants, any or all of the following wildlife: rhinoceros, giant forest hog, buffalo, leopard, hyena, bush pig, bushbuck, waterbuck, monkey, baboon, duiker (small antelope), and other denizens of the district.

"These animals are not, never have been, tame or domestic," said the photographer. "This is as natural a habitat as you find in East Africa."

Once a leopard climbed into the bungalow by an open window. Apparently thinking it a trap of some sort, the frantic beast madly scratched and tore at walls. Finally he ripped down a partition and escaped. Wire netting now prevents a repeat performance.

Playful Pachyderms Rub Noses, Tangle Tusks

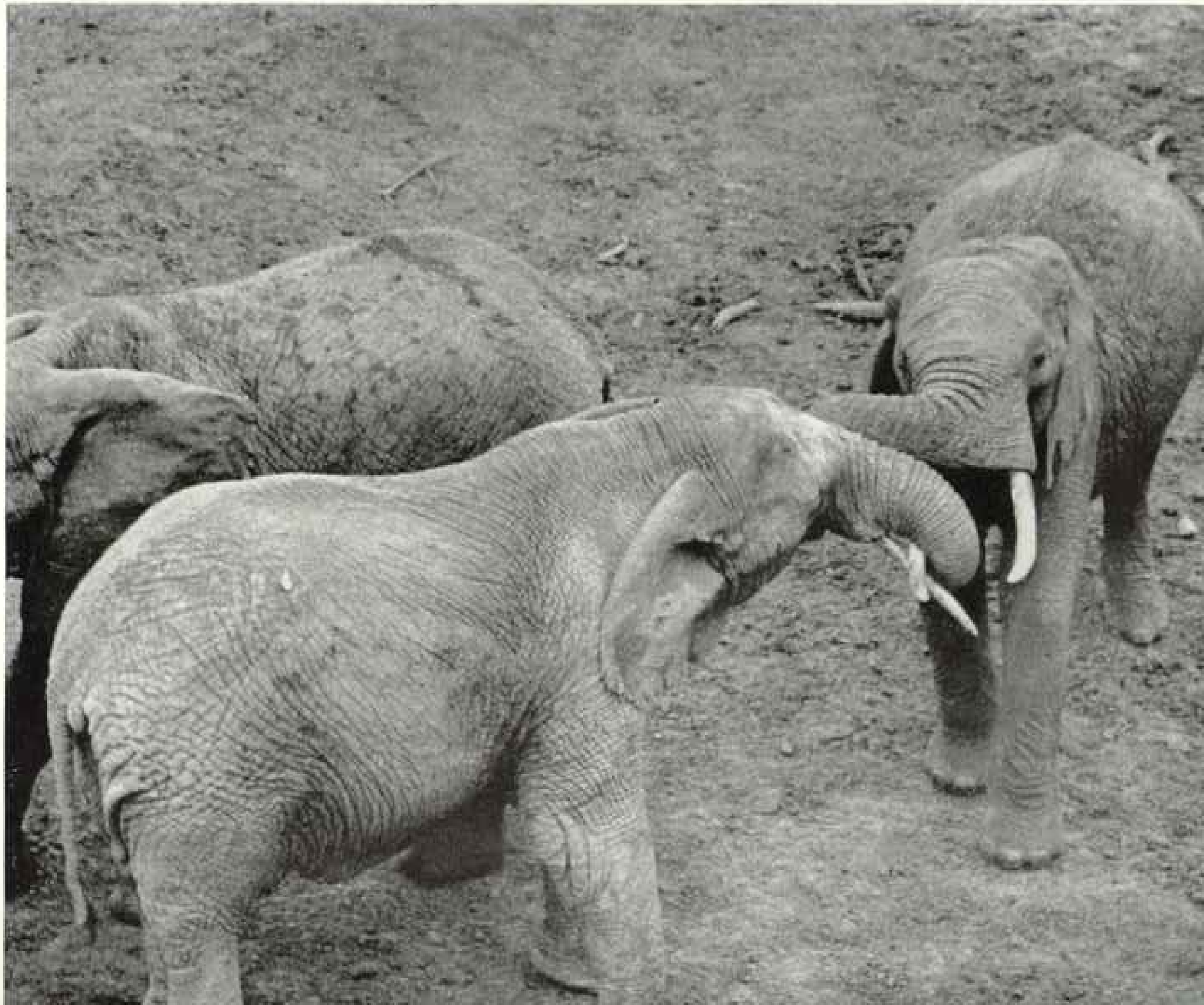
Limp ears, drooping tail, and casual stance show the jumbos are only jousting, not fighting. Thirst quenched and hunger appeased, members of Africa's happiest mammal family enjoy a ponderous frolic.

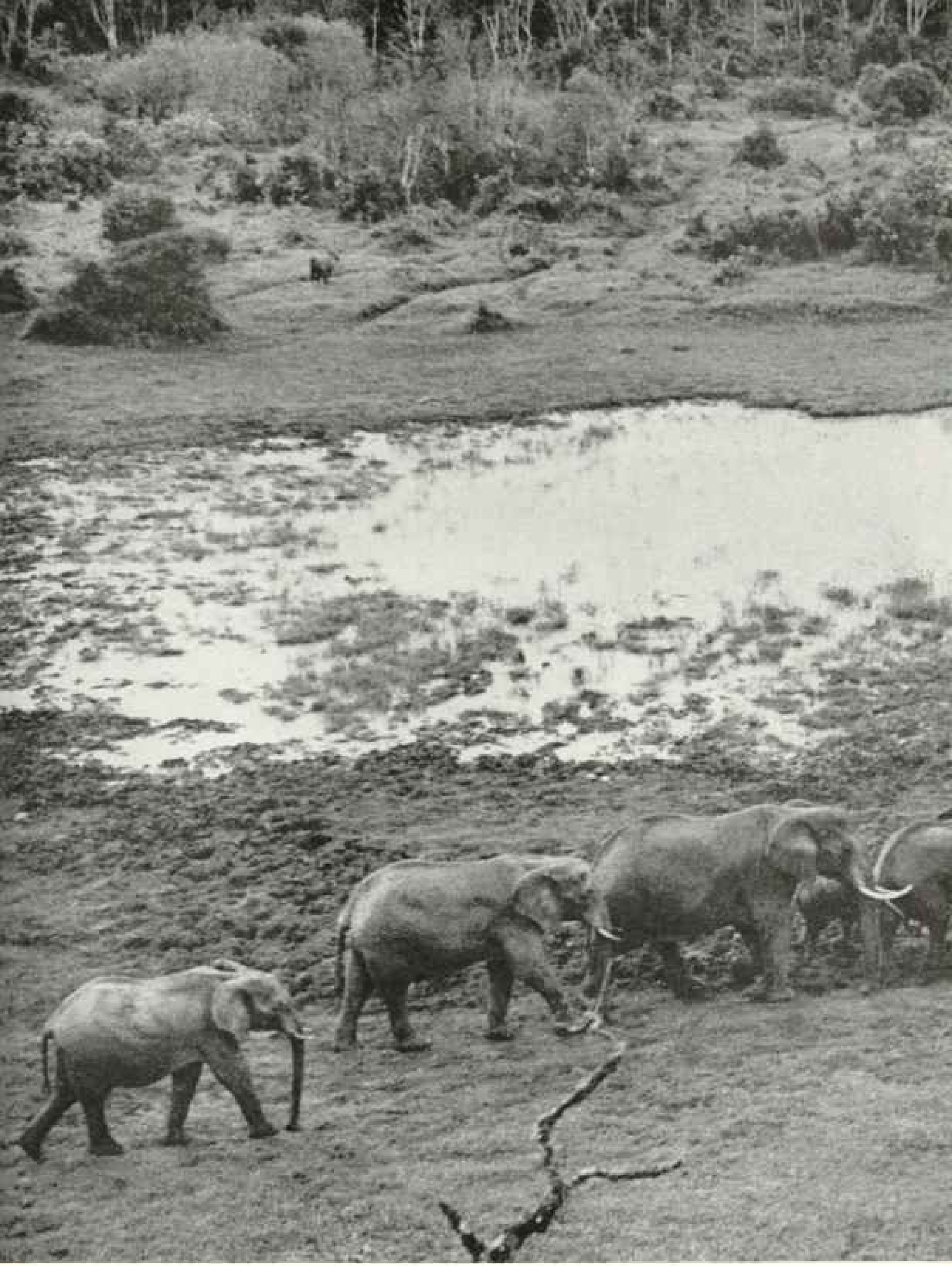
The elephant's bulk usually guarantees immunity from attack by other animals except man and rogues (outlaws) of his own species. When surprised by hunters, a herd sticks together; it even forms a wall of defense around older and infirm individuals. If one is wounded, others often rush to the rescue and support the victim between their massive flanks; thus, in a body, they move away.

Almost as remarkable as its trunk is the elephant's foot. The forefoot has four nails, the hind but three. An elephant walks on its toes, which are encased in baglike skin with well-padded bottom. Feet swell under the beast's weight, contract with removal of pressure. Thus the monster can move through swamps without getting stuck in the mud, for when it lifts its legs, feet shrink, reducing suction.

Although its hide is inch-thick, the elephant feels the cold, and so lives close to the Equator.

In its much-wrinkled suit, baggy at knees and rubbed at elbows, the beast always looks as if it had slept in its clothes.





274

As if Rehearsing for Circus Parades, Elephants Shuffle Along in Single File

Herds require little sleep; they spend most of the day eating in deep forest. Leaves, roots, fruits, and grasses make up their menu. Toward sundown they follow well-worn trails (background) made by themselves to some water hole, lake, or river to drink and bathe. A wary male waterbuck watches from a safe distance.

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Drinking Is an Evening Ritual for Thirsty Bulls, Babies, and Cows

They plod to water in a clearing after the day of forest feeding. In Kenya Colony elephants eat acacia, bamboo, *mararweau* bush, and manioc root. They especially like *sansevieria* in dry seasons when water holes are scarce; this fiber plant contains much watery juice, enabling them to go days without a drink.

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Elephants Love to Guzzle and Frolic in the Old Water Hole After a Long, Hot Day Browsing in Forests

They consume enormous quantities of water, for they may travel 50 miles between drinks. Here trunks suck up water to squirt into mouths or shower over backs. Elephants often walk along deep river bottoms with only their snouts above the surface like submarines' snorkels.

In Elephantine Rage Single-tusker Turns, Attacks Keynes's Car

What a mighty wallop this cow's tons could deal! Cocked ears and lashing tail warn that the beast viciously resents man's presence. Because an elephant can see better on either side than straight ahead, the monster charges in an arc. Even thick elephant grass only slightly hinders her mad rush. Had she crashed into the automobile, the impact would have upset it. An adult elephant has the strength of 16 oxen.

As elephants commonly grub for food with one of their tusks, or incisors, the cow probably lost her right one while digging up a tough root. If the tusk came out root and all, another will not replace it. But if the ivory broke off, the stump will grow.

African tusks are thicker than Indian and weigh from 70 to 235 pounds each. Old bulls with extra-heavy ivories struggle to keep up with herds; sometimes they place tusks in tree forks to rest weary neck muscles.

Once elephants ranged much of the African Continent. Today, herds live mostly in the equatorial area. They forage from sea level to timber lines 10,000 feet up snow-capped mountains.

Mr. Keynes made this picture in the Rwindi region of the Belgian Congo, south of Lake Edward; the others in Kenya.

Thirty-three Elephants in One Place Make a Rare Picture; Yet This View Shows Only Half the Herd

Wise old cows lead elephant herds; large bulls bring up the rear. Older calves remain slightly apart from mothers and babies, following them or running ahead.

With Its Useful Trunk the Pachyderm Feeds, Feels, Drinks, Works, Scents Danger, and Fights

Old and young alike grub for salt planted to bait wild animals. The sensitive snouts probably found the "lick" before the eyes saw it. An elephant depends on smell more than on any other sense. Possibly the best smelling apparatus in the world, the trunk is absolutely flexible at every point. It contains no bone, but its tough muscle and sinew challenge the sharpest knife. It can lift and easily toss a ton of timber—or deftly pull a blade of grass.

Gestation period of elephants varies from 18 to 22 months. At birth a baby has a woolly coat of downy hair over grayish-pink skin; erect, black bristles cover the head. Weaning occurs at about two years. Calf at right is only a few months old.

As pets of the herd, infants receive much attention from both cows and bulls. Amusing and mischievous, the very young try to frighten ever-indulgent mothers. They hide, then squeal as if in distress. When a mother goes to the rescue, her calf rushes out and butts her hard.

No one seems to have fixed conclusively the life span of an elephant. Some authorities now believe the animal dies at about 50 or 60.

▲ **Little Toto Shelters under Jumbo**

For safety, shade, or suckling, calves scamper under parents. Mud gives the infant's hide a whitish cast.

▼ **Tusks and Trunks Do the Talking**

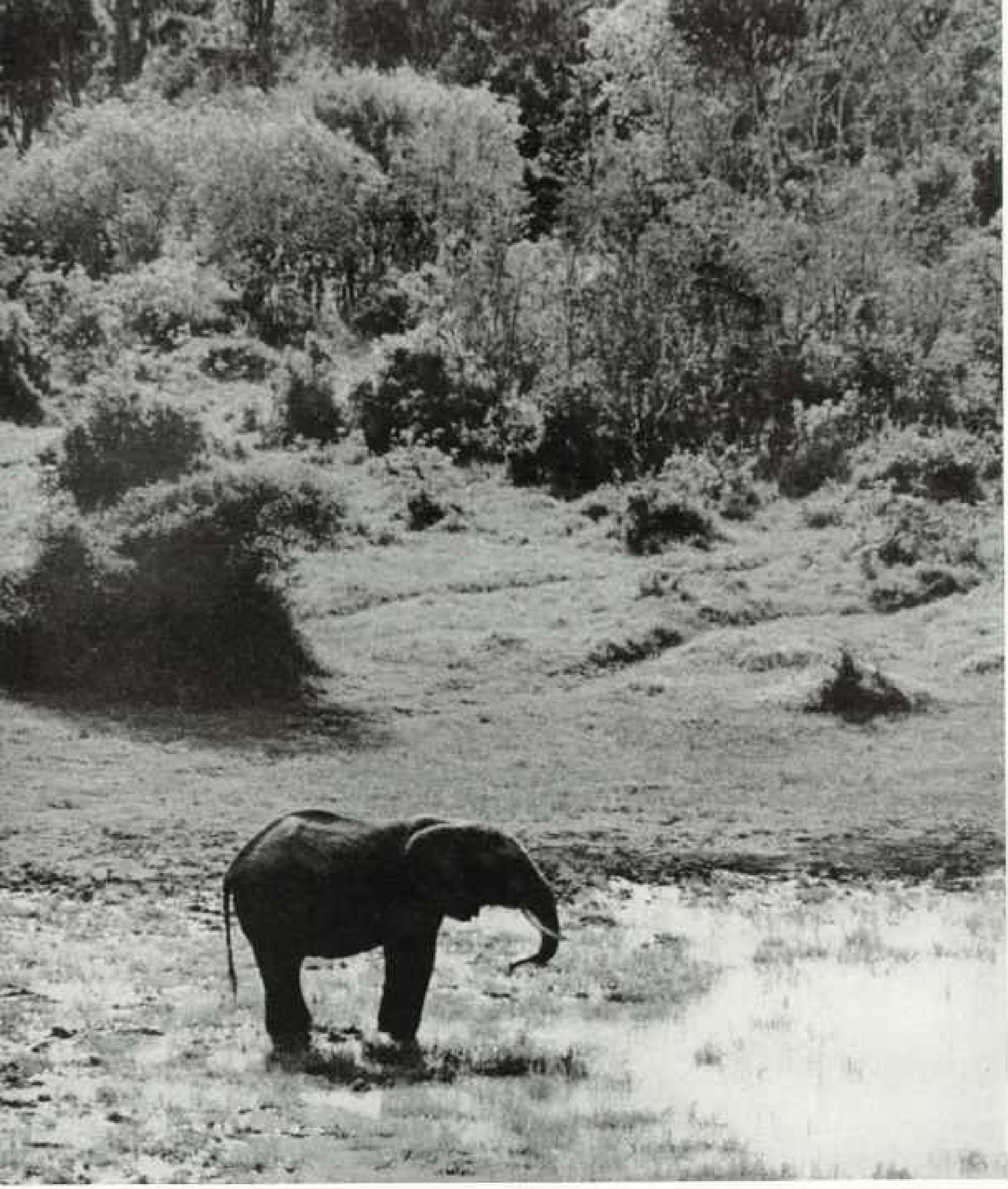
Bull at left appears to listen to a cow's upturned proboscis, as a mother prods youngster with ivory.

↑ Cow Guards Her Calf for Four Years

A female produces one offspring every four or five years. The infant nurses between its mother's forelegs.

↓ Angry Brothers Square Off for a Fight

In a rare family squabble young bulls vigorously settle a petty dispute. Widespread ears express wrath.



For Reasons of Her Own, This Aged Cow Remains Apart from the Herd

Long experience dodging hunters may have taught her that she enjoys greater security in solitude, though shooting of cows is taboo. According to elephant custom, she may soon wander off and meet natural death alone.

Some hunters believe elephants repair to special places to die, but no fabulous bone pile has yet been discovered.

Ivory, long the gold of tropical Africa, tells a tragic story of reckless butchery of elephants. But enamels and plastics are replacing objects once carved from African tusks; even billiard balls are now made of plastics. With man's declining interest in ivory and the advent of stricter game laws, the animals have tasted revenge. In some districts increasing herds menace villages.

Although elephants normally find sufficient food in the forest, they sometimes invade native farms to feed on beans, millet, banana trees, or any other crop. Africans have to post night guards at fields so threatened; they blow ivory horns, shout, and beat tom-toms to frighten off the ravenous raiders.

Elephants feeding in the forest make a dreadful din; branches crack like pistol shots; whole trees crash to earth; and the woods generally suggest the brewing of a storm. Yet, when scenting danger, an entire herd can move away like a gentle breeze, scarcely stirring the foliage, not even snapping a twig.

The Caves of the Thousand Buddhas

By Franc and Jean Shor

With Illustrations from Photographs by the Authors

TWO THOUSAND years ago, when the center of the world's civilization still lay in the East, the Great Silk Road carried the treasures of China to India and Persia. Winding west from Siking (Sian or Changan), China's ancient capital, in Shensi Province, it emerged from the Great Wall of China at Yumen, the "Jade Gate" of the west.

A little farther west, near the thick-walled city of Tunhwang,* the highway forked. One road ran northwest across the Gobi (*i.e.*, "Desert") to Hami (Qomul) and Turfan, and thence to Persia (Iran). A southern fork dared the forbidding Lop Nor desert and the waterless march to Khotan, then scaled the mountain passes into India.

So it was at Tunhwang that the great trade caravans paused for a last chance to refresh men and camels and lay in a last supply of food and water.

The caravan roads were primarily avenues of trade, but wherever men traveled, they learned new things. Traders who made their way back along the grueling route brought news of other lands, other customs—and other religions. It was not strange, then, that new beliefs first found a foothold in the desert sands. Buddhism, Manichaeanism, and later Nestorian Christianity and Mohammedanism were to flow east along those same tracks that carried the produce of China to the outer world.

500 Sacred Shrines to Buddha

Four hundred years after the birth of Christ, the young and vigorous religion of Buddhism had become the dominant faith among the merchants who passed through Tunhwang. It was natural, then, that these devout men should pause to worship. Ahead lay a dangerous journey. They might be waylaid by bandits, perish of thirst in the desert, or lose their lives climbing towering mountain passes.

A dozen miles outside the city walls of Tunhwang, in a narrow gorge between the Mingsha and Sanchi mountains, Buddhist monks established a temple in a great cave, hollowed out of the rock cliff which walled the river. For more than a mile hundreds of similar caves honeycombed the cliff.

The 200-foot wall was dotted with chambers of varying sizes, sometimes as many as four set one above the other. In the central chamber the monks burned incense, beat their great brass gongs, and chanted ancient litanies. Here the merchants, travelers, and soldiers came to pray for safety and success and to make sacrifices and donations.

In the middle of the fourth century an unknown merchant commissioned an artist to decorate one of the smaller caves as a chapel dedicated to his expedition and paid temple priests to worship in it.

The idea caught on. For more than 1,000 years the practice continued. Gradually some 500 caves were filled with paintings, frescoes, and stucco images of Buddha and his disciples. Eight dynasties rose and fell while the Caves of the Thousand Buddhas were developed. As their fame spread across the desert sands, reverent Buddhists made annual pilgrimages to the remote temple. In a single month 50,000 trekked across the desert sands to worship there.

The past 50 years have seen the caves stripped of manuscripts and hangings by Western explorers, their statues and carvings plundered by Chinese looters. They were used as dwelling places by White Russian refugees, who blackened the mud walls with their cooking fires.

Few foreigners have visited Tunhwang. Western traders who reached China in the 19th century came by sea. Tunhwang, with its extraordinary cache of priceless art, was 1,500 miles inland; it offered no attraction.

Today the only highway in the area, that from Lanchow to Urumchi, runs 70 miles northeast of the sleepy little town. Only a narrow cart track links it with the outside world. Tunhwang lost its importance hundreds of years ago. A scant 20,000 people remain, eking out a meager existence as farmers and trading with nomadic Mongol and Kazak herdsmen who live in the surrounding desert.

A Little-known Wonder of the World

Yet, in the middle of this wasteland, stand the famous Caves of the Thousand Buddhas, many still intact. They represent a remarkable repository of Oriental religious art, one of the little-known wonders of the world.

* To locate important places mentioned in this article, see the National Geographic Society's New Map of Asia and Adjacent Areas, published as a supplement with this issue of the National Geographic Magazine.

Franc Shor and a Tungan Friend Row a 30-foot Boat Across Sinkiang's Heavenly Lake

This American writer and his wife were among the few Westerners ever to visit the sacred Caves of the Thousand Buddhas in northwest China's Kansu Province. Starting from Urumchi, they rode balky trucks crammed with Chinese passengers, babies, and baggage (page 390).

In the summer of 1948 we decided to see the caves. We had been in China for three years and had visited every part of the country except the isolated northwest. Now we were planning to return to the United States, and the military situation made it clear that it might be years before travel in the interior would again be possible. This would probably be our last chance.

Beyond Tunhwang lay Sinkiang, now in Communist hands, and its capital city of Urumchi, plus the romantic cities of Turfan and Hami. We decided to fly to Urumchi and return overland, stopping to see the ancient caves.

Getting permission to visit Sinkiang was difficult, but affable Jimmy Wei of the Ministry of Information took care of all our problems. We thanked him profusely. But by the time we had made the 14-hour flight from Shanghai in a war-weary C-46 airplane, we weren't really so sure he had done us a favor.

A Perilous Flight

Surrounded by airsick Chinese army officers, we bounced in and out of rough landing fields and finally made a dusk landing on a postage-stamp field surrounded by towering glacier-capped mountains, with no place to turn if we missed it.

Baby Pokes His Head Out of Papa's Vest Just in Time for His Flashlight Picture

In Sinkiang the authors got a warm welcome in every felt-covered yurt. This Kazak chief assembled his entire family to meet them. A daughter (standing) wears plumes to show she seeks a husband.

Our reception at Urumchi, however, more than made up for the flight. Maj. Robert Ekvall, U. S. Military Attaché, met us at the field and drove us to the American consulate, where we were the guests of consul J. Hall Paxton and his wife. We told them of our plans to return overland.

City in Another World

They thought it might be possible, but they warned us that it would mean living as the natives lived. They added that, to their knowledge, no foreign woman had made quite the same overland journey which we had in mind. That, of course, was all Jean needed. She had been a little worried, but now nothing could dissuade her. By the time we went to bed, the unpleasant trip just behind us had been forgotten in our plans for the one coming up.

We awoke in a new world. Forgotten was the fetid air of Shanghai, the stench and racket and bustle of millions of hurrying people. The consular compound was ablaze with flowers, enormous cosmos four inches in diameter, dahlias, and giant sunflowers.

After breakfast we strolled down the street in the late summer morning. To the east, the glacier-covered peak of Bogdo Ula, Sinkiang's sacred mountain, thrust its glistening head into the blue sky. Along the little street, compounds basked behind mud walls, trees and

Prof. Joseph Needham from Paul Pepper

Wall Crumbles, How Long Will This Stucco Saint Stand?

This 12-foot figure is one of the hundreds housed in China's Caves of the Thousand Buddhas, one of the little-known wonders of the world. Still in its original form, the statue is some 1,100 years old. A wooden framework formed the skeleton; bundles of reeds made up arms and legs. Then clay was applied and, when dry, carved into shape.

flowers dotted courtyards surrounding rambling adobe houses. Gourd vines climbed over patios, and strings of bright-red peppers hung from roof poles.

Naked children played in the street dust. Tungan women, their dresses gay banners of red and green, walked slowly to market. Overhead great flocks of pigeons wheeled in the clear air, a soft humming note coming from tiny wind whistles attached to their legs. A bearded Turki gentleman rode slowly by, seated directly over the hind legs of his tiny donkey. Behind us sounded the deep note of a bronze bell, and we stepped aside to let a train of huge two-humped camels amble by.

We walked to the main street. There are few automobiles in this city of a quarter-million people. Residents travel afoot or by animal. Public buckboards replace taxis. A buckboard driver follows a prescribed route, and you simply trot alongside to bargain with him, then leap aboard.

To visitors, it appears Urumchi's biggest trade is in food. Vendors of grapes, Turfan raisins, vegetables, and peanuts line the streets. Melons are everywhere, all sizes, all colors. Great piles of them appear every few yards. There are tiny hard-shelled ones, resembling acorn squash, others like canteloupes, muskmelons, watermelons, and dozens of other varieties. All are delicious and amazingly cheap. Ten cents buys the largest of the lot. For two cents you can get one large enough for two people.

Nearly every block along the main street has its *shaslik* stand. Glowing coals fill six-foot metal troughs. Sit on a low stool in front of one, and the eager vendor will seize a handful of long metal skewers and thread each with six or eight good-sized pieces of mutton. Sizzling over the coals, they are

seasoned with salt and red pepper. You eat your fill but save the used skewers. The cook figures your bill by counting them. Cost: one cent each.

We planned on returning to the consulate for lunch, but instead we feasted on shaslik and Turki bread, then bought a ripe melon. We wandered down to a clear millstream, where we sat and enjoyed our dessert.

Across the stream was a large walled compound. Women were washing clothes in the stream, and curious children lined up to watch us eat. Tungan, Turki, Chinese, and White Russian families all lived in the same compound in harmony (pages 392, 393).

Cans Frame a Strange Picture

In the afternoon we rode a buckboard to the walled business section, where there are cobblestoned streets and a few modern buildings. The shops were full of canned goods, principally U. S. Army surplus items, at fantastic prices. A five-pound can of powdered milk sold for $30, and a small can of army stew brought $4.50.

We stood inside a shop and looked through windows piled high with American canned goods at the street. Two Kazak herdsmen, clad in great sheepskin coats and wearing bright-red peaked hats topped with owl feathers, sat in silver-mounted saddles astride fine-looking ponies. They were driving a herd of fat-tailed sheep. That picture, framed in a window full of canned meat and cocoa, made us rub our eyes and wonder if we weren't dreaming.

Hall Paxton gave us a brief lesson in Sinkiang geography and history the next day. "It's the largest Province in China," he said, "and the most sparsely settled. About 3,500,000 people live in an area of more than 600,000 square miles. That's more than twice the size of Texas. Yet there isn't much room for immigration.*

"Actually, less than five percent of the land is usable. The rest is desert or so mountainous it can't be used even for sheep raising.

"Chinese form a very small proportion of the population. There are only about 200,000 in the Province, and two-thirds of them live in Urumchi.

"Nearly three million of the population are Uigurs, a Turkic people who originally came from Mongolia and embraced the Moslem religion. Then there are about 300,000 Kazaks, a nomadic people, related to the Uigurs in speech and religion. They are the most colorful people in the Province. They love horses and ride everywhere. I've even seen them ride right into a store in Urumchi.

"The rest of the population," Mr. Paxton continued, "includes Chinese and Turkic stock, and handfuls of Mongols, White Russians, Manchus, Tajiks, and Taranchi. There have been numerous battles between the Chinese rulers and the other races, but at the moment everything is peaceful. I think you can travel through most of the Province in perfect safety."

"Americanski" Opens Many Doors

We took Mr. Paxton at his word and found it correct. During the next month we traveled both north and south of Urumchi by truck, horse, and camel. Never did we meet anything but hospitality.

We rode south into the Tien Shan (Heavenly Mountains) and to Tien Chih (Heavenly Lake) (page 384), on a hunting trip. We found a warm welcome in every felt-covered Kazak yurt. Invariably, at the word "Americanski" the door flap would be pulled back, we would be invited inside, and hot tea, wooden bowls of fresh milk, and heaps of roasted grain would be placed in front of us. Payment was impossible (page 383).

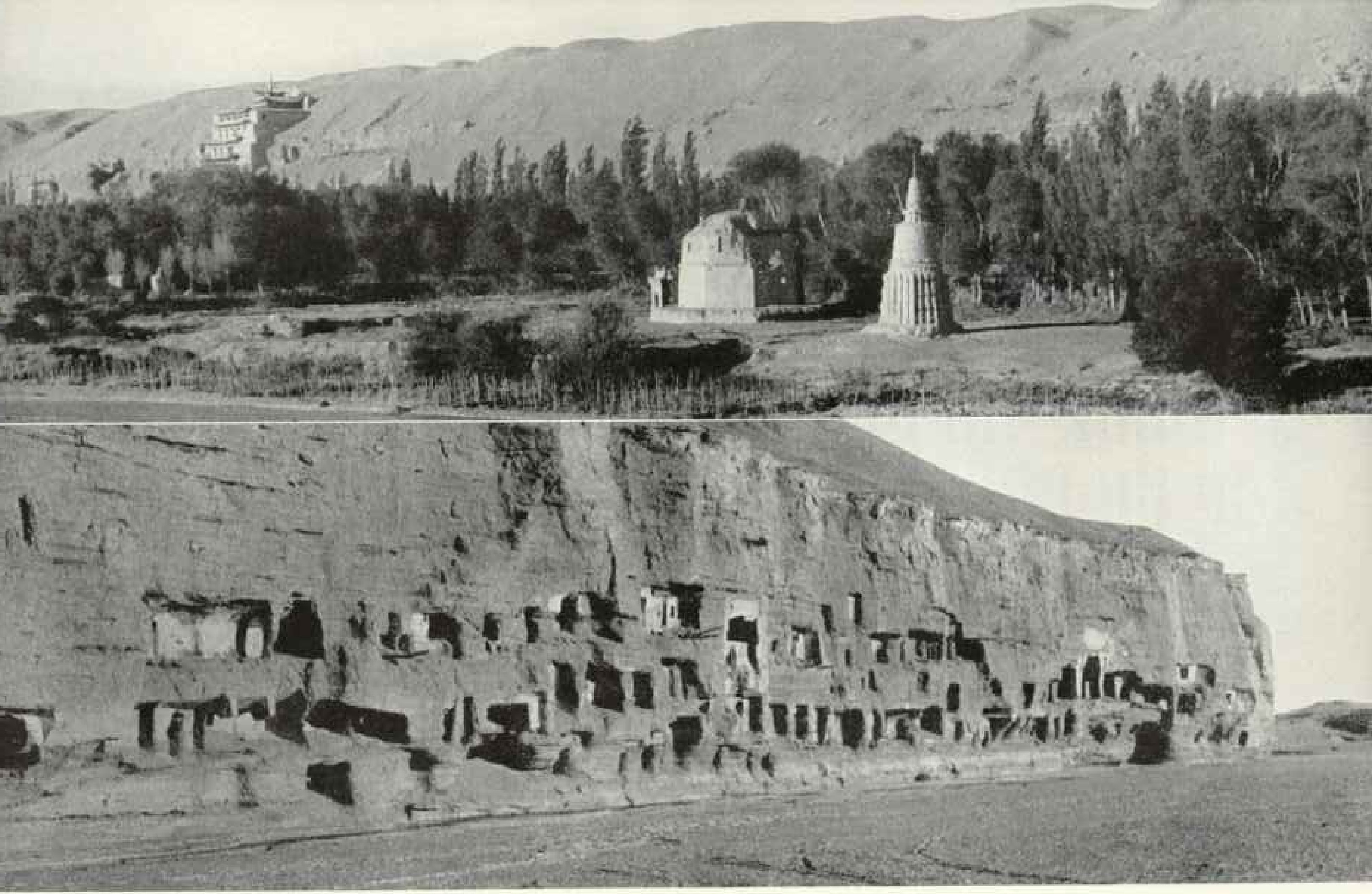
Nor was such friendliness found only in the countryside. Americans are rarely seen in Urumchi. We were followed almost everywhere by groups of youngsters and a few elders, all anxious to assist us. The most amazing thing to us was the community aspect of our bargaining.

In China proper, crowds watch in silent glee while a clever merchant cheats an unsuspecting foreigner. Not so in Urumchi.

When Jean or I found a saddlebag or a pair of soft leather boots we liked, we'd try to bargain in Chinese. But most merchants spoke only Turki dialect. When that happened, the onlookers would take over. Members of the crowd would examine the article, hold a brief consultation, and agree on a proper price. The merchants might protest, but it did them no good. The crowd decided on a fair price and wouldn't allow us to pay more.

We would gladly have stayed the winter in Urumchi, but we had already spent a month, and our trip across the desert would take at least as long. We arranged to leave the city on a government truck departing in a few days.

* See, in the National Geographic Magazine: "With the Nomads of Central Asia," by Edward Murray, January, 1936; "From the Mediterranean to the Yellow Sea by Motor," November, 1932, and "First Over the Roof of the World by Motor," March, 1932, both by Maynard Owen Williams; "On the World's Highest Plateaus," by Hellmut de Terra, March, 1931; "Desert Road to Turkestan," June, 1929; and "By Coolie and Caravan Across Central Asia," by William J. Morden, October, 1927.



Irene Vincent

Tunhwang Carved Temple and Caves from a Cliff

One morning the authors walked toward the grove of poplars in time to see the great cliff in the first rays of the rising sun (page 388).

"Ahead of us," they relate, "loomed the Temple of the Great Buddha" (top panel, left). "From the corner of its pagodalike roof tiny temple bells tinkled in the breeze, sending their curious notes up the silent, desolate valley" (pages 391, 411).

On the right stand two mud-brick stupas, or chortens, containing the ashes of Buddhist holy men.

Lower panel: The cliff's crumbling face exposes tiers of tiny caves. These bare niches, which have no frescoes, are believed to have been monks' quarters rather than shrines.

A Buddha and His Court Have Occupied This Cave 1,200 Years

Warrior, demon, and attendants stand or sit in their original positions in a once-enclosed grotto laid open by erosion.

With them stands a young Chinese art student commissioned to visit the Tunhwang caves and copy designs for rugs and silk-screen prints. He holds scrolls of his drawings.

Prof. Joseph Needham from Paul Popper

On the morning of September 29, Paxton drove us to the Highway Department compound. We located our chariot, a battered wartime Studebaker, and tossed our barracks bags aboard.

Foreigners Get Choice Seats

Invited to ride in the front seat, we managed to squeeze in, with our shoulder bags, trench coats, gun case, and canteens vying for space with a big sack of mail. We would have been more comfortable riding with the half-dozen Chinese passengers atop the mountain of oil drums, freight, and luggage in the rear. But our driver had instructions we were to have the choice front seats. No amount of persuasion would change his mind.

The driver mounted to the cab and turned the switch. His tiny mechanic turned the crank several times, then leaped high in the air like a ballet dancer and came down with all his weight on it. The motor coughed, the truck shook, the mechanic scrambled to the top of the cab, his feet dangling in front of the windshield, and we were off.

A half-mile out of town we halted beside a crowd of people and a mountain of luggage. The driver jumped out and began bargaining with the crowd. We were surprised for a moment, then recognized the old Chinese custom of the "yellow fish," passengers who pay the driver rather than the truck owner.

There were 14 new passengers, including one entire family traveling with all its possessions. While we watched in open-mouthed amazement, they loaded onto the already crowded truck a crate of chickens, another with four squealing pigs, and a great assortment of bundles and boxes.

When there was no more room on top, one man produced a rope and skillfully lashed half a dozen chairs and two pairs of huge elk (wapiti) antlers to the back of the truck. Then, from the ditch beside the road, he lifted a bamboo ladder, and the "yellow fish" mounted the truck. The mechanic went through his ballet performance once more, and we were on our way again.

The road from Urumchi to Turfan, our first overnight stop, is good. For two hours we rolled along at a brisk 25 miles an hour. Then the driver, Mr. Li, began to watch the ammeter intently, shaking his head with grave foreboding. The gauge registered a steady "charge," and I could see nothing wrong. But Mr. Li was obviously concerned.

Finally, with a sigh of resignation, he halted beside the road. Mr. Kao, the mechanic, took a tool kit from under the seat, and with considerable speed and efficiency they dismantled the generator. They wiped the parts, reassembled them, and cranked the truck. Mr. Li viewed the ammeter with a critical eye. It registered exactly as before, but this time he smiled with satisfaction. We resumed our journey.

Five times that day we repeated the performance. Three times it was the generator; twice the carburetor was taken apart. I was positive nothing was wrong, and the whole performance mystified me.

Then Jean pointed out the admiring attention the whole exhibition drew from the other passengers, how they smiled and nodded; and I understood. The boys were simply showing off their mechanical knowledge. Like an American cowboy who makes a gentle horse misbehave before a crowd to demonstrate his horsemanship, our new friends were making it look hard.

Mechanical Skill "Makes Face"

The performances of other drivers we met later confirmed our conclusion. Between Urumchi and Lanchow we kept careful score, and that 1,000-mile stretch of road saw generators disassembled 31 times, with carburetors a close second at 27. Each time the passengers watched with open admiration. Mechanical transportation has simply added another facet to the ancient Chinese custom of "making face" (pages 410, 412).

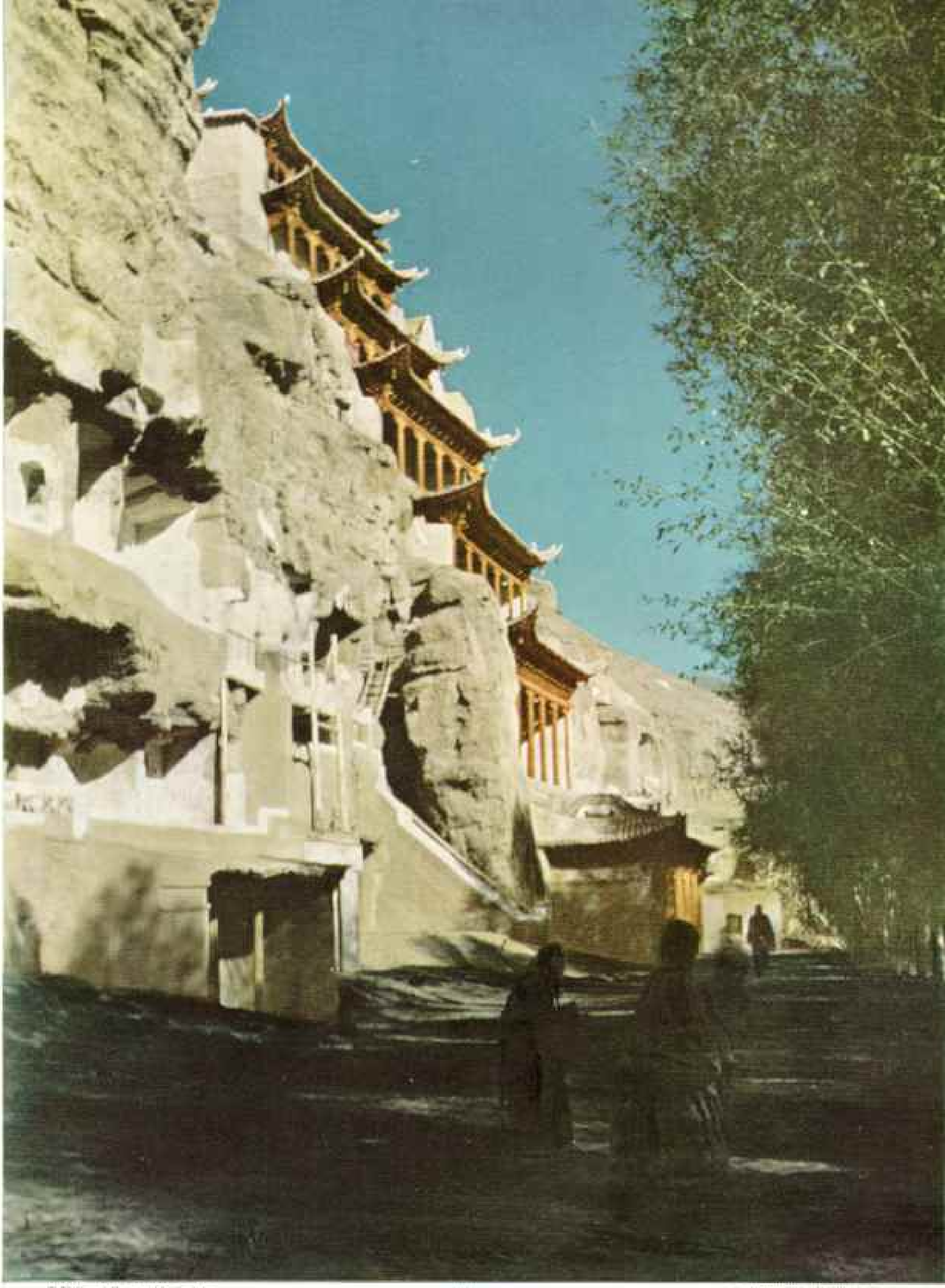
Despite frequent exhibitions of mechanical skill, we reached Turfan at dusk. It had taken us nine hours to cover 125 miles. We stopped at a roadside inn, where we had a tiny private mud hut, with a broad *kang*, or mud bed, taking up half the floor space.

On the main street two Chinese children were selling stewed chicken for a nickel a piece. We were about to try some when a Chinese army officer took a pair of chopsticks and removed every piece from the pot, tasting each before replacing it. He then selected two pieces, paid the children, and left.

They offered us next choice, but somehow we had lost our appetite for chicken. We bought a loaf of Turki bread, a delicious melon, and a handful of white Turfan raisins and retired to our sleeping bags.

We started at dawn the next day. Our lunch was at a tiny desert village. A delightful old Chinese gentleman, traveling with his daughter, joined our table, as did a Chinese army captain who introduced himself as Captain Hwang.

We made good time in the afternoon, with only three stops to take apart the generator. We reach Chi Chueh Chuan (Seven-cornered Well) about 9, and stopped for the night. Here there were no small rooms such as we



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Kodachrome by Frank Shaw

Hewn from Solid Rock: the 10-story Main Temple of the Caves of the 1,000 Buddhas

This shrine near Tunhwang, western China, has only one face. Within it sits a 180-foot Buddha, shaped from the native rock. Five hundred caves dotting the cliff contain a remarkable collection of Oriental religious art.

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Kodachrome by Frank Sher

Flowing Water Makes a Cool, Shady Play Site for Children in Hot, Dusty Urumchi

Flying to Urumchi, the capital of Chinese Sinkiang, the authors made a 600-mile journey on broken-down trucks to Tunhwang to inspect the Buddha caves. In Urumchi they saw caravans of two-humped camels and flocks of pigeons with wind whistles attached to legs. Sister and brother (left) are White Russian refugees.

Chinese, Tungan, and Turki Children Live and Play Like Brothers in an Adobe Compound in Urumchi

Urumchi's main street, with its frame buildings, some with false fronts, reminded the authors of an American frontier town. The Shors found few automobiles in this city of 250,000 people; buckboards served as taxis. Arabic characters of a Turki dialect are written on the wall.

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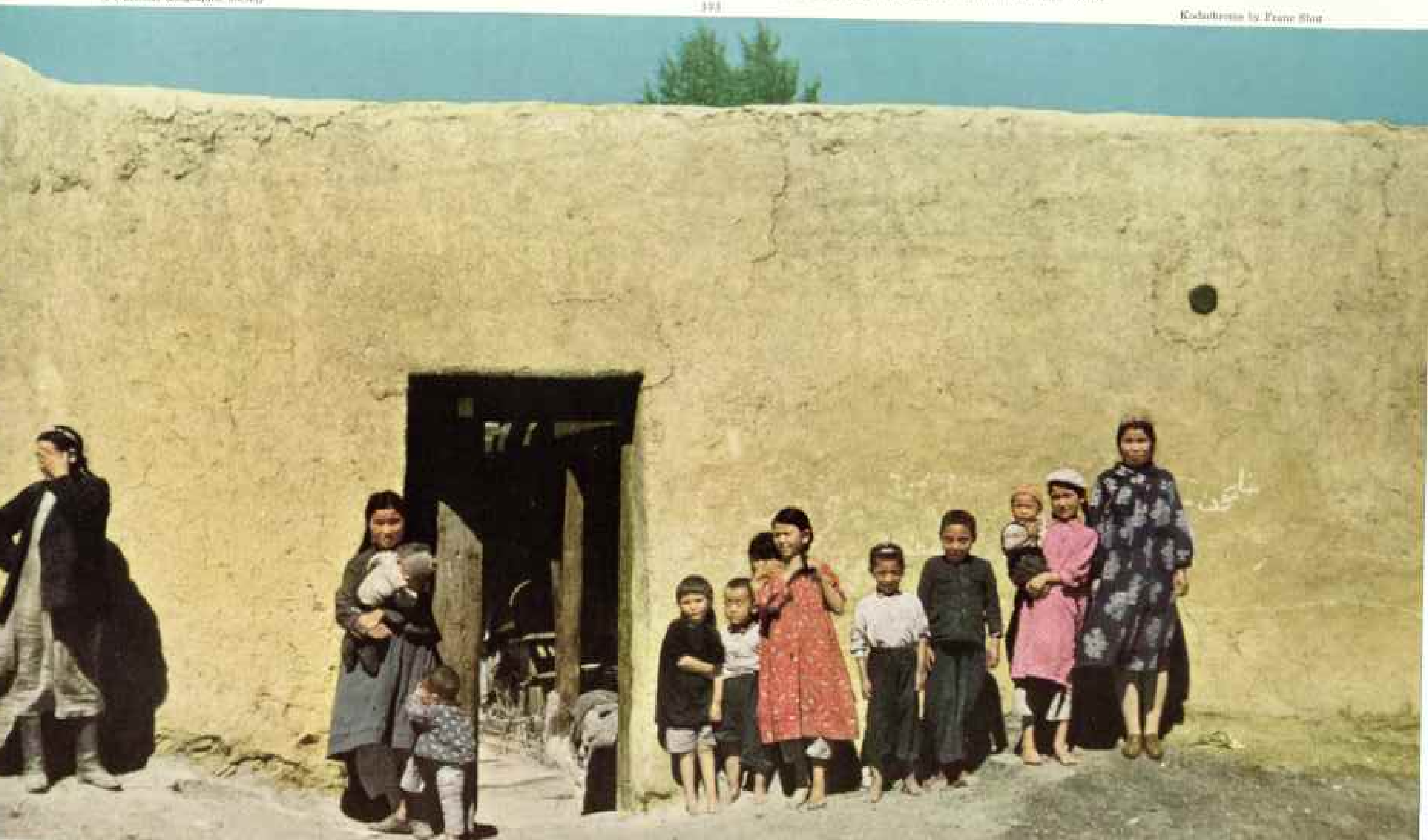
Kodachrome by Franc Shor



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Kodachrome by Juan R. Rion

For More than a Mile the 500 Caves of the 1,000 Buddhas Honeycomb a Cliff near Tunhwang

These sacred grottoes date back to the 4th century. Once their façades were plastered and decorated; the elements have left them bare. Timber bridges connect some outside balconies; tunnels link other caves. A caretaker has identified the shrines with numbered signs.

Chinese Statues Show a Strange Grecian Flavor

Greek sculptural forms reached China from Gandhara, an ancient district in northwest India, almost 1,000 years before Marco Polo. Alexander the Great's successors in Bactria, establishing kingdoms in Gandhara, founded a Hellenistic culture.

Buddhist art, which flourished in Gandhara, was influenced by Greek patterns. Later these were carried into western China by traders and missionaries.

These stucco figures in the Tunhwang caves were carved centuries ago when Buddhist religious art was young and vigorous. They show no sign of those many-armed statues characteristic of later Buddhist art.

Few of the older statues retain their original form because the heads, hands, and feet have been clumsily restored.

Left: The figure in silhouette shows a classic Athenian profile. The companion image is some 1,200 years old. Right: These Bodhisattvas (those who have not quite attained Buddhahood) date back more than 15 centuries. They have lost most of their coloring.

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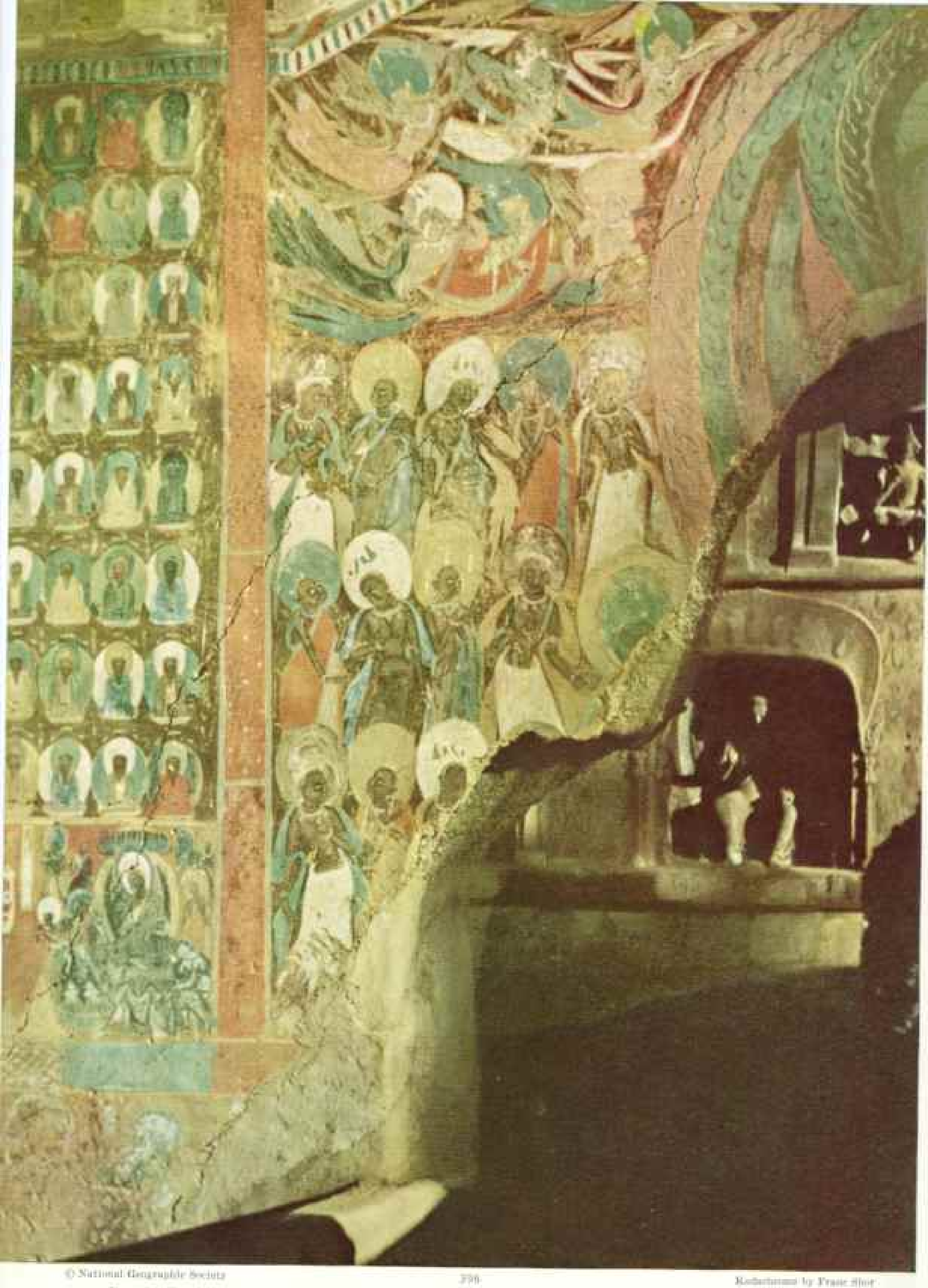

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Reproduction by Frank Shor

Pastel Buddhas in Turbanlike Halos Transform a Musty Cave into an Art Gallery

Thousands of such delicately frescoed figures gave the caves their name. Angellike Apsarases, or celestial dancers of Indian mythology, float across the 6th-century wall (above). A crumbled section reveals images in an adjacent cave.

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Kodachrome by Franz Shor

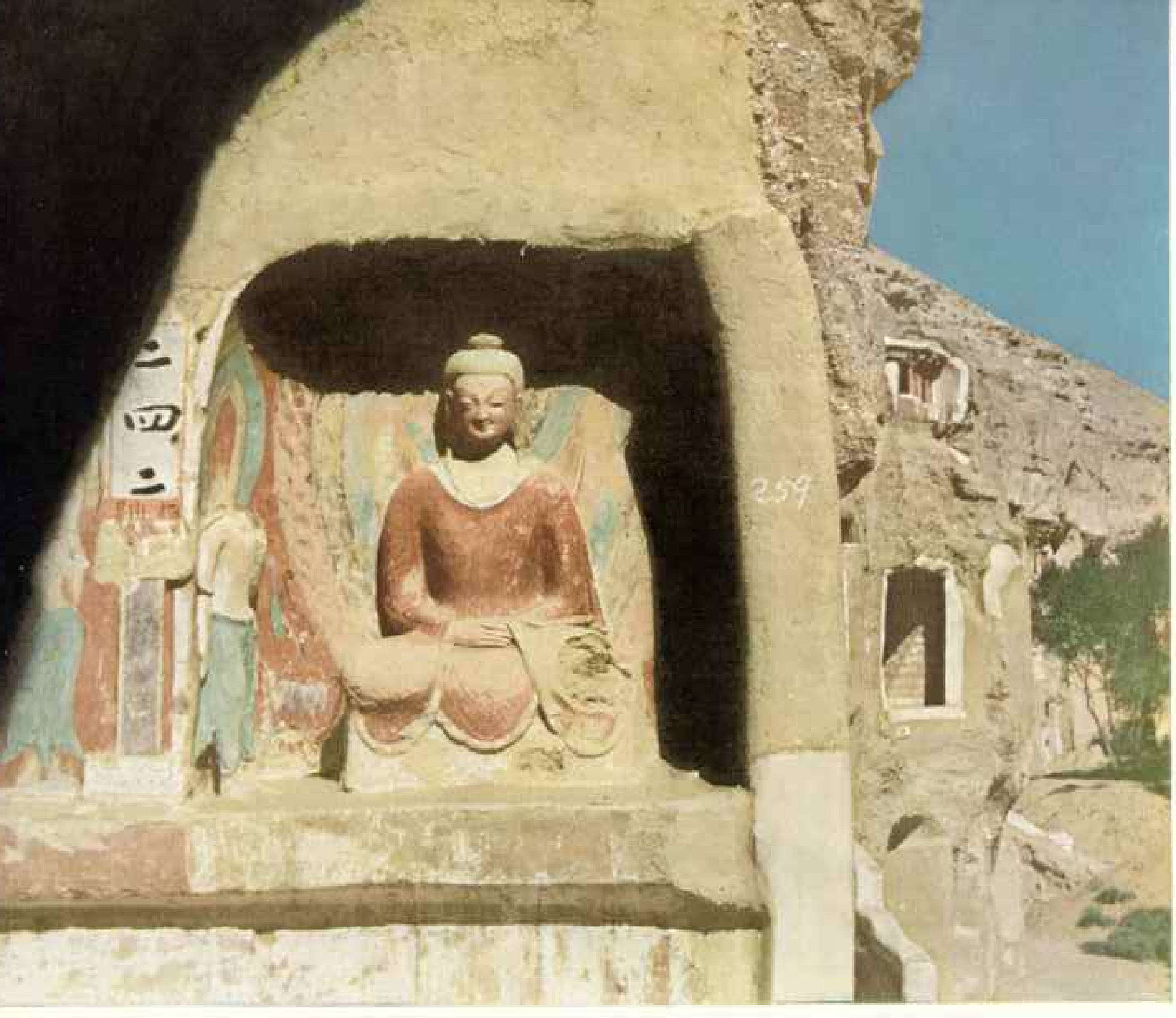
^ A Lotus-petal Design, 1,200 Years Old, Weaves a Wallpaper Pattern

This mural, typical of the Tang period (A. D. 618-907), preserves its original colors. Dozens of caves repeat the motif. To Buddhists, the lotus is purity's symbol because it rises from mud with undefiled beauty.

^ Ancient Priests Walked on Lotus Bas-reliefs on Cave Floors

The lotus idea is carried out in the hand-carved blocks flooring scores of caves. Stones are greenish with paint and stains splashed over floors when the grottoes were hollowed out by artisans in the 4th century.

Kodachrome by Juan B. Shor



Buddha's Dark Cave Is Exposed to Light by a Collapsed Wall

By A. D. 400 Buddhism had become the dominant religion among merchants plying the Great Silk Road. These men, facing many dangers on the trail, were accustomed to pray during their long, hazardous journeys between China and India or Persia.

A dozen miles from the walled city of Tunhwang, Buddhist monks established a temple in a large cave hollowed out of a cliff. On either side of the temple they carved hundreds of small chambers in the 200-foot rock wall. Here the merchants stopped to pray for safety and success. They hired artists to decorate the small caves as private chapels and paid temple priests to conduct worship.

This practice continued for some 1,000 years. More than 500 caves were filled with paintings, frescoes, and statues. When there was no more room, some of the old caves, faded and cracked, were redecorated in the names of newer supplicants.

Eight Chinese dynasties rose and fell while the Caves of the Thousand Buddhas were being developed. On cracked walls, protected by darkness and dry desert air, grew an outstanding accumulation of Chinese art.

Sitting high in the cliff, this serene figure dates back to the Northern Sung Dynasty (A. D. 960–1126).

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Kodachrome by Frans Lanting

A Hot Day in Tunhwang: Baby Wears a Thin Layer of Mud, but Pilgrim Mother Clings to Heavy Skins

Carrying her child, the Mongolian woman walked hundreds of miles from her mountain home to worship at the sacred caves. The Chinese youngster, frolicking in a water hole, was pleased about having his picture taken. A second later his mother snatched him from view.

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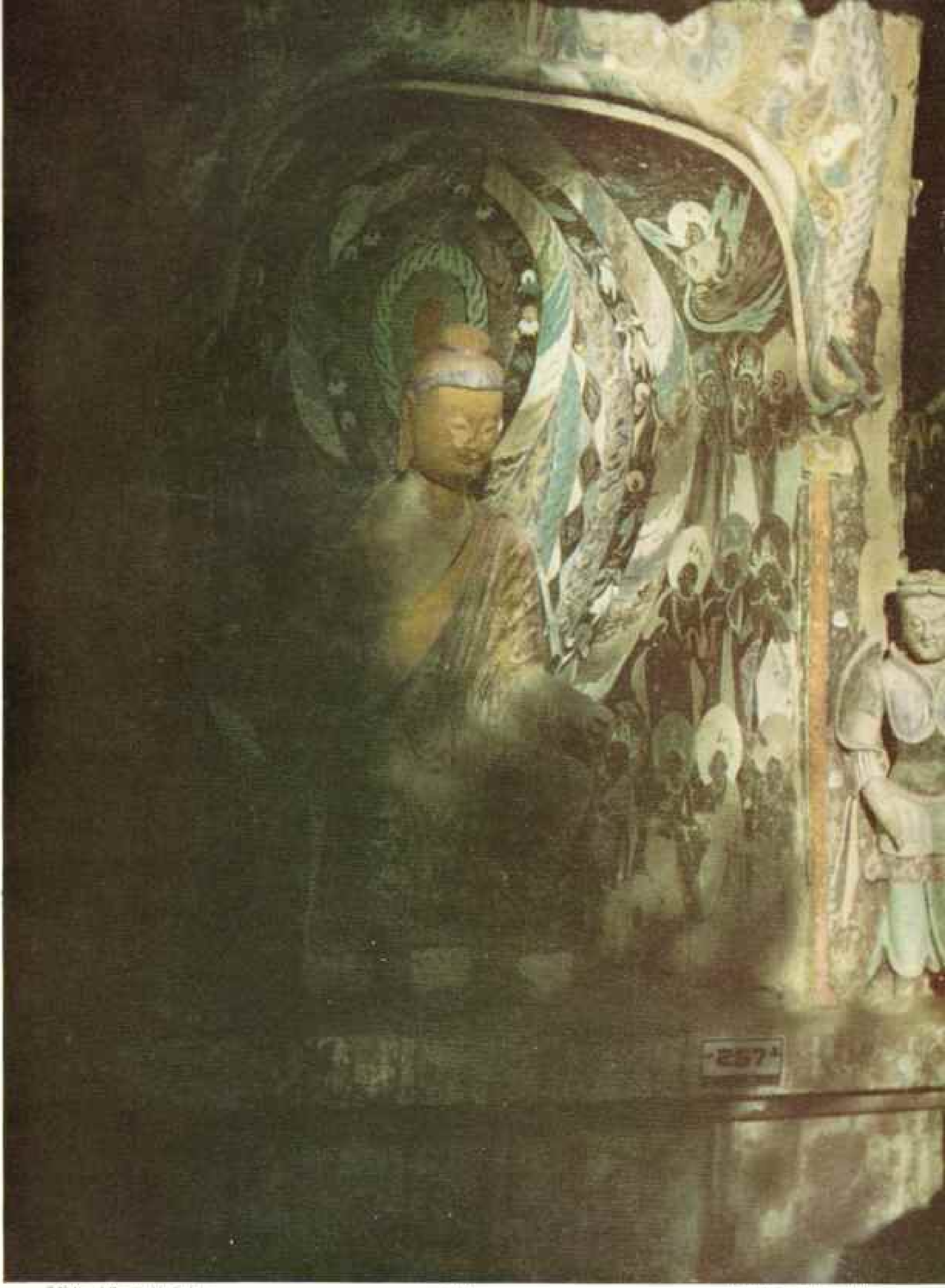
↑ A Dvarapala (Center), Buddha's Guardian in Heaven, Stands in Armor

These images are comparatively modern, having been erected after 1650. Buddha presides on the left. Divine attendants stand by him. Faint traces of Tang paintings 1,300 years old appear on the wall at right.

↓ Jean Shor Makes Friends with Ducks in the Caves' Temple Area

Ruddy sheldrake ducks (center) "had a permanent crook in their necks," the authors report. "As a result, they always looked downcast or ashamed of something. Saddest-looking birds we ever saw."

Kodachrome by Frank Shor



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A Regal Buddha, His Cave Door Eroded Away, Reposes in Sunlight and Shadow

Through the centuries, the cliff face has washed away, revealing richly decorated walls of several grottoes. Ruthless collectors and pious restorers alike have taken heavy toll of the caves' older treasures.

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Kodachrome by Frank Shor

Crescent Lake, a Garden Spot in the Sinkiang Desert, Sparkles at the Base of Golden Sand Dunes

Chinese legend says that long ago a priest of the caves was falsely accused of crime and driven into the desert. For two days he wandered. Near death from thirst, he prayed for water and fell asleep as the sun went down. Awakening, he found this lake of pure water at his feet.

A Coin's Lucky Toss Saved Tunhwang's Priceless Frescoes

When trade routes shifted, Tunhwang became a blind alley, and the caves remained unknown to Chinese and Western scholars for nearly 15 centuries.

Sir Aurel Stein, the English explorer, visited the site in 1907. He and Paul Pelliot, a Frenchman, bought many manuscripts and silk paintings and took them to London and Paris. But they left untouched the magnificent centuries-old frescoes, such as the ones pictured here.

Two years earlier, Albert von Le Coq, a German explorer, was scouring Sinkiang for just such frescoes. When he discovered one, he sawed off the wall section, crated it, and shipped it to the Berlin Museum.

As Le Coq was preparing to depart for the caves near Tunhwang, he received a message instructing him to meet his expedition chief in Kashgar, 1,250 miles away.

There was no time for both trips, Le Coq related. So he flipped a Chinese silver dollar—heads for Tunhwang, tails for Kashgar. Tails it was.

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A Chinese Farm Wife Dresses for a Shopping Trip to Ansi

Franc Shor asked this couple to pose, but the husband refused. When Ansi's police chief spoke harshly, the man complied smilingly. "I told him that if he didn't, I'd throw him in jail," the chief explained.

Tunhwang Solves the Diaper Problem by Doing Without

The town lacks bus connections with the Urumchi-Lanchow highway, which lies 70 miles distant. Luckily, the authors caught a military truck and, after 10 hours and many motor breakdowns, reached their destination.

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Kodachrome by Jean R. Shor

Kiuchuan's Vegetable Market Offers an Oasis in the Kansu Desert

Flat, undecorated walls of plaster and brick mark many villages in western China today. The Nationalist Government, trying to modernize the country, had to tear down many antique but graceful buildings.

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Kodachrome by Jean B. Shor

Grinning Father and Glum Son Followed the Pilgrim Trail from Mongolia to See the Caves

had enjoyed the night before, but only two large halls, each with a kang some 25 feet long. Captain Hwang bedded down next to us and agreed to awaken us in the morning.

Chinese Sleep Talking—in English

At 4 o'clock I was awakened by a voice droning, in a low monotone, "Mis-ter Shaw-er, please get up ver-rey ear-ly. Mis-ter Shaw-er, please get up ver-rey ear-ly."

I was surprised, for none of our fellow passengers spoke English. I turned on my flashlight. There lay Captain Hwang, sound asleep, repeating the sentence, syllable by syllable. As I watched, he rolled over and was quiet.

When he awoke us at 6, I asked him, in Chinese, why he hadn't told us he spoke English. He explained he had studied it for two years but spoke so badly he was embarrassed to attempt it. When I told him of his nocturnal conversation, he wouldn't believe me.

The day was miserable. A cold wind swept across the rocky desert, and a driving rain sought out the cracks in the truck cab. Our fellow passengers on top snuggled beneath a canvas tarpaulin. Peculiarly enough, not once during that day did our crew find it necessary to dismantle the motor!

Toward evening the weather cleared, and when we reached the outskirts of Hami (page 409), the long rays of the sun turned the oasis into a fairyland. Suddenly the desert was gone, and we were among lush green fields and groves of trees.

We passed through the ruined walls of what was once the Moslem area of the city, where wrecked mud houses told a silent story of bitter battles in the revolt of 1937. Untouched among the desolation stood a magnificent mosque, its walls agleam with white- and blue-figured tiles and its green-tile dome glowing softly.

We paused outside the gate of the Chinese city to discharge our "yellow fish," then rolled on to the Highway Department repair shop. There Mr. Li informed us we would remain in Hami for two or three days.

We tossed our bags on a Hami taxi, a heavy wooden cart pulled by a tired little Mongol pony, and rode to an inn where we got a tiny private room graced with a small wooden table, two stools, and a smoking oil lamp hanging from the ceiling.

Captain Hwang insisted on taking us to dinner. We suggested an open-air meal of shaslik and melons, but he was horrified at the idea of eating on the street. "Ver-rey dir-tey, ver-rey dir-tey," he said. Instead, he led us through narrow alleys to the dirtiest Chinese restaurant I have ever seen. There a half-dozen dishes were served in filthy bowls with food-encrusted chopsticks.

We managed to down a bite or two of some things, but couldn't quite negotiate the spiced beef. The proprietor kept this choice item hanging just outside the shop. To serve it, he simply brushed away the flies and sliced off a few tidbits. We thanked the captain for an excellent dinner and went to bed hungry.

Jean awoke the next morning with a firm determination to take a bath. After a pleasant breakfast of Chinese meat rolls and eggs cooked with green peppers, we set out to find a bathhouse. We asked a Chinese gentleman where we could find one, and while he told us, he also told everyone else within hearing. A crowd of some 50 people followed us to the establishment. They were friendly, but Jean found their concern a little embarrassing. As it turned out, they saved the day.

They crowded into the office of the little bathhouse with us, and listened patiently while I addressed the surprised proprietor. He was pleasant enough, but horrified. Women in China do not go to public bathhouses, he explained firmly. They bathe at home.

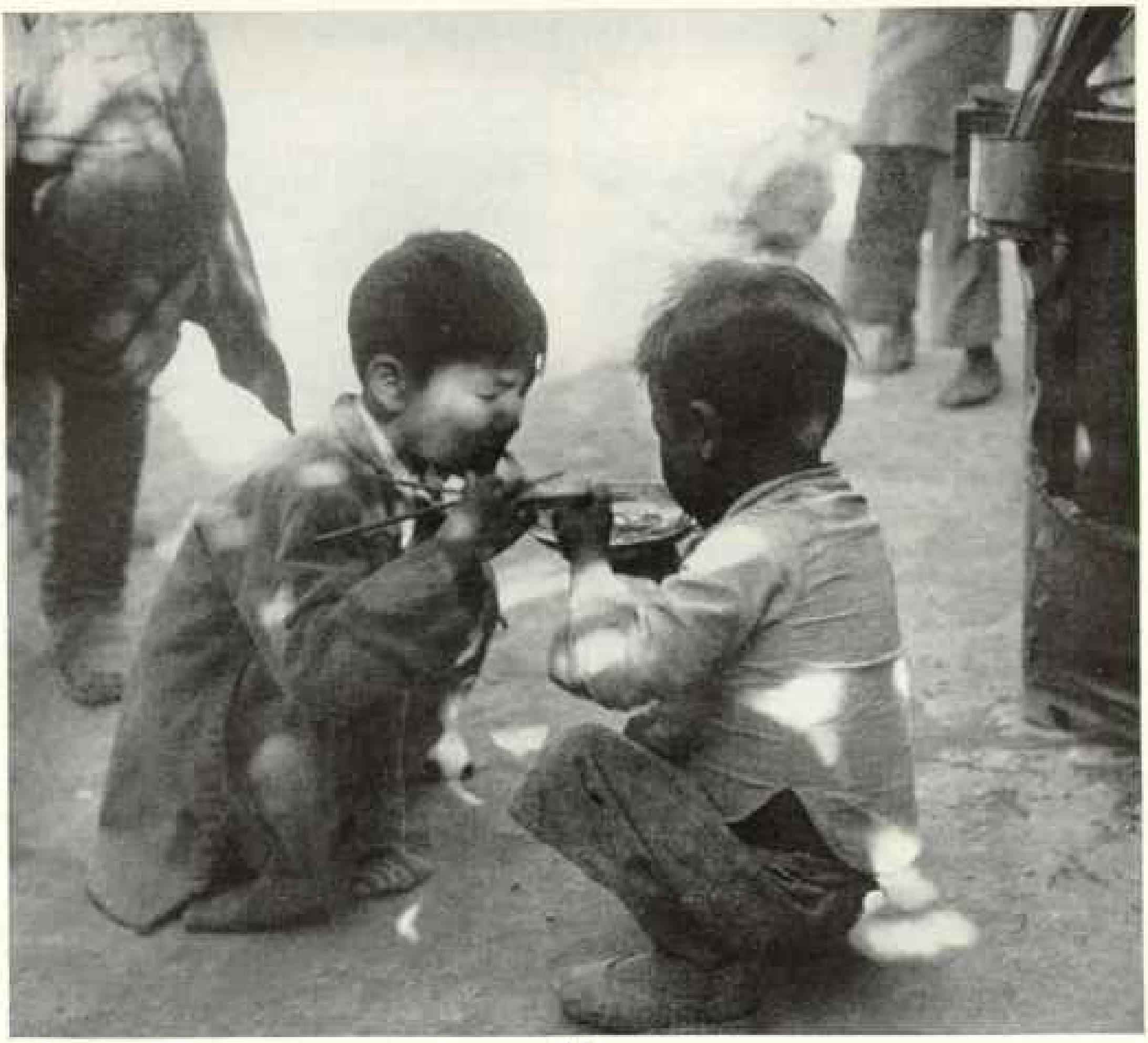
Courtesy Enforced at the Bathhouse

But the crowd had a different idea. A very old Chinese gentleman stepped out of the audience and spoke sharply to the proprietor. Here were two honored foreign guests, among the few Westerners who had ever been in Hami, asking a simple favor, and he, the bathhouse proprietor, was rudely turning them away. What kind of courtesy was that? What would the foreigners think of Hami?

A Turki gentleman wearing an enormous fur hat and a sheepskin coat took over at this point. He shouted first at the proprietor, then at the crowd. The audience hustled through the door of the little entry room where we sat, and in a few minutes out came the regular customers of the establishment, some still buttoning their outer garments and all looking very confused.

The manager even got into the spirit of the thing. He started ordering his employees around in a loud voice. Within five minutes the bathing room was empty, double curtains had been stretched around one corner, a bench, table, and pot of tea had been placed inside the curtained space. Jean was ushered into the room with great ceremony.

Then the crowd smiled at me and bowed. I bowed back, and they withdrew across the street. I went back into the bathing room and found another curtained corner prepared for me.



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Young Friends, Neglecting Chopsticks, Gulp Noodles with the Power of Suction

In western China the authors, living like the Chinese, took their meals at open-air stands. They found these boys noisily sharing dinner in Turfan.

In 15 minutes we were thoroughly scrubbed and attired in clean clothes. The smiling manager refused any pay. I left a little pile of Chinese currency on a table. Outside we thanked the crowd as profusely as my Chinese would permit. They assured us we were most welcome, and wished us a pleasant stay.

Mr. Li and Mr. Kao came by late the next evening to inform us that the truck would leave at dawn. We got up at 4, lugged our bags to the Highway Department compound, and found no one there.

At high noon we departed, picked up a new load of "yellow fish" a mile out of town. Then the usual motor trouble started again. But this time the generator seemed to be really broken, for we stopped every few minutes.

Bedbugs in a Sandstorm

We made only 50 miles before nightfall and stopped at Lo To Chan (Camel Station), a tiny collection of huts. There we were shown to the only private room in the inn, obviously the owner's private bedchamber.

By midnight we were both awake and scratching, and a quick look with a flashlight revealed an army of bedbugs marching into our sleeping bags. We cleaned out the bags as best we could, filled them with insect powder and DDT, and carried them outside. We preferred to spend the rest of the night on the desert.

An hour later the wind rose, and our bags were soon covered with six inches of sand. Reluctantly we returned to the inn and slept on the mud floor of the kitchen. For three hours the wind howled, and streams of sand piled into the room from every crack. At dawn the wheels of our truck were a foot deep in sand and the back was half full of Gobi.

It took almost an hour to clean it out, but once on the road we made excellent time. Kao and Li had been up half the night with the

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Squeaking High-wheelers Cart Watermelons to Hami's Market Place

Melons take the place of canteens in Chinese desert travel. A truck passenger always carries one. When he gets thirsty, he cuts it open. Etiquette requires him to offer slices to fellow travelers.

generator, and it functioned perfectly. We stopped only for lunch and chugged proudly into Ansi, the westernmost city of importance in China proper, just before midnight.

Jean and I arose at 6 to bid farewell to our traveling companions, since we had to take another vehicle to Tunhwang, then went back to bed and slept until noon.

My inquiries about transportation to Tunhwang, however, brought bad news. The city lies 70 miles off the main highway, and there are no buses. Fortunately, a military truck was leaving late that afternoon. We called on the commander of the local garrison. He gave us permission to go and told us that the truck would leave promptly at 4.

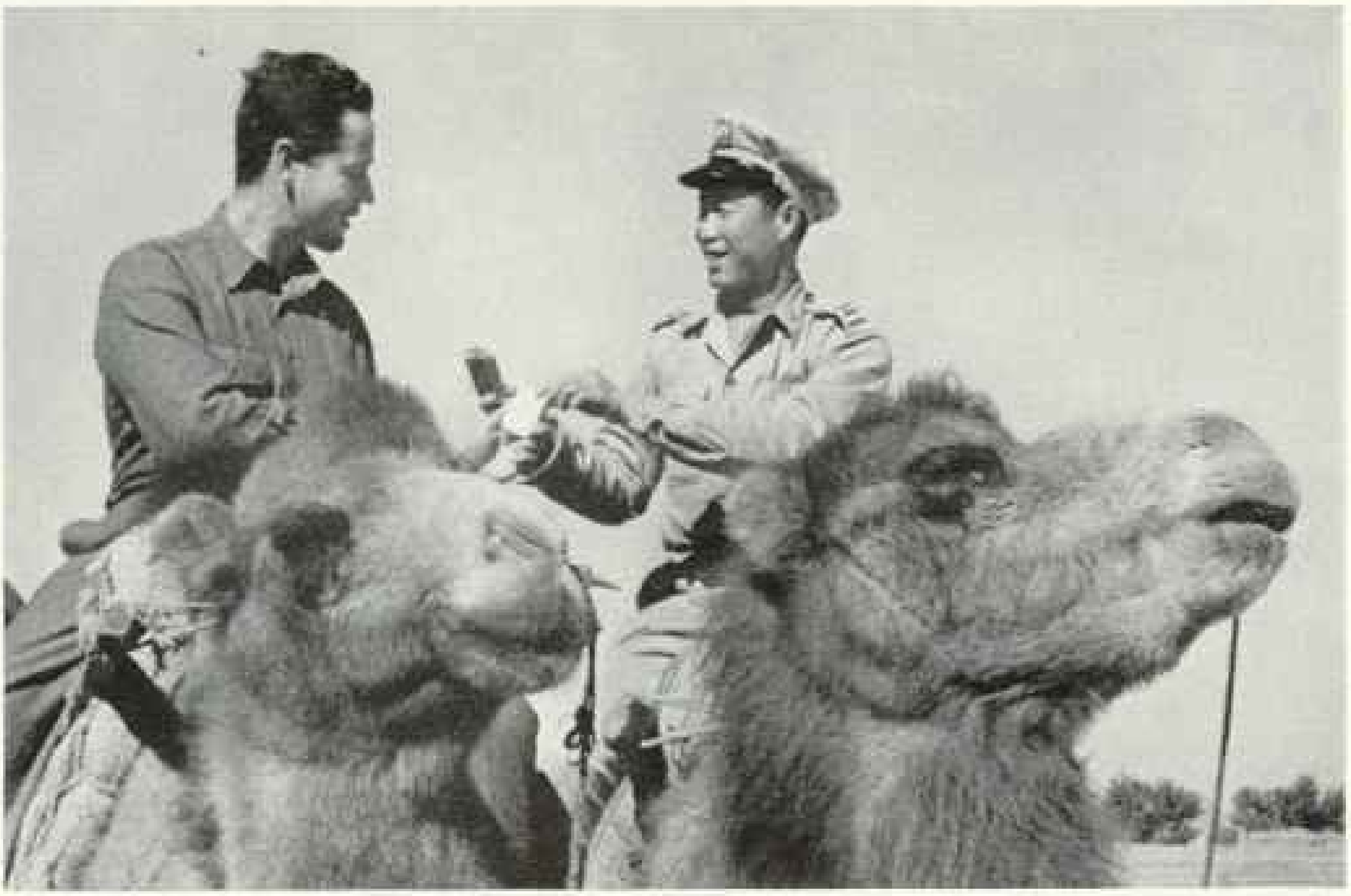
An Incredible Feat in Time

We finally left at 7. The night ride was a nightmare. We had discovered that whenever a Chinese driver had to stop for any reason, such as a flat tire or a boiling radiator, he would seize the opportunity to take apart the generator or the carburetor.

But this driver set a new record. A passenger's hat blew off, the crowd yelled, and the driver stopped. Before the racing passenger could recover his hat and return to the truck, the crew had the generator apart, the carburetor disassembled, and one tire off. We wouldn't believe it either unless we had seen it.

It took us eight hours to get within two miles of Tunhwang. Then, at 3 o'clock in the freezing morning, we ran out of gas. The mechanic walked to town and returned with a pint. Another mile, and we ran out again. Finally reaching Tunhwang at 5, we staggered a quarter-mile to an army barracks, where we had been invited to spend the night. We slept on the orderly room floor.

Our reception when we awoke, however, was worth the trouble. Colonel Chiu, the garrison commander, turned out to be the most pleasant and interesting gentleman we had met in



Franc Shor and Chinese Captain Swap Cigarettes atop Caravan Camels in Hami

Here Mrs. Shor broke Chinese tradition by requesting a shower in the public bathhouse, to which women were not admitted. The proprietor demurred, but bystanders compelled him to oblige the American (page 407).

Driver and Mechanic "Make Face" by Needlessly Repairing a Generator

To impress passengers, the crew made many unnecessary stops to strip and reassemble the foreign-made "send-out-electricity machine." Their exhibition always drew admiring nods and smiles (page 390).

China. He had been educated in Japan and spoke a little English. With my meager Chinese we got along beautifully.

Soldiers carried our bags to his own house, where his gracious wife furnished an excellent breakfast of noodles, Chinese bread, green vegetables, and beef cooked with green onions. We would, he insisted, be his guests in Tunhwang, and his cavalry regiment would furnish horses for our trip to the caves, 12 miles out of town.

We wanted to leave immediately, but he explained that a cavalry escort would be necessary, since marauding Kazak bands had recently robbed Chinese travelers in the area. No soldiers were available that afternoon, he said, but he promised us an adequate escort in the morning.

About 5 o'clock we were seeing the sights of Tunhwang, when the colonel came rushing up to us. "You're lucky," he said. "There are men from the caves here. We'll get you a ride." He hailed a truck and introduced us to some young Chinese, including Mr. Dwan Li-sen, an artist.

They stopped at the colonel's house for our bags and drove us out of town and across the desert to the caves. Before us in the moonlight suddenly appeared a tall grove of poplars. We turned into a whitewashed compound and were shown to a two-room apartment, its walls lined with copies of cave paintings and reproductions of Buddha images.

We arose early the next morning and walked the 100 yards to the caves in time to see the great cliff in the first rays of the rising sun (page 388). Much of the cliff face is covered with fading murals. Ancient wooden balconies mark the entrances to many of the grottoes (page 394), and many tiny niches in the cliff contain small statues. The poplars between the cliff and the river cast a deep shadow over the lower portion of the cliff, softening the colors of the garish restorations of recent years.

Eastern Housewife Meets Western Author at Ansi's Temple

Mrs. Li, wife of Ansi's highway director, "let me stumble in my vile Chinese," writes Franc Shor. "Suddenly she started speaking perfect English!"

Darkness and Dry Air Protect Caves

Fortunately, a lack of funds has hampered "restoration" work, which involves touching up the wonderfully muted and fading colors with bright reds, greens, blues, and yellows; so most of the frescoes are still in their original state. In the dry desert air, preservation is excellent; the paintings inside the caves, protected from the rays of the sun, are still exquisitely colored. Those on the cliff face have been softened and blend beautifully with the rocky cliffs and desert sands.

This Battered War-surplus Truck Carried the Authors Across 500 Desert Miles

When an uncapped oil drum leaked over the side, the truck stopped, and the crew lost no time stripping the generator again. Here the mechanic lifts the hood; the driver inspects the leak. In 1,000 miles, crews dismantled 31 generators, 27 carburetors (pages 390, 410).

The first thing which we saw was the Temple of the Great Buddha (pages 389, 391), set almost in the middle of the long expanse of cliff. Outside, it resembles one face of a pagoda, with nine caves protruding from the cliff face. From the corners of the roof eaves little temple bells tinkle in the breeze.

We entered the temple beneath a magnificently carved archway, through a hall lined with Sung dynasty paintings of monstrous temple guardians, and suddenly found ourselves in the dim light of a huge chamber. As our eyes became accustomed to the darkness, an enormous Buddha took shape in the dim cavern.

We stared in awe at the seated figure, nearly 180 feet high, shaped from the rock of the cliff itself. At his feet stood a row of low tables on which incense burned in ancient vessels. Figures of lesser divinities stood in niches on either side of the great vault, and the walls themselves were covered with an endless pattern of thousands of small Buddhas.

Dwan, our artist friend, told us the giant Buddha was comparatively modern. The caves' real beauty, he said, lay in the smaller grottoes, decorated as individual chapels. He volunteered to be our guide for the day.

We walked to the southern end of the cliff, where 22 caves constructed during the Northern Wei dynasty (A. D. 386-534) are located. Inside these caverns, the paintings remain exactly as when first executed 1,400 years ago. The colors are deep and rich. Black predominates, and the lines, though primitive, are strong and free. Most impressive was the singular feeling of rhythm and movement which the ancient artists imparted to their work.

Around the tops of the Wei caves were graceful figures representing happy souls in paradise. Each was seated on a tiny cloud, with flowing garments draped to suggest the rippling of a gentle breeze. On the walls beneath were small figures of Buddha and scenes from his life on earth. The whole composition seemed to live and move.

The Wei caves, Dwan told us, stand almost alone as a representation of the primitive period of Chinese Buddhist painting. Few other

National Geographic Photographer B. A. Stewart

Library of Congress Visitors Examine a Seventh-century Scroll Found in the Caves

Some 15,000 Tunhwang manuscripts were discovered by a Chinese priest in 1899. Among them was the world's oldest printed book (dated A. D. 868), now in the British Museum. About 900 years ago the collection was sealed, probably against robbers. This scroll from the Buddhist scriptures is preserved in Washington, D. C.

paintings of that dynasty exist today. A further note of interest was that the ancient Chinese artists, representing the typically Indian characters and incidents of Buddhist lore, garbed all the figures save those of Buddhist deities in Chinese dress and placed them in Chinese scenes—just as many great artists of the Renaissance garbed the lesser figures of their religious masterpieces in 16th-century costumes, portraying only the Holy Family in appropriate dress.

Japanese Copied Tang Masterpieces

As we came down from an upper tier, we met a Mongol herdsman (page 406), dressed in heavy sheepskins and liberally smeared with mutton fat. His wife was carrying a baby (page 399). He, too, literally glistened with grease. Mr. Dwan explained that the Mongols grease their bodies and their clothes in winter to keep warm. Numbers of them, he said, still make the long trek to Tunhwang.

The second period represented in the Tunhwang paintings covers the Sui (A. D. 589-618) (page 396) and Tang (A. D. 618-907) dynasties. This was the golden age of Chinese art, still copied by students of classic Oriental culture. Except for those in the caves, only a few real examples of the Tang style of painting exist today (page 403, left). Japanese painters, according to the late Laurence Binyon, authority on Oriental painting, founded their early style on that of the Tang masters. At Tunhwang there are 177 Tang caves (page 401) and 87 decorated during the preceding Sui dynasty.

The Sui and Tang caves follow a rather rigid pattern. They average about 20 feet square, each having a group of small images set on a dais opposite the entrance (pages 389 and 400). These statues represent various Bodhisattvas, those who have not quite attained Buddhahood (page 395). In posture and drapery they show strong evidence of the Greek influence which came from the Graeco-Indian school of Gandhara, India.

On each side wall are three separate pictures, showing scenes from the Gautama Buddha's life, single figures of Bodhisattvas (page 403), or scenes from the Western Paradise.

These latter scenes are of striking grace and beauty, representing the souls of the blessed reclining in elaborate pavilions around a lotus-covered lake. Celestial beings sing and dance for them, and a soft rain of blossoms perfumes the air.

Jean was particularly fascinated by the ceiling and border designs (page 397, top). Some were simple geometric patterns, others a symmetrical arrangement of lotus flower designs. All were done with a wealth of color and balance of design which made them singularly attractive.

Most interesting to us were the remarkable panels which tell religious stories in a series of pictures. These distinguished ancestors of our modern comic strips are done in magnificent colors and in many cases in a style almost alarmingly modern.

Walt Disney Animals Charm

Particularly fascinating are the animals represented in these animated panels. Graceful fawns and antelope spring through the air, identical in pose and expression with Disney figures. Little rabbits and foxes watch the action with open-eyed astonishment; they look like illustrations for a modern children's book.

One Tang cave contains a series of panels, 36 inches high, representing the introduction of Buddhism from India into China. As your eye follows the course of the paintings around the caves, it is almost impossible to escape the feeling that you are seeing a motion picture.

The great attributes of the Tang paintings, Dwan believed, are the vigor of their strokes, the wealth of color, and the strength of movement. From the technical point of view this is no doubt true, but to us their beauty will always be in their realism and in their almost unbelievable presentation of living beings.

There are more than 500 caves in the temple area, and it was impossible for us to visit them all in three days. But Dwan and the other staff members took us to representative caves from each period in order that we might get a balanced picture.

There is an unusual sense of continuity in the cave paintings. The primitive strength of the Wei school blends smoothly into the more finished product of the Sui and Tang periods, with virility and the feeling of youth still a strong factor.

Then gradually, through the caves of the Five Dynasties (A. D. 907-959) and into the Sung dynasty (960-1279) (page 398) there is evident first a leveling off, then a period of seeming stagnation, and ultimately, in the few grottoes attributed to the Yuan, or Mongol (1279-1368) period, a strong hint of decay. The obvious love for the characters portrayed in the Sui and Tang eras is no longer present. There is a sameness about the 100 caves of the Sung period which clearly indicates disinterest and a lack of imagination.

One of the most striking examples of this loss of vigor can be seen in caves where original Tang frescoes have been plastered over and covered by Sung and Yuan paintings. In some spots the newer layer has fallen away, leaving half a wall of Tang and an equal area of Sung decoration. The later period suffers greatly by comparison.

After the fall of the Yuan dynasty the caves fell into disuse for nearly 300 years. Then, in the Ching (Manchu) period (1644-1912), a few new grottoes were decorated. The temple continued to be a center of Buddhist worship, but the caravan routes had shifted. No longer were there wealthy traders to act as patrons to artists and priests.

Though half the caves are approximately the same size, others range from the vaulted cavern of the Great Buddha to tiny closetlike grottoes containing a single figure and a few feet of painted wall. Many of the caves are joined by tunnels or a series of balconies. Thus it is possible to travel the entire length of each level without descending to the ground.

We spent two full days and most of a third at the caves. We would gladly have spent another week, but Colonel Chiu had told us of a truck which was to leave Tunhwang Sunday morning. Reluctantly we left the caves and started back to the modern world.

But in Tunhwang we found that the truck was "broken down." We set out shortly before noon the next day, accompanied by six other regular passengers and 24 "yellow fish." The load was too great for the tires of the ancient vehicle, and we repaired a total of 18 flats in 70 miles. We were on the road 24 hours, and it was the low point of our whole trip. But there was an amusing incident that made it worth while.

At dusk we stopped to patch a tire at a tiny place known as Tien Shui Chuan (Fresh Water Spring). In the days of the great caravans it was an overnight stopping place. Now it had fallen into disuse. A very old Chinese farmer and his wife were the sole inhabitants. Some of the passengers asked them for food.

The old couple protested that they had no food other than their own meager supper. Most of the travelers accepted the situation. But one well-dressed, sly young man drew the old farmer aside.

"Old one," I heard him say, "you are a fool. I have money, and you need it. You

can have your own supper and still profit. While your wife talks with these strangers, you take her supper and bring it here to me. In the dark no one will see. I will pay you well."

The old farmer protested, but as the stranger kept increasing the price, he finally agreed. "But you must wait a few minutes," he told the purchaser. "This must be done with caution."

Shocked by his actions, I walked back to the kitchen, wondering whether I should warn his wife. I didn't need to worry. She sat at the table with another of our travelers, both finishing large bowls of noodles and gruel.

"Hurry," she said to him, "finish the bowl and leave. If my husband finds I have sold his supper, he will surely beat me. I too shall leave and then return and cry that someone has stolen our meal!"

When we finally reached Ansi, we rested for a day and then bought tickets on a postal truck. These vehicles are the aristocracy of the road in western China, and we were pleasantly surprised that they ran on schedule.

We rode the long length of Kansu Province on a succession of them, through the great "Jade Gate" at Yumen, through Kiuchuan and Kanchow (Changyeh), Shantan, and Wuwei. We sat high in the rear of the trucks, sharing our space and our food with peasants and farmers, soldiers and businessmen, young and old. We slept at night on mud kangs and ate noodles and chicken in friendly inns.

Suddenly we were rolling along a smooth highway beside the turbulent Yellow River, passing the giant water wheels which turn 100 feet into the air. Through a thick wall and a great gate: we were in Lanchow.

From here we could get a plane back to Shanghai, back to motorcars and running water and hurrying crowds. Behind us lay five weeks of travel over 1,000 miles of the Gobi,* the cold of early mornings, the Caves of the Thousand Buddhas, and the dusty solitude of the Great Silk Road.

An hour later, fresh from a tub bath, we sat in the lobby of the Northwest House, Lanchow's leading hotel. Jean picked a copy of the NATIONAL GEOGRAPHIC MAGAZINE from a pile lying on a table. She opened it and found an article about a canoe trip down the Potomac. Her eyes lighted up.

"Just think," she said, "in a month we'll be back home, and maybe we can take some interesting trips like this one!"

* See "Explorations in the Gobi Desert," by Roy Chapman Andrews, NATIONAL GEOGRAPHIC MAGAZINE, June, 1933.

Courtesy Lowell Thomas, Jr.

The Youthful Dalai Lama Smiles from His Throne in Lhasa

To millions of Buddhists this Tibetan boy is as holy as the Buddhas pictured in the Tunhwang caves some 800 miles away. They regard him as a living divinity, the incarnation of all his predecessors. Within Tibet he holds absolute spiritual power. Lately, invading Chinese Communists have threatened to install a puppet in his palace. This photograph, showing the Dalai Lama in rare mood, is taken from Lowell Thomas, Jr.'s, best seller, *Out of This World*, in which he describes his 1949 journey across the Himalayas to Lhasa.

New National Geographic Map Shows Changes in Asia and Europe

SINCE World War II, Russia has expanded its borders by 264,400 square miles and communized nine neighboring countries. In this period, Western nations have granted freedom to 13 Asiatic lands containing one-fourth of the human race.

Recording the tremendous transformation, the National Geographic Society's new map of Asia and Adjacent Areas presents up-to-date geographical background for the problems facing the world in Eurasia.

"Adjacent Areas" include Europe, a peninsula of Mother Asia. The mapped area contains 30 percent of the land surface of the globe and is home to 80 percent of the earth's people.

From the British Isles to Bering Sea and from the Arctic to Australia, the changing Old World is spread before The Society's members in the light of the latest data. All members receive the 10-color map as a timely supplement to their March, 1951, NATIONAL GEOGRAPHIC MAGAZINE. More than 2,000,000 copies have rolled from big lithographic presses to meet the needs of the membership and agencies of the Government and United Nations.*

The 37-by-29-inch sheet bears 7,646 place names, many of them new as a result of portentous postwar changes.

Russia Swallows Equivalent of 11 States

Soviet Russia, stretching from Bering to Baltic, bulks larger than ever after swallowing the gains of World War II—81,900 square miles in Asia and 182,500 square miles of European territory. These gains by the world's largest country are more than equal to all of New England, New York, Pennsylvania, Maryland, Virginia, and North Carolina.†

The Union of Soviet Socialist Republics, "Russia" for short to most Americans, is now 2.87 times the size of the continental United States and holds an estimated 50,000,000 more people than our own 152,300,000.

Moscow has extended its sway far beyond even these greatly expanded borders by turning neighbor nations into Communist satellites—Poland, Czechoslovakia, Hungary, Romania, Bulgaria, Albania, Mongolian Republic, and then immensely populous China. Communist Yugoslavia's refusal to be a Russian puppet was heavily outweighed by the communizing of China, whose swarming population totals 452,548,000, almost three times the number of people in the United States.

Aggressive communism, backed by the grim threat of Russia's undemobilized armies, has caused turmoil in Korea, Indochina, even the Shangri-la land of Tibet, and compelled the United States, Great Britain, and other democracies of the West to begin rebuilding the forces they so quickly disbanded after World War II. Tragic events in Korea, once remote, have reached into every American home.

Ramparts We Watch

At the outer edges of the map rise the bastions of the West. With their easternmost defenses in divided Germany and their small but growing forces united under General of the Army Dwight D. Eisenhower, ten nations of Western Europe stand together and with the United States and Canada, linked by the North Atlantic Treaty and a common heritage of free institutions. On the other flank are United Nations forces seeking to prevent the spread of Communist conquest in Asia. Occupied Japan, Okinawa, Formosa, and the Philippines form a chain protecting the Pacific.

Once-strong Japan is prostrate militarily. Its 82,000,000 people are dependent upon the West for protection, at least until a peace treaty can be written. Its present constitution renounces war and preparation for war.

Russians now are close to the Japanese islands, in the Kurils and southern Sakhalin Island, which Stalin won by agreement at Yalta as part of his price for the eleventh-hour Soviet attack on mainland troops of tottering Japan.

Three hundred and twenty miles south of Japan, Okinawa serves the United States as an unsinkable aircraft carrier.

Within fighter range to the southwest lies the unhappy island of Formosa—Taiwan, as the Chinese call it. It forms the refuge of the Nationalist leader Chiang Kai-shek and his armies driven from the mainland.

In Communist hands the fertile island of palms, paddies, and misty mountains could form a wedge between American bases in Okinawa and the Philippines and threaten

* Members may obtain additional copies of the new map of Asia and Adjacent Areas (and of all standard maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices, in United States and Possessions, 50¢ each on paper; $1 on linen; Index, 25¢. Outside United States and Possessions, 75¢ on paper; $1.25 on linen; Index, 50¢. All remittances payable in U. S. funds. Postage prepaid.

† See "The Society's New Map of Europe and the Near East," by Athos D. Grazzini, NATIONAL GEOGRAPHIC MAGAZINE, June, 1949.

that now independent island republic. Americans and Filipinos remember that Formosa formed the springboard for World War II invasion of the islands by Japan.*

Half-billion Asiatics Given Independence by Western Powers

Asia is now a continent governed almost entirely by Asiatics or by European-Asiatic Russia. In contrast to Russia's extension of power, the United Kingdom, Netherlands, United States, and France have given independence to the resurgent peoples of Asia over an area about equal to the continental United States. Thirteen States, with a combined population of more than half a billion people, now control their own welfare and destiny, under their own constitutions, in territories formerly controlled by Western nations.

Six of these States have emerged from territory that belonged to Great Britain or was under British mandate—India, Pakistan, Ceylon, Burma, Israel, and Jordan. The first three have elected to remain members of the British Commonwealth, but because they are close to one another they are given distinctive coloring on the map.

Once a territory of the United States, the independent Republic of the Philippines was born July 4, 1946, with full American support and approval.

Syria and Lebanon, once under French mandate, became independent and sovereign countries in April, 1946, with complete withdrawal of foreign troops.

The 14-month-old Republic of Indonesia, a full-fledged State, comprises all the territory of the former Netherlands Indies except western New Guinea and near-by islands.

The word "French" has been dropped from the name of Indochina, which has been reorganized within the French Union into an association of the three independent States of Viet Nam, Laos, and Cambodia. French administrators are being replaced by local talent. The States have been recognized by the United States and other governments and bring to 13 the number given independence by Western countries.

On the southern end of the Malay Peninsula, the single designation Malaya replaces the names of the old Straits Settlements, formerly a British crown colony, and the Malay States. A British high commissioner in Kuala Lumpur, the capital, supervises administration of the three-year-old Federation of Malaya, the great world port of Singapore (once a part of the Straits Settlements but now a separate British colony), and North Borneo, Sarawak, and Brunei.

Revolt in Indochina ties down numbers of French troops. The French have been hard-pressed by strong Communist forces trained and supplied in neighboring China.

In southern China the French Tricolor was hauled down in August, 1945, from strategic Fort Bayard, north of Hainan Island, when France voluntarily returned Kwangchowan to China, then under Chiang Kai-shek. France had controlled this fragment of China since 1898 under a 99-year lease. Chinese Siying replaces Fort Bayard.

Chandernagore, a former French possession about 25 miles north of Calcutta, was restored by plebiscite to India in May, 1950, after 262 years of French rule. Despite Indian pressure, France and Portugal have maintained their other possessions shown on the east and west coasts of the Indian peninsula.

Palestine is gone from the map. The former British mandated area was divided among the new nation of Israel and its neighbors, Egypt and Jordan. The partition is shown according to the armistice lines of January, 1950, which are subject to further negotiation. The Holy City of Jerusalem has been split. The walled city is in Jordan's hands; the western suburbs are now the capital of Israel.

Cease-fire Line in Coveted Kashmir

With India and Pakistan both claiming the State of Jammu and Kashmir, that lofty, cool Himalayan prize is shown on the map as a no man's land, with a cease-fire line established by a United Nations commission.

Flanked by Nepal and Bhutan in the buffer zone between India and Tibet, the autonomous State of Sikkim has been recognized by India. Formerly part of India, it looks to her for defense, diplomacy, and communications. Strategically important, the tiny State holds India's main trade route to Tibet, now invaded by Chinese Communists.

What used to be called Outer Mongolia is now a Russian satellite, the Mongolian People's Republic. China relinquished its claim in 1946.

Missing from the map is the former nominally independent State of Tannu Tuva, northwest of the Mongolian People's Republic. During its short checkered career it was claimed and occupied by both China and Russia. In October, 1944, the little-known State was formally incorporated, Russian style, into the Soviet Union.

In China the map shows names of prov-

* For recent articles on Japan, Formosa, Korea, and other key spots in Asia, see "National Geographic Magazine Cumulative Index, 1899–1950."

inces, but their boundaries are omitted because of the constant changes being made by the Communist Government.

Among the many place-name changes are sweeping revisions of the names in Korea, Manchuria, and Formosa, formerly ruled by Japan. Japanese forms have been changed to the native spellings. In the new nation of Indonesia, native names replace the long-familiar designations left by the Dutch.

On our new map Chosen becomes Korea; Taiwan is Formosa; Fusan is now Pusan; Heijo is Pyongyang, capital of North Korea. Batavia and Bangkok are Djakarta and Krung Thep, and Levant States are Syria and Lebanon.

Joseph Stalin's name peppers the map of Russia, with ten places named for the Soviet dictator. Satellite Bulgaria has added its flattery by changing the name of the Black Sea port of Varna to Stalin, a far cry from its ancient Greek name, Odessus, which honored Homer's roving hero.

Iron Curtain secrecy, prevailing over three-fourths of Asia, hides even nonmilitary details. Thus the mapping of new Russian railroads must depend upon limited information.

One of Russia's most important construction projects is known to be the second trans-Siberian railway, the South Siberian Magistral (trunk line), planned to run from the Volga at Kuibyshev to the Pacific at the new port of Sovetskaya Gavan.

Dotted and solid lines show planned and completed sections of this long rail route across Siberia, calculated to end Russian dependence upon one vital railroad to reinforce and supply its troops in the Far East. One section, completed during World War II, connects the great new steelworks of Magnitogorsk, in the Urals, with Aktyubinsk and the Karaganda coal fields.

In China long-disrupted rail services are being re-established under the Communist regime. The Peiping-Hankow Railroad, for example, has been reopened after 13 years. Now it is possible to travel by train from Canton or Hong Kong to Moscow—in about two weeks.

Europe Gets Oil from Asia

Red lines show roads, still the only means of land travel in wild interior parts of Asia. Some, such as the old silk routes of China, have histories that reach back into the vague dawn of human history.

Information packed into the map ranges from ancient ruins to airports and oil fields, from the Great Wall of China to such modern engineering achievements as the 1,068-mile-long Tapline across Arabia. This American-built pipe line has started delivering 315,000 barrels of oil a day at a brand-new terminal in the old Biblical city of Sidon.

In Netherlands New Guinea the map shows the new Klamono oil field, with a short pipe line to Sorong—first important industrial development in that remote part of the world.

Much of the Old World's oil comes from Iran and Iraq, close to the Soviet Union. Iran produces 681,000 barrels a day and Iraq 126,700. If this output was captured by the Communists, it would more than double the Soviet supply and would deny Western Europe its main source of precious oil. About two-thirds of the million barrels daily used by the Marshall Plan countries come from the Near East, the other third from South America.

In all, the Western Hemisphere yields 8,000,000 barrels of oil a day, against 2,900,000 for the Eastern Hemisphere. The United States alone each day produces 6,000,000 barrels, more than eight times the Soviet production.

Largest Continent Mapped on Special Projection

In many ways, however, Asia is the continent of superlatives. By far the largest and most populous, it contains the world's highest mountain, 29,002-foot Mount Everest; the greatest known ocean depth, the new 34,440-foot Cape Johnson Deep, off Mindanao, in the Philippines, which replaces the old 35,400-foot determination; the Dead Sea, lowest sheet of water on earth, 1,286 feet below sea level.

To map this immense Old World area, The Society's cartographers have used a projection never before employed, to their knowledge, for mapping Asia. Called the Two Point Equidistant Projection, it shows the continent's long and important shore-line areas with maximum accuracy and minimizes the distortion and scale variation that must occur when such a large part of the round earth is shown on a flat sheet.

A top-of-the-world inset shows how close are Asia and North America. By the scale, true distances can be measured to the Russian industrial center of Sverdlovsk.

Asia and Adjacent Areas is fifth in the National Geographic Society's postwar series of continent maps. It follows Australia, March, 1948; Europe and the Near East, June, 1949; Africa and the Arabian Peninsula, March, 1950; and South America, October, 1950. This continent series will be continued with a new map of North America, planned for the near future.

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

Articles and photographs are desired. For material 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 16, 1930, 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.

A notable undertaking in the history of astronomy was launched in 1949 by The Society in cooperation with the Palomar Observatory of the California Institute of Technology. This project will require four years to photomap the vast reaches of space, and will provide the first sky atlas for observatories all over the world.

In 1948 The Society sent out seven expeditions to study the eclipse of the sun along a 5,330-mile arc from Burma to the Aleutians. The fruitful results helped link geodetic surveys of North America and Asia.

The Society granted $25,000, and in addition $75,000 was contributed by individual members, to help preserve for the American people the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California.

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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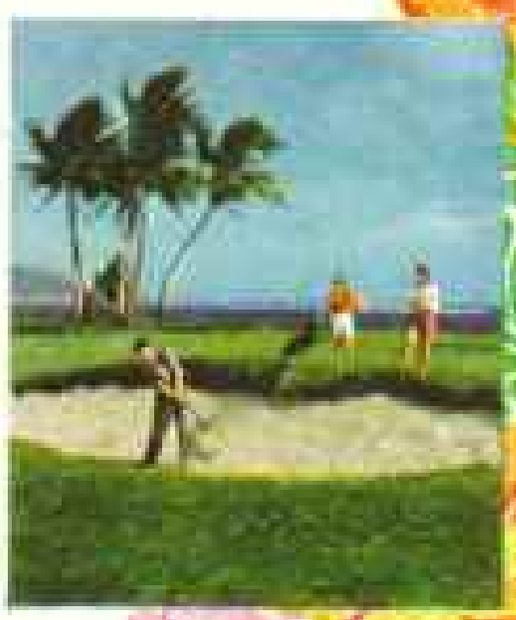
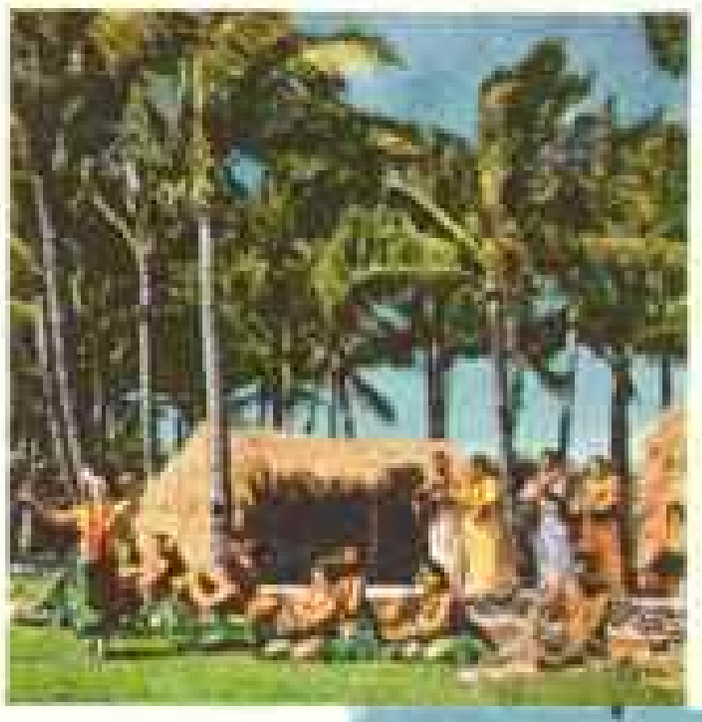
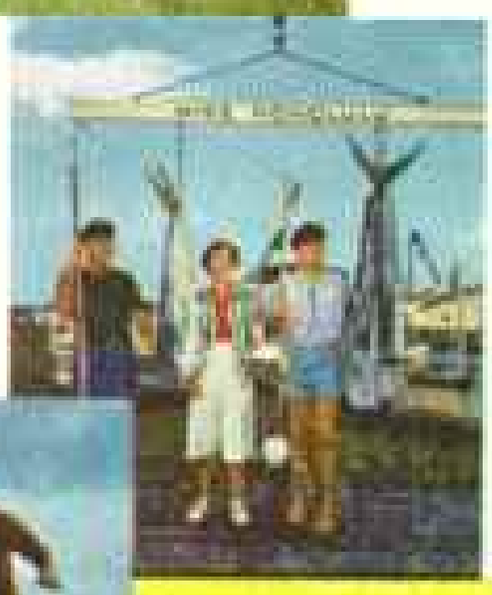




Air and steamship lines link Hawaii with San Francisco, Los Angeles, Portland, Seattle, Vancouver. You can go one way by air, the other by sea.



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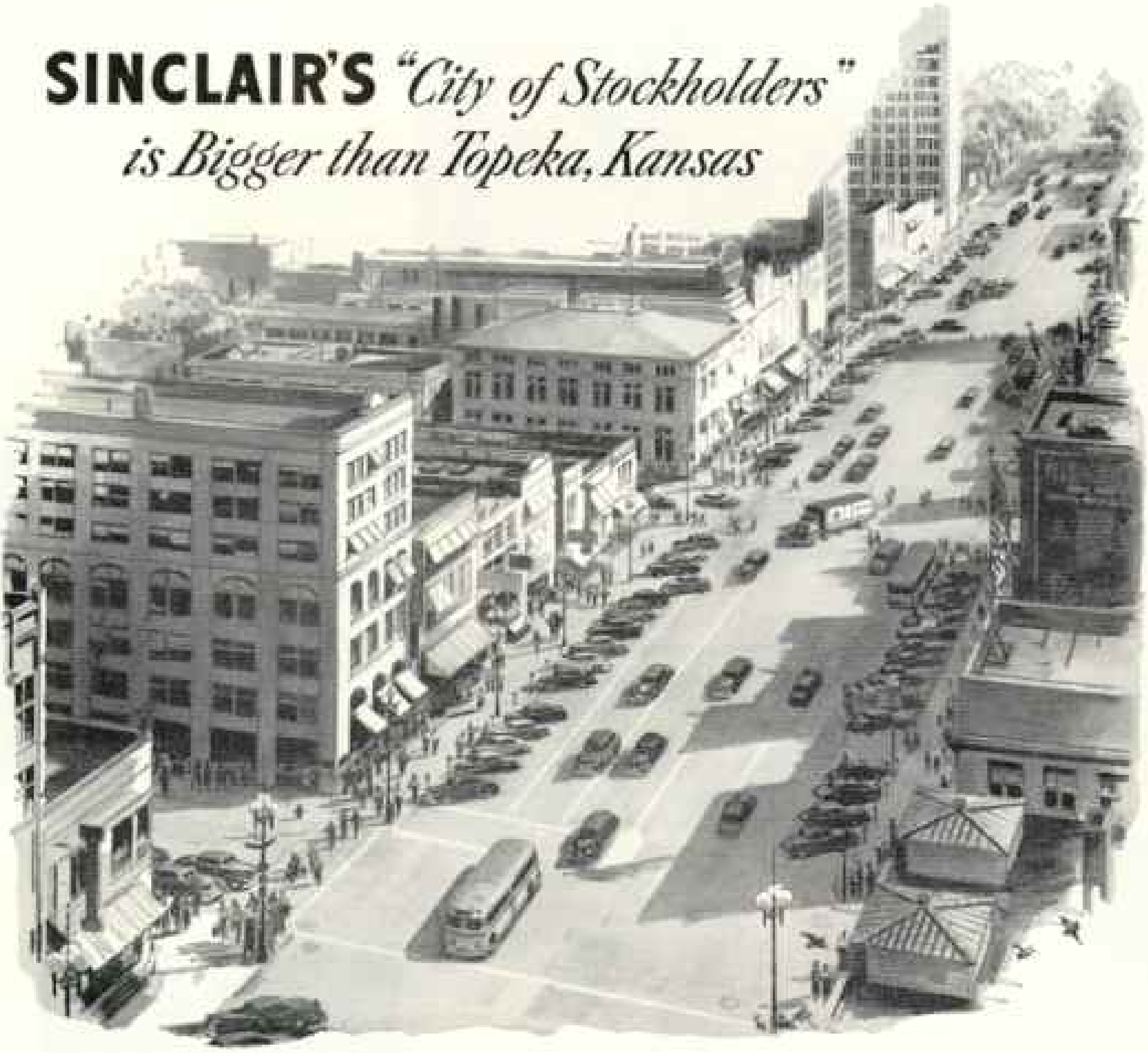

SINCLAIR'S "City of Stockholders" has an even larger population than Topeka, the Capital of Kansas—which will give you an idea of the broad ownership of this corporation.

Sinclair has 100,542 stockholders — people of wealth and moderate means, employees, widows, men and women who have retired. The list of shareholders includes many leading institutions — colleges, hospitals, churches, as well as insurance companies, investment trusts and trust funds. No one person, family or organized group owns more than 1% of the stock. In fact, the average holding is 122 shares.

This widespread ownership of Sinclair by people and institutions all over the United States, imposes a responsibility which Sinclair management endeavors to fulfill by policies that are both prudent and progressive—as they must be to meet the competition of other leading companies in America's oil industry.

SINCLAIR
A Great Name in Oil

SINCLAIR OIL CORPORATION • 630 FIFTH AVENUE • NEW YORK 20, N.Y.

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NEW HIGHWAYS TO HIGH MOUNTAINS... cascading trout streams, great forests, new trails, brilliant lakes, new lodges and cabins, the smell of pine needles.

NEW EXCITEMENT IN MOVIE COLONY...Television has been added! See premieres, homes of the stars, big-time radio shows, famous cafes.

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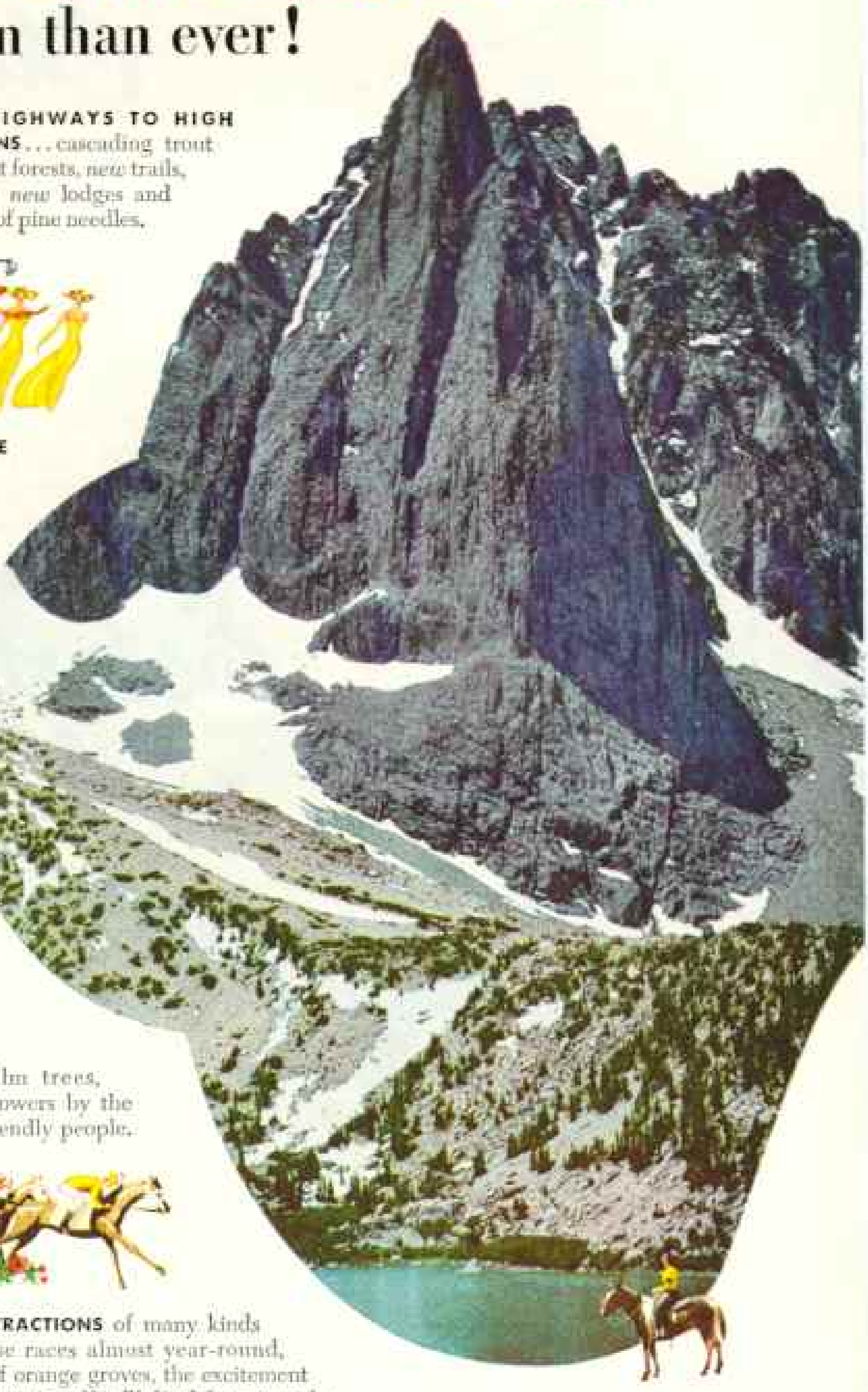
NEW DESERT RESORTS...palm trees, swimming pools, spring flowers by the mile, riding, golf, friendly people.

NEW ATTRACTIONS of many kinds ...horse races almost year-round, miles of orange groves, the excitement of a big city. You'll find Los Angeles County and all Southern California sunny and delightful in winter, spring, summer or fall. Ample accommodations.



ALL-YEAR CLUB OF SOUTHERN CALIFORNIA, LTD. *This advertisement sponsored by the Los Angeles County Board of Supervisors for the citizens of Beverly Hills, Glendale, Hollywood, Long Beach, Los Angeles, Pasadena, Pomona, Santa Monica and 182 other communities. Copyright, 1953, by All-Year Club of Southern California, Ltd.—a non-profit community organization serving vacationists.*

Advise anyone not to move here now unless assured in advance of employment.

AMERICA'S 4-SEASON VACATIONLAND

SEND COUPON FOR NEW FREE COLOR FOLDER

All-Year Club of So. California, Dept. C-3
629 S. Hill St., Los Angeles 14, Calif.

Please send me your free color folder "PLANNING YOUR SOUTHERN CALIFORNIA VACATION."

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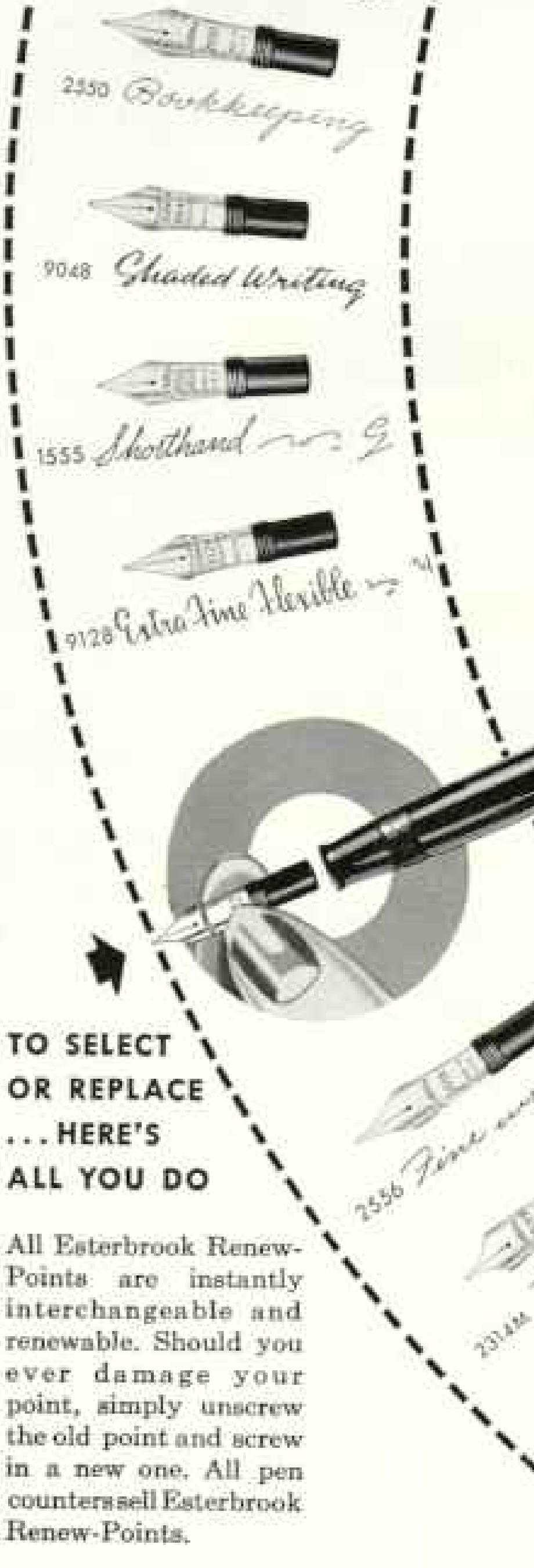
The Right Point for the Way You Write

. . . No matter *what* you write, no matter *how* you write it, there's an Esterbrook point made expressly for your kind of writing. For the greatest writing ease you've ever known, choose *your* point at the pen counter and fit it into an Esterbrook Fountain Pen.

Esterbrook®

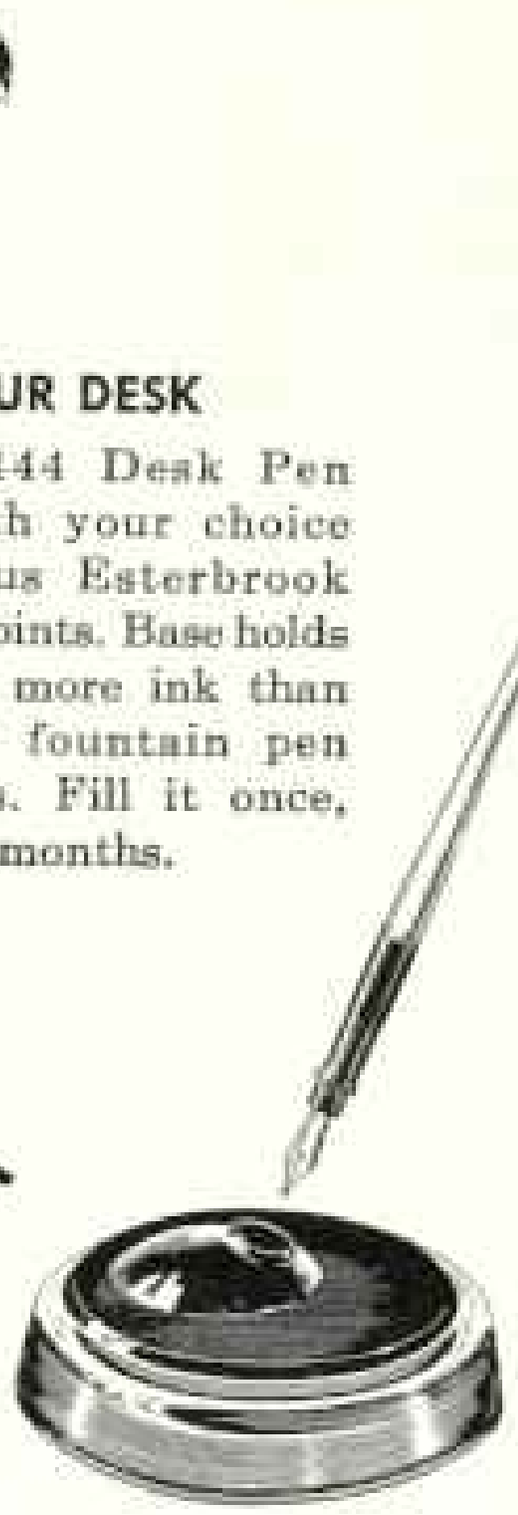
FOUNTAIN PEN

BY AMERICA'S FIRST PEN MAKER



TO SELECT OR REPLACE ... HERE'S ALL YOU DO

All Esterbrook Renew-Points are instantly interchangeable and renewable. Should you ever damage your point, simply unscrew the old point and screw in a new one. All pen counters sell Esterbrook Renew-Points.



FOR YOUR DESK

Model 444 Desk Pen Set. With your choice of famous Esterbrook Renew-Points. Base holds 40 times more ink than ordinary fountain pen desk sets. Fill it once, write for months.

Copyright 1931, The Esterbrook Pen Company

30 inches!

THE WORLD'S LARGEST TELEVISION TUBE

Another Du Mont first!

CABINET BY HERBERT ROSENGREN

From the laboratories that have made possible television itself . . . from the endless research that for twenty years has pioneered each step on the road to ever bigger and better pictures . . . comes the magnificent Du Mont *Royal Sovereign* . . . with its giant 30-inch tube . . . ushering in a new era in the beauty, power and glory of television. This Teleset* embodies on an unrivalled scale all the famous and exclusive Du Mont advantages . . . all the features that combine to produce the incomparable performance that is the hallmark of Du Mont.

*Trade Mark

The ROYAL SOVEREIGN by Du Mont, with 526-square-inch Lifetone* picture on a 30-inch direct-view tube. This distinguished Du Mont Teleset* has 46 tubes (including cathode ray tube and 6 rectifier tubes). FM radio. Cabinet dimensions: 48" high, 30" wide, and 27½" deep. Mahogany.

20th YEAR AS PIONEER

first with the finest in Television **DU MONT**

Copyright, 1951, Allen B. Du Mont Laboratories, Inc., Television Receiver Division, East Paterson, New Jersey and the Du Mont Television Network, 515 Madison Avenue, New York 22, New York.

"Honeymoon dreams came true... on our White Empress cruise to Europe"

"Everything was perfect from the start... the luxurious Canadian Pacific Empress of Scotland... the cruise down the picturesque St. Lawrence River. Canadian Pacific service made us feel relaxed and carefree. Every hour brought new fun... new excitement! Deck games galore... mid-morning bouillon, afternoon tea. We loafed in the sun... attended movies at night. The meals were wonderful, too.

"And imagine! All this—for as low as $252 First Class...$156 Tourist. A glorious 7-day holiday voyage... with airy staterooms, luxurious lounges, and the finest of service. The holiday spirit, John and I decided, simply must have been arranged with our honeymoon in mind!"

P.S. "Our local travel agent handled all details for us . . . without charge. He told us about Canadian Pacific's 19 resorts and lodges in Canada. Next year we plan to go to Banff and Lake Louise in the Canadian Rockies."

Canadian Pacific

SPANS THE WORLD

Railways • Steamships • Airlines
Hotels • Communications • Express

SEE YOUR LOCAL AGENT OR CANADIAN PACIFIC IN PRINCIPAL CITIES IN U. S. AND CANADA

Last year the automobile industry built an average of 27,000 cars and trucks every working day.

This represents a miracle of timing the flow of parts and components from thousands of suppliers the country over.

The size of the task may be judged from the part The Budd Company takes in this precise and delicate schedule.

Every day Budd must produce and deliver more than two hundred and sixty-seven freight car loads of automobile, truck and highway trailer parts . . . roofs, frames, doors, hoods, decks, panels, wheels, hubs, drums—a cataract of steel which merges with countless others on final assembly lines.

The all-steel automobile body was the first of many Budd developments, which have included the steel automobile wheel, the all-stainless steel railway passenger car, the railway disc brake, and, in a number of cases, the tools and processes with which to make them. The Budd Company, Philadelphia, Detroit, Gary.

Budd

PIONEERS IN BETTER TRANSPORTATION

NEW!

OLDSMOBILE

"HOLIDAY" SEDAN

A GENERAL MOTORS VALUE

*Standard equipment, accessories, and trim illustrated are subject to change without notice. *Oldsmobile Hydra-Matic Drive optional at extra cost.*

Above, distinctive new "Holiday-type" rear quarter window.

1951 "ROCKET" OLDSMOBILE "98"

"ROCKET 98"!—a *great* new Oldsmobile! A *magnificent* new Oldsmobile! The most *luxurious* new Oldsmobile ever built! *"ROCKET 98"*—now being launched at Oldsmobile dealers' showrooms everywhere! Four ultra-modern models—the De Luxe Holiday Sedan above, the De Luxe Holiday Coupé, the Holiday Coupé, the De Luxe Convertible Coupé! Four smooth, *smooth* new Oldsmobile Hydra-Matic* cars! Four great new gas-saving "Rocket" Engine stars—with a superb new "Rocket Ride"! And they all feature new roominess inside—new distinction and glamour throughout! See your Oldsmobile dealer—meet the new flagship of the "Rocket" fleet—*OLDSMOBILE "98" FOR 1951!*

New! Power-packed! Value-packed!

GE TABLE RADIO

You'll enjoy big-set performance with this compact, power-packed G-E beauty. *So* powerful it actually outperforms many consoles. You'll enjoy excellent tone—rich and full. Illuminated slide rule dial and large numbers for easy, accurate tuning. Exceptionally lovely cabinet in mahogany or ivory plastic. Here's top value at **$32.95***

General Electric Company, Syracuse, N. Y.

**Slightly higher West and South. Subject to change without notice.*

Model 404

Dial Beam Radio—It's Different

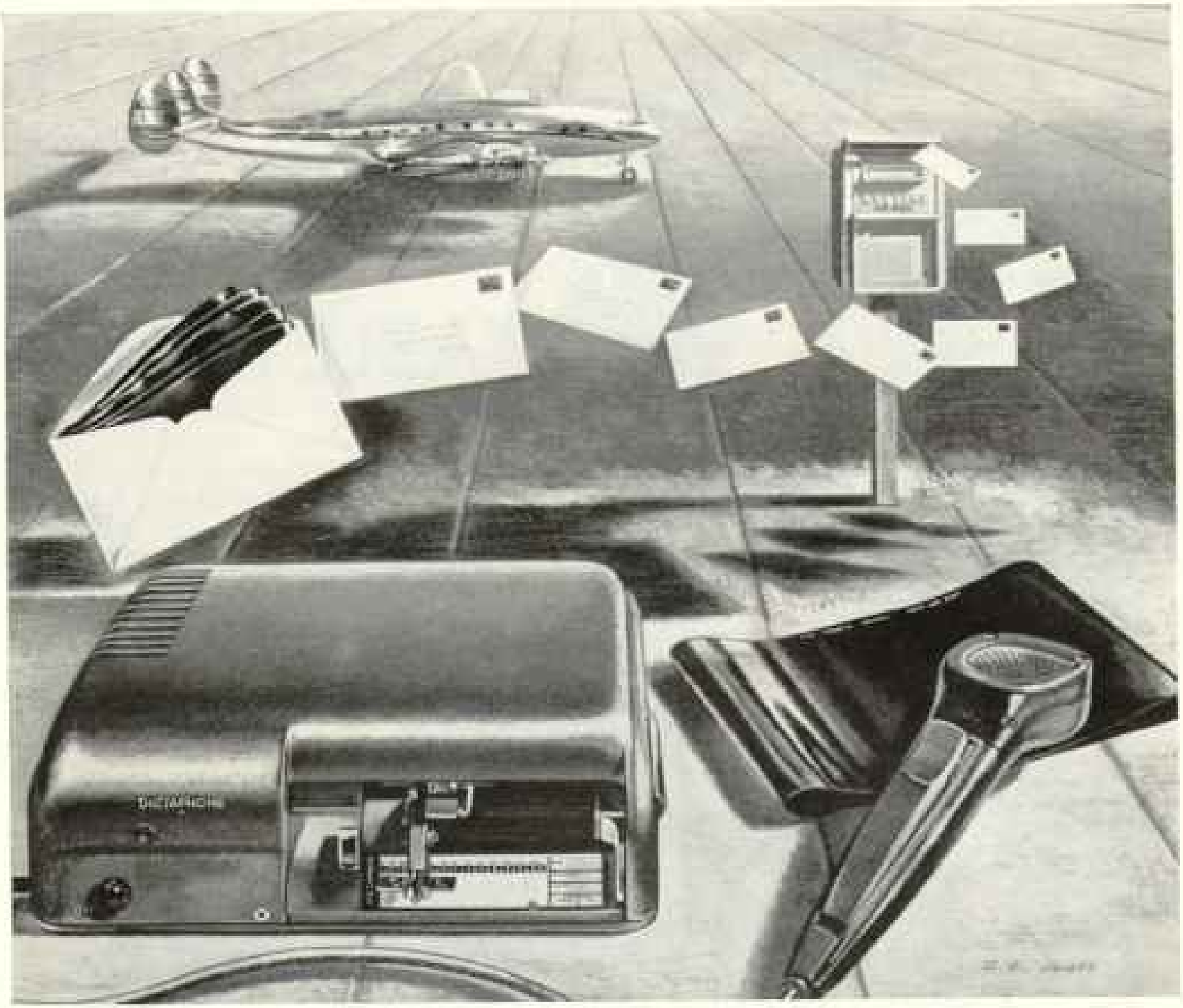
As you dial, a magic beam spotlights each station, for easy tuning, even in the dark! Beautiful cabinet in alabaster ivory, Congo brown or Persian red... *all at one low price!* Only **$22.95**

Model 400

You can put your confidence in—

GENERAL ELECTRIC

Mention the National Geographic—It identifies you



No dictating machine in history ever promised so much!

And lived up to its promise.

The Dictaphone TIME-MASTER definitely enables you to get more done, in less time, and at less cost! Just "think out loud" to the TIME-MASTER! It will help you do better work, increase office efficiency!

An electronic "thought trap," the TIME-MASTER is always there, ready in an instant to record your thoughts as they occur to you! Just the flick of a switch and you can start talking!

The plastic *Memobelt*, TIME-MASTER's unique *one-time* recording medium, accounts for the TIME-MASTER's compactness and complete portability! It's always ready—always handy!

And—your secretary will love transcribing with the TIME-MASTER's tiny Magic Ear that's light as a feather and won't muss hair!

For complete details on getting things done with the new TIME-MASTER and *Memobelt* write for your free copy of Dictaphone's new booklet: "Time Itself." Write Dictaphone Corporation, Dept. H-31, 420 Lexington Avenue, New York 17, N. Y.

DICTAPHONE CORPORATION

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Loads of fun for everyone in Ontario

All year

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"The crystal air and peaceful quiet of the Northern lakes are yours for the asking".

"For fishing thrills . . . go where the fighting big ones await you—Ontario!"

"... and for swimming or sunbathing, there's bracing water and soft sand beaches".

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Ontario

Ontario Travel
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Please send me free guide map and illustrated booklet about Ontario.

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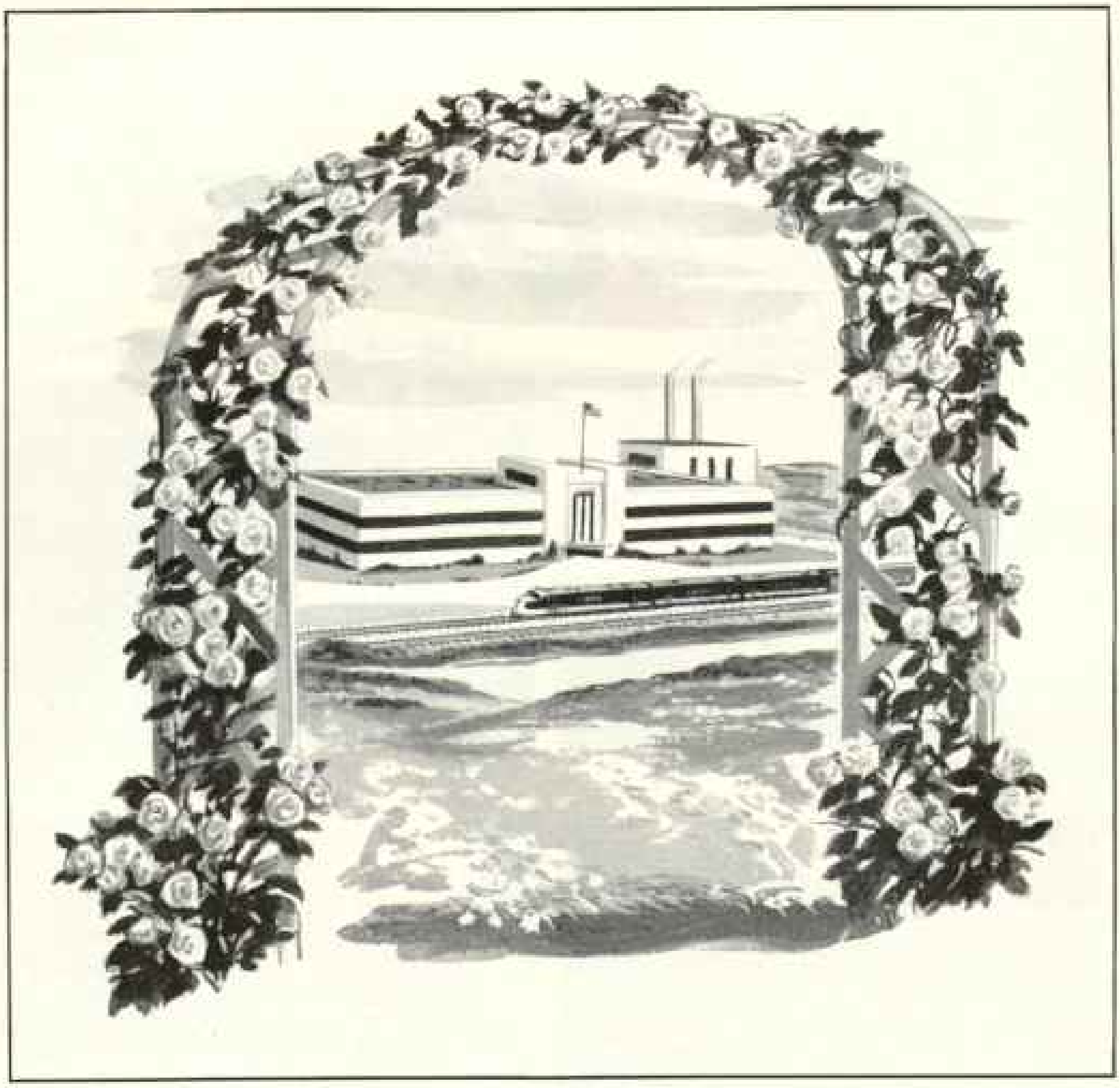
WRITE TODAY FOR FREE ILLUSTRATED BOOKLET AND GUIDE MAP



Land of roses . . . *without rose-colored glasses!*

INDUSTRIES in the fast-growing Southland don't need rose-colored glasses to see a "rosy" future!

For here, a gentle climate and a generous Nature offer exciting new opportunities to factories of every kind.

Along the Southern Railway System industries are facing the future with courage and confidence . . . inspired by the unique advantages of this modern industrial "wonderland."

"Look Ahead—Look South!"

Ernest E. Norris

President

LOOK SOUTH LOOK AHEAD

SOUTHERN RAILWAY SYSTEM

The Southern Serves the South

ZENITH BRINGS YOU

PITCH AND TEMPO CONTROL

WITH THE SIMPLEST AUTOMATIC RECORD PLAYER EVER INVENTED!

IT'S ZENITH'S *sensational new way to play records.* And music lovers are a-buzz with the news of these new Zenith "Cobra-Matic" Radio-Phonographs!

Just think—*now* you can play all records always at the *exact* speed they were recorded. You can play records faster or slower, to suit your dancing mood. You can control pitch to suit your own musical preference. Thus you can *sing* with any record, too. Or *accompany* it with any musical instrument!

Now your cherished old records, too . . . the Gold Seals, Columbias, Victors, Brunswicks that were recorded at different speeds . . . can be played in perfect pitch and with rich new tone quality. The "Cobra-Matic" has 3,000 speeds to let you play records of any present speed from 10 to 85—including the coming 16 R.P.M. You set one control for record speed, the other control for record size—7, 10 or 12 inch. *And that's all there is to it!*

Above, the New Zenith® **"Classic" Radio-Phonograph,** with Cobra-Matic Record-Player, Super-Sensitive FM Radio, Long-Distance® AM Radio. Chippendale cabinet, beautiful Swirl Mahogany veneers. **$349.95***

New Zenith "Cobra-Matic" Record Player—the Music Lover's Dream. Available only on new Zenith Radio-Phonographs and TV Combinations. See them now at your Zenith Radio and Television dealer's.

ZENITH RADIO and TELEVISION

*Prices subject to change without notice.

Zenith Radio Corporation, Chicago 39, Illinois • *Also Makers of Fine Hearing Aids*

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Top Secretary HAZEL MENDLER
Secretary to Randolph Sevier, President, Matson Navigation Company, says, "I am delighted with my new Electri-conomy—it makes typing so easy, so fast."

and thousands like her prefer the Remington *Electri-conomy*

Today, essential industries realize that it takes peak output in the office to achieve peak production in materials handling. That's why top secretaries like Matson Lines' Miss Mendler go for the swift, effortless typing speed of the Electri-conomy—those 20 clear carbons at one typing—the handsome "Executype" for letters of true distinction that will be signed with pride—and that glorious "alive-at-five" feeling because *electricity does the work!*

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THE FIRST NAME IN TYPEWRITERS

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☐ Yes, I would like a FREE copy of "The New Remington Electri-conomy Typewriter" (RE 8353).

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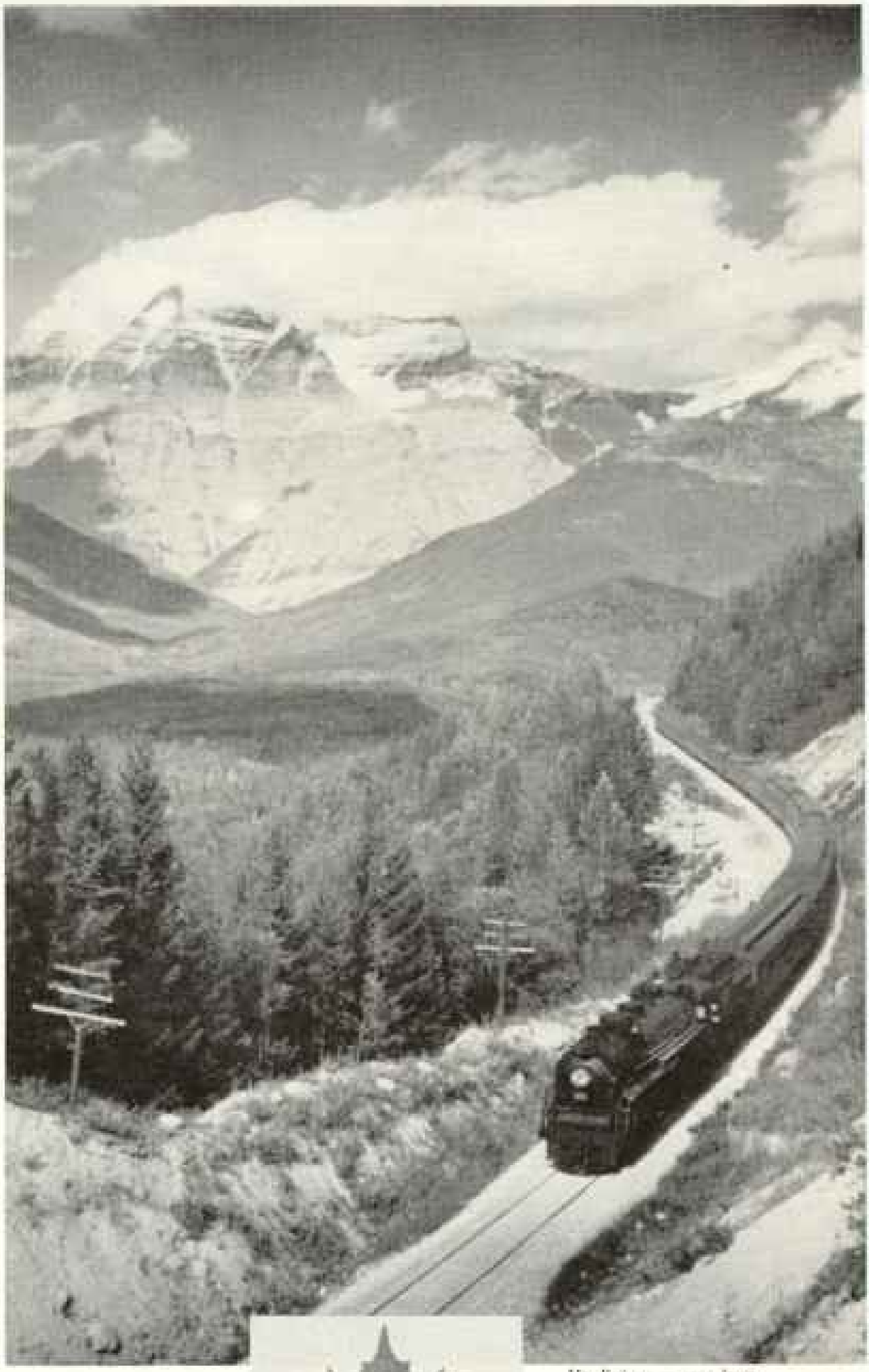
Make your selection now. Let us help you plan your vacation in Canada. Canadian National's MAPLE LEAF TOURS (unescorted) outline routes, days, dollars, and can be tailored to meet your needs. Visit or write your nearest Canadian National office listed below,* or your Travel Agent.



Mt. Robson — seen from "The Continental Limited"

Across Canada ...ONE OF CANADA'S 10 TOP VACATIONS!

To California or the Pacific Northwest — to New York or anywhere East — travel one way Canadian National and get these big bonuses: exciting Canadian Rockies scenery — stopovers "abroad" in colorful Canadian cities — a chance to enjoy the hospitality of smart Canadian resorts. Your trip is easily arranged at any C.N.R. office. U.S. citizens need no passport.

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SERVING ALL 10 PROVINCES OF CANADA

*Canadian National offices in Boston, Buffalo, Chicago, Cincinnati, Detroit, Flint, Mich., Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Philadelphia, Pittsburgh, Portland, Me., San Francisco, Seattle, St. Louis, Washington, D.C. Offices also in Montreal, Que., Can.; Sydney, Australia; and Wellington, New Zealand.

WHENEVER YOU COME...WHEREVER YOU GO...YOU'LL FIND MORE THAN EVER TO DO AND SEE!

COME FOR ENTERTAINMENT . . . great music, drama, ballet and opera brilliantly performed and superbly presented at more than twenty fairs and festivals . . . Britain's and the world's greatest on display.

COME FOR THRILLS at *world-renowned* sports events . . . the Grand National, the 172nd Derby, the Tennis Championships at Wimbledon, yachting at Cowes, golf at St. Andrews. Be here for one or more!

Come to Britain

IN FESTIVAL YEAR

Thrill to the Scottish Piper's pibroch.

● This is *your* year of years to "Come to Britain"! For this year—"Festival Year", with its glittering parade of exhibitions, fairs, and festivals lends added color and excitement to everything you'll see . . . famous sporting events . . . age-old ceremonies . . . glorious pageantry! Whenever you come, in any month of the year, you'll sense a special and gala spirit in the air.

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Consider coming in April or May—to avoid the midsummer rush! Ask your travel agent for FREE literature or write BRITISH TRAVEL CENTRE, Box 113, 336 Madison Avenue, New York 17, N. Y.

WHEREVER YOU SHOP...WHATEVER YOU BUY...YOU'LL FIND THAT YOUR DOLLAR GOES FARTHER!

EXPLORE THE PAST in ancient places . . . castles, palaces, cathedrals . . . scenes enchanted by literature and legend . . . places made famous by great men. In Britain, history's charm is all around you!

ENJOY THE PRESENT, taking time out from eventful days to relax in Britain's unspoiled countryside. You'll find a warm welcome in our quiet towns, our inns, and truly get to know a friendly people!

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How long does it take to roast a Receivable?

In minutes...in an ordinary safe or metal cabinet ...though no flame touches them...*a fire can destroy your vital business papers and put you out of business!*

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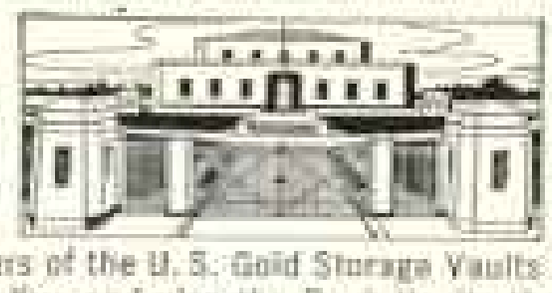

Builders of the U. S. Gold Storage Vaults at Fort Knox, Ky., and also the Bank Vaults that withstood the Atomic Bomb at Hiroshima and preserved their contents.

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☐ The free booklet, "What You Should Know About Safes."

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200 NOTE SHEETS
100 ENVELOPES
All printed with your name and address
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Order in quantities as listed. No "split-package" orders accepted. Maximum printing—4 lines, 30 characters per line. Remit with order. West of Denver, Colo., and in U.S. possessions, add 10%. (No foreign orders.) We pay the postage. *Satisfaction guaranteed.*

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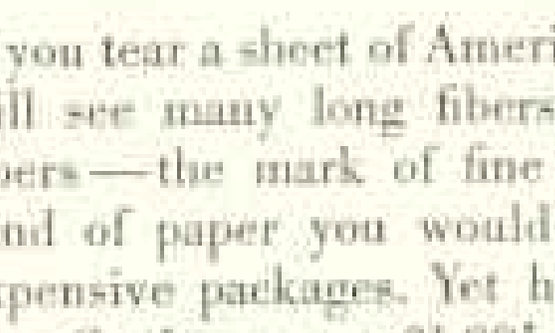

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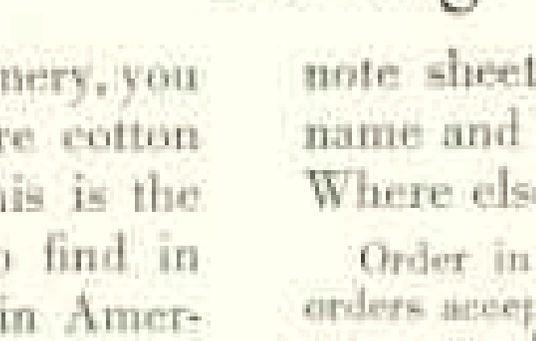
500 TIGHT-SEAL ENVELOPES (envelopes as in the Standard Package). A perfect seal with the slightest pressure. Neatly printed. Only $1.00



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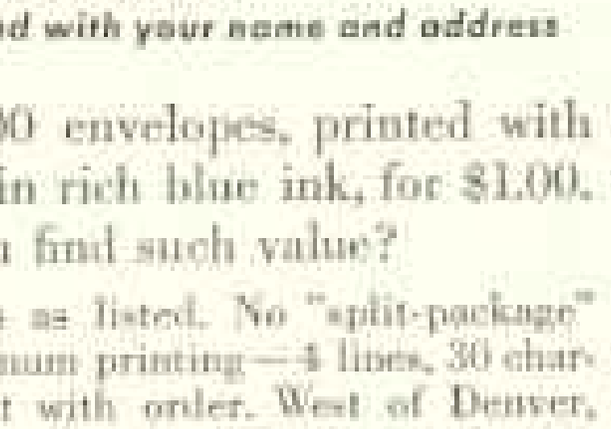

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125 LONG STYLE SHEETS (6½ x 10½) and 125 LONG STYLE ENVELOPES in heavier *cotton fiber* paper. All neatly printed with your name and address . . $2.00

Mention the National Geographic—It identifies you

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From steaming geysers to glaciers of blue ice . . . timbered mountains to Pacific Ocean sands . . . bustling waterfronts to wilderness chalets, the Pacific Northwest is a bountifully endowed vacationland.

What could be better than going there on The Milwaukee Road's Olympian HIAWATHA? The scenery is glorious, the service superb and accommodations may be chosen to suit your travel budget. Private-room cars with Skytop Lounge, unique and thrifty Touralux sleepers, Luxurest coaches, diner and Tip Top Grill.

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YOU'D ROAM flower-filled valleys, and explore cool pine forests. You'd ford mountain streams, and fish them for trout. You'd broil a steak under the stars, and hear cowboys swap tall tales. You'd see a rodeo, snap portraits of bear and antelope. All this you can do *this* summer at a Rocky Mountain Dude ranch. And to enjoy your summer vacation *more*, ask your Travel Agent to route you via the streamlined **NORTH COAST LIMITED**—the comfortable, convenient way between Chicago and the North Pacific Coast.

Send now for our **FREE PICTURE BOOKLET** "Ranch Vacations". Write G. W. Rodine, 502 Northern Pacific Railway, St. Paul 1, Minn.

NORTHERN PACIFIC

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Baltimore, Boston, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Kansas City, Milwaukee, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Sheboygan.

Plan now . . . GET MORE OUT OF YOUR VACATION

There's more to do . . . more fun for you in MAINE

Explore lakes and streams, deep woods and the beaches and bays of Maine's island-studded seacoast. Enjoy swimming, golfing, fishing, canoeing, sailing, camping. Fun for all the family . . . accommodations to suit your purse.

Send for your **FREE KIT**

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Please send my **MAINE VACATION PLANNING KIT**

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...**Or sightsee,** shop, "take in" special events in cities old and new.

WHEREVER you travel, wherever you play in Canada, you'll find Nature at your side. Here are high mountains and lovely woodland lakes, romantic ocean shores and mighty inland cruiseways. Feast your eyes and click your camera in the green vastness of National Parks. Live in casual luxury at a beauty-blessed resort. Go calling on relatives or friends . . . You can flavour your holiday exactly to your taste in friendly Canada.
Write now for information, or use the handy coupon below.

...**Or get together** with fellow-anglers at a northwoods fishing camp, where canny guides lead you to the big ones.

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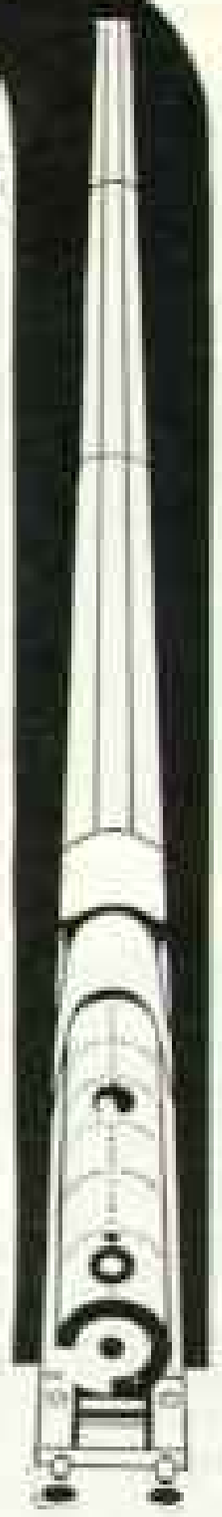
1951—FESTIVAL OF BRITAIN YEAR



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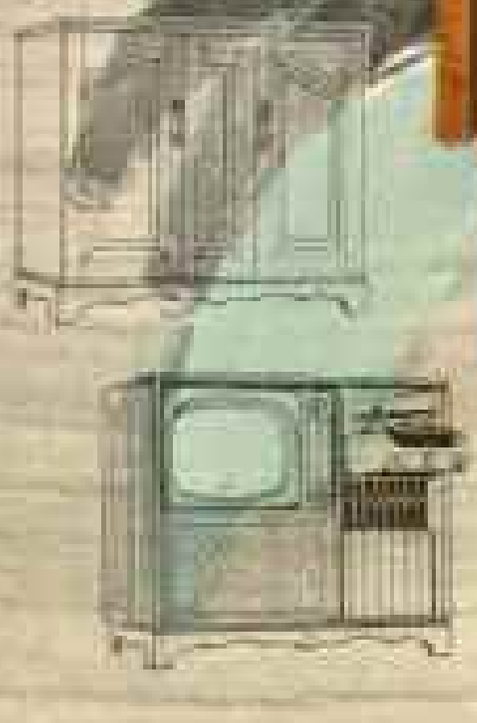

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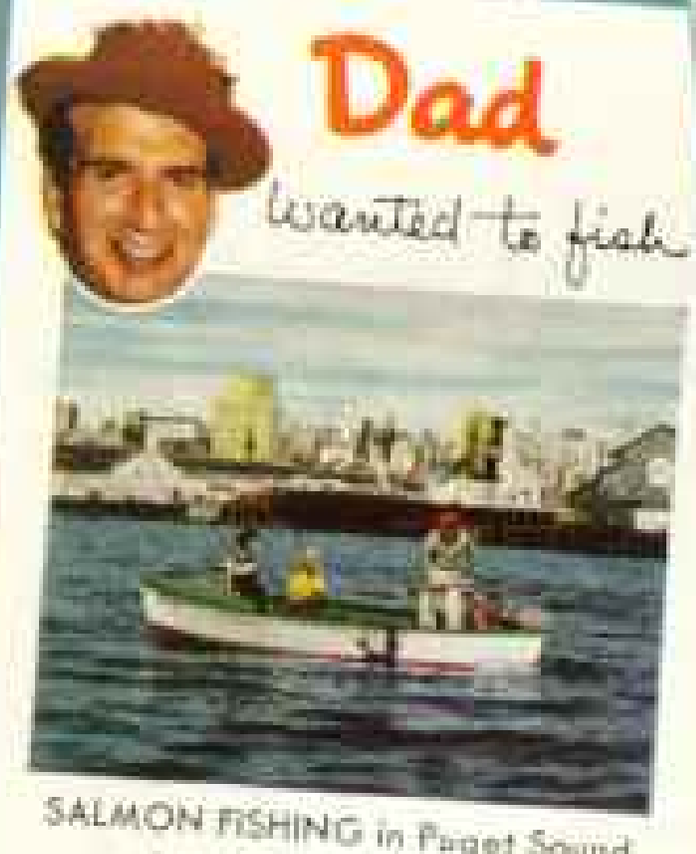

Dad

wanted to fish

SALMON FISHING in Puget Sound —also trout in lakes, streams.

Mom

wanted to relax

CRUISING in San Juans— we relaxed in scenic wonderland.

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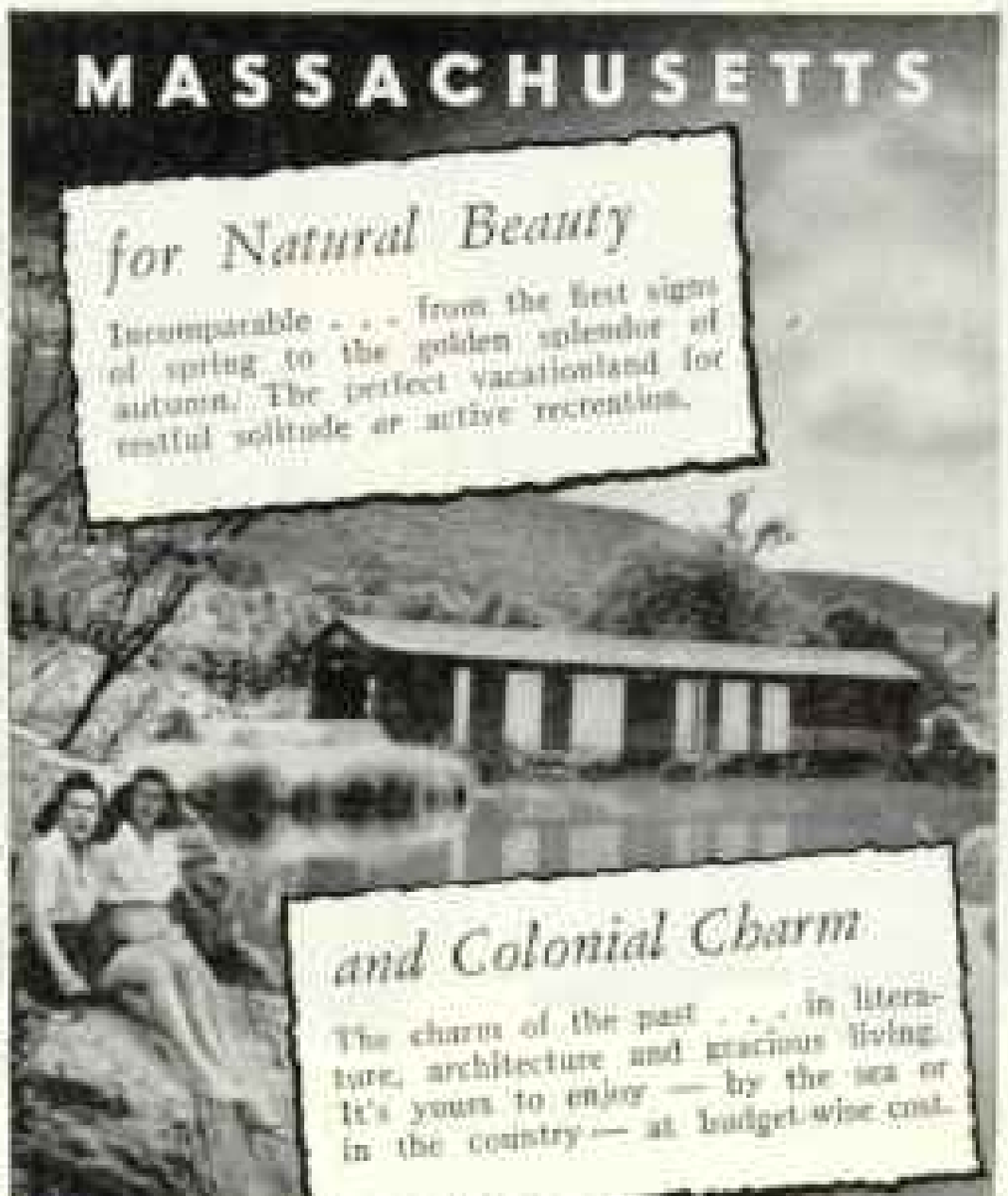

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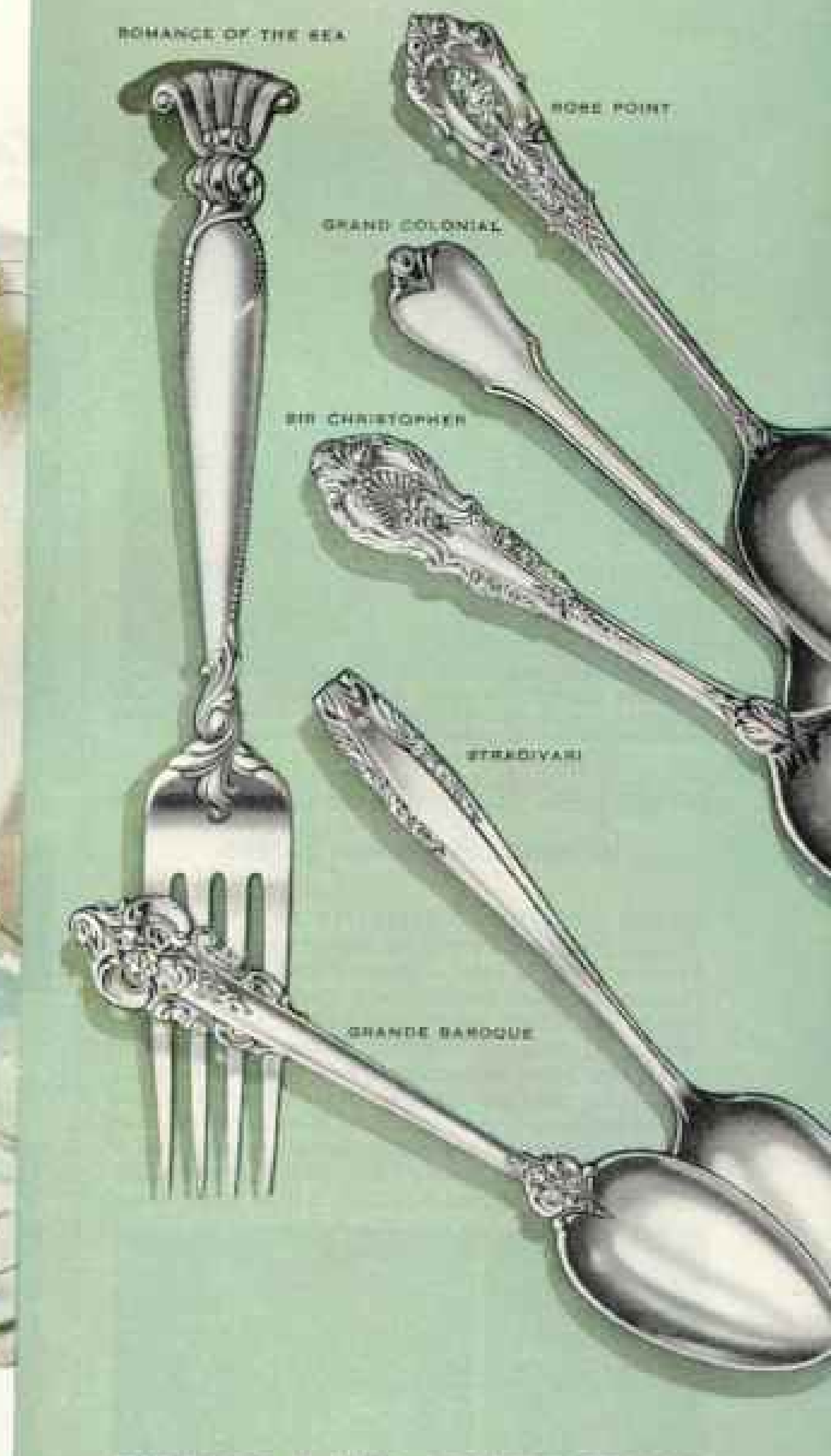

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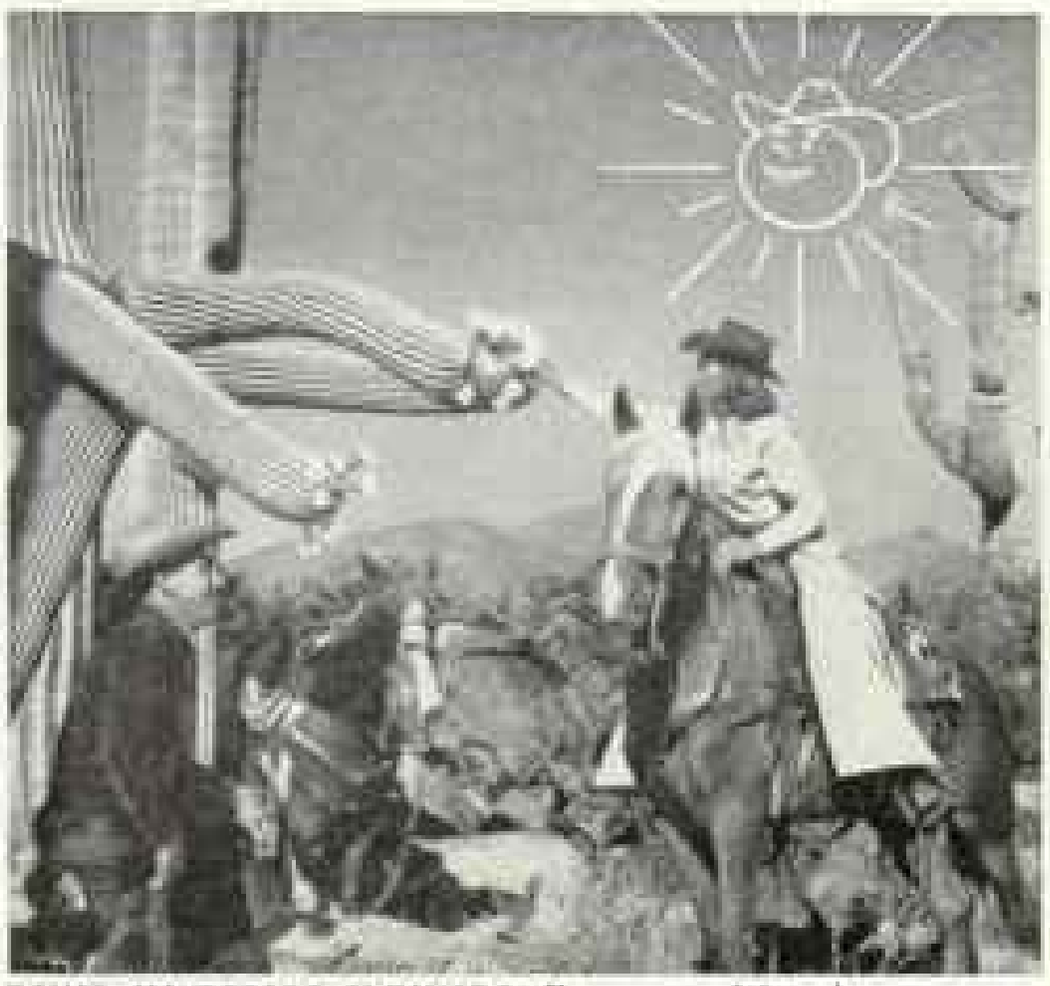

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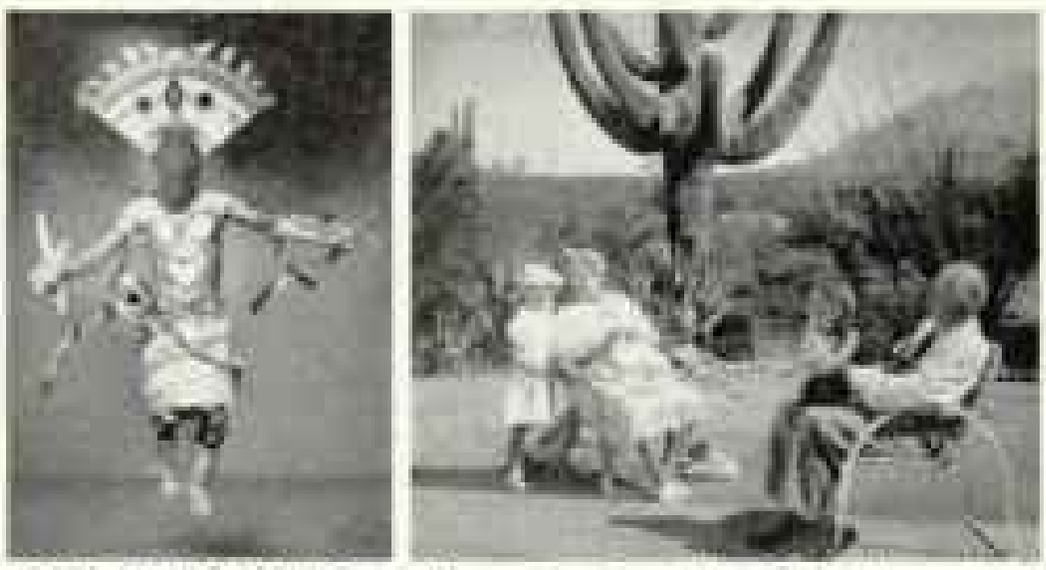

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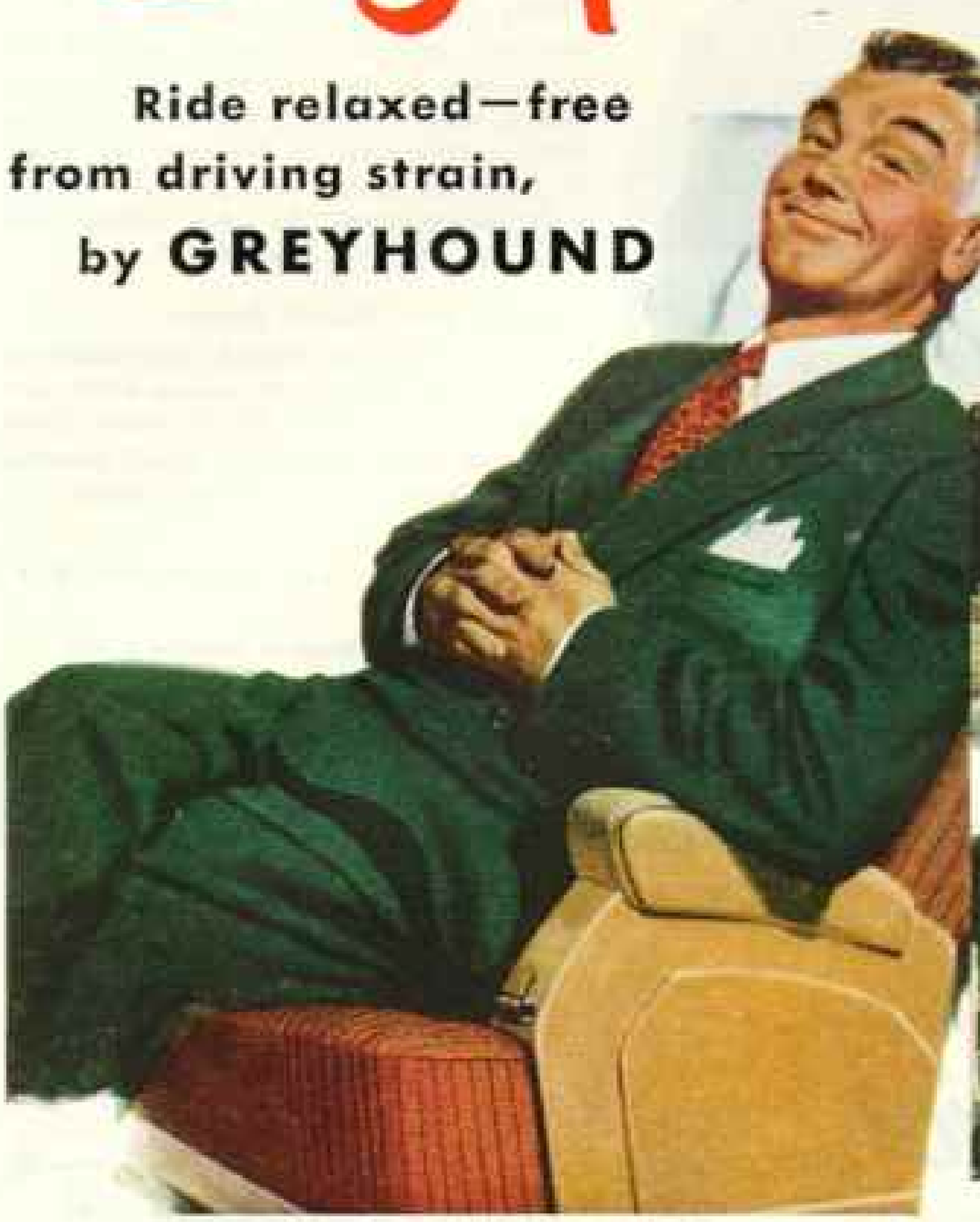

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Virginia's lovely gardens are open to visitors during Garden Week (April 21-28), and the countryside is beautiful with Dogwood, Redbud, and wild flowers.

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E-7

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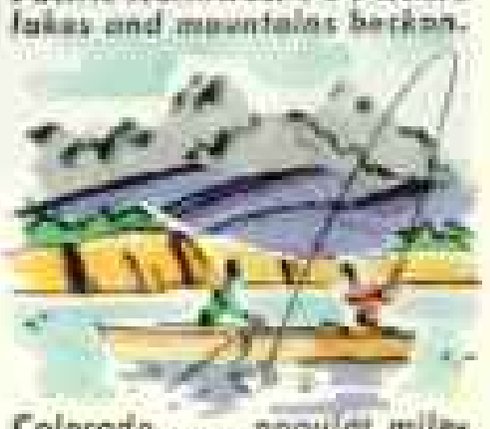
California . . . . glamorous land of healthful recreation.

Pacific Northwest . . . where lakes and mountains beckon.



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Ocean beaches . . . lakes and streams . . . mountains . . . canyons . . . geysers. There's a wide variety of scenic attractions from which to select. And—if you like healthful recreation or prefer a complete rest, you'll find it in the vast "Union Pacific West."

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yet my mouth feels fresh, clean and cool—thanks to Polident!*

*"Every day I soak my plates in a solution of Polident and water. My mouth feels clean and cool all the time . . . and no Denture Breath."

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YOU know what Mr. R means—don't you! It's a wonderful feeling to know that you're not offending friends with Denture Breath.

Soak your plates in Polident every day. It's so easy and quick. And Polident soaks into every corner and crevice—places brushing never seems to reach.

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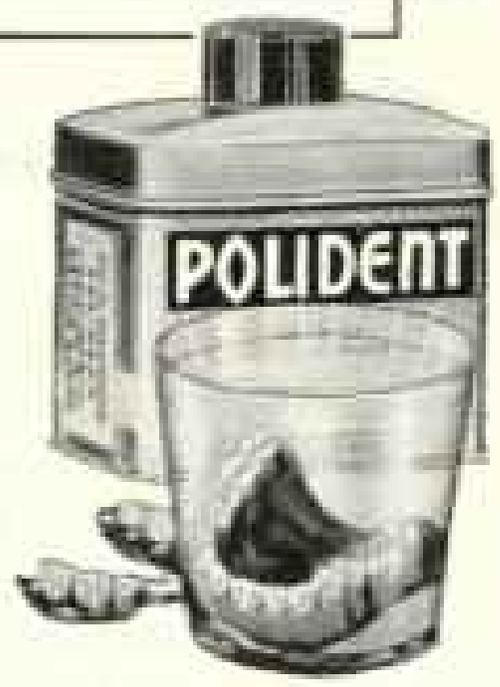


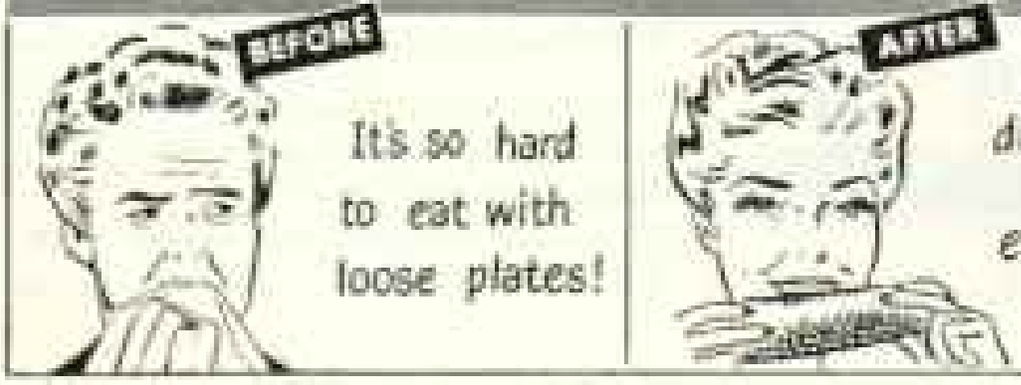
Soak plate or bridge daily—fifteen minutes or more—in a fresh, cleansing solution of Polident and water.

No Brushing

POLIDENT

Recommended by more dentists than any other denture cleanser

LOOSE FALSE TEETH?



Amazing New Cream Holds Tighter, Longer than anything you've ever tried or double your money back

POLI·GRIP

Made and guaranteed by POLIDENT

GOOD DENTAL HEALTH

Protect the first teeth

By keeping the child's first teeth clean and free of decay, there is less likelihood of losing them prematurely and a better chance that permanent teeth will develop normally.

Authorities recommend periodic examinations beginning at age three. Sodium fluoride treatments, which help teeth resist decay, may also be given by your dentist.

Guard against teen-age decay

It is estimated that 95 out of every 100 high school children have some tooth decay. During teen years, teeth seem to be especially susceptible to cavities and eating too many sweets may contribute further to this condition.

Proper diet and regular dental care during these years may help to assure good dental and physical health throughout life.

Eat enough tooth-building foods

A diet rich in vitamins and minerals is one of the most important factors in building and maintaining sound teeth at all ages.

These elements are supplied by milk, meat, eggs, vegetables and fruits, bread and cereals, and fish liver oils. In addition, vigorous chewing of tough, crisp foods helps keep teeth and gums healthy.

Keep the teeth clean

The acids which cause decay are formed in the mouth soon after eating. Thus, to get the full benefit of the toothbrush, it should be used *after meals and especially before retiring*.

The dentist will be glad to advise you about the proper methods of keeping teeth clean.

Help protect the gums

Gum diseases affect about 80 per cent of the adult population. Frequently, such conditions are brought on by deposits of tartar which irritate the gums, and the infection may spread to other parts of the body.

By having the dentist treat infected gums early, it is usually possible to cure them and to prevent the spread of infection.

Visit the dentist regularly

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Periodic visits to the dentist for cleansings, examinations, and necessary treatment are the best safeguards against serious conditions which may affect the teeth and the mouth.

Metropolitan Life Insurance Company

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Please send me a copy of your booklet, 31N, "For Good Teeth."

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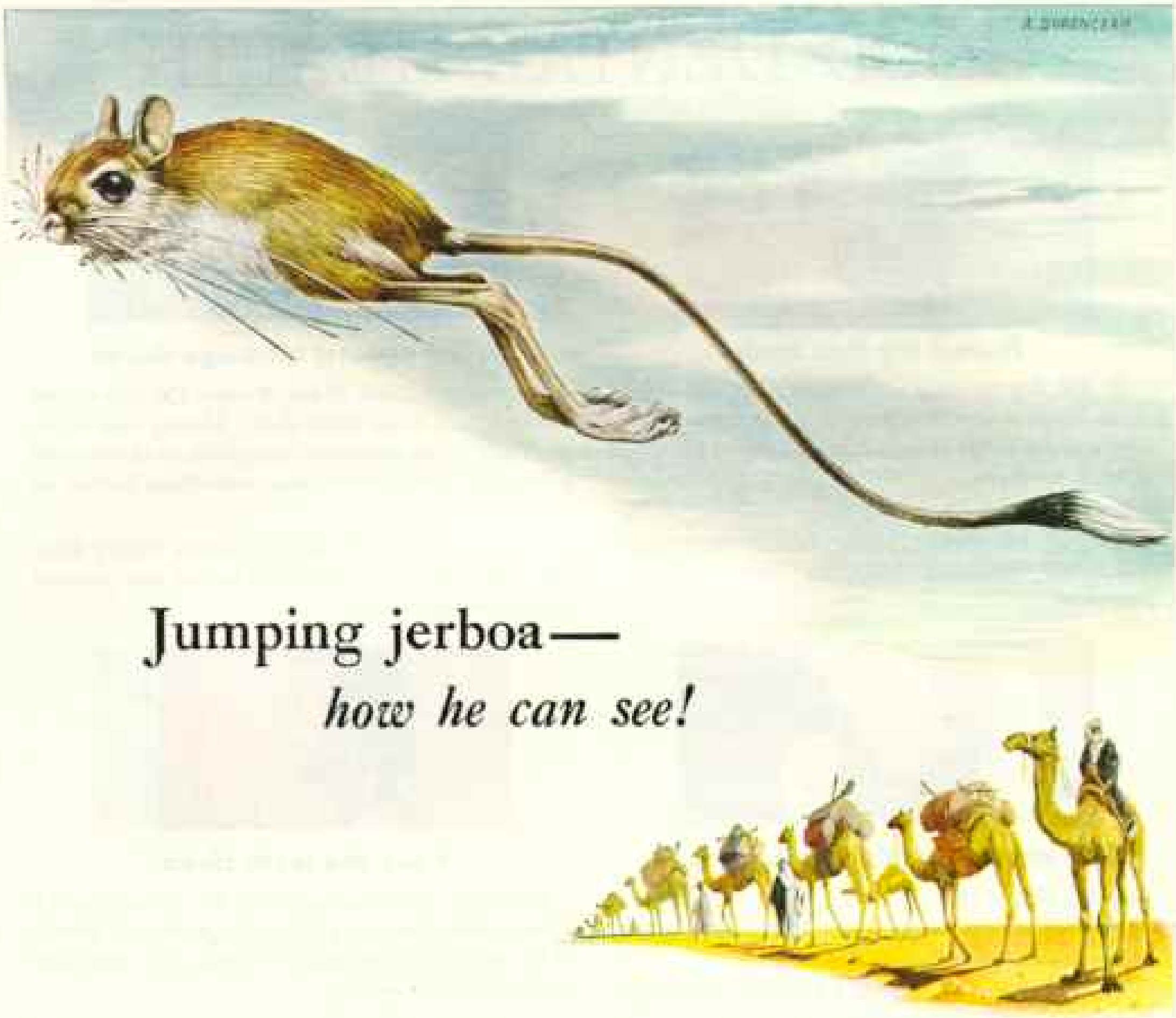

Jumping jerboa—

how he can see!

THE AFRICAN JERBOA, *Jaculus jaculus*, never has to crane his neck to see what's behind, above, or to the side of him.

His vision is a full, horizon-sweeping 360 degrees. So when he's being chased by a fox, desert hawk, or other enemy, he can keep an eye on his chaser to see how he's doing and look ahead for a hiding hole—without even turning his head.

And when he's hard pressed, the jerboa, which is only five inches tall, can jump fifteen feet in one hop—to get out of trouble's way.

If everybody who drives a car were as well equipped as Jaculus to spot oncoming danger—and to duck it—automobile accidents undoubtedly would be fewer. But even if all of us had eyes in the back of our heads (and cars were as nimble as a jerboa), there'd still be a terrifying lot of smash-ups, with traffic what it is today.

Fact is, approximately 1,600,000 persons were injured in auto accidents last year. And never before has it been so important to carry insurance, *and enough of it.*

In nearly every state of the Union and in the provinces of Canada, you can—if you have an accident—lose your driving license, your car license, your car and your savings, and also accumulate a debt to last for years.

That's much too big a risk to take. So why not call your Travelers agent or broker today?

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VALIANT
Pen, $12.50
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One of the popular models in the new TM "White Dot" range. Other Sheaffer's from $3.75.

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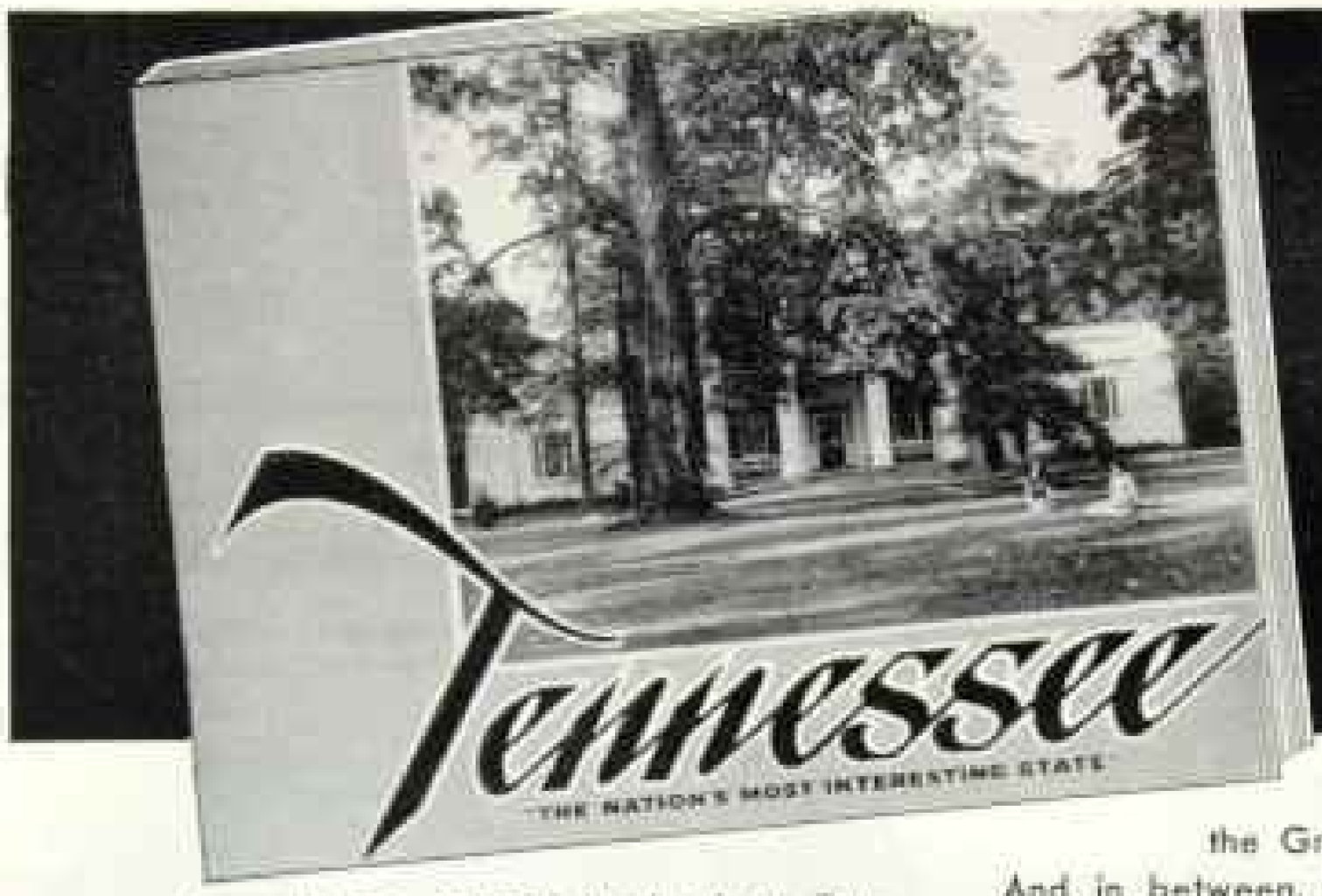

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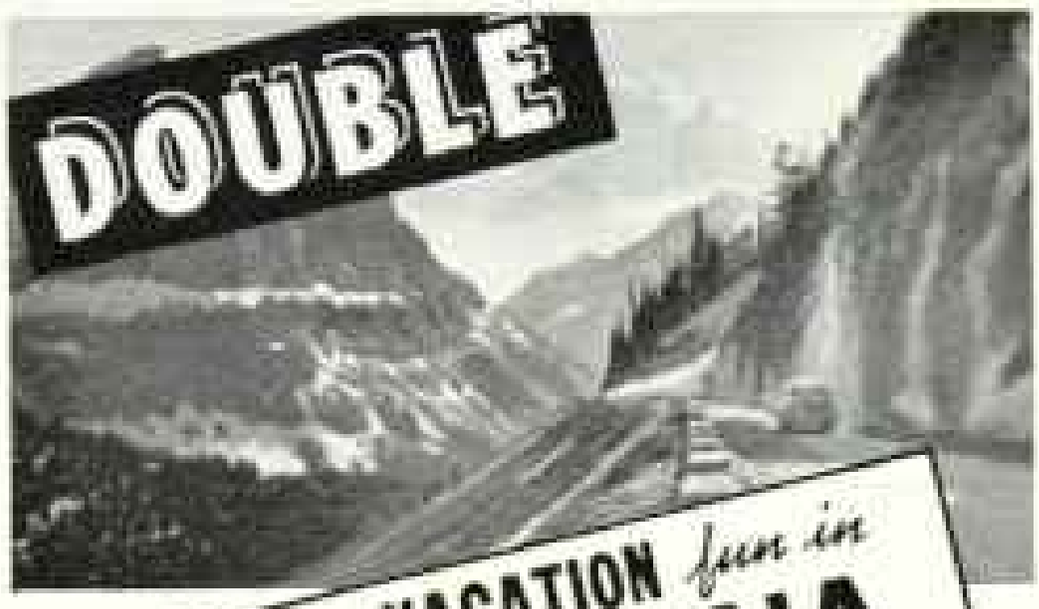

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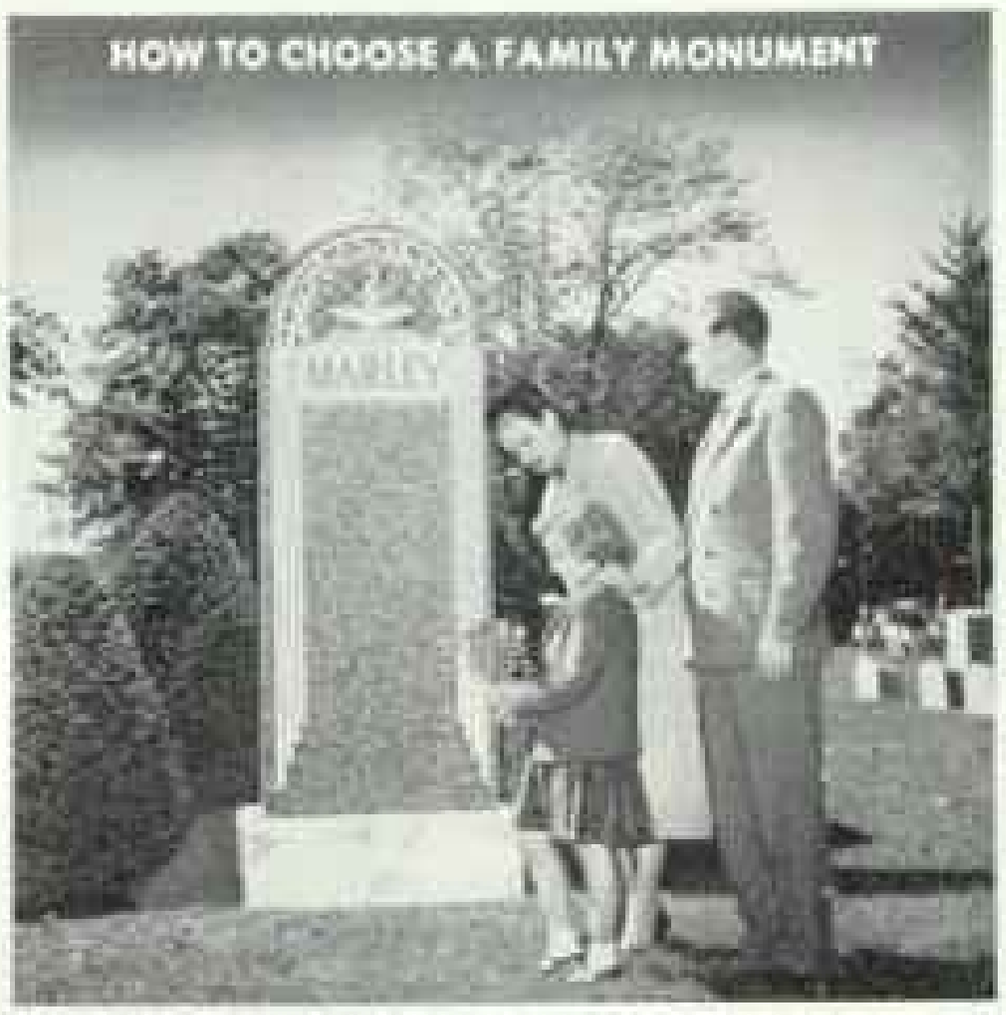

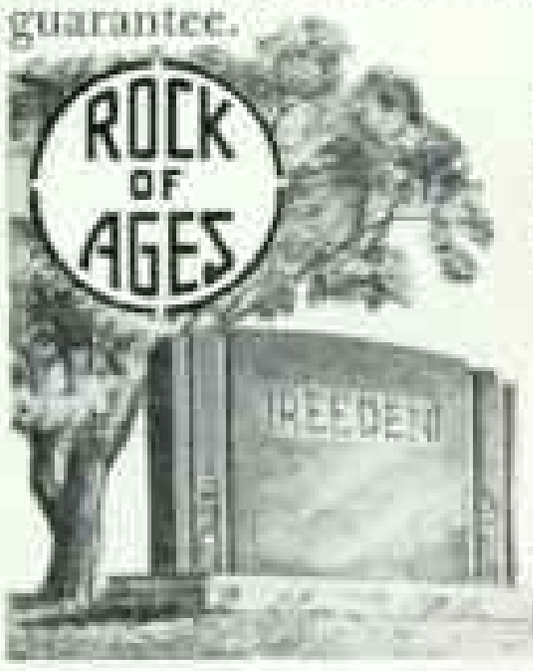

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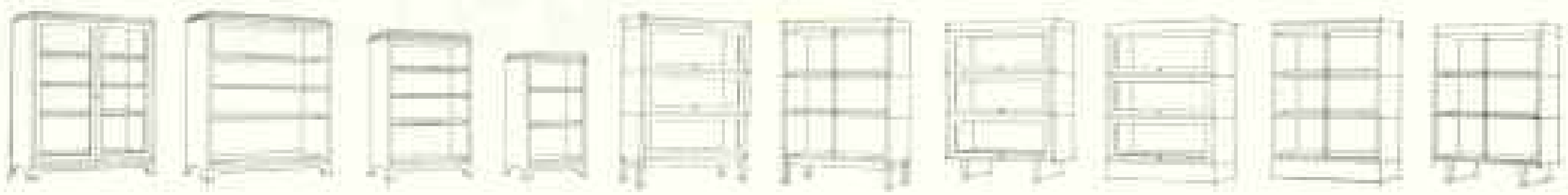

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